



**CENTER FOR  
VALUE BASED  
MEDICINE®**

# **Quality-of-Life Utility Database®**

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# Table of Contents

|                                    | <u>Page</u> |
|------------------------------------|-------------|
| Title page                         | 1           |
| Table of Contents                  | 2           |
| Executive Summary                  | 4           |
| Overview                           | 6           |
| Utility Analysis                   | 7           |
| Value-Based Medicine               | 8           |
| Case Analysis                      | 9           |
| The Need                           | 10          |
| Specific Database Features         | 12          |
| • Methodology                      |             |
| • Preferences                      |             |
| • Numbers                          | 13          |
| • Demographics                     |             |
| -Age range of participants         |             |
| -Ethnicity of the sample           | 14          |
| -Educational level of participants |             |
| • Sampling Strategy                | 15          |
| • Comorbidities                    |             |

## Table of Contents (cont.)

|   | <u>Page</u> |
|---|-------------|
| <b>Database Features (cont.)</b>  |             |
| Reliability (reproducibility)   | 16          |
| • Test-retest reliability   |             |
| • Intra-rater reliability   | 17          |
| • Inter-rater reliability   |             |
| Confounding variables   |             |
| Smoothing of the data   |             |
| Correlations with other quality-of-life instruments                           | 18          |
| Exclusion criteria  |             |
| Dropout rate  |             |
| Validity  | 19          |
| • Overview  |             |
| • Criterion validity  |             |
| • Construct validity  |             |
| Field Evaluation of the <i>Database</i>                                       |             |
| Summary   | 20          |
| References  | 21          |
| Table of Contents for the Quality of Life<br>Valuation Database <sup>SM</sup> | 25          |
| Appendix  | 47          |
| The Center for Value-Based Medicine <sup>®</sup>                              | 52          |
| Principals of the Center for Value-Based Medicine <sup>®</sup>                | 53          |

# Executive Summary

1. The *Quality-of-Life Utility Database*<sup>SM</sup> is an information system that numerically quantifies the quality-of-life associated with diseases across all specialties of medicine using time tradeoff utility analysis values obtained from patients.
2. The *Quality-of-Life Utility Database*<sup>©</sup> consists of 50,000+ standardized, utility point estimates obtained from over 5,000 patients and the peer-reviewed literature that can be used to quantify the *patient-perceived value* conferred by healthcare interventions.
3. The *Quality-of-Life Utility Database*<sup>©</sup> can be used in cost-utility (cost-effectiveness) analyses to objectively evaluate and compare all pharmaceutical, medical and surgical interventions.
4. When integrated with the best evidence-based data, the *Quality-of-Life Utility Database*<sup>©</sup> allows the practice of *Value-Based Medicine*<sup>®</sup>, a process that more accurately measures patient treatment benefits than *evidence-based medicine* alone.
5. There is no known comparable database on the market globally.
6. The principals who led the endeavor to create the *Quality-of-Life Utility Database*<sup>©</sup> have unmatched credentials in the crossover areas of medicine, nursing, clinical research, managed care, business, biostatistics, epidemiology and public policy.
7. The *Quality-of-Life Utility Database*<sup>©</sup> was created with the intention of maximizing compatibility with evidence-based clinical trials, especially pharmaceutical trials.
8. The *Quality-of-Life Utility Database*<sup>©</sup> is correlated with specific diseases (using ICD-9-CM codes) and the *severity* of these diseases.

9. ***Quality-of-Life Utility Database***<sup>®</sup> data demonstrate excellent construct validity when correlated with quality-of-life instruments used in general medicine, oncology, cardiology, pulmonology, neurology, rheumatology, ophthalmology and other specialties.
10. The primary data in the ***Quality-of-Life Utility Database***<sup>®</sup> statistically mirror an ethnic cross-section of the US population.
11. The ***Quality-of-Life Utility Database***<sup>®</sup> has been demonstrated in the peer-reviewed literature to have excellent reproducibility.
12. The ***Quality-of-Life Utility Database***<sup>®</sup> has been corroborated for construct validity across gender, age, ethnicity, educational levels, socioeconomic strata, and international borders in the peer-reviewed literature.
13. The ***Quality-of-Life Utility Database***<sup>®</sup> obviates the need to repeat prohibitively expensive clinical trials to obtain quality-of-life data.
14. ***Quality-of-Life Utility Database***<sup>®</sup> data have been used in analyses to decide public policy and set healthcare standards for over 100 million people.
15. The ***Quality-of-Life Utility Database***<sup>®</sup> provides patient-based preferences that allow drug and healthcare service purchasers to perform value and cost-effectiveness analyses on the goods and services they purchase. They can thus more effectively and scientifically price their current and future payments for these goods.
16. The ***Quality-of-Life Utility Database***<sup>®</sup> utilities are correlated with other quality-of-life instruments, including the American College of Rheumatology Classification of Global Functional Status in Rheumatoid Arthritis, the American Heart Association Functional Capacity Classification, the Karnofsky Performance Status Scale, the Eastern Cooperative Oncology Group Scale and the Modified Rankin Scale among others.

# Overview

The Center for Value-Based Medicine<sup>®</sup>, *Quality-of-Life Utility Database*<sup>®</sup> is a globally unique, standardized, health-related, quality-of-life information system created primarily through the efforts of more than 30 experienced physician researchers over a 9-year period from 1998 through 2012. Employing time tradeoff utility analysis as the measurement instrument to quantify the quality-of-life associated with specific diseases, the *Database* is comprised of values obtained from patients with those diseases.

For the first time, the *Database* presents a powerful tool that allows clinicians, researchers and other interested parties to perform *standardized* cost-utility (cost-effectiveness) analyses on the majority of interventions in healthcare. The *conferred value* and cost-utility of medical interventions, surgical interventions and pharmaceutical interventions can be objectively evaluated and compared on the same scale using common outcome measures. Such analyses comprise the foundation for *value-based medicine*, the practice of medicine in which interventions are critically appraised according to the *value* (improvement in quality-of-life and/or length of life) they confer to patients, rather than on primary evidence based outcomes alone.<sup>1-5</sup>

The *Database* was created specifically for use in healthcare cost-utility analyses, particularly pharmacoeconomic analyses. During its early development, the *Database* regularly underwent the process of continuous improvement known as Total Quality Management (TQM), in which there is a focus on user responsiveness, as well as the systematic identification and solving of problems by researchers involved in front-line data acquisition.<sup>6</sup>

This emphasis on TQM has allowed *Database* information to be integrated with the majority of evidence-based clinical trials. Unlike other quality-of-life databases, the *Quality-of-Life Utility Database*<sup>®</sup> is applicable across all specialties in healthcare, uses patient preference-based data, and integrates the data with specific diseases and the severity of these diseases.

# Utility Analysis

*Utility analysis* is a valuation instrument that objectively measures the quality-of-life associated with a health state or disease, as well as the improvement in quality-of-life conferred by a healthcare intervention.<sup>9-25</sup> By convention, a utility value of 1.0 equates with perfect health and a value of 0.0 equates with death. The closer a utility value is to 1.0, the better the quality-of-life associated with a health state, while the closer the utility value is to 0.0, the poorer the quality-of-life associated with a health state. As examples, treated hypertension is associated with a utility value of 0.98, while a Rankin class 5 stroke (severe paralysis) is associated with a utility value of 0.34.

Patient interviews are utilized as the basic method of utility data acquisition for the *Quality-of-Life Valuation Database*<sup>®</sup>. Patients are first asked how long they expect to live. They are next asked how much of that time--if any--they would be willing to trade in return for an immediate improvement to permanent normal health. The utility value is then calculated by subtracting the proportion of years traded from 1.0.<sup>1,5,9-22</sup> As an example, if a patient with diabetes mellitus who expects to live 20 additional years is willing to trade three of those remaining 20 years in return for a permanent cure of the diabetes, the resultant utility value is  $1.0 - (3/20) = \mathbf{0.85}$ .

When multiple values are obtained for a disease, the 95% confidence interval surrounding the mean utility value is calculated. As the number of cases increases, the 95% confidence interval surrounding a utility value associated with a disease becomes increasingly narrow.<sup>13,14,17</sup> The upper and lower limits of a 95% confidence interval are the numbers between which there is a 95% chance the mean utility value would fall if the study was to be repeated. Narrow confidence intervals indicate excellent reproducibility for a mean utility value.

# Value-Based Medicine

*Evidence-based medicine* is the practice of medicine based upon the highest level of interventional evidence available.<sup>7,8</sup> The criterion, or gold standard, in evidence-based medicine is Level 1 evidence, typically that derived from a randomized clinical trial with low type I and type II errors, or from a well-performed meta-analysis.<sup>7,8</sup>

*Value-based medicine* incorporates the best evidence-based medical data and transitions these data to yet a higher level of healthcare quality information.<sup>1-5</sup> This is accomplished by quantifying the *value* (improvement in length of life and/or quality-of-life) conferred by healthcare interventions. The improvement in length of life can often be gathered from the evidence-based literature, but the improvement in quality-of-life is more difficult to assess.

How is the total value conferred by an intervention measured? Let us assume that a drug (or other intervention) cures a severe stroke, thus taking the utility value of a patient from 0.34 to 1.00, an improvement of 0.66 utility points. The *total value* conferred by the drug--measured in quality-adjusted life-years (QALYs)--is then calculated by multiplying the improvement in utility value by the duration of treatment benefit.<sup>25,26</sup> Thus, if the anti-stroke benefit lasts for ten years, the *total value* conferred by the intervention is (0.66 utility points) x (10 years) = **6.6 QALYs** (quality-adjusted life-years).

Many clinical trials measure improvement in length of life, but often fail to incorporate the associated quality-of-life increments or decrements in appraising the total value conferred by an intervention.<sup>1-5</sup> By quantifying the improvement or diminution in length of life *and* quality-of-life conferred by an intervention, the total patient-perceived value of a treatment can be more precisely determined. And more precise identification of the best interventions allows providers to deliver the highest quality patient care.

A case analysis best illustrates how *value-based* information more accurately measures a treatment benefit than *evidence-based* information.



# Case Analysis

Let us assume that a new pharmaceutical agent given daily for the treatment of osteoporosis (thinning of the bones) increases quality-of-life by lowering the incidence of vertebral and hip fractures by 2% per year. While this sounds encouraging, a side-effect of the drug is moderate to severe nausea. Thus, a person experiences less fractures, but has daily nausea. Is the average patient better off with the treatment or with no treatment? Evidence-based medicine does not accurately tell us. Value-based medicine does.<sup>1,25-29</sup>

## Assessment with Value-Based Medicine

It is a general principle that discounting is applied to the outcomes and costs associated with healthcare economic analyses, typically at a rate of 3% annually. In this case, the discounted gain in quality-of-life adds 2.1% additional value to the patient's life compared to the baseline of no treatment.

When the side-effect of nausea is factored in, however, the value of the treated person's remaining life drops by 15% compared to the baseline of no treatment! Thus, *value-based medicine* tells us that this new hypertension treatment takes away more value from the average patient's remaining life than it adds. *Evidence-based medicine* tells us just the opposite, since the primary outcome of interest is a diminution in fractures and there is no set mechanism to quantify and factor in the comorbidity of nausea.

Value-based medicine also shows that the addition of an anti-nausea medication brings the patient back to a state in which value is conferred by the overall treatment regimen.

## The Need

Why is the *Quality-of-Life Utility Database*® needed? As noted, value-based medicine affords higher quality care by providing a more accurate measure of the worth of healthcare interventions to patients than evidence-based medicine alone. The *Database* also allows the performance of cost-utility (cost-effectiveness) analyses which considerably improve the efficiency of healthcare resource allocation by highlighting interventions that provide superior value, negligible value, no value, or that are harmful.

Currently, there is no uniformly accepted, health-related, quality-of-life measurement instrument, much less a database comprised of values obtained by such an instrument. In discussions with top officials from Medicare, the U.S. Congress, the Agency for Healthcare Research and Quality (AHRQ) and the National Institutes of Health (NIH), as well as in the peer-reviewed literature<sup>1-5,9-25,31-40</sup>, the principals at the Center for Value-Based Medicine®, have created substantial interest in value-based medicine and the standardization of quality-of-life measures for healthcare economic analyses. It is not a matter of *whether* value-based medicine will assume a critical role in healthcare practice in the United States, but a matter of *when*.

Noteworthy is the fact that a number of more recent clinical trials have incorporated quality-of-life instruments. Unfortunately, the more commonly utilized instruments, such as the Medical Outcomes Study Short Form-36 and Short-Form 12, the Sickness Impact Profile (SIP), the EuroQol, and others often are insensitive to milder diseases and not applicable across all specialties.<sup>1</sup> Additionally, most emphasize primarily function. Unlike utility analysis, they frequently fail to incorporate all parameters (concern about family and other dependents, socioeconomic status, caregiver status, anxiety versus depression, fear of the unknown or the future, etc.) associated with health-related quality-of-life.<sup>1</sup>

Despite the fact that more clinical trials are incorporating quality-of-life instruments, the instruments employed are often not comparable with other instruments, and the data may not be available for years. Additionally, it is

unfeasible to repeat prohibitively expensive clinical trials, especially on FDA approved pharmaceutical agents, to obtain primary quality-of-life data. The *Quality-of-Life Utility Database*<sup>®</sup> is already compatible with the data obtained from many pharmaceutical clinical trials, thus allowing the savings of countless billions of dollars that would be required to obtain primary quality-of-life data by repeating these trials.

We are unaware of a similarly comprehensive, health-related, quality-of-life database currently available for the performance of healthcare economic analyses.<sup>25-28</sup> The most recent extensive review, that of 1,000 health-related quality-of-life estimates by Tengs and Wallace<sup>28</sup>, demonstrates the disorganization in the quality-of-life research arena and the incomparability of health-related quality-of-life values in the peer-reviewed literature. Hundreds of quality-of-life measurement variants exist, but few are comparable. Consequently, cost-utility analyses using these disparate quality of life values are rarely comparable.



## Specific Database Features

The features of The Center for Value-Based Medicine<sup>®</sup>, *Quality-of-Life Utility Database*<sup>®</sup> are listed in this section.

**Methodology of data acquisition:** Structured interviews were utilized as the primary method of data acquisition. Time tradeoff utility values were obtained from patients in a disease-specific fashion, rather than assessing the overall utility value of a person. To illustrate, when evaluating osteoarthritis of the hip in a person with hypertension and diabetes, the time tradeoff utility analysis question specifically asks how much time, if any, a person would trade for a permanent cure of the osteoarthritis.

The *Quality-of-Life Valuation Database*<sup>®</sup> was designed specifically to be in compliance the Americans with Disability Act of 1990. Accordingly, utility values were gathered in a fashion that does not discriminate against those who are disabled (see Comorbidities).

**Preferences:** Utility values, sometimes referred to by researchers as patient preferences, are obtained from patients with a health state or disease of interest. For example, to assess the utility value associated with American Heart Association (AHA) Functional Class II angina, only data from patients who have experienced AHA Functional Class II angina are included.

Patient-based utility values often differ considerably from those obtained from experts, the general community or other surrogate respondents.<sup>15,16</sup> Since patients live with a disease on a daily basis, they are best able to appreciate the impairment upon quality of life caused by that disease. We therefore believe that patient utility values are the gold standard (criterion) to which others should be compared.

**Numbers:** The *Database* is comprised of over 50,000 utility values obtained from patients with specific diseases.

1. More than 26,000 primary, time tradeoff utility point estimates were obtained by interviewer administration, using standardized questionnaires, from over 5,000 adult patients examined in a cross-sectional fashion by a physician or other trained researcher.
2. More than 25,000 time tradeoff utility values were obtained from a comprehensive review of the world literature. Only those time tradeoff values obtained from patients with a specific disease were utilized. An extensive search of the peer-reviewed, global literature on utility analysis, quality-of-life instruments, and healthcare economic analysis from the 14 million medical article database of the National Library of Medicine, as well as the Embase and HealthStar databases, disclosed approximately 50 peer-reviewed articles with data suitable for inclusion in the *Database*.

### **Demographics:**

**Age range of participants.** The ages of patients in the *Database* range from 18 years to 96 years, with a mean age of 64.7 years and median of 67 years. The standard deviation is 12.8 years and the 95% confidence interval ranges from 64.1 - 65.3 years. An analysis of *Database* data reveals that age is not a confounding variable that affects the proportion of years traded in return for perfect health (ANOVA,  $p = 0.36$ ). Prior publications from the Center for Value-Based Medicine<sup>®</sup> have also demonstrated a lack of effect of age upon utility values.<sup>13,14,24</sup> Thus, people in their forties trade the same proportion of remaining time of life as people in their sixties to be rid of the same disease and return to normal health.

**Ethnicity of the sample.** The *Database* is comprised of the ethnic subsets shown in its major disease categories (Table 1). Thus, the *Database* sample is *population-based* for the United States since the ethnic strata that comprise it parallels those of the overall U.S. population.

**Table 1. Ethnic Subsets of *Database* Subjects and the US General Population (Year 2000 Census)**

|                            | <u>White</u> | <u>African-American</u> | <u>Other</u> |
|----------------------------|--------------|-------------------------|--------------|
| U.S. overall <sup>41</sup> | 82 - 90%     | 5 - 13%                 | 5%           |
| <u>QOLU Database</u>       | 83%          | 14%                     | 3%           |

(QOLV = Quality-of-Life Utility)

(The chi-square test for the analysis of categorical variables reveals no significant difference in the ethnicity group distribution between the *Database* sample and the general population across the entire United States,  $p = 0.76$ .)

**Educational level of participants.** The mean number of years of education after kindergarten in *Database* subjects is 13.2, with a median of 12 years and a range of from one year to 28 years. The standard deviation is 2.8 years and the 95% confidence interval ranges from 13.1 – 13.3 years.

A comparison between age-matched individuals in the *Database* and year 2000 US Census data is shown in Table 2.

**Table 2. Educational Level of *Database* Subjects and the US General Population (Year 2000 Census)**

|                            | <u>&lt; grade 12</u> | <u>Grade 12+</u> | <u>College</u> | <u>PG</u> |
|----------------------------|----------------------|------------------|----------------|-----------|
| U.S. overall <sup>42</sup> | 19%                  | 58%              | 13%            | 10%       |
| QOLV <i>Database</i>       | 15%                  | 58%              | 17%            | 10%       |

**(QOLU = Quality-of-Life Utility, Grade 12+ = high school graduates with and without college courses, but no college degree, College = bachelor degree, PG = post-graduate)**

(The chi-square test reveals no significant difference in the education group distribution between the *Database* sample and the age-matched population across the entire United States,  $p = 0.21$ .)

**Sampling strategy:** Holistic. A *holistic strategy* is one that is disease-specific.<sup>43</sup> The utility values in the *Database* are thus associated with specific diseases and stratifications of the severity of those diseases. The diseases are categorized according to the *International Classification of Diseases, 9<sup>th</sup> Revision, Clinical Modification*, the nomenclature system utilized for healthcare services reimbursement in the United States.<sup>44</sup>

**Comorbidities:** While one study showed that comorbidities do not affect utility values<sup>23</sup>, a subject of considerable controversy has been whether and how to account for the presence of comorbidities associated with a primary disease of interest. To date, the inclusion of comorbidities with quality of life instruments often biases the quality of life improvement conferred by an intervention against a person who has accompanying comorbidities.<sup>45</sup>

Consequently, total hip surgery is often considered more valuable in an otherwise healthy person than in someone who has also had a kidney transplant and the Guillian-Barre Syndrome.

In the United States, the answer to this dilemma is provided by the Americans with Disabilities Act (ADA) of 1990.<sup>46</sup> The ADA specifically prohibits discrimination against the disabled. Title I contains employment provisions and Titles II and III address the operation of state government, local government and places of public accommodation (hospitals, hotel, restaurants, doctor offices, etc.). Examples of disability include impairment in: walking, speaking, breathing, performing manual tasks, sitting, lifting, seeing, hearing, learning, caring for oneself, working, reading and others.

The Americans with Disabilities Act also prohibits federal agencies (Medicare) and agencies that receive federal money (Medicaid) from participating with entities that violate the Americans with Disabilities Act.<sup>46</sup> Thus, the inclusion of comorbidities which result in discrimination in healthcare economic analyses used for the purpose of resource allocation violates federal law.

The *Quality-of-Life Utility Database*<sup>©</sup> therefore contains values gathered specifically for each disease, without including a correction for comorbidities, thus adhering to the principles of the ADA of 1990. The values have therefore purposefully not been adjusted for the presence of comorbidities, although data exist that could permit this type of adjustment.

### **Reproducibility (reliability):**

**Test-retest reliability.** Excellent reproducibility has been shown for time tradeoff utility values in general.<sup>47,48</sup> An intraclass correlation coefficient, or reliability coefficient, of 0.77 has been demonstrated for *Database* values when utility value analysis is repeated at a four week interval.<sup>47</sup> As per Rosner, an intraclass correlation coefficient ( $\rho$ ) of  $\geq 0.75$  indicates excellent reproducibility.<sup>49</sup>

Utility values in the *Database* obtained for diseases in Pennsylvania have been shown to be statistically similar to those obtained for the



same diseases in New Jersey, as have utility values from the United States and Canada.<sup>9</sup>

**Intra-rater reliability.** Excellent intra-rater reliability (reproducibility when the same researcher repeats the interview) ( $\rho = 0.87$ ) has been demonstrated for the *Database*, as well as for time tradeoff utility analysis in general.<sup>47</sup>

**Inter-rater reliability.** The inter-rater reliability for the *Database* has been demonstrated to be 0.86, indicating excellent reproducibility among values obtained by different examiners.

**Confounding variables:** It has been demonstrated in the peer-reviewed literature that *Database* utility values are generally unaffected by gender, ethnicity, level of education, age or level of income.<sup>9-25</sup> They instead appear to be innate to human nature.

**Smoothing of the data:** The science of obtaining patient-based, time tradeoff utility analysis values is such that incongruous results *occasionally* result. This occurs especially when dealing with smaller numbers of patients in a clinical category of a disease under study. For example if only a small number of patients are surveyed, it is possible that the mean utility value associated with arthritis patients with American College of Rheumatology Classification of Global Functional Status in Rheumatoid Arthritis (ACR) Class II disease might be less than that of arthritis patients with ACR Class III disease, when just the opposite is expected.

In keeping with the construct that the clinical manifestations and/or stages of a disease should match utility values, the *Quality-of-Life Utility Database*<sup>®</sup> employs smoothing in approximately 5% of cases. With this process, a maximum of 10% of cases in a clinical or quality of life category have been moved upward or downward a maximum of one category so the mean utility

values associated with the respective categories increase or decrease correspondingly with milder and more severe clinical disease levels.

**Correlations with other quality-of-life instruments:** The utility value database is correlated with other commonly utilized, categorical, quality of life instruments such as the Karnofsky Performance Status Scale, the Eastern Cooperative Oncology Group Performance Status Scale, the American Heart Association Classification of Functional Capacity, the American College of Rheumatology Classification of Global Functional Status in Rheumatoid Arthritis, the Modified Rankin Scale, Snellen and logMAR visual scales and other instruments.

This correlation of utility values from the *Database* with other quality-of-life instruments facilitates the conversion of evidence-based data from clinical trials to value-based data for use in healthcare economic analyses.

**Exclusion criteria:** Patients who had Alzheimer's or some other form of dementia were excluded from utility analysis evaluation.

**Dropout rate:** Approximately 3.2% of subjects evaluated with utility value analysis were unable to answer the utility analysis questions. This is almost identical with the dropout rate in the Beaver Dam Health Outcomes Study of 1,356 participants who underwent time tradeoff utility analysis assessment.<sup>50</sup>

## **Validity:**

**Overview.** There are two basic forms of validity: *criterion validity* and *construct validity*. *Criterion validity* assesses how well data from a quality-of-life measurement instrument correspond to a gold standard, while *construct validity* evaluates how well the instrument measures what it is intended to measure, especially in regard to predicting outcomes or behaviors. Database utilities have been validated in over 100 peer-reviewed articles and 100 other writings.

**Criterion validity.** Since there is no *gold standard* for measurement of the quality of life associated with diseases, there is no *criterion* to which the *Database* can be compared.

**Construct validity.**<sup>51</sup> The construct validity of the *Database* has been repeatedly shown via correlation with the severity of clinical symptoms and signs, as well as with general categorical scales such as the Karnofsky Performance Status Scale and the Eastern Cooperative Oncology Group Performance Status Scale. Correlations of utility values with the American Heart Association Classification of Functional Capacity, the American College of Rheumatology Classification of Global Functional Status in Rheumatoid Arthritis, the Modified Rankin Scale, and Snellen and logMAR (log of the minimal angle of resolution) visual acuity scales have also demonstrated excellent construct validity for *Database* values.

**Field Validation of the *Database*:** The use of scientific information by other researchers is a critical aspect for validating its importance. Published utility values from the *Database* have been utilized or referenced in numerous peer-reviewed papers published by the global scientific community. *Database* utility values have also been used in healthcare economic analyses to decide healthcare policy and resource allocation for over 100 million people.

## Summary

The Center for Value-Based Medicine<sup>®</sup>, *Quality-of-Life Utility Database*<sup>®</sup> is a singularly unique, health-related, quality-of-life database, comprised of patient-based, time tradeoff utility analysis values. The *Database* allows researchers to perform credible cost-utility (cost-effectiveness) analyses on pharmaceutical and other healthcare interventions. Utility values in the *Database* are correlated with diseases, the severity of these diseases, and other health-related, quality-of-life instrument values to facilitate the conversion of evidence-based, clinical trial data to value-based format.

The *Database* is an essential cornerstone of *value-based medicine*, the practice of medicine that provides a more accurate measure of patient-perceived treatment benefit than evidence-based medicine alone.<sup>51</sup> *Value-based medicine* allows pharmaceutical purchasers to quantify the patient-perceived value of drugs and justify the prices they are willing to pay for these drugs. Information in the *Database* can be utilized in analyses that provide an accurate assessment of the patient-perceived value of current drugs, drugs under development and drugs under consideration for development. Alternatively, the value of a drug can be compared with that of any other drug, medical devices and any intervention in healthcare.



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# Table of Contents for the Quality of Life Utility Database<sup>©</sup>

(Standard deviations and 95% confidence intervals are included for the majority of conditions, as well as strata for those condition, when more than one utility is present)

## LONG-TERM UTILITIES

| <u>CONDITION</u> | <u>ICD-9-CM</u> |    |
|------------------|-----------------|----|
| AIDS/HIV*        | (042)           | 47 |
| ALLERGIES*       | (477.9)         | 48 |
| AMPUTATIONS      |                 | 49 |
| Above the knee   | (897.2)         |    |
| Below the knee   | (897.0)         |    |
| Bilateral leg    | (897.6)         |    |
| Foot             | (896.0)         |    |
| Toe              | (895.0)         |    |
| ANEMIA           | (285.9)         | 50 |

(ICD-9-CM = International Classification of Diseases-9<sup>th</sup> Revision-Clinical Modification code, 2004, \* = non-Center values)

# Table of Contents (cont.)

| <u>CONDITION</u>             | <u>ICD-9-DM</u> | <u>Page</u> |
|------------------------------|-----------------|-------------|
| <br><b>ARTHRITIS</b>         |                 |             |
| All arthritis                | (716.9)         | 51          |
| -osteoarthritis & rheumatoid |                 |             |
| Osteoarthritis               |                 |             |
| -overall                     | (715.9)         | 52          |
| -back                        | (721.90)        | 53          |
| -elbow                       | (715.92)        | 54          |
| -foot                        | (715.97)        | 55          |
| -hand                        | (714.94)        | 56          |
| -hip                         | (714.95)        | 57          |
| -hip*                        | (714.95)        | 58          |
| -knee                        | (715.96)        | 59          |
| -neck                        | (715.98)        | 60          |
| -shoulder                    | (715.91)        | 61          |
| Psoriatic arthritis          | (696.0)         | 62          |
| Rheumatoid arthritis         |                 |             |
| -overall                     | (714.0)         | 63          |
| -overall*                    | (714.0)         | 64          |
| -elbow                       | (714.02)        | 65          |
| -foot                        | (714.07)        | 66          |
| -hand                        | (714.04)        | 67          |
| -hip                         | (714.05)        | 68          |
| -knee                        | (714.06)        | 69          |
| -neck                        | (714.08)        | 70          |
| -shoulder                    | (714.01)        | 71          |

(ICD-9-CM = International Classification of Diseases-9<sup>th</sup> Revision-Clinical  
Modification code, 2004, \* = non-Center values , SP = status post)

# Table of Contents (cont.)

| <u>CONDITION</u>      | <u>ICD-9-DM</u> | <u>Page</u> |
|-----------------------|-----------------|-------------|
| <br><b>CANCER</b>     |                 |             |
| All cancers           | (M8000/3)       | 72          |
| All cancers *         | (M8000/3)       | 72          |
| Fear of uncertainty   | (293.84)        | 73          |
| Bladder cancer        | (189.9)         | 74          |
| Breast cancer         | (174.9)         | 75          |
| Breast cancer*        | (174.9)         | 76          |
| Mastectomy, S/P       | (174.8)         | 77          |
| Colon cancer          | (153.9)         | 78          |
| Colon cancer*         | (153.9)         | 79          |
| Esophageal cancer     | (150.9)         | 80          |
| Head & neck cancer*   | (195.0)         | 81          |
| Laryngeal cancer      | (161.9)         | 82          |
| Leukemia              | (208.9)         | 83          |
| Lung cancer           | (162.9)         | 84          |
| Melanoma, skin        | (172.8)         | 85          |
| Non-Hodgkins lymphoma | (171.9)         | 86          |
| Ovarian cancer        | (183.0)         | 87          |
| Ovarian cancer*       | (183.0)         | 88          |
| Prostate cancer       | (185)           | 89          |
| Prostate cancer*      | (185)           | 90          |
| Rectal cancer         | (154.1)         | 91          |
| Renal cell carcinoma  | (189.0)         | 92          |
| Stomach cancer        | (151.9)         | 93          |
| Testicular cancer*    | (186.9)         | 94          |
| Throat cancer         | (149.0)         | 95          |
| Uterine cancer        | (179)           | 96          |

(ICD-9-CM = International Classification of Diseases-9<sup>th</sup> Revision-Clinical  
Modification code, 2004, \* = non-Center values)

# Table of Contents (cont.)

| <u>CONDITION</u>                   | <u>ICD-9-DM</u> | <u>Page</u> |
|------------------------------------|-----------------|-------------|
| <br><b>CARDIAC DISEASE</b>         |                 |             |
| Angina                             | (413.9)         | 97          |
| Angina*                            | (413.9)         | 98          |
| Arrhythmias, all                   | (427.9)         | 99          |
| Arrhythmia with dyspnea            | (427.9)         | 100         |
| Arrhythmias*                       | (427.9)         | 101         |
| Atrial fibrillation                | (427.31)        | 102         |
| Atrial fibrillation*               | (427.31)        | 103         |
| Cardiomyopathy                     | (425.4)         | 104         |
| Congestive heart failure           | (428.0)         | 105         |
| Pretibial edema                    | (782.3)         | 106         |
| Coronary artery disease            | (414.00)        | 108         |
| Coronary artery angioplasty/stent  | (414.00)        | 108         |
| Coronary artery bypass surgery     | (414.05)        | 109         |
| Dyspnea, cardiac                   | (428.1)         | 110         |
| Fatigue, cardiac                   | (428.9)         | 111         |
| Hypotension, orthostatic           | (458.0)         | 112         |
| Myocardial infarction              | (414.8)         | 113         |
| -with & without subsequent surgery |                 |             |
| -without subsequent surgery        |                 | 115         |
| -with subsequent surgery           |                 | 117         |
| Myocardial infarction*             | (414.8)         | 118         |
| Symptoms, cardiac                  |                 | 122         |
| -dizziness                         | (780.4)         |             |
| -palpitations                      | (785.1)         |             |
| -tachycardia                       | (785.0)         |             |
| Valvular disease, cardiac          | (746.9)         | 123         |

(ICD-9-CM = International Classification of Diseases-9<sup>th</sup> Revision-Clinical  
Modification code, 2004, \* = non-Center values)

# Table of Contents (cont.)

| <u>CONDITION</u>                 | <u>ICD-9-DM</u> | <u>Page</u> |
|----------------------------------|-----------------|-------------|
| <b>COLLAGEN VASCULAR DISEASE</b> |                 |             |
| Systemic lupus erythematosus     | (710.0)         | 124         |
| <b>COUMADIN USE</b>              | (286.7)         | 125         |
| <b>DERMATOLOGY</b>               |                 |             |
| General skin disorders           |                 | 126         |
| -flushing                        | (782.62)        |             |
| -fragility                       | (448.9)         |             |
| -sweating (hyperhidrosis)        | (780.8)         |             |
| Acne                             | (706.1)         | 127         |
| Baldness (female)                | (704.00)        | 128         |
| Basal cell carcinoma             | (M8090/3)       | 129         |
| Contact dermatitis               | (692.9)         | 130         |
| Dry skin                         | (701.1)         | 131         |
| Eczema                           | (692.9)         | 132         |
| Fungus of nails (onychomycosis)  | (110.1)         | 133         |
| Hirsutism                        | (704.1)         | 134         |
| Hives                            | (708.9)         | 135         |
| Myeloproliferative disorder      | (238.7)         | 136         |
| Nevus, skin                      | (M8720/0)       | 137         |
| Nevus, skin, precancerous        | (M8720/1-2)     | 138         |
| Psoriasis                        | (696.1)         | 139         |
| Rash                             | (782.1)         | 140         |

(ICD-9-CM = International Classification of Diseases-9<sup>th</sup> Revision-Clinical  
Modification code, 2004, \* = non-Center values)

# Table of Contents (cont.)

| <u>CONDITION</u>                 | <u>ICD-9-DM</u>    | <u>Page</u> |
|----------------------------------|--------------------|-------------|
| <br><b>DERMATOLOGY (Cont.)</b>   |                    |             |
| Rosacea                          | (695.3)            | 141         |
| Seborrheic keratosis             | (702.19)           | 142         |
| Squamous/basal cell carcinoma    | (M-8070/3:M8090/3) | 143         |
| Stevens Johnson Syndrome         | (695.1)            | 144         |
| Symptoms, pruritis               | (698.9)            | 145         |
| Vitiligo                         | (790.01)           | 146         |
| <br><b>DIABETES MELLITUS</b>     |                    |             |
|                                  | (250.0)            | 147         |
| <br><b>EAR NOSE &amp; THROAT</b> |                    |             |
| Allergic rhinitis                | (477.9)            | 150         |
| Anosmia                          | (781.1)            | 151         |
| Aphthous ulcer                   | (528.2)            | 152         |
| Cheilitis                        | (528.5)            | 153         |
| Deviated septum                  | (470)              | 154         |
| Epistaxis                        | (784.7)            | 155         |
| Hearing loss                     | (389.9)            | 156         |
| Hypersalivation (ptyalism)       | (527.7)            | 157         |
| Laryngeal cancer                 | (161.9)            | 158         |
| Laryngitis                       | (464.00)           | 159         |

(ICD-9-CM = International Classification of Diseases-9<sup>th</sup> Revision-Clinical  
Modification code, 2004, \* = non-Center values)

# Table of Contents (cont.)

| <u>CONDITION</u>                          | <u>ICD-9-DM</u> | <u>Page</u> |
|---|-----------------|-------------|
| <b>EAR NOSE &amp; THROAT (Cont.)</b>      |                 |             |
| Mastoiditis, status post                  | (383.9)         | 160         |
| Otitis externa                            | (380.10)        | 161         |
| Otitis media                              | (382.9)         | 162         |
| Otitis, serous                            | (381.4)         | 163         |
| Pharyngitis                               |                 | 164         |
| -Acute                                    | (462)           |             |
| -Thrush (Candida)                         | (112.0)         |             |
| -Chronic                                  | (472.1)         |             |
| Polyps                                    |                 |             |
| -Nasal                                    | (471.0)         | 165         |
| -Vocal cord (larynx)                      | (478.4)         | 166         |
| Post-nasal drip (sinusitis)               | (461.9)         | 167         |
| Sinusitis (Center and <i>non-Center</i> ) | (461.9)         | 168         |
| Thrush (oral Candidiasis)                 | (112.0)         | 169         |
| Tinnitus                                  | (388.30)        | 170         |
| Tracheostomy                              | (V44.0)         | 171         |
| URI Symptoms & Signs                      | (465.9)         | 172         |
| Vertigo                                   | (780.4)         | 173         |
| <br><b>ENDOCRINE</b>                      |                 |             |
| Gynecomastia                              | (611.1)         | 174         |
| Hyperthyroidism                           | (242.9)         | 175         |
| Hypothyroidism                            | (244.9)         | 176         |
| Pituitary adenoma                         | (225.0)         | 177         |
| Thyroid nodule                            | (241.0)         | 178         |
| Thyroidectomy, status post                | (244.0)         | 179         |

(ICD-9-CM = International Classification of Diseases-9<sup>th</sup> Revision-Clinical  
Modification code, 2004, \* = non-Center values)

# Table of Contents (cont.)

| <u>CONDITION</u>                              | <u>ICD-9-DM</u>    | <u>Page</u>    |
|---|--------------------|----------------|
| <b>FIBROMYALGIA</b>                           | <b>(729.1)</b>     | <b>180</b>     |
| <br><b>GASTROINTESTINAL DISEASE</b>           |                    |                |
| <b>Anorexia</b>                               | <b>(783.0)</b>     | <b>181</b>     |
| <b>Barret's esophagus</b>                     | <b>(530.85)</b>    | <b>182</b>     |
| <b>Cholecystitis</b>                          | <b>(575.10)</b>    | <b>183</b>     |
| <b>Colitis (see Ulcerative colitis)</b>       | <b>(556.9)</b>     | <b>183</b>     |
| <b>Colostomy</b>                              | <b>(V44.3)</b>     | <b>185</b>     |
| <b>Esophageal stricture</b>                   | <b>(530.3)</b>     | <b>186</b>     |
| <b>Gastritis (see GERD)</b>                   | <b>(535.5)</b>     | <b>187</b>     |
| <b>Gastroparesis</b>                          | <b>(536.3)</b>     | <b>188</b>     |
| <b>GERD, gastritis, hiatal hernia,</b>        | <b>(530.81)</b>    | <b>189</b>     |
| <b>GERD (gastroesophageal reflux disease)</b> | <b>(530.81)</b>    | <b>190</b>     |
| <b>GERD/hiatal hernia</b>                     | <b>(553.3)</b>     | <b>191</b>     |
| <b>Hiatal hernia (see GERD)</b>               | <b>(553.3)</b>     | <b>192</b>     |
| <b>Irritable bowel syndrome</b>               | <b>(564.1)</b>     | <b>192</b>     |
| <b>Polyps, colon</b>                          | <b>(211.3)</b>     | <b>194</b>     |
| <br><b>GI Symptoms (&amp; Signs)</b>          |                    | <br><b>195</b> |
| <b>-Cramps</b>                                | <b>(789.0)</b>     |                |
| <b>-Constipation</b>                          | <b>(564.00)</b>    |                |
| <b>-Diarrhea</b>                              | <b>(787.91)</b>    |                |
| <b>Ulcer/gastritis</b>                        | <b>(533.9)</b>     | <b>198</b>     |
| <b>Ulcerative colitis</b>                     | <b>(556.9)</b>     | <b>198</b>     |
| <b>Ulcerative colitis*</b>                    | <b>(556.9)</b>     | <b>199</b>     |
| <b>Varices, esophagus</b>                     | <b>(456.1)</b>     | <b>200</b>     |
| <br><b>GOUT*</b>                              | <br><b>(274.9)</b> | <br><b>201</b> |

(ICD-9-CM = International Classification of Diseases-9<sup>th</sup> Revision-Clinical  
Modification code, 2004, \* = non-Center values)



# Table of Contents (cont.)

| <u>CONDITION</u>                  | <u>ICD-9-DM</u> | <u>Page</u> |
|-----------------------------------|-----------------|-------------|
| <b>GYNECOLOGY</b>                 |                 |             |
| Cervical cancer                   | (180.9)         | 202         |
| Endometrial dysplasia/hyperplasia | (621.2)         | 203         |
| Endometriosis                     | (617.9)         | 204         |
| Fibroid tumors, uterine           | (M8890/0)       | 205         |
| Hysterectomy, status post         | (V45.77)        | 206         |
| Incontinence (female)             | (788.30)        | 207         |
| Infertility (child-bearing years) | (628.9)         | 208         |
| Libido, loss of                   | (302.9)         | 209         |
| Menopause                         | (627.2)         | 210         |
| Menstrual cycle abnormalities     | (626.4)         | 211         |
| Dysmenorrhea                      |                 |             |
| Irregular menses                  |                 |             |
| Ovarian cysts                     | (620.2)         | 212         |
| Uterine cancer                    | (182.0)         | 213         |
| Uterine prolapse                  | (618.1)         | 214         |
| Vulvovaginitis, monilia (Candida) | (122.1)         | 215         |
| <br><b>HEADACHE</b>               |                 |             |
| All types                         | (784.0)         | 216         |
| Cluster                           | (346.2)         | 217         |
| Migraine                          | (346.9)         | 218         |
| Sinus                             | (473.9)         | 219         |
| Tension                           | (307.81)        | 220         |
| <br><b>HYPERLIPIDEMIA</b>         | <br>(272.4)     | <br>221     |

(ICD-9-CM = International Classification of Diseases-9<sup>th</sup> Revision-Clinical  
Modification code, 2004, \* = non-Center values)

# Table of Contents (cont.)

| <u>CONDITION</u>  | <u>ICD-9-DM</u>         | <u>Page</u> |
|---|-------------------------|-------------|
| HYPERTENSION, SYSTEMIC ARTERIAL                                 | (401.9)                 | 222         |
| ILLNESS, SEVERE   | (300.19)                | 223         |
| Overall   |                         |             |
| Trauma, hospitalized  | (959.9)                 |             |
| <b>INFECTION</b>  |                         |             |
| Bronchitis  | (490)                   | 224         |
| Symptoms (chills, exhaustion, fever)                            | (780.99, 780.79, 780.6) | 225         |
| Tuberculosis  | (011.9)                 | 226         |
| Unspecified contagious disease*                                 | NA                      |             |
| Upper respiratory infection                                     | (465.9)                 | 227         |
| Urinary tract infection   | (599.0)                 | 228         |
| Urinary tract infection symptoms                                |                         |             |
| -Dysuria  | (788.1)                 | 229         |
| -Frequency, severe  | (788.41)                | 229         |
| INJURY*   | (959.9)                 | 230         |
| <b>KIDNEY DISEASE</b>   |                         |             |
| Azotemia, pre-dialysis  | (790.6)                 | 231         |
| Azotemia, pre-renal transplant *<br>and post-transplant (1 yr.) | (790.6)                 | 232         |
| Carcinoma, renal cell   | (189.0)                 | 233         |
| Dialysis  | (V56.0)                 | 234         |
| Dialysis*   | (V56.0)                 | 235         |
| Pyelonephritis  | (590.80)                | 236         |
| Polycystic kidney disease, adult                                | (753.13)                | 237         |
| Stones (calculi)  | (592.0)                 | 238         |
| Transplant  | (V42.0)                 | 239         |
| Transplant*   | (V42.0)                 | 240         |
| Transplant, periods postoperatively*                            | (V42.0)                 | 241         |

(ICD-9-CM = International Classification of Diseases-9<sup>th</sup> Revision-Clinical Modification code, 2004, \* = non-Center values, NA = not applicable)

# Table of Contents (cont.)

| <u>CONDITION</u>                   | <u>ICD-9-DM</u> | <u>Page</u> |
|------------------------------------|-----------------|-------------|
| <br><b>LIVER DISEASE</b>           |                 |             |
| Hepatitis, chronic*                | (571.40)        | 242         |
| Cirrhosis*                         | (571.5)         | 243         |
| <br><b>NEUROLOGICAL DISEASE</b>    |                 |             |
| Alzheimer's disease (dementia)     | (331.0)         | 244         |
| Aneurysm, asymptomatic             | (437.3)         | 245         |
| Apnea, sleep                       | (770.81)        | 246         |
| Ataxia                             | (781.3)         | 247         |
| Bell's palsy                       | (351.0)         | 248         |
| Epileptic seizures*                | (780.39)        | 249         |
| Epileptic seizures                 | (780.39)        | 250         |
| Neuropathy, diabetic               |                 | 250         |
| - Pain                             | (250.6)         | 252         |
| - Numbness                         | (250.6)         | 252         |
| - Pain + numbness                  | (250.6)         | 252         |
| Panic attack                       | (300.01)        | 253         |
| Paralysis (complete or incomplete) | (344.9)         | 254         |
| Paraplegia                         | (344.1)         | 255         |
| Paraparesis                        | (344.9)         | 256         |
| Parkinson's disease                | (332.0)         | 257         |
| Shingles, acute                    | (053.9)         | 258         |
| Stroke* (cerebrovascular)          | (436)           | 259         |
| Stroke (cerebrovascular)           | (436)           | 261         |
| Symptoms                           |                 | 262         |
| -Numbness                          | (782.0)         |             |
| -Paresthesias                      | (782.0)         |             |

(ICD-9-CM = International Classification of Diseases-9<sup>th</sup> Revision-Clinical  
Modification code, 2004, \* = non-Center values)

# Table of Contents (cont.)

| <u>CONDITION</u>                | <u>ICD-9-DM</u> | <u>Page</u> |
|---------------------------------|-----------------|-------------|
| <b>NEUROLOGY (Cont.)</b>        |                 |             |
| Syncope                         | (780.2)         | 263         |
| Tic                             | (307.20)        | 264         |
| Transient ischemic attack (TIA) | (435.90)        | 265         |
| Tremor                          | (781.0)         | 266         |
| Trigeminal neuralgia            | (350.1)         | 267         |
| Vertigo                         | (780.4)         | 268         |
| <br><b>NEUROSURGERY</b>         |                 |             |
| Herniated lumbar disc           | (722.93)        | 269         |
| <br><b>OBESITY</b>              |                 |             |
|                                 | (278.00)        | 270         |
| <br><b>OPHTHALMOLOGY</b>        |                 |             |
| Anterior Segment                |                 |             |
| Keratoconjunctivitis sicca*     | (375.15)        | 271         |
| Symptoms & Signs                |                 |             |
| - burning                       | (379.91)        | 272         |
| - foreign body sensation        | (930.9)         | 272         |
| - hypertrichosis, lid           | (374.54)        | 272         |
| - injection (erythema)          | (372.74)        | 272         |
| - iris, darkened                | NC              | 272         |
| - itching                       | (379.99)        | 272         |
| - lacrimation (epiphora)        | (375.20)        | 272         |
| - photophobia (sensitivity)     | (368.13)        | 272         |

(ICD-9-CM = International Classification of Diseases-9<sup>th</sup> Revision-Clinical  
Modification code, 2004, \* = non-Center values)

# Table of Contents (cont.)

| <u>CONDITION</u>                                    | <u>ICD-9-DM</u>      | <u>Page</u> |
|---|----------------------|-------------|
| <br><b><u>OPHTHALMOLOGY (Cont.)</u></b>             |                      |             |
| Diplopia  | (368.2)              | 273         |
| Glaucoma  | (365.9)              | 274         |
| Orbital disease                                     |                      |             |
| Periocular & periorbital<br>pigmentation, increased | (374.52)             | 275         |
| Refractive errors                                   |                      |             |
| Presbyopia  | (367.4)              | 276         |
| Myopia & high myopia                                | (367.1)              | 276         |
| Hyperopia   | (367.0)              | 276         |
| Visual disturbances                                 |                      |             |
| Time tradeoff values (Snellen)                      |                      | 277         |
| Time tradeoff (good vision)                         |                      | 278         |
| Time tradeoff (Bailey-Lovie or<br>ETDRS chart)      |                      | 279         |
| Standard gamble values                              |                      | 280         |
| Diabetic retinopathy                                | (250.5)              | 281         |
| Macular degeneration                                | (362.50)             | 282         |
| <br><b>ORTHOPEDICS</b>                              |                      |             |
| Ankylosing spondylitis                              | (720.0)              | 283         |
| Carpal tunnel syndrome                              | (354.0)              | 284         |
| Charcot joint                                       | (713.5)              | 285         |
| Hip fracture, status post                           | (820.8)              | 286         |
| Hip fracture*, hip & vertebral fracture*            | (805.8 : vertebral)) | 287         |
| Kyphoscoliosis                                      | (737.30)             | 288         |
| Osteomyelitis                                       | (730.2)              | 289         |
| Osteoporosis  | (733.00)             | 290         |

(ICD-9-CM = International Classification of Diseases-9<sup>th</sup> Revision-Clinical  
Modification code, 2004, \* = non-Center values, ETDRS = Early Treatment  
Diabetic Retinopathy Study)

# Table of Contents (cont.)

| <u>CONDITION</u>                       | <u>ICD-9-DM</u>  | <u>Page</u> |
|--|------------------|-------------|
| <br><b>ORTHOPEDICS (Cont.)</b>         |                  |             |
| Osteoporosis*                          | (733.30)         | 291         |
| Rotator cuff injury                    | (840.4)          | 292         |
| Spinal stenosis                        | (724.00)         | 293         |
| Total hip surgery, status post         | (V45.4)          | 294         |
| Total knee surgery, status post        | (V45.4)          | 295         |
| Vertebral fracture                     | (805.8)          | 296         |
| Vertebral fracture*                    | (805.8)          | 297         |
| <br><b>PERIPHERAL VASCULAR DISEASE</b> |                  |             |
| Arterial insufficiency                 | (443.9)          | 298         |
| Ileac artery stenosis*                 | (443.9)          | 299         |
| Arterial insufficiency, claudication*  | (440.31)         | 300         |
| Claudication                           | (440.31)         | 301         |
| Diabetic vasculopathy. atherosclerotic | (443.9)          | 302         |
| Thrombophlebitis                       | (451.9)          | 303         |
| Ulcer, lower extremity or foot         | (707.10, 707.15) | 304         |
| Varicose veins                         | (454.9)          | 305         |
| Venous insufficiency                   | (459.81)         | 306         |

(ICD-9-CM = International Classification of Diseases-9<sup>th</sup> Revision-Clinical  
Modification code, 2004, \* = non-Center values)

# Table of Contents (cont.)

| <u>CONDITION</u>                       | <u>ICD-9-DM</u> | <u>Page</u> |
|--|-----------------|-------------|
| <br><b>PSYCHIATRY</b>                  |                 |             |
| Anxiety                                | (300.00)        | 307         |
| Cognitive difficulties                 | (294.9)         | 308         |
| Depression                             | (311)           | 309         |
| Depression (community values)          | (311)           | 310         |
| Depression*                            | (311)           | 311         |
| Hallucinations                         | (298.9)         | 312         |
| Insomnia                               | (780.52)        | 313         |
| <br><b>PULMONARY DISEASES</b>          |                 |             |
| Asthma                                 | (493.9)         | 314         |
| Bronchitis                             | (490)           | 315         |
| COPD/Emphysema                         | (492.8)         | 316         |
| Cystic fibrosis                        | (277.00)        | 317         |
| Emphysema (see COPD)                   | (492.8)         | 318         |
| Influenza                              | (487.1)         | 319         |
| Lung cancer (bronchogenic carcinoma)   | (162.9)         | 320         |
| Oxygen dependency                      | (NA)            | 321         |
| Pulmonary fibrosis                     | (515)           | 322         |
| Sarcoidosis                            | (135)           | 323         |
| Shortness of breath (dyspnea)          |                 | 324         |
| Asthmatic cause                        | (493.9)         |             |
| Cardiac cause                          | (428.1)         |             |
| Shortness of breath (community values) |                 | 325         |
| Asthmatic cause                        | (493.9)         |             |
| Cardiac cause                          | (428.1)         |             |
| Tuberculosis*                          | (011.9)         | 326         |
| URI (upper respiratory infection)      | (465.9)         | 327         |

(ICD-9-CM = International Classification of Diseases-9<sup>th</sup> Revision-Clinical  
Modification code, 2004, \* = non-Center values, NA = not applicable or no listing)

# Table of Contents (cont.)

| <u>CONDITION</u>                           | <u>ICD-9-DM</u> | <u>Page</u> |
|--|-----------------|-------------|
| <b>TRAUMA, ACUTE, HOSPITALIZED</b>         | <b>(959.9)</b>  | <b>328</b>  |
| <br><b>UROLOGY</b>                         |                 |             |
| <b>Benign prostatic hypertrophy*</b>       | <b>(600.00)</b> | <b>329</b>  |
| <b>Benign prostatic hypertrophy</b>        | <b>(600.00)</b> | <b>330</b>  |
| <b>Bladder cancer</b>                      | <b>(188.9)</b>  | <b>331</b>  |
| <b>Cystitis</b>                            | <b>(595.9)</b>  | <b>332</b>  |
| <b>Cystocele</b>                           | <b>(618.0)</b>  | <b>333</b>  |
| <b>Dysuria</b>                             | <b>(788.1)</b>  | <b>334</b>  |
| <b>Frequency, severe</b>                   | <b>(788.41)</b> | <b>335</b>  |
| <b>Impotence</b>                           |                 | <b>336</b>  |
| <b>Organic</b>                             | <b>(607.84)</b> |             |
| <b>Psychogenic</b>                         | <b>(302.72)</b> |             |
| <b>Impotence*</b>                          |                 | <b>337</b>  |
| <b>Organic</b>                             | <b>(607.84)</b> |             |
| <b>Psychogenic</b>                         | <b>(302.72)</b> |             |
| <b>Incontinence</b>                        | <b>(788.30)</b> | <b>338</b>  |
| <b>Libido, loss of</b>                     | <b>(302.70)</b> | <b>339</b>  |
| <b>Nocturia</b>                            | <b>(788.43)</b> | <b>340</b>  |
| <b>Prostate cancer</b>                     | <b>(185)</b>    | <b>341</b>  |
| <b>Prostatitis</b>                         | <b>(601.9)</b>  | <b>342</b>  |
| <b>Renal cell carcinoma</b>                | <b>(189.0)</b>  | <b>343</b>  |
| <b>Ureterostomy</b>                        | <b>(V44.6)</b>  | <b>344</b>  |
| <b>Urinary tract infection, repetitive</b> | <b>(599.0)</b>  | <b>345</b>  |
| <b>Urinary tract infection, symptoms</b>   |                 | <b>346</b>  |
| <b>Dysuria</b>                             | <b>(788.1)</b>  |             |
| <b>Frequency</b>                           | <b>(788.41)</b> |             |

(ICD-9-CM = International Classification of Diseases-9<sup>th</sup> Revision-Clinical Modification code, 2004, \* = non-Center values, NA = not applicable or no listing)



# Table of Contents (cont.)

## SHORT-TERM UTILITIES

(all conditions are moderate to severe)

| <u>CONDITION</u>                  | <u>ICD-9-DM</u> | <u>Page</u> |
|-----------------------------------|-----------------|-------------|
| <b>CARDIAC</b>                    |                 |             |
| Dizziness                         | (780.4)         | 347         |
| Orthostatic hypotension           | (458.0)         |             |
| Palpitations                      | (785.1)         |             |
| Tachycardia                       | (785.0)         |             |
| <b>EAR NOSE &amp; THROAT</b>      |                 |             |
| Anosmia                           | (781.1)         | 348         |
| Aphthous ulcer                    | (528.2)         |             |
| Cough                             | (786.2)         |             |
| Dry mouth                         | (527.7)         |             |
| Epistaxis                         | (784.7)         |             |
| Hypersalivation (ptyalism)        | (527.7)         |             |
| Laryngitis                        | (464.00)        |             |
| Nasal congestion                  | (478.1)         | 349         |
| Rhinitis                          | (487.1)         |             |
| Rhinorrhea                        | (478.1)         |             |
| Sore throat (pharyngitis)         | (462)           |             |
| Taste, bitter                     | (462)           |             |
| Taste, loss of                    | (782.0)         |             |
| Tinnitus                          | (388.30)        |             |
| URI (upper respiratory infection) | (465.9)         |             |

(ICD-9-CM = International Classification of Diseases-9<sup>th</sup> Revision-Clinical  
Modification code, 2004, \* = non-Center values)

# Table of Contents (cont.)

## SHORT-TERM UTILITIES(CONT.)

| <u>CONDITION</u>           | <u>ICD-9-DM</u> | <u>Page</u> |
|----------------------------|-----------------|-------------|
| <b>GASTROINTESTINAL</b>    |                 |             |
| Appetite loss (anorexia)   | (783.0)         | 350         |
| Constipation               | (564.00)        |             |
| Cramps, abdominal          | (789.0)         |             |
| Diarrhea (4-6x/day)        | (787.91)        |             |
| Flatulence                 | (787.3)         |             |
| Heartburn                  | (787.1)         |             |
| Hiccups (constantly)       | (786.8)         |             |
| Jaundice appearance        | (782.4)         |             |
| Nausea (constant)          | (787.02)        | 351         |
| Pain, abdominal            | (789.0)         |             |
| Vomiting, overall          | (787.03)        |             |
| With nausea                | (787.01)        |             |
| Vomiting (1-2x/day)        | (787.03)        |             |
| Vomiting (4-6x/day)        | (787.03)        |             |
| Vomiting, severe           | (787.03)        |             |
| Weight gain (10#)          | (783.1)         |             |
| Weight gain (>20#)         | (783.1)         |             |
| Weight gain, overall       | (783.1)         |             |
| Weight loss                | (783.21)        |             |
| <b>GENERAL</b>             |                 |             |
| Chills, shaking            | (780.99)        | 352         |
| Edema, extremities         | (782.3)         |             |
| Fatigue/exhaustion, severe | (780.89)        |             |
| Fever >102°                | (780.6)         |             |
| Flu syndrome               | (487.1)         |             |
| Insomnia                   | (780.52)        |             |
| Sleepiness                 | (780.09)        |             |
| Swelling of legs           | (782.3)         |             |
| Weakness (asthenia)        | (780.79)        |             |

(ICD-9-CM = International Classification of Diseases-9<sup>th</sup> Revision-Clinical Modification code, 2004)

# Table of Contents (cont.)

## SHORT-TERM UTILITIES (CONT.)

| <u>CONDITION</u>                                       | <u>ICD-9-DM</u> | <u>Page</u> |
|--|-----------------|-------------|
| <b>GYNECOLOGIC/UROLOGIC</b>                            |                 |             |
| Dysuria  | (788.1)         | 353         |
| Gynecomastia   | (611.1)         |             |
| Menses, irregular                                      | (626.4)         |             |
| Menses, painful  | (625.3)         |             |
| Sex drive, loss of                                     | (302.70)        |             |
| <br><b>NEUROLOGIC</b>                                  |                 |             |
| Ataxia   | (781.3)         | 354         |
| Headache   | (784.0)         |             |
| Numbness   | (782.0)         |             |
| Paresthesias   | (782.0)         |             |
| Syncope  | (780.2)         |             |
| Tremor   | (781.0)         |             |
| Twitching  | (781.0)         |             |
| Vertigo  | (780.4)         |             |
| <br><b>PAIN</b>  |                 |             |
| Back   | (724.2)         | 355         |
| Breast   | (611.71)        |             |
| Joint  | (719.40)        |             |
| Leg  | (729.82)        |             |
| Muscle cramps  | (729.82)        |             |
| Muscle, generalized                                    | (729.82)        |             |
| Neck, severe   | (723.1)         |             |
| <br><b>Acute postoperative (0-3days after surgery)</b> |                 |             |
| 2" incision  | (879.8)         | 356         |
| 6" incision  | (879.8)         |             |
| 12" incision   | (879.8)         |             |

(ICD-9-CM = International Classification of Diseases-9<sup>th</sup> Revision-Clinical Modification code, 2004)

# Table of Contents (cont.)

## SHORT-TERM UTILITIES (CONT.)

| <u>CONDITION</u>                  | <u>ICD-9-DM</u> | <u>Page</u> |
|-----------------------------------|-----------------|-------------|
| <b>PSYCHIATRIC</b>                |                 |             |
| Agitation                         | (307.9)         | 357         |
| Anxiety                           | (300.00)        |             |
| Confusion                         | (298.9)         |             |
| Euphoria                          | (NA)            |             |
| Hallucinations, visual            | (368.16)        |             |
| Lability, emotional               | (301.3)         |             |
| Memory loss                       | (780.93)        |             |
| Nightmares                        | (307.47)        |             |
| Pre-operation anxiety             | (300.00)        |             |
| <b>RESPIRATORY</b>                |                 |             |
| Cough                             | (786.2)         | 358         |
| Bronchitis                        | (490)           |             |
| URI (upper respiratory infection) | (465.9)         |             |
| Wheezing                          | (786.07)        |             |
| <b>SENSORY</b>                    |                 |             |
| Ear, Nose & Throat                |                 | 359         |
| Loss of smell (anosmia)           | (781.1)         |             |
| Loss of taste                     | (782)           |             |
| Ringling in ears (tinnitus)       | (388.30)        |             |
| Eyes                              |                 |             |
| Blurred vision, reading           | (367.4)         |             |
| Burning                           | (371.91)        |             |
| Double vision (diplopia)          | (368.2)         |             |
| Foreign body sensation            | (930.9)         |             |

(ICD-9-CM = International Classification of Diseases-9<sup>th</sup> Revision-Clinical Modification code, 2004, NA = not applicable or no listing)

# Table of Contents (cont.)

## SHORT-TERM UTILITIES (CONT.)

| <u>CONDITION</u>                                   | <u>ICD-9-DM</u> | <u>Page</u> |
|--|-----------------|-------------|
| <b>Eyes (cont.)</b>                                |                 |             |
| Hypertrichosis, lid                                | (374.54)        | 360         |
| Iris, darkening                                    | NC              |             |
| Itching  | (379.99)        |             |
| Lacrimation, excess                                | (375.20)        |             |
| Night blindness                                    | (368.60)        |             |
| Periocular & perorbital<br>pigmentation, increased | (374.52)        |             |
| Photosensitivity                                   | (368.13)        |             |
| Redness  | (372.74)        |             |
| <br><b>SKIN</b>                                    |                 |             |
| Acne, severe                                       | (706.1)         | 361         |
| Alopecia areata                                    | (704.01)        |             |
| Baldness, female                                   | (704.00)        |             |
| Baldness, male                                     | (704.00)        |             |
| Dry skin   | (701.1)         |             |
| Flushing   | (782.62)        |             |
| Fragile (bleeding into) skin                       | (448.9)         |             |
| Hirsutism (face also)                              | (704.1)         |             |
| Hirsutism (female)                                 | (704.1)         | 362         |
| Hirsutism (male)                                   | (704.1)         |             |
| Hives (urticaria)                                  | (708.9)         |             |
| Hot flashes  | (782.62)        |             |
| Iris, increased pigmentation                       | NC              |             |
| Itching (pruritis), generalized                    | (698.9)         |             |
| Rash, overall                                      | (782.1)         |             |
| Rash, face, severe, itching                        | (782.1)         |             |
| Rash, face, severe, no itching                     | (782.1)         |             |

(ICD-9-CM = International Classification of Diseases-9<sup>th</sup> Revision-Clinical Modification  
code, 2004; NC = no code)

# Table of Contents (cont.)

## SHORT-TERM UTILITIES (CONT.)

| <u>CONDITION</u>               | <u>ICD-9-DM</u> | <u>Page</u> |
|--------------------------------|-----------------|-------------|
| <b>SKIN (cont.)</b>            |                 |             |
| Rash, body, severe, itching    | (782.1)         | 363         |
| Rash, body, severe, no itching | (782.1)         |             |
| Sweating (hyperhidrosis)       | (780.8)         |             |

(ICD-9-CM = International Classification of Diseases-9<sup>th</sup> Revision-Clinical Modification code, 2004; NC = no code)

# APPENDIX

## American College of Rheumatology Classification of Global Functional Status in Rheumatoid Arthritis --All arthritis--

| <u>Class</u> | <u>Description</u>   |
|--------------|--|
| Class I      | Completely able to perform usual activities of daily living (self-care, vocational, and avocational) |
| Class II     | Able to perform usual self-care and vocational activities, but limited in avocational activities     |
| Class III    | Able to perform usual self-care activities, but limited in vocational and avocational activities     |
| Class IV     | Limited in ability to perform usual self-care, vocational and avocational activities                 |

[Usual self-care activities include dressing, feeding, bathing, grooming and toileting. Avocational (recreational and/or leisure) and vocational (work, school, homemaking) activities are patient-desired and age- and sex-specific]

### References

- Hochberg MC, Chang RW, Dwosh I, Lindsey S, Pincus T, Wolfe F. The American College of Rheumatology revised criteria for the classification of global functional status in rheumatoid arthritis. *Arthritis Rheum* 1992;35:498-502.
- Trucki G, Stoll T, Bruhlmann P, Michel B. Construct validation of the ACR 1991 criteria for global functional status in rheumatoid arthritis. *Clin Exp Rheumatol* 1995;13:349-352.

# **American Heart Association Functional Capacity Classification --Cardiac Disease--**

**Class I. Patients with cardiac disease but without resulting limitation of physical activity. Ordinary physical activity does not cause undue fatigue, palpitation, dyspnea or anginal pain.**

**Class II. Patients with cardiac disease resulting in slight limitation of physical activity. Ordinary physical activity results in fatigue, palpitation, dyspnea, or anginal pain.**

**Class III. Patients with cardiac disease resulting in marked limitation of physical activity. Less than ordinary activity causes fatigue, palpitation, dyspnea, or anginal pain.**

**Class IV. Patients with cardiac disease resulting in inability to carry on any physical activity without discomfort. Symptoms of heart failure or the anginal syndrome may be present even at rest. If any physical activity is undertaken, discomfort increases.**

## **References**

From the Internet at <http://www.americanheart.org>, cited 9/4/2003.

American College of Cardiology/American Heart Association Chronic Heart Failure Evaluation and Management guidelines: relevance to the geriatric practice. *J Am Geriatr Soc* 2003;51:123-126.

Anonymous. AHA medical/scientific statement. 1994 revisions to classification of functional capacity and objective assessment of patients with diseases of the heart. *Circulation* 1994;90:644-645.

AHA Medical/Scientific Statement: 1994 revisions to classification of functional capacity and objective assessment of patients with diseases of the heart. *Circulation* 1995; 92:2003-2005.



**Eastern Cooperative Oncology Group (ECOG)/ WHO  
Performance Status Scale  
--General Medical--**

|                |  |
|----------------|--|
| <b>Grade 0</b> | <b>Fully active, able to carry on all pre-disease performance without restriction</b>  |
| <b>Grade 1</b> | <b>Restricted in strenuous physical activity but ambulatory and able to carry out work of a light or sedentary nature, e.g., light house work, office work</b> |
| <b>Grade 2</b> | <b>Ambulatory and capable of all self care, but unable to carry out any working activities. Up and about more than 50% of waking hours</b>                     |
| <b>Grade 3</b> | <b>Capable of only limited self care, confined to bed or chair more than 50% of waking hours</b>   |
| <b>Grade 4</b> | <b>Completely disabled. Cannot carry on any self care. Totally confined to bed or chair</b>  |
| <b>Grade 5</b> | <b>Dead</b>  |

(WHO = World Health Organization)

### **Reference**

**Oken MM, Creech RH, Toomey DC, Horton J, Davis TE, McFadden ET, Carbone PP. Toxicity and response criteria of the Eastern Cooperative Oncology Group. *Am J Clin Oncol* 1982;5:649-655.**

# **Karnofsky Performance Status Scale**

## **--General Medical--**

(in %)

- |            |  |
|------------|--|
| <b>100</b> | <b>Normal, no complaints, no evidence of disease</b>                                 |
| <b>90</b>  | <b>Able to carry on normal activity; minor signs or symptoms</b>                     |
| <b>80</b>  | <b>Normal activity with effort; some signs or symptoms of disease</b>                |
| <b>70</b>  | <b>Cares for self; unable to carry on normal activity or do active work</b>          |
| <b>60</b>  | <b>Requires occasional assistance, but is able to care for most of his/her needs</b> |
| <b>50</b>  | <b>Require considerable assistance and frequent medical care</b>                     |
| <b>40</b>  | <b>Disabled, requires special care and assistance</b>                                |
| <b>30</b>  | <b>Severely disabled; hospitalization indicated. Death not imminent</b>              |
| <b>20</b>  | <b>Very sick; hospitalization indicated. Death not imminent</b>                      |
| <b>10</b>  | <b>Moribund, fatal process progressing rapidly</b>                                   |

### **Reference**

**1. Karnofsky DA, Abelmann WH, Craver LF, Burchenal JH. The use of nitrogen mustards in the palliative treatment of carcinoma. With particular reference to bronchogenic carcinoma. *Cancer* 1948;1:634-638.**

# Modified Rankin Scale

## --Neurology (Stroke)--

| <u>Score</u> | <u>Description</u>  |
|--------------|---|
| 0            | No symptoms   |
| 1            | No significant disability despite symptoms. Able to carry out all usual duties and activities                               |
| 2            | Slight disability. Unable to carry out all previous activities, but able to look after own affairs without assistance       |
| 3            | Moderate disability. Requiring some help but able to walk without assistance  |
| 4            | Moderately severe disability. Unable to walk without assistance and unable to attend to own bodily needs without assistance |
| 5            | Severe disability. Bedridden, incontinent, and requiring constant nursing care and assistance                               |
| 6            | Dead  |

### References

1. Rankin J. Cerebral vascular accidents in patients over the age of 60. *Scott Med J* 1957;2:200-215.
2. van Swieten JC, Koudstaal PJ, Visser MC, Shouten HJ, van Gijn J. Interobserver agreement for the assessment of handicap in stroke patients. *Stroke* 1988;19:604-607.
3. Bonita R, Beaglehole R. Modification of Rankin Scale. Recovery of motor function after stroke. *Stroke* 1988;19:1497-1500.



# CENTER FOR VALUE BASED MEDICINE®

Founded in 1998, the Center for Value-Based Medicine® is a healthcare economic research organization that amalgamates the highest level of evidence-based medical data with patient preferences to quantify the value of healthcare interventions. Since the inception of the organization, as well as in prior years, the principals have been intimately involved in pioneering research with healthcare outcomes as they relate to quality-of-life.

The priorities of the Center for Value-Based Medicine® include:

- Identifying the best medical outcomes
- Converting evidence-based medical data into a value-based system
- Developing cost-effectiveness data information systems

The principals of the Center for Value-Based Medicine® have collectively published over 700 healthcare book, article and chapter authorships, and have established the Center nationally in the fields of evidence-based medicine and quality-of-life measures. Their diverse real-world experiences, multiple advanced degrees, and extensive crossover knowledge of medical, nursing, economic, business, epidemiologic, biostatistical, managed care and public policy arenas have allowed unprecedented advancements in the value-based medicine arena.

## Principals



**Melissa M. Brown, MD, MN, MBA**

**Melissa M. Brown, MD, RN, MN, MBA** graduated from Keuka College with a Bachelor of Science in Nursing in 1972 and received her Master of Nursing degree from Emory University as a Clinical Nurse Specialist in Adult Health in 1976. She then taught on the faculty of the School of Nursing at the University of Pennsylvania.

She returned to Jefferson Medical College where she earned her MD in 1986. After a flexible internship at Chestnut Hill Hospital, she completed a residency in ophthalmology at Wills Eye Hospital and is a Diplomate of the American Board of Ophthalmology. Dr. Brown obtained her MBA in Strategic Management from the Haub School of Business at Saint Joseph's University's in 1998.

Dr. Brown is currently CEO of the Center for Value-Based Medicine, a Professor at Jefferson Medical College and on the Research Department at Wills Eye Hospital. The author of over 200 publications, she is also a reviewer for multiple peer-reviewed scientific journals. She was a founder and a Co-chief Editor of *Evidence-Based Ophthalmology*, Lippincott Williams and Wilkins publisher's launch into evidence-based medicine and cost-effectiveness analysis. A former congressional candidate, she has also served as President of the Montgomery County Medical Society and on the Advisory Council of the National Institute of Aging of the National Institutes of Health.

Dr. Brown has been named to Who's Who in Medicine and Health Care, Who's Who in America, National Register's Who's Who in Executives and Business, Strathmore's Who's Who 2000 Millennium Edition, and Who's Who Among Entrepreneurs.

Nationally recognized for her research endeavors, Dr. Brown is lead author of *Evidence-Based to Value-Based Medicine*, a text published by the AMA Press with a foreword by former Medicare Administrator Tom Scully, which elucidates Value-Based Medicine<sup>®</sup> principles.



**Gary C. Brown, MD, MBA**

**Gary C. Brown, MD, MBA** graduated from Colgate University in 1971. He received his MD degree from the SUNY Upstate Medical Center in 1975. He interned in pediatrics at Grady Memorial Hospital in Atlanta, Georgia, and then completed a residency in ophthalmology and fellowship in vitreoretinal diseases at Wills Eye Hospital, Philadelphia, PA. He is a Diplomate of the American Board of Ophthalmology and received his MBA degree in Strategic Management from the Haub School of Business at Saint Joseph's University's in 1998.

Dr. Brown is a Professor of Ophthalmology at Jefferson Medical College and Director Emeritus of the prestigious Retina Service at Wills Eye Hospital. He is Chief Medical Officer at the Center for Value-Based Medicine<sup>®</sup>. His academic accomplishments include authorship or co-authorship of 11 textbooks and over 600 scientific writings. An investigator for multiple National Institutes of Health clinical trials, Dr. Brown has given numerous named lectureships and is a reviewer for many peer-reviewed journals. He has served as President of the Philadelphia Ophthalmic Club, the Wills Hospital Society and the Pennsylvania Academy of Ophthalmology. He was a founder and Co-chief Editor of *Evidence-Based Ophthalmology*, Lippincott Williams and Wilkins publisher's launch into evidence-based medicine and cost-effectiveness analysis. Former founder and Chairman of the Board of the Pennsylvania Physician Healthcare Plan, Dr. Brown has extensive experience in the managed care arena.

Included among Dr. Brown's academic honors are Phi Beta Kappa, Alpha Omega Alpha, the Robert Shoemaker Award, the Paul Craig Award, the American Academy of Ophthalmology Senior Honor Award, and the prestigious Arnall Patz Medal. He has been named in *Who's Who in Medicine*, *Who's Who Among Outstanding Business Executives*, *Who's Who in the World*, *Philadelphia's Top Doctors* and *Castle-Connolly America's Best Doctors*.