Melanoma Quality of Life: Pilot Study Using Utility Measurements

Q uality of life (QOL) is an important predictor of melanoma survival and thus important to understand. Utilities are a health economic measure of QOL eliciting patient preferences for a specific health state. Patients theoretically give up something of value (money, time, risk of death) to not have the disease in question, thus providing insight into the burden of disease. In an era of limited economic resources and with an annual direct cost of over $563 million, the effectiveness of melanoma therapy, in terms of survival and QOL, is a vital criterion for setting priorities in health care. Utilities are used to adjust the amount of life extended by therapeutic interventions investigated in cost-effectiveness analyses (CEAs).

Currently, no repository of melanoma utility data by stage exists. Our goal was to fill this void and test face validity, comparing utilities across stage and time. We hypothesized that melanoma utilities would decrease (more QOL impact) with increasing stage of disease and that time from initial diagnosis would temper the QOL impact as reflected in increased utilities. Finally, because some researchers use proxy subjects to estimate utilities, we explore the ability of our subjects to estimate the impact of melanoma at stages other than their own.

Methods. After institutional review board approval, we recruited consenting consecutive adult patients with melanoma from 2003 to 2005 from the Emory Pigmented Lesion and Oncology Clinics after their visit. We used the 1997 American Joint Committee on Cancer criteria to stage the disease and divided cases into new (1 year or less after diagnosis) and established groups. An established case was defined as one evaluated more than 1 year after diagnosis, except stage IV for which the definition was shortened to more than 6 months owing to poor long-term survival.

Utilities were measured using the time trade-off method and a computer-based utility generator (http://individual.utoronto.ca/bayoumi/prospec). Subjects theoretically exchanged a portion of their future survival time (t years), the life expectancy for a person of his/her age and sex (US Life Tables) with a chance of dying early from melanoma, for a life without melanoma but with a shortened life span (x/t). The time in perfect health, x, was adjusted until the subject was indifferent between the 2 choices. Utility was then equal to x/t.

To standardize the melanoma knowledge base, participants viewed presentations with information from published literature and the Centers for Disease Control and Prevention Web site. For the proxy portion, subjects with stage I disease imagined having a new diagnosis of stage II, III, or IV, while subjects with higher-stage disease imagined the impact of a new stage I diagnosis. Utilities were compared using Kruskal-Wallis tests, adjusted for multiple comparisons. P < .05 was considered significant.

Results. Of the 163 subjects with melanoma, 99% were white; 55% were women; and the average age was 51 years. Most nonparticipants were unable to complete the program owing to time constraints. Newly diagnosed cases had been diagnosed 4 to 9 months prior to study enrollment. Established cases had been diagnosed 2 to 8 years before study enrollment for all except stage IV cases, for which the average established diagnosis was 22 months.

Utilities (Table 1 and Table 2) significantly decreased (decreased quality of life) with increasing new stage (I, II and III, IV) (P = .01), increasing established stage as well as when new and established cases were combined (I and II, III, IV or I, II and III, IV or I, II, III and IV) (P < .001 for all comparisons). Increasing time (new vs established) resulted in significantly increased utilities for stage III melanoma (P = .01).

Subjects with established stage I diagnoses significantly overestimated the impact of new stage II (P = .02)
and IV disease (P = .01). Subjects with established stage II diagnoses underrated the impact of newly diagnosed stage I (P = .07) as did those with new stage IV diagnoses (P = .03).

Comment. Our pilot data indicate that melanoma has significant QOL impact across all stages with reasonable face validity. Subjects with lower-stage disease reported higher utilities (better QOL) than those with advanced disease, and QOL increased significantly with time in stage III. For stage I, the high 5-year survival rate of 98% and the dismal survival rate for stage IV (16%) might have outweighed any time benefit. Small numbers may also contribute to the nonsignificant differences. Finally, our subjects were poor proxies for utility elicitation. Groups with more than 10 subjects were unable to hypothesize utility two-thirds of the time.

Additional limitations include the single-institution source of subjects, which may limit generalizability. We also did not fully characterize or enumerate the refusal patients, thus limiting speculation of potential selection bias. However, our subjects are notably similar to the general melanoma population: 55% female (vs 44% nationally); average age, 51 (vs 58) years.10

Our pilot data provide a starting point for future CEAs evaluating melanoma treatment and screening programs. While cost analyses focus purely on the financial aspects of interventions, CEAs incorporate QOL impact using utilities. For example, a screening program may demonstrate little in terms of cost for life-years saved and yet display a significant quality-adjusted life-year benefit. Readers are referred to 2 excellent reviews by Ellis et al11 and Drummond et al12 for details on incorporating utilities into CEAs.

<p>| Table 2. Utilities for Overall (New and Established Combined) Melanoma Diagnoses |</p>
<table>
<thead>
<tr>
<th>Stage</th>
<th>Mean Utility, Mean (SD)</th>
<th>Median (IQR)</th>
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<tbody>
<tr>
<td>I</td>
<td>0.926 (0.119)</td>
<td>0.989 (0.886-1.000)</td>
</tr>
<tr>
<td>II</td>
<td>0.915 (0.127)</td>
<td>0.965 (0.900-1.000)</td>
</tr>
<tr>
<td>III</td>
<td>0.720 (0.282)</td>
<td>0.655 (0.600-0.977)</td>
</tr>
<tr>
<td>IV</td>
<td>0.580 (0.340)</td>
<td>0.565 (0.263-1.000)</td>
</tr>
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</table>

Abbreviations: IQR, interquartile range.

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Author Contributions: Drs Coleman King, Chen, and Veledar had full access to all of the data in the study and take responsibility for the integrity of the data and accuracy of the data analysis. Study concept and design: Bonaccorsi, Hadley, Lawson, and Chen. Acquisition of data: Bonaccorsi, Bendeck, Hadley, Puttgen, and Veledar. Analysis and interpretation of data: Coleman King, Bonaccorsi, Kolm, Veledar, and Chen. Drafting of the manuscript: Coleman King, Bendeck, and Kolm. Critical revision of the manuscript for important intellectual content: Coleman King, Bonaccorsi, Hadley, Puttgen, Veledar, Lawson, and Chen. Statistical analysis: Kolm and Veledar. Obtained funding: Chen. Administrative, technical, and material support: Coleman King, Bendeck, Hadley, Lawson, and Chen. Study supervision: Coleman King, Bonaccorsi, Lawson, and Chen.

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