

# Re·FLECTIONS

RGA's Medical Underwriting Newsletter

## LETTER FROM THE EDITOR



Dear Readers:

The prior edition of *Re-flections* discussed several aspects of assessment of the elderly life risk, specifically the use of testing for the evaluation of cognitive and physical function. In this edition, I will be discussing the measurement of social engagement in the elderly and correlating it to physical and cognitive functional testing.

I hope you enjoy this publication!

J. Carl Holowaty, M.D.  
[cholowaty@rgare.com](mailto:cholowaty@rgare.com)

### OLD-AGE UNDERWRITING

By J. Carl Holowaty, M.D.

#### **Vitality in the Elderly and the Relationship between Social Engagement, Cognitive Function and Physical Function**

The evaluation of the degree to which an elderly insurance applicant is engaged in social activities has been studied as a predictor of longevity. This article examines the evidence that links social engagement to mortality and will then correlate this information with the known associations between cognitive function and physical function in the elderly that were discussed in detail in the previous publication of *Re-flections*.

Socialization is the process by which people adapt to behavior patterns in the community. It allows members of society to participate in the culture of the community. Social behavior is unique to each cultural group within any particular society, and there is often the need to adapt one's social skills for each particular subset of a society. Socialization is learned from infancy and is influenced by parents, teachers and the aural or visual

examples of others. The term 'social engagement' denotes the degree to which a person is involved in the community. Social engagement is usually very limited in infancy, and then expands enormously as we progress through our schooling and professional careers. With advancing age, however, it is not uncommon for social engagement to contract. This may be due to induced isolation related to medical problems, or in some cases can be due to a mentally diminished capacity to engage in this function. This situation is perhaps best described by William Shakespeare in his play *As You Like It*, act 2, scene 7, when he describes the last of the seven stages of man:

*"Last scene of all,  
 That ends this strange eventful history,  
 Is second childishness and mere oblivion,  
 Sans teeth, sans eyes, sans taste, sans everything."*

He is clearly describing an involitional phase of life that demonstrates a shrinkage in our intellectual, sensory, physical and social spheres. These are the aspects of an aging individual that need to be measured in order to obtain a reasonably accurate measure of longevity.

Social engagement in the elderly includes interactions with family members, friends, community organizations such as clubs, and even caretakers. There are varying degrees of social engagement. The lowest degree of social engagement consists of solitary engagement, such as watching television, listening to a radio or reading newspapers or books. A higher degree of engagement involves group activities such as talking with family or friends, playing cards, attending movies with others or eating with friends in a café. The highest degree of social engagement involves more complex activities that include borrowing or lending activities or repeated visits with neighbors.

Researchers have examined the linkage between social engagement and mortality, as well as the more specific relationship between the degree of social engagement and mortality. The CALAS Study looked at

Social Factors and Mortality in the Old-Old in Israel (Journal of Gerontology: SOCIAL SCIENCES, 2002, Vol. 57B, No. 5, S308-S318). They measured 8-year mortality in people aged 75-94 and concluded that, "After controlling for socio-demographics and measures of health, cognitive status, depressive symptoms, and physical function, the measures of social engagement that explicitly involve others were associated with a lower risk of mortality." They also indicated that participating in activities with people outside the immediate family is associated with a lower risk of death. Those who engaged in more reciprocal neighborly relationships had lower mortality, and those who frequently or very frequently engaged in solitary and group leisure activities all showed lower mortality than did those who never or rarely engaged in those activities. The worst mortality was in those that were living in the community without a spouse but with a child, and those that were living in institutions. The mortality figures for this study are listed below:

Measures	No.	%	Mortality %
<b>Reciprocal Neighborly Relationships</b>			
No	719	53.7	67.0
1	195	14.6	55.9
2	70	5.2	54.3
3	356	26.6	51.7
<b>Leisure Activity (solitary)</b>			
Never/Very Rarely	140	10.4	73.6
Frequently	395	29.5	61.5
Very Frequently	805	60.1	58.0
<b>Leisure Activity (group)</b>			
Never/Very Rarely	792	59.1	67.0
Frequently	290	21.6	52.8
Very Frequently	258	19.3	50.0

A study of Social Networks, Institutionalization, and Mortality among Elderly People in the United States published in the Journal of Gerontology (Based on Longitudinal Study of Aging (LSOA), 1992, Vol. 47, No. 4, S183-S190) indicated that institutionalization was associated with adverse mortality. Further, participation in informal networks helped to keep elderly people out of institutions, while socially isolated and less socially integrated people were more likely to commit

suicide. Some of the risk factors for institutionalization were solitary living arrangements and being widowed. Participating in social activities decreased the likelihood of institutionalization by almost half. Participating in social activities and visiting or talking with friends or relatives decreased the likelihood of mortality by almost half. One of their conclusions was that, "Apparently, in order to have beneficial effects, a social activity or relationship must involve greater active effort by the individual and some contact with other people." This suggests that it is not enough for an elderly person to passively participate in social activities, but the person must be actively involved in the initiation of these activities.

While these study results certainly suggest that there is a favorable association between higher levels of social engagement and mortality, this is an area that is still relatively poorly studied. The dearth of studies, as well as the contradictory conclusions from earlier researchers such as Schoenbach et al. (1986) and House, Robbins, and Metzner (1982), raise some caution in the overly optimistic application of the more recent findings. These studies have tried to link mortality with the degree of social engagement, but have not addressed the issue of change in status of social engagement. For example, an elderly applicant who has always been socially uninvolved in community events may not be in the same risk category as someone who was formerly highly involved in the community but is now no longer active in community affairs.

While social engagement may not necessarily turn out to be a primary independent marker for mortality, there certainly seems to be some association between higher levels of social engagement and mortality. It also appears that the type of social engagement is important, with reciprocal engagement between non-family members being the most beneficial.

From the perspective of life and health insurance, the measurement of social engagement can be relatively simple, inexpensive and time-efficient. The use of self-reported questionnaires is usually sufficient to determine risk stratification regarding social engagement. A non-leading questionnaire detailing current social engagement as well as asking about any recent changes in this function would be ideal.

The last edition of *Re-reflections* dealt at length with the relationships between cognitive function and physical function and mortality in the elderly. Additional information on these issues is available in the Webcast presenta-

tion recordings found at the internet site [www.rgare.com/underwritingconnection](http://www.rgare.com/underwritingconnection).



It is apparent that cognitive health and physical function are related to mortality in the elderly. It is also clear that there is a variety of methods by which both of these functions can be assessed. Various tests have been developed to estimate cognitive decline. This function consists of a number of different components, and each test measures at least some of these components to a certain degree. While early cognitive change remains difficult to detect easily and accurately, it is important for insurers to recognize moderate and severe forms of dementia, since they have significant mortality implications. All commonly used cognitive tests are well suited to this purpose and do provide protective value. The amount of independent protective value may possibly be overestimated in an insurance setting, since moderate and severe forms of dementia are often already known through sources such as attending physicians' statements.

Physical function can also be objectively measured. Once again, this function has a variety of components, including factors such as speed of motion, endurance, balance and strength. Some tests measure just one of these components, whereas other more elaborate tests measure multiple components and thereby increase the accuracy of the assessment. These more thorough tests however may come at the expense of cost and convenience for the applicant and insurer. The simplest form of assessment is self-reporting. Unfortunately this type of test is subject to potential anti-

selection, as well as recall concerns in a population with a high incidence of cognitive dysfunction.

At the other extreme of testing complexity and expense are tests such as exercise treadmills that provide a wealth of information relating to balance, speed and endurance as well as respiratory function and, of course, insight into the presence of ischemic cardiac disease. In contrast to self-reporting, this type of testing provides objective and comprehensive evaluation of physical function that will go a long way towards accurate assessment of overall risk in the elderly. It is unfortunate that this test is being done less often now when its value as a predictor of older age mortality is most needed.

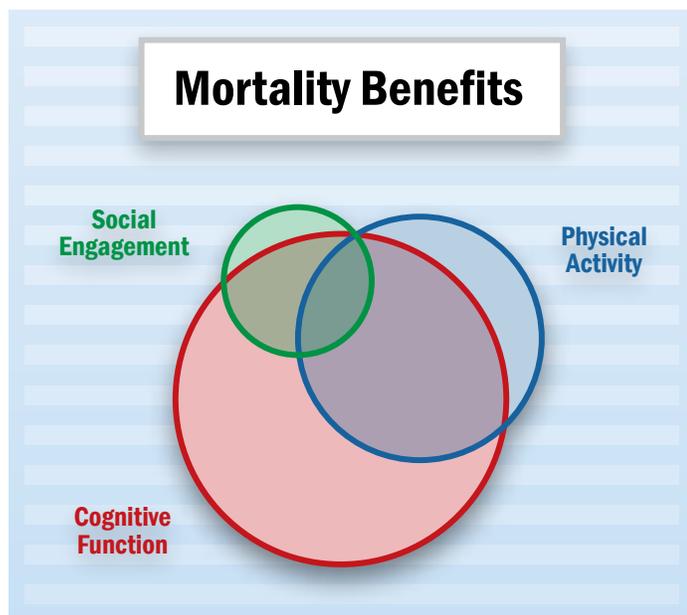
In the middle ground of physical function testing are tests such as the Timed Get Up and Go Test, which quickly and inexpensively provide objective measurement of the physical vitality of an elderly applicant. Perhaps the ideal usage of this variety of tests would entail using each test where its value can be titrated against the face amount and premium of the case.

Most clinical studies of vitality in the elderly look primarily at one component of their vitality and try to isolate the association between this component and mortality. While this is a reasonable approach from an academic perspective, as insurers we are more concerned about a holistic evaluation of vitality. It seems reasonable that there should be some interplay between the three primary components that have been discussed in this edition of *Re-flections*.

For instance, while it is certainly quite possible that an elderly applicant may have deficits in only one component of vitality, it is often likely that more than one of these components will be affected. For example, if an applicant has evidence of moderate dementia, it is expected this person would also have significant contraction of their level of social engagement as well as a diminution of their level of physical activity. Even if a person is cognitively intact, loss of physical function (e.g. marked arthritis) would probably lead to a less active social life, and taken to the extreme, this loss of social engagement could contribute to a decline in cognitive ability.

It is difficult, then, to estimate that the mortality benefits of evaluating each of these components of vitality should be assigned in a purely cumulative fashion. Instead, it may be more likely that the mortality benefits in fact overlap each other to a certain degree in a fashion similar to the Venn diagram on the next page.

This diagram is not intended to be completely accurate, but rather to stimulate the thought process in how the mortality benefits of each of these components of mortality might interact. Having said that, the differences in size of the mortality benefits is deliberate, with the smallest circle being assigned to social engagement and the next smallest being assigned to physical function. The largest circle is assigned for the mortality benefits related to cognitive function. For the purpose of this illustration, the benefit measuring cognitive function is depicted as larger than that of physical function since cognitive status usually declines slowly and somewhat predictably, while physical status can decline from superior to very low quite quickly under a variety of circumstances.



The prior edition of *Re-reflections* discussed at some length the value of each of the tests of cognitive and physical functions. While this is certainly highly pertinent when estimating their protective value, it is equally important to consider how the test results will be used. As an example, we all accept that measuring serum lipids is useful to evaluate coronary artery disease risk, but simply measuring this serum component is not enough. Careful consideration has to be given to how the results are used in a credit-debit system. This is equally true of the test results for cognitive, physical and social function. Using a test result too stringently can result in the possibility of losing good business, while the use of too liberal of a scoring system can effectively negate the use of the test altogether. Another potential pitfall of older-age testing is the use of possibly inappropriate crediting. For example, does it make sense to give credits for an applicant

with normal cognitive function to be used against existing diseases such as moderately severe coronary disease?

Other considerations are the 'Sentinel Effect' as well as the impact on overall old-age business. Assuming that a certain critical number of life and health insurers are appropriately using these tests, it is reasonable to expect that some of their applicants will receive rated or decline decisions, compared with traditional risk evaluation procedures. These same applicants may decide to seek insurance elsewhere, putting the non-testing companies at risk of anti-selection in the same manner that occurred in the past when cotinine testing was introduced.

To test or not to test, that is the question! How to test and how to apply those test results successfully will be measured in future old-age mortality experience.

For more detail on this article, please visit: [www.rgare.com/underwritingconnection](http://www.rgare.com/underwritingconnection)

## References

- <sup>1</sup> Bliss, R. "Low Protein + Low Exercise = Sarcopenia." *Agricultural Research Magazine*, Volume 53, Number 5, May 2005.
- <sup>2</sup> Catanzano, T. "Lung, Primary Tuberculosis." [www.emedicine.com](http://www.emedicine.com). September 2005.
- <sup>3</sup> Centers for Disease Control and Prevention, [www.cdc.gov](http://www.cdc.gov).
- <sup>4</sup> Kasper, Braunwald, Fauci et al. *Harrison's Principles of Internal Medicine*, Volume 1, 16th Edition, McGraw-Hill, New York.
- <sup>5</sup> Leung, A. "Pulmonary Tuberculosis: The Essentials." *Radiology*, Volume 210, Number 2, p. 307-322. February 1999.
- <sup>6</sup> Mayo Clinic, [www.mayoclinic.com](http://www.mayoclinic.com).
- <sup>7</sup> National Institute of Allergy and Infectious Diseases, [www.niaid.nih.gov](http://www.niaid.nih.gov).
- <sup>8</sup> Palomino, J.C. "Newer diagnostics for tuberculosis and multi-drug resistant tuberculosis." *Pulmonary Medicine*, Volume 12(3), p. 172-178. May 2006.
- <sup>9</sup> Schurr, E. "Is susceptibility to tuberculosis acquired or inherited?" *Journal of Internal Medicine*, Volume 261(2), p. 106-111. February 2007.
- <sup>10</sup> Sheff, B. and Hayes, D. "Connecting the DOTS to treat pulmonary TB." *Nursing*, Volume 35, Number 10. 2005.
- <sup>11</sup> Laloo, U.G. et al. "Recent advances in the medical and surgical treatment of multi-drug resistant tuberculosis." 2006.
- <sup>12</sup> World Health Organization, [www.who.org](http://www.who.org).
- <sup>13</sup> [www.emedicine.com](http://www.emedicine.com).