Older Age Applicants: Medical Directors' Perspective

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The number of individuals in the United States over the age of 65 is expected to increase rapidly during the remainder of this century and well into the next century. This growth rate is most marked for those individuals over the age of 85. Lest one think that this is a phenomenon unique to the United States, let me be quick to point out that most industrialized countries have experienced or are anticipated to experience a similarly increased growth rate of elderly individuals.

This rapid growth rate in the number of elderly, accompanied with a shift in wealth to the older age groups and the need for the elderly individuals to protect and transfer their assets, has resulted in a large potential market for life and other insurance products. However, because baseline mortality and morbidity rates are high among the elderly, it is very important that products be priced appropriately and that underwriting be tailored to reflect the relative differences in the importance of risk factors and impairments in the elderly compared to younger age groups. Failure to do so will result in the deterioration of experience, which will likely become apparent much sooner than might be the case for a block of business consisting primarily of younger lives.

As Dr. Svanborg has shown, many consequences of aging are not due to age itself, but are instead related to the duration of exposure to various risk factors. Depending upon the duration and intensity of exposure and individual susceptibility, the consequences of aging may range from mild to severe and from relatively benign to that producing premature morbidity and mortality. Hence, elderly individuals may be expected to demonstrate greater heterogeneity in their health status compared to younger individuals. Therefore, risk classification and selection might be expected to assume even greater importance in this age group.

Factors to be considered in underwriting the elderly fall into two general categories: those that are commonly seen in both younger and older age groups, the differences being largely a matter of degree and therefore quantitative in nature; and those unique to the elderly age groups or those seen almost exclusively in the older age groups, the difference here being largely qualitative.

Table 1 depicts the various causes of death in the younger and older age groups. As we can see, in younger age groups cancer and heart disease each account for about 25% of deaths. In the old age groups, heart disease accounts for 50% and cancer and cerebrovascular disease account for another 25% of deaths. Thus although the conditions are similar, the differences that exist are largely a matter of degree and therefore quantitative in nature. Accordingly, the risk factors that we use to assess morbidity and mortality for these impairments in older age groups are largely the same as those we use in the younger age groups, and include family history, blood pressure, cholesterol, physical activity, diabetes and preexisting heart disease.

But in addition, qualitative differences also exist. For instance, many studies over a number of years have shown that the incidence of coronary heart disease increases with increases in systolic and diastolic blood pressure, both for younger and older age groups (a quantitative difference). However, there are unique aspects to hypertension in elderly age groups, qualitative differences. One of these is the influence of isolated systolic hypertension, which is common among elderly and which conveys considerable risk of mortality. Another is the U-shaped relationship between blood pressure and mortality in older individuals as shown in Figure 1.

This figure demonstrates that mortality rises with increases in systolic and diastolic blood pressure. With treatment, mortality falls to a point, and then starts to increase again when blood pressure falls or is reduced.
As a further example consider cholesterol. Again numerous studies have shown increasing incidence of coronary heart disease with rising cholesterol levels both in younger and older age groups. However, the relative risk conveyed by hypercholesterolemia diminishes with increasing age, but because the incidence of coronary heart disease increases rapidly with age, the risk of coronary heart disease attributable to hypercholesterolemia actually increases.

Recently, controversy has again risen about the influence of hypercholesterolemia as a prediabetic factor for the development of coronary heart disease and mortality beyond the age of 70. This debate was highlighted last November with the publication of a paper by the New Haven Group of the EPESE Investigators. Their data suggested that neither elevated total cholesterol levels nor depressed HDL cholesterol levels were predictive of mortality or morbidity in persons older than age 70.

More recently this past month, publication of the full results of the EPESE study seemed to confirm the statement made a number of years ago by Castelli based upon the Framingham data. That statement was, with respect to HDL and coronary heart disease, “the association is equally as strong at all ages for the three decades beyond age 60.” In the EPESE study, hypercholesterolemia appeared not to be a risk factor for coronary heart disease in elderly individuals, although depressed levels of HDL and the ratio of HDL to total cholesterol remained predictive. Again a quantitative difference.

However, there are also qualitative differences. It has long been recognized that depressed levels of total cholesterol, and especially total cholesterol levels that are rapidly falling, are markers for excess mortality. This is due not only to the risk of cancer, but also due to the risk of mortality from any cause, and, for women, due to the risk of coronary heart disease.

We must also bear in mind that the presence of multiple impairments is commonplace in the elderly. This is termed co-morbidity, the combination of impairments existing together which increases the risk of morbidity or mortality.

Those co-morbid conditions seen commonly in the elderly population include arthritis, hypertension, cataracts, heart disease, varicose veins, diabetes, cancer, osteoporosis, fractures, and stroke.

The presence of co-morbid impairments increases with age. At age 60, 35% of males and about 50% of females have the presence of two or more co-morbid impairments. By age 80, that proportion increases to 50 and 70%, respectively. The challenge, therefore, is to differentiate those elderly individuals having multiple co-morbid impairments and who are frail and at risk of premature mortality and morbidity from those other elderly individuals who have no such increased risk.

In order to do so, I suggest that we think about functional ability. As an aid to recalling those aspects of functionality that are predictive for mortality and morbidity, consider this mnemonic: A-AGED. The first A stands for activities of daily living. The second A stands for the presence of Alzheimer’s disease and other dementing illnesses. The G stands for impairment in gait and other markers of frailty. The E stands for an assessment of exercised capacity. The D stands for depression.

Activities of basic living are classified as basic activities of daily living, the instrumental activities, and the advanced activities. The basic activities of daily living are really self-care activities: eating, bathing, dressing, transferring. The instrumental activities of daily living require some higher level of functionality: telephoning, managing finances, performing minor home repairs. The advanced activities of daily living are those activities which give richness and meaning to our lives. These are largely recreational in nature and consist of activities such as going to the theater and participating in various recreational sports.

Impairments in activities of daily living convey a substantial risk for subsequent mortality. In one study, elderly individuals who required help with activities of daily living had a mortality risk fourfold above those who had no such requirement. Difficulties with instrumental activities of daily living conferred a twofold increase in mortality.

The second A is Alzheimer’s disease and the presence of other cognitive impairments. We must recall that Alzheimer’s disease is but one of the causes, albeit the most common cause of dementing illness. Other causes include multiple infarct dementia, various reversible dementias, the pseudo-dementia associated with depression, as well as other degenerative neurologic disease such as Parkinson’s disease and Pick’s disease. The prevalence of dementia increases with age and ranges from 1-5% at age 65, to 15% at age 85.

The presence of dementia confers a substantial risk of mortality. In an analysis prepared by Battis, the mortality risk of Alzheimer’s disease was calculated to be about 300%, and that of multi-infarct dementia to be approximately 450%.

In a more recent study, 126 patients with Alzheimer’s disease were followed for six years. The median survival was nine years from the onset of dementia and five years from the time of the first
physician visit for evaluation of dementia. When one performs life table analysis on this cohort, one finds that mortality was increased substantially after five years of disease duration to a degree roughly equivalent to that calculated by Battis.

The third item to consider is gait assessment and other markers of frailty. In an older study which still retains some validity, 125 persons who fell in their homes were followed and matched with controls according to age and sex. Only three sustained fractures of the femur, 15 sustained other fractures and most sustained only trivial injuries. There were 20 “long lies,” defined as inability to get up without help for more than an hour. Again the risk of falling conveyed substantial mortality compared to controls. Any fall conveyed a relative mortality risk of 400%, a fall associated with incontinence conveyed a relative mortality of 560% and a long lie conveyed a mortality risk of 760%. Multiple falls and a long lie were associated with a relative mortality of over 1,000%. The risk factors for falls have been elucidated by Tinetti. They include a previous history of falling, the use of walking aids, a history of vertebral compression fractures, moderate or worse impairment of cervical motion, orthostatic hypertension, and impairments of activities of daily living.

The fourth aspect of functionality to consider is exercise capacity, usually expressed in terms of METS - or Metabolic equivalents. One MET is defined as the oxygen consumption at rest. Various activities are then expressed in terms of multiples of that basal oxygen consumption, five METS being the oxygen consumption of the peak activities of daily living.

It has long been recognized that exercise capacity is a powerful predictor of subsequent mortality. Cooper demonstrated that as maximum exercise capacity increased, mortality fell in individuals younger than age 65. Subsequently, other studies have shown that this predictive power of exercise capacity extends into the older age. For example, the Harvard Alumni Study used questionnaires to investigate the level of physical activity of 17,000 alumni and divided the cohort into three groups: those expending less than 500 kilocalories per week, those expending 500-2,000 kilocalories per week, and those expending more than 2,000 kilocalories per week. For all ages, increased levels of exercise capacity correlated with a decreased risk of mortality.

The last component of functional ability to consider is “depression” and the presence of other psychiatric illnesses. We must recognize that depression is only one of many psychiatric illnesses. However, most psychiatric illnesses are less common in the elderly and convey a lesser risk of mortality compared to young ages, with two exceptions: cognitive impairment (which we have already discussed) and depression.

Although depression is less common in the elderly, it can be associated with substantial excess mortality. In a study of nursing home patients reported by Rovner, the presence of dementia was associated with a relative mortality risk of 150%. In a more recent study of community-dwelling elderly Finish people, the relative mortality risk at 15 years was 350%. The clues to the presence of depression that one must consider include male sex, the presence of physical illness that produces symptoms and functional limitations, a history of previous depressive illness, a history of previous suicide attempts, bereavement, and a history of drug or alcohol abuse.

In summary then, I suggest that underwriting the elderly requires consideration of both traditional risk factors, those risk factors which are common to both younger and elderly age groups and which may differ by degree (*at is to say quantitatively), and those risk factors that are unique to or confined almost exclusively to elderly age groups. These later factors are largely indicators of functional ability and may be remembered by the mnemonic “A-AGED.”
References:


Table 1
Top Ten Causes of Death of the Young vs the Elderly

<table>
<thead>
<tr>
<th>Percentage of Total Deaths</th>
<th>Ages 35-54</th>
<th>Ages 65+</th>
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<tbody>
<tr>
<td></td>
<td>Rank</td>
<td>Cause of Death</td>
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<tr>
<td>~25</td>
<td>1</td>
<td>Cancer</td>
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<td>~25</td>
<td>2</td>
<td>Heart Disease</td>
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<tr>
<td>~25</td>
<td>3</td>
<td>Accidents</td>
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<td>4</td>
<td>Suicide</td>
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<td>5</td>
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<td>Homicide</td>
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<td>7</td>
<td>Cerebral-Vasc. Dis.</td>
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<tr>
<td>~25</td>
<td>8</td>
<td>Diabetes</td>
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Total Percentage of Deaths 85% 99+%


Relationship Between Blood Pressure and Death Rates in Elderly Treated and Untreated Hypertensive Patients


