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EDITORIAL COMMENT

Age: A Nonmodifiable Risk Factor?*

Mathew S. Maurer, MD
New York, New York

Chronologic age has been identified in almost all cardiovascular investigations as a potent, independent risk for increased morbidity and mortality. As clinical cardiologists, we are constantly faced with diagnostic or treatment decisions regarding what is "appropriate" for an older individual. In the absence of sound evidence, these decisions can be strongly influenced by the stereotypic and often negative perception of older adults (1).

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The percentage of older patients constituting a cardiologist's practice has increased from under 40% in the late 1970s to almost 60% (2). Despite progressive declines in age-adjusted mortality rates from coronary heart disease and hypertensive cardiovascular disease (3), the incidence and prevalence of heart failure both in the setting of an impaired and preserved ejection fraction, chronic ischemic heart disease, and atrial fibrillation are increasing, and it has been projected that these rates will continue well into the 21st century (4,5). Thus, we have many new yet-older consumers in need of our cardiovascular expertise.

Perceptions of elders as debilitated, disabled, and dependent are yielding to a recognition that a growing population of older adults are "aging successfully" with independent, functional lives (6). Until recently, a widely held view in cardiology was that the risk of our interventions for elders was high and the perceived benefits low (7). However, over the past three decades, cardiologists have gained a wealth of experience and judgment in the management of older patients as evidenced by the development and application of coronary artery bypass graft surgery (CABG). In the Coronary Artery Surgery Study (CASS) registry of 8,913 patients who underwent CABG in the period from 1975 to 1979, 12.2% were 65 years of age and older (8). Two decades later, 56% of the nearly 600,000 CABG operations in the U.S. were being performed in patients 65 years of age and older. Clearly, the cardiovascular community has embraced the performance of CABG for the older individual. However, numerous publications documented that among octogenarians there was a high perioperative mortality (9,10). In an effort to understand these outcomes, cardiovascular researchers identified predictors of perioperative mortality in elders, including but not limited to urgency of the surgery, severity of cardiovascular disease, renal insufficiency, lower body mass index, and comorbid conditions (11–14). We have recognized the increased risks, identified some predictors, and now can provide our older patients with meaningful probabilities for short-term survival. However, is it sufficient to recommend a procedure merely because it could be performed within acceptable limits of mortality?

Over the last few years, the quality of life outcomes in older patients undergoing CABG surgery have become a major issue. Quality of life outcomes cover the sustained impact of cardiovascular limitations on living, including function and symptom distress. These are reasonable and appropriate outcome measures because they are major concerns of our older patient population. In recent years there have been several investigations documenting that after CABG there is a general increase in quality of life, sense of well being, and satisfaction with the decision to undergo the operation (15–17); however, these results have come from small single-center studies. In this issue of the *Journal*, Conaway et al. (18) provide us further answers and insights regarding the role of surgical revascularization in the elderly patient with coronary artery disease. Using a prospective design, a consecutive series of 690 patients undergoing CABG had serial assessments of the impact of the procedure on measures of functional status, symptom burden, and quality of life. Older patients were shown to have absolute improvements in physical function, angina frequency, and quality of life, and there were no statistically significant differences in these respects between older and younger subjects. In fact, there were trends toward greater reduction in angina frequency and greater increase in overall quality of life one year after surgery in the elderly. These findings, taken together with previous studies, indicate that in older subjects there is an increased baseline risk (19), leading to the inference that elderly patients may benefit more from our interventions than younger counterparts.

We have begun to seek answers on how to minimize the risks of adverse perioperative outcomes observed during our experiences applying surgical revascularization to the elderly population. For example, the role of off-pump procedures in reducing the risk of cognitive decline observed after cardiopulmonary bypass, especially in the elderly patients, has been a focus of active investigation (20). What should be our reaction to the observation delineated by Conaway et al. (18) that functional recovery is delayed in our older patients? Is it an inevitable outcome in older individuals after such aggressive interventions? Or should we do what we have done for decades: identify the risk factors for delayed functional recovery; develop targeted interventions involving interdisciplinary approaches; and test in rigorously designed, large, multicenter trials whether we can change what we currently perceive to be non-modifiable? Such

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From Columbia University, New York, New York. Dr. Maurer is supported by a Career Development Award from the National Institute on Aging (K23-AG00966).

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studies can provide meaningful data that permit generalizable information to the growing population of elders undergoing CABG and provide sufficient power to identify predictors of quality of life outcomes in relevant subgroups of elders undergoing revascularization procedures.

In the care of older patients, cardiology has been at the forefront of creating a model for subspecialty involvement. Initially, faced with the growing population of older individuals in need of our services, cardiologists and cardiac surgeons developed experience in caring for these individuals. These experiences contradicted classic paradigms, suggesting that our services could be provided with reasonable risks and with potentially much gain. Amazing advancements in the delivery of care has permitted us to apply valuable, life-preserving techniques to the elderly. Future investigations should continue to challenge our bias against treating the elderly, demanding rigorous investigation into the factors that impair quality and quantity of life for the elderly patient with cardiovascular disease. We should not assume that age is a non-modifiable risk for worse outcomes. Rather, we need to understand the biological, psychological, and social factors that result in poor outcomes for our older clientele and develop systems of care capable of addressing these issues. After all, where we once would have treaded cautiously when treating a 65-year-old patient, we now routinely perform cardiac surgery on 80-year-old patients. Our perception of what constitutes "old" is continually changing. This has been exemplified by the progress we have achieved in providing cardiovascular care to a growing and constantly older set of individuals (21).

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Reprint requests and correspondence: Dr. Mathew S. Maurer, Columbia University, Medicine, 177 Fort Washington Avenue, MHB5-435, New York, New York 10032. E-mail: msm10@columbia.edu.

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