Health and Disease in Old Age

Edited by
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Preface

The past 10 years have seen American geriatrics advance from obscurity to visibility through numerous programs in medical schools and teaching hospitals. This increasing interest has been accompanied by an increased demand for educational materials and curriculum offerings in geriatric medicine at the undergraduate levels. We offer this textbook in the hope that it will be of value to medical students, physicians-in-training, and practitioners. In its development, we have attempted to strike a balance between the desire for completeness and the recognition that much of what is generally considered to be geriatric medicine is discussed very adequately in textbooks of primary care or general internal medicine.

This book has several characteristics that we hope will make it useful. We have included substantial information about the normal physiologic and psychosocial changes that occur with age, both in introductory chapters and in the initial portions of each individual chapter. This reflects our belief that much of the influence of age on disease presentation, response to treatment, and ensuing complications results from the interaction of a disease process with an age-altered physiologic substrate. The juxtaposition of normal age-related changes and disease characteristics should help the physician to identify the separate clinical consequences of aging and disease. This book generally contains information only on diseases that occur late in life or that present special characteristics in the elderly as compared to younger individuals. Since our aim was to write a book that could appropriately serve as a supplement to a more general text rather than to reproduce a textbook of internal medicine, we have chosen not to include information regarding many diseases and, in the case of hematology, an entire organ system. We have included subjects not usually found in general texts, such as the biology and physiology of aging, the social context of geriatric medicine, long-term care, nutrition, ethical issues in geriatrics, and a consideration of the research methodologies appropriate for clinical gerontologic investigations.

We hope that this book will provide physicians with a gerontologic data base and with principles of geriatric medical practice so that they can better arm themselves to care for the disproportionate burden of illness borne by our increasingly large elderly population.

J. W. R.
R. W. B.

NOTICE

The indications and dosages of all drugs in this book have been recommended in the medical literature and conform to the practices of the general medical community. The medications described do not necessarily have specific approval by the Food and Drug Administration for use in the diseases and dosages for which they are recommended. The package insert for each drug should be consulted for use and dosage as approved by the FDA. Because standards for usage change, it is advisable to keep abreast of revised recommendations, particularly those concerning new drugs.

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1. The Data Base of Geriatric Medicine

Richard W. Besdine

For a generation in many western European countries, medical education and health care have had a special focus on the elderly; Britain has even developed a specialty with freestanding academic and service departments. In the United States, however, little special attention has been given to old people, either in terms of medical education or in health care systems design [1,2]. Congress in 1976 identified gaps in physician education and expressed concern about the capability of American practitioners to meet successfully the medical care needs of an increasing number of old people in the population [3]. In 1974, only one program was offering postgraduate training in geriatrics [4].

Recently, an extensive report by the Institute of Medicine of the National Academy of Sciences [5] recommended substantial specific innovation in American medical education, both predoctoral and postdoctoral, in order to provide information about aging. The goal in America should not be the creation of another clinical specialty, since there already exist adequate numbers of physicians who could provide care for elderly patients [6]; rather, establishment of an academic specialty was recommended to equip the educational mainstream with information enabling students, house staff, and practicing physicians to manage sickness and disability in the American elderly population. The data base needing to be taught is both broad in perspective and disease-specific. Its major components include demography, health care delivery, gerontology (study of normal aging), and geriatric medicine (disease in old age). *Geriatrics* is a general term that covers relevant information in all four areas. This chapter will outline the components of the data base required in the health care of elderly individuals, emphasizing the interrelationships among the multiple disciplines needed for successful treatment of elderly Americans.

Demography

Like Europe before us and developing nations in the future, the United States population is becoming top-heavy with elders. Many factors have collaborated over the past century to "age" our society. Understanding the greying of America provides the clinician with an important perspective. The longest-lived Americans are no older today than during the Revolutionary War, the aged survivors still living approximately 100 years. Maximum human life span has not changed [7], but a dramatic increase in average life expectancy has allowed many more people to survive into old age, creating a new medical care need in Western countries that Bernard Isaacs has called "the survival of the unfittest." Previously unimagined numbers of people are surviving into extreme old age with burdens of disease,

social disadvantage, emotional vulnerability, and the inevitable poverty such burdens create [8]. Average life expectancy in America has increased by more than 25 years for an individual during the twentieth century—from 47 years in 1900 to 73 years in 1980 [9]. In the next 50 years the elderly population will double, reaching more than 50 million individuals, while the total United States population growth is projected at only 40 percent, resulting in more than one in five citizens being over 65 years of age. The "old-old" subset of elderly will increase even faster. Americans older than 75 years of age will increase from 35 percent to 45 percent of the elderly population, and those 85 years of age and older will increase threefold, from two million to six million individuals [10]. The American demographic shift toward old age demands adequate preparation, both attitudinal and educational, by health care providers.

Normal Aging

Gerontology, the study of normal aging, draws from all of the biobehavioral sciences that contribute to our understanding of changing human function (see Chap. 2). Gerontologic investigation attempts to distinguish effects of normal healthy aging from disease effects. As people age and disease becomes more prevalent, healthy subjects for study are harder to find. Many studies have included impaired elderly subjects; these erroneously attribute observed differences between young and old to aging when the differences actually arise from disease. Furthermore, cross-sectional studies, which are relatively easy to do, may be less useful than longitudinal studies, which are difficult because of subject dropout and the long life span of humans [11]. Although generalizations are dangerous, especially since variability increases with age, most age-related biologic changes show growth and development peaking at or before age 30 with subsequent linear decline until death, even into the ninth decade. Biologic functions declining with age include: renal blood flow and creatinine clearance, cardiac output, glucose tolerance, vital capacity of the lung, lean body mass, and cellular immunity [12]; but, synthetic and metabolic liver functions and total lung capacity remain the same across the age spectrum, and secretion of antidiuretic hormone in response to osmolar stimuli actually increases with age [13]. Although there is certainly need for more good human aging research, a body of gerontologic data does now exist and knowledge is accumulating rapidly. These relevant data are the intellectual frontier of geriatric care and must be assimilated into the specifics of diagnosis and treatment for the elderly. Most physicians have not been taught fundamental data about normal human aging and thus do not know what to expect in terms of cardiac output, kidney function, blood pressure, ventilatory capacity, or glucose removal in a healthy old person. When illness is superimposed on normal age-related changes, the classic parallel lines of normal human biology and disease con-

verge at the elderly patient, causing a dilemma for the clinician unschooled in gerontology. The need for detailed elucidation of normal biologic aging is obvious when we consider the potential for confusion in the practitioner encountering a sick old person. This patient has biobehavioral and functional abnormalities not found in younger healthy individuals, but whether the observed differences are attributable to normal aging or disease cannot be ascertained without a detailed understanding of the multifarious changes resulting from normal human aging. Only with a clear view of normative age-related changes can a sick old person be properly evaluated and treated. Ignorance of these data have two equally dangerous consequences. First, normal, age-related changes may be attributed to disease, initiating treatment that will certainly be ineffective and will likely do harm. Alternatively, disease effects are mistakenly attributed to normal aging and neglected, allowing unchecked progression of a potentially treatable underlying disease. A third outcome, and perhaps the most destructive, is the avoidance of elderly patients altogether by clinicians frustrated and discouraged by unsuccessful interactions with aged individuals whose multiple problems have disease and age-related components.

Health Care Delivery

USE OF HEALTH SERVICES BY THE ELDERLY

Disability, doctor visits, and disease are more prevalent in the elderly and generate increased use of health care services. The prevalence of disease and disability rises sharply with age and is highest in the very segment of the elderly population increasing the most rapidly of all, the old-old. The rapidly growing group of increasingly old and infirm citizens is making demands on the traditional health care delivery system that are qualitatively different from any experienced before. These demands will continue to escalate, and the strain on the health care system will increase disproportionately since the elderly, having more illness, use more services. Although only 11 percent of our population, Americans over 65 account for 40 percent of our "acute" hospital bed days, buy one-quarter of all prescription drugs, spend 30 percent of our over 160-billion-dollar health budget, and account for more than 50 percent of the 40-billion-dollar federal health budget [14]. Nursing home care cost 10 billion dollars in 1976, rose to 21.6 billion in 1980, and in 1990 is expected to reach 75 billion dollars [15]! As early as 1972, institutional beds used for long-term care were more numerous than acute-care hospital beds. Currently the 1.3 million nursing home beds (1.1 million occupants over age 65) outnumber the 850,000 hospital beds used for short-term care by a ratio of more than 3 : 2. With only 5 percent of Americans over 65 years old in nursing homes, it seems reasonable to regard the nursing home experience as largely irrelevant to American elderly in spite of the high cost. Individuals currently 65 years of age and older, however, have

a 20 percent chance of being admitted to a nursing home in their remaining lifetime. People over age 80 are much more likely to die in nursing homes than in their own homes.

IMPORTANCE OF EARLY DETECTION OF DISEASE

As disease progresses undetected in elders, prolonged disability and permanent functional losses become increasingly likely. Since illness and loss are predictable, at least statistically, identification of the high-risk elderly and periodic checking for a decline in health is a sensible approach to improving care of older Americans. As informal support networks in communities become less available to provide home-delivered services for dependent elderly (because nuclear families are replacing extended ones, and care-giving daughters and daughters-in-law are entering the work force), the demand for expensive, formal community and institutional services will continue to rise. Early detection of illness and prevention of disability in older people will therefore likely save money on total service consumption and improve life quality by maximizing independence. It is likely that an early detection program will result in higher aggregate costs early on because of the increased demand generated by case-finding and referrals. In the long run, however, overall costs should be lower because of early, less costly interventions that will delay costlier interventions and long-term institutionalization.

The concept of risk is crucial in developing better health services for elderly Americans. One definition of high risk is heavy health service consumption, including long-term institutional care. Although only 5 percent of older Americans live in long-term care institutions at any one time, for each aged nursing home resident there are at least two home-dwelling elderly who qualify for institutional care and differ from the nursing home group primarily in having a capable family network providing the informal supports that allow continued community-dwelling [16]. The most impaired, high service–consuming elderly comprise 15 to 20 percent of the population over 65 years old and are at highest risk for health-related decline.

The frail elderly are those at highest risk for decline based on health-related problems. Careful surveillance of their condition is crucial to detecting early decline based on illness and preventing functional losses that reduce life quality and increase cost. The high-risk, community-dwelling elderly are identifiable by five markers [17]. Those over 75 years of age are three to five times more likely to require assistance due to health impairment than are 65- to 74-year-olds, making advanced age a first reasonable marker. Elderly persons living alone are at greater risk, if only because decline is less likely to be noticed. Persons recently bereaved are at greatly increased risk to become ill and even die in the grieving period and post-bereavement year. Elderly individuals recently discharged from hospitals

have a one in four chance of rehospitalization in the following year, marking increased risk. Others who would appear to have increased risk but for whom the risk has not been documented include aged persons with cognitive loss (demented), mobility problems, or incontinence.

The most frail Americans generally reside in nursing homes where round-the-clock "surveillance" already exists. Unfortunately, high-quality surveillance in most long-term care facilities is sadly lacking for a variety of reasons. Most nursing homes are understaffed, particularly with well-trained professionals who are best qualified to assess and monitor the health status and function of patients. Physicians, when they appear in the facility, tend to be oriented toward acute illness crises and are likely to see only those patients identified as "having a problem." Registered nurses have become so administratively burdened that their patient contact is primarily limited to that care that, by law, only they can provide. They therefore are unlikely to monitor patient function in a systematic way and may only become aware of decline if it is called to their attention by aides or other staff. Finally, the nursing home, both by its structure and in societal attitudes toward it, presents multiple incentives to dependency. Decline in independent function may be viewed by family and staff as a "natural adjustment" to the nursing home setting. New initiatives are needed in nursing homes to alert staff to a surveillance role and to prevent unrecognized decline.

ILLNESS BEHAVIOR IN THE ELDERLY

Underreporting of Illness

The first, and a pervasive, phenomenon partly responsible for advanced disease states engendering major disability in frail elderly is the failure of the elderly themselves to report illness. Legitimate symptoms heralding serious but often treatable disease are concealed, or at least not reported, by elderly patients. The first suggestion that older persons did not seek medical attention when suffering health-related functional decline came from Scotland. In the 1950s and 1960s, several pioneer geriatricians screened elderly individuals, seeking information about illness behavior, suspecting that verifiable differences might underlie the clinical impression that old people did not seek medical care promptly when ill [18,19]. The findings in these and subsequent corroborating studies were surprising, even to the investigators. An iceberg of concealed disease was discovered among Scottish elderly enrolled in the British National Health Service, which appeared to have the necessary features to provide adequate service to the elderly: doctors responsible for each older person's outpatient care, free care, and numerous, accessible doctors' offices. Yet startling numbers of problems hitherto unknown to and untreated by the patient's responsible physician were discovered. Nor were the problems esoteric, requiring sophisticated diagnostic methodology. Frequently encountered disorders included congestive heart failure, correctable hearing and vision deficits, tuberculosis, urinary dys-

function, anemia, chronic bronchitis, claudication, cancers, nutritional deficiencies, uncontrolled diabetes, foot disease hampering mobility, dental disease impeding nutrition, dementia, and depression.

Further questioning of subjects and review of primary data led to some clear explanations for this apparently self-destructive illness behavior of elderly Scots. Older people perceive pain, malaise, and disability adequately but choose to conceal their distress or at least not seek treatment. The most common explanation for symptom tolerance and nonreporting was the pervasive belief that old age is inextricably associated with illness, functional decline, and feeling sick. Old and young, lay and professional, men and women, all believe that to be old is to be ill. Obviously this "ageist" view of health and disease guarantees that older individuals, even when afflicted with the same symptoms that impel the middle-aged sick into the mainstream of the health care system, will not seek care, will suffer in silence the progression of many diseases, and endure the functional losses engendered by untreated illness. That old age in the absence of disease is a time of good health and persisting function has been documented by numerous studies of normal aging [12], but while our society labors in ignorance of gerontologic information, elders will continue expecting decline and dysfunction. A useful geriatric maxim to be remembered is that sick old people are sick because they are sick, not because they are old. Although certainly decline in numerous physiologic functions characterize normal human aging, these declines are gradual, and their functional impact is ameliorated by the decades over which they occur and by the remaining, if diminishing, reserve capacities of the individual. Thus, major functional decline, especially if abrupt in an individual already old, is usually attributable to disease, not age.

A second explanation for old people not reporting illness was that the high prevalence of depression, coupled with the many losses common in late life, interfered with the desire to regain vigor. A third block to reporting illness was found to be intellectual loss. Though never normal, the increasing prevalence of cognitive loss with age is doubly dangerous to the detection of disease. Cognitively impaired individuals have a diminished ability to complain and are also evaluated less enthusiastically for associated medical disease or even reversible disease producing the intellectual losses themselves [20]. A fourth explanation for symptom concealment by elderly patients was fear that something would be found and generate diagnostic or therapeutic interventions that in themselves would produce functional loss and jeopardize independent living. Finally, today's octogenarians, having grown up when health care systems produced less salubrious interventions, may be reluctant to seek care even in the present.

The abundant documentation that disease is not being reported by the elderly appears to contradict a clinical rule of thumb that identifies hypochondriasis as common among aged patients. Many clinicians caring for

elderly patients cite an individual or two who tries their patience and goodwill with endless complaints rooted in trivial or nonexistent illness. Yet when studied, the hypochondriacal, doctor-shopping, old person appears to be one more unverifiable mythical figure in people's ideas about aging [21]. Not only is hypochondriasis less common among older people, but when elders do complain, important disease is found underlying their complaints substantially more often than in younger, nonhypochondriacal individuals [22].

Nonreporting of symptoms of underlying disease in elderly persons is an especially dangerous phenomenon when coupled with the American organizational structure of health care delivery. Our health care system is passive, especially for elderly people, and lacks prevention-oriented or early detection efforts. American medical care of the critically ill, elderly hospitalized patient is the best in the world. Science and technology are most expertly blended to help the sick. But American hospital beds, HMOs, physicians' offices, emergency rooms, and neighborhood health centers all wait passively for the symptomatic patient to activate the system. For the most part, this passive system of health care provision is adequate for children, who have parental advocates, and for young and middle-aged adults who have the need to work and earn impelling them to seek medical relief of function-impairing symptoms. But aged persons, without advocates and usually without jobs, burdened by society's and their own ageist views of functional loss in the elderly, cannot be relied upon to initiate appropriate health care for themselves, especially early in the course of an illness when intervention is most likely to have a favorable outcome. In summary, our health care system relies on the patient to enter the system and initiate care; and that is precisely the one illness behavior most often missing in aged individuals. These factors make undetected decline especially likely and suggest that adding a more active case-finding facet to the system for the elderly would be beneficial.

"Predeath" Among Hospitalized Elderly

A second phenomenon endangering older Americans in our health care system was again identified in Scotland. A year-long study of 4,000 hospital deaths in individuals over 65 years of age revealed a recurring pattern of preadmission debility and surprisingly long stays for those patients destined to die [23]. The older the patients were, the longer they survived before dying in the hospital. A high proportion—nearly three-quarters—of the deaths were preceded by a period of increasing dependency prior to hospitalization. A high correlation of dependency with advancing age and death following hospitalization led to naming the dependent period "predeath." The most common causes of the predeath dependency were immobility, incontinence, and mental impairment, often in combination. The durations of predeath and attendant hospitalization were strikingly age-