Case Studies in Geriatric Medicine

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This case-based approach to geriatric medicine is suitable for all health professionals and trainees who provide care for the elderly, including interns, residents, geriatric fellows, physicians in practice, and nurse practitioners. Illustrated with more than 40 cases based on the authors' experience in clinical practice, the examples range from the healthy elderly to those with advanced cognitive or physical impairments. Discussions are evidence based with extensive references, emphasizing differential diagnosis, atypical presentations in late life, age-appropriate medical management, interdisciplinary methods, and care in the context of different health care settings. The authors have distilled a wealth of practical and clinical experience in this area to produce a user-friendly guide to geriatric medicine. This is the ideal study guide for certifying examinations and highly suitable as a textbook for courses in geriatric medicine and gerontology.

Case Studies in Geriatrics

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Preface

Case Studies in Geriatric Medicine condenses a rapidly growing body of knowledge about aging and geriatric care. The intent of this volume is to reach clinicians at all levels of experience – to intercept the student before nonage-adjusted principles become too firmly imbedded, and to enhance the well-honed skills of the experienced health care provider. The case-based learning approach will propel the reader to think about the total patient, to consider the medical as well as the psychosocial, ethical, and complex interdisciplinary aspects of caring for elderly patients.

Cases are identified by the patient's symptom or syndrome, so the reader can arrive at "the right answer" through a process of question and answer. Cases are grouped by syndrome category (for example, early, moderate, and late dementia; hypothermia and hyperthermia), and categories or individual cases may be studied in or out of sequence as desired. The question and answer format will serve as a skill enhancer and a supplemental guide for geriatric certifying examinations, and hopefully will make the learning process enjoyable. Current and some "classic" references are provided throughout for additional reading.

As the body of knowledge has expanded, basic geriatrics principles have endured. Awareness of these principles is essential to the mastery of geriatric medicine.

Chronologic and biologic age are not well matched

While some people are "old at 18," many 90-year-olds appear or act in ways that are surprisingly youthful. Behavior that is merely youthful should not be regarded as inappropriate; depression and social crises should not be considered to be "expected at that age." New physical complaints should not be ignored or ascribed to "old age."

When considering treatment options, clinician as well as patient should resist age biases, but must also realistically consider projected life span, benefits, and burdens.

Evidence-based geriatric practice is encumbered by pitfalls of aging research

Cross-sectional studies by age group differ in their definition of the age groups under study; for example, one must question the validity of comparing subjects "under 65" with "65 and older" if the average age of the two cohorts varies only by a few years. Longitudinal studies are plagued by dwindling numbers in the oldest age groups, and the findings may be confounded by extrinsic factors that have changed over time. Many studies exclude subjects over 75 years of age, and most studies of older adults include few patients in the oldest age groups. Biologic heterogeneity increases with age, making it practically impossible to draw conclusions about an aged cohort when one can be studied. A carefully selected "healthy" cohort of people over 85 may represent a biologic elite and their study results cannot be extrapolated to the majority.

All of these factors must be carefully considered when applying research findings to elderly patients.

Disease more often presents "atypically" in the elderly

This important observation is related to physiologic changes of aging and the existence of overt and occult disease of late life. Atypical presentations are given little emphasis in most general medical textbooks but are to be expected in geriatric practice. Among frail elderly, "atypical" presentations are in fact "typical."

Silent pathology is often present

A quiescent process, such as atherosclerosis, may remain silent until an additional insult is superimposed. Diminished reserve, such as impaired baroreceptor function, may not be apparent until the organism is stressed. Disorders not yet symptomatic, such as preclinical Alzheimer's disease, may remain asymptomatic unless acute illness occurs, or an iatrogenic factor, such as a medication, is added.

Drugs are potential poisons

Compared with younger adults, older patients take more drugs, develop more adverse effects, and tend to exhibit a certain spectrum of effects, such as altered

mental status, urinary symptoms, weakness, or changes in behavior. If a symptom occurs, the first question should be "what medications has the patient taken?" More often than not, it is prudent to discontinue a medication rather than add one.

Older patients often have multiple diseases and functional impairments

Although the astute clinician seeks to "unify" multiple symptoms and explain them on the basis of one pathologic process, diverse symptoms in an elderly patient are more often due to several problems occurring at one time in more than one organ system. These problems may be etiologically unrelated but physiologically intimately interrelated. Thus, a health care provider must not only sharpen his or her "subspecialty" skills, but must become a skillful generalist who treats the complex patient as a unified whole.

Geriatrics is a multidisciplinary field

The primary care provider for the complex geriatric patient requires the assistance of professionals from the fields of social work, rehabilitation, nursing, nutrition, podiatry, dentistry, and other disciplines, such as the medical subspecialties. Family, friends, or neighbors are often an integral part of this multidisciplinary team.

Geriatrics is an interdisciplinary field

The primary care provider is the gatekeeper and needs to organize all of the people in the item above for the benefit of the patient.

Case 1

Annual physical

An 84-year-old widow lives alone in her apartment in a "continuing care retirement community" where payment includes full medical care. She is summoned to the medical clinic for her "annual physical."

The patient says she can't understand why she is there, because she feels "just fine." You explain the need for periodic health screening, doing so in a loud voice, since she has obvious hearing loss. "You don't have to shout," she says, a little annoyed. "I'm not hard of hearing."

You review the past year with her, asking about any falls, incontinence, and recent losses. You ask her how she is managing in her apartment, focusing on activities of daily living (like bathing, dressing, and grooming) and instrumental activities of daily living (like paying bills, taking medication, and driving). She says that she gave up driving when she moved into the retirement community because "everything is so convenient here."

The patient mentions that she enjoys a cocktail with the ladies once in a while, but doesn't think she drinks too much. She has been taking calcium supplements and a daily multivitamin but has declined hormone replacement therapy in the past. She says that she walks for 30 minutes every day on the paved oval in the complex and she has convinced some of her friends to join her. She takes no other medications.

In the chart, there is an advance directive that designates the patient's daughter, who lives nearby, as her health care agent (medical power of attorney).

On physical examination, she appears robust and has a normal gait. Her blood pressure is 126/80, her pulse 72 and regular. The examination is completely normal, including breast, rectal, neurologic, and mental status examination. Tympanic membranes are normal and well visualized. Stool is guaiac negative. She refuses pelvic examination, stating that she is "too old for that."

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Questions

1. Is the patient "hard of hearing" or not? What is going on?
2. What is the rationale for offering a pelvic exam and Pap smear to an 84-year-old widow?
3. What other health screening should she undergo?
4. What immunizations are recommended?
5. Why has this patient chosen to live in a "continuing care retirement community?" What other options are available?

Answers

1. She is hard of hearing, as is obvious to the speaker but less so to the listener, a common inconsistency in the setting of progressive sensorineural hearing loss (presbyacusis), which occurs commonly in late life. Most people with presbyacusis will hear better when spoken to loudly, but if loud speaking is perceived as shouting, the patient might be experiencing the "recruitment phenomenon." People with normal hearing can hear and understand an increasing number of speech stimuli as the loudness is increased above a whisper (see Figure 1). With presbyacusis, there is a leveling off of the amount that can be heard as loudness increases. Thirty percent of people with presbyacusis experience the recruitment phenomenon, in which the amount that can be heard actually decreases as a particular state of loudness is reached. Such people have a great deal of difficulty being fitted with hearing aids, which amplify extraneous noise as well as sounds that the patient wants to hear. The best approach is to speak distinctly, in an ordinary or slightly loud voice, looking directly at the patient, ensuring good eye contact.

   The patient can undergo audiologic evaluation consisting of audiometry (pure-tone testing) and speech testing. Audiometry is performed by presentation of tones through the use of earphones, applying sounds of varying loudness in decibels and different frequencies (Hertz). In presbyacusis, high-frequency sounds are generally lost first. Speech testing consists of the delivery of monosyllabic words at a comfortable level of loudness, a level at which normal young people will understand 100% of what is heard. Certain patients may perform fairly well in audiometry but poorly on speech testing. Such patients are said to have problems with "discrimination" and often fail to distinguish between rhyming words with high-frequency, voiceless consonants, such as "thin" and "shin," or "cap" and "tap."

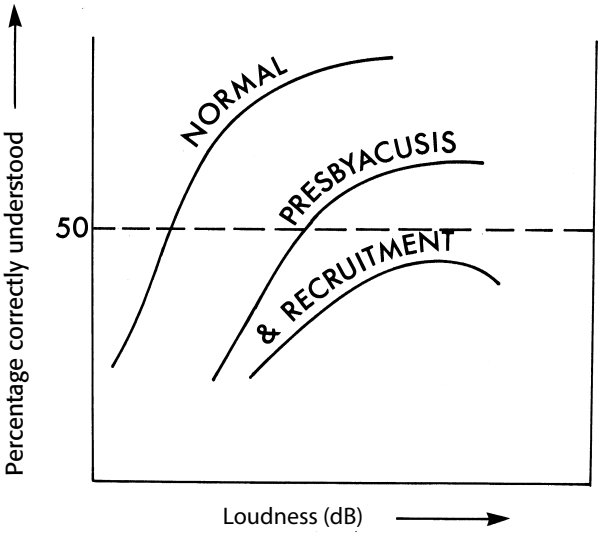

Figure 1 The recruitment phenomenon. People with normal hearing can comprehend more spoken words as loudness in decibels (dB) increases above a whisper. In presbyacusis, the curve shifts to the right. In the recruitment phenomenon, hearing and comprehension begin to decrease as a particular state of loudness is reached.

2. Most elderly women have not been adequately screened for cancer of the cervix, and many have never had a Papanicolaou (Pap) smear or have not seen a gynecologist since menopause. The incidence of carcinoma *in situ* (cervical intraepithelial neoplasia), detected by Pap smear, decreases dramatically with age over 30 years, and in older women newly diagnosed noninvasive and invasive cervical cancers are virtually all in patients who have been inadequately screened. A general consensus exists that screening can be discontinued after age 65 or 70 if prior screening has been adequate and normal, because the risk of interventions from false positive examinations outweighs the benefits, and because a speculum examination can be very uncomfortable in late life, especially among women with untreated atrophic vaginitis. Also, with advancing age, there is an increase in the rate of false positive smears – i.e. smears interpreted as "squamous atypia;" in most cases, though not all, these findings represent benign enlargement of cell nuclei seen in atrophic epithelium, which reverts to normal after a course of topical estrogen, and which differs in appearance from nuclear changes in precancerous cells.

   Despite consensus to liberalize cervical cancer screening requirements in late life, gynecologic examination provides the opportunity to screen for other important pathology, including gynecologic malignancies that occur most often in the elderly. Despite the high incidence of false negatives, many cases of endometrial cancer

can often be detected on speculum examination or Pap smear. Vulvar cancer is frequently missed but curable if detected early. Vaginal cancer is rare, but is almost exclusively a disease of late life.

Recommendations to discontinue screening or reduce frequency from annual to every 2–3 years at most do not apply for women in certain high-risk groups, such as those with prior treatment of cervical cancer or those with high risk of papilloma virus exposure. One should be sure to inquire about sexual activity and screen any woman who has begun a new sexual relationship in late life as the thinning and dryness of the vaginal mucosa increases susceptibility to sexually transmitted diseases. Likewise, the incidence patterns of cervical cancer differ among groups; for example, the incidence of invasive cervical cancer continues to rise with age among African American women and does not plateau among the oldest old.

3. In an elderly person, a screening test should be able to detect disease for which corrective action can be taken, including cure, amelioration, or improvement in quality of life.

   Intraocular pressure should be measured annually by an ophthalmologist since open angle glaucoma can remain asymptomatic for years and is a preventable cause of blindness.

   All patients should have an annual full body skin examination to detect cancerous and precancerous lesions. The incidence of basal and squamous cell carcinoma, as well as malignant melanoma, increases with age, and most are curable if detected at an early stage.

   Recommendations for other forms of periodic health screening are generally based on studies performed in people under the age of 75 years, so special considerations may modify official recommendations made by professional groups.

   Cholesterol screening is controversial in people over the age of 75 (see Case 13). However, many people are curious about their cholesterol level and highly motivated to improve their health. Furthermore, elevated cholesterol may be an added incentive for people to exercise and improve their diet. No action should be taken on elevated cholesterol done without measurement of high and low density subfractions, since the predictive value of total cholesterol declines with age.

   The incidence of breast cancer rises with age in women until, approximately, age 80. However, the impact of screening (including mammography) on mortality is controversial, and there is a paucity of data in women over the age of 75. Several factors complicate this issue in the older age group. Studies in which outcomes focus on all-cause mortality may obscure any reductions in cancer-related mortality, as elderly women will have higher death rates overall. Statistically, healthy women aged 70 and older may have lower breast cancer-specific mortality than the average middle-aged woman (Walter *et al.*, 2001).

Mammography itself may have enhanced positive predictive value in older women. The ratio of fatty to glandular tissue increases with age, improving the ability to visualize abnormalities radiographically. Conversely, the use of hormone replacement therapy can increase radiographic density, making tumors harder to detect. Decision to perform mammography should take into account the patient's overall quality of life and estimated life expectancy, and ability to tolerate the physical or emotional stress of a positive exam and the consequent workup.

The incidence of colon cancer rises dramatically with age and there is little controversy regarding the outcome of minimally invasive treatment. Colonoscopy is well tolerated when patients are sedated, but, because not all older patients are able to prepare adequately for the procedure, it may be difficult from a practical standpoint for many patients to complete an outpatient colonoscopy (or the alternative, an air contrast barium enema). Sigmoidoscopy is less sensitive, detecting about 80% of cancers, and is actually less well tolerated because patients may not receive sedation.

Currently, the American Cancer Society (ACS) recommends that screening colonoscopy be performed every 10 years in people over 50 (more often if they have a family history of colon cancer or adenomatous polyps). The limited sensitivity of solitary annual fecal-occult blood testing can be enhanced by multiple and more frequent testing.

Not ordinarily included in official health screening recommendations, blood tests are virtually routine in office practice. Those that are particularly useful for the elderly include complete blood count (CBC), blood glucose, and thyroid function tests. CBC may be a useful adjunct in screening for colon cancer or for other conditions very common in late life, including vitamin B12 and iron deficiency. Although more expensive, serum levels of B12 and ferritin are more sensitive measurements of these conditions. Plasma glucose should be checked on a regular basis because the incidence of type II diabetes rises dramatically with age; the sensitivity of that test is enhanced if the sample is taken after a meal rather than in the fasting state, although use of nonfasting glucose for screening is controversial. Although controversial (see U.S. Preventive Services Task Force, 2004) most geriatricians recommend that thyroid function tests should be performed in all elderly persons because thyroid disease is difficult to diagnose on clinical grounds, as discussed in Case 41.

Screening for alcoholism, depression, and dementia should be considered because these problems are often missed by primary care physicians. These aspects of screening and their limitations are discussed in Cases 4, 11, and 27.

4. Influenza vaccine should be given annually in late autumn to all people over the age of 50. Although viruses other than influenza virus often cause deaths that occur

during influenza epidemics, influenza is the only respiratory virus for which an effective vaccine exists. A large proportion of older adults have at least one risk chronic medical condition that increases the risk of influenza-associated complications, and people aged 65 and over are five times more likely than younger adults to die from these complications. Community-wide immunization is particularly important in closed communities such as skilled nursing facilities, where epidemics can be curtailed only when the vaccination rate approaches 75%.

Pneumococcal vaccine is generally recommended for all elderly persons because it is the most common form of community-acquired pneumonia in that age group and because the risk of mortality increases with age. However, the efficacy in older individuals has been questioned, especially for the oldest old and those with serious chronic illnesses. Limited efficacy might be related to rapid decline in the levels of protective antibody in these groups. Efficacy of revaccination as well as its timing are uncertain. For example, increase in antibody level following revaccination is lower and shorter in duration than following initial vaccination. Since the vaccine is generally safe, and since it does seem to protect against the development of pneumococcal bacteremia ("invasive disease"), it is generally recommended. More controversy exists regarding revaccination of older adults, which is currently recommended after 5 years only for people who received primary vaccination prior to the age of 65 (Centers for Disease Control, 1997). However, revaccination recommendations are not based on actual efficacy data. Status of the evidence regarding pneumoccal vaccine in the elderly is discussed in the references (see Artz *et al.*, 2003).

Tetanus and diphtheria are rare, but mortality and the most severe morbidity among adults occur primarily in the underimmunized, older population. Although many elderly men received primary immunization during military service, elderly men and women attended school prior to school immunization programs. If immunization history is not known, or if a booster has not been given in the past 10 years, primary series should be given. Tetanus and diphtheria toxoid may be given alone or together as the usual adult preparation (Td).

5. Most people aged 65 and over are able to live independently with little assistance. It is not widely recognized that fewer than 5% of Americans aged 65 and older live in nursing homes, although, among those aged 85 and older, over 18% reside in nursing homes.

   Increasing frailty and dependence on assistance can lead to a change in living situation. Some seniors choose to live in an "age exclusive" community where everyone is over a certain age, usually 55; others prefer to live nearer to their children, or where the cost of living is lower, or where health care is more readily available. A "continuing care retirement community," also known as a "life care community," is one option in a broad spectrum for the elderly. A life care community offers

several levels of care in one location. One entrance option is that the senior pays an "entrance fee" and monthly charges that vary with the level of care required. Housing is in a private apartment, and varying levels of assistance are provided, depending on need. There is usually a wide range of activities offered, transportation for shopping and recreation, full meals, maintenance services, and housekeeping on site. Medical care may be provided on site as well. People generally move in when they are relatively healthy, but, when they become more frail, they move to an area with more assistance in the complex or to an on-site nursing home. Contractual arrangements made at the time of entrance will specify the levels of care provided and the accompanying charges.

Other housing options include government-funded senior housing, which are rental apartments designed to meet the needs of people who no longer wish to care for a single family home but who do not need daily assistance. These apartments may have alarm pull cords in the bathroom and be designed to accommodate persons in wheelchairs. One may also find "congregate" housing in an apartment building setting. Seniors who need a bit more assistance may live on one floor of the building and receive one or more meals a day, medication reminders, and some assistance with daily activities. "Assisted living residences" are facilities where seniors live in their own room or apartment, have on-site help with daily activities including taking medications, receive full meals, and have activities and transportation provided. The cost of assisted living residences vary depending on the services, amenities, and location, but generally cost less than a skilled nursing facility (nursing home), which provides the highest level of assistance. Residents of a nursing home receive the highest level of assistance, up to 24-hour assistance with activities, medication administration, meal service or feeding, daily monitoring by nursing staff, and can receive physical therapy or other skilled services. Increasingly, nursing homes in the United States are delivering various types of acute and subacute care previously available only in the hospital setting.

Various forms of available housing in the United States are reviewed in the references (see Administration on Aging and American Association of Homes and Services for the Aging).

Caveats

Hearing aids are very expensive and are not reimbursed by Medicare. Many states now require that patients be able to purchase a hearing aid trial for a modest amount, so that, if they are not satisfied with the results, the apparatus can be returned. Unfortunately, not all elderly are aware of this option and it is not uncommon for an unscrupulous merchant to take advantage of this fact.

With age, the glands that produce cerumen tend to produce a harder wax than previously, and impacted cerumen can compromise hearing. Complete occlusion may cause rapid onset of hearing loss, often unilaterally, but can be remedied with irrigation of the external auditory canal or by extracting the wax.

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