The Changing Demographic Landscape and Aging Population

There is a wide range of literature on aging and healthcare. We sample this literature and find it fits into the subcategories of theoretical aging, medical significance of aging, treatment of the elderly, and resource allocation to the elderly. Themes are that financial arrangements can cause inefficient and ineffective care and that care guidelines need to developed specifically for the elderly rather than extrapolating guidelines for younger patients.

Resource Allocation to the Elderly

It is unfortunate but realistic that financing the healthcare needs of the elderly is viewed as a reallocation of resources from other uses. The articles here tend to take that view. Bodenheimer's two articles say that medical care is currently organized around an acute care theory even though the majority of care is for chronic disease. Therefore we treat chronic disease inefficiently as a series of episodes. He advocates a Chronic Care Model. Bottomley argues that healthcare funding for the elderly has not changed with their changing needs and available treatments. This is due to the institutional focus on cost cutting. Bottomley also recommends that the fragmented healthcare system of specific programs targeted at specific needs of carefully-defined groups must be replaced by a universal system. Clarfield presents an international comparison that shows similar problems of disjointed care in the US, Israel, and Canada. The handoffs between providers required by financial arrangements hurts the care of the elderly more than younger patients. Rothmann reviews whether generalists or specialists provide better chronic care. Existing research gives mixed results. Rothmann says a team approach is required no matter who leads it. Cohen-Almogar writes an ethical rebuttal to the utilitarian (greatest good for the most people) argument of Callahan. Callahan takes the extreme position that those over age N receive no further care. Katz discusses the distinctly gender specific patterns of home care for the elderly disabled. Men receive care from their wife. Women receive care from their daughters and provide for their husband. Social implications are discussed. Lee projects the elderly population and their healthcare needs into the twenty first century and sees depletion of the Social Security and Medicare Trust Funds. Lubitz studies the impact of three decades of Medicare. The healthcare use, the healthcare expense, and especially the actual health of the elderly have all been increased. Stallard's SOA monograph describes static and dynamic projections of future healthcare and long term care use. It is the most comprehensive work included here. Wolf discusses how several demographic trends will all increase demand for the nursing home system. He also discusses pressure on the supply of care.

Treatment Guidelines for the Elderly

This should not only guide the medical professionals, of course, but those designing insurance and other health care financing systems. Dzankic studies the blood test guidelines for the elderly in preparation for surgery. A number of routine tests are found to have no real purpose. Surgery and all the treatment surrounding it do not vary based on the results of these tests. Elimination could save the US system billions. Ghezzi gives

practical guidelines for dental treatment of the patient with dementia. The holistic view demonstrates much about the growing impact of dementia on society. Gloth studies pain management guidelines and literature. The most important variable in predicting unsuccessful pain management is old age. Gurwitz studies methods for drug medication programs. Prescription adherence problems are a major cause of senior health problems. This is due to the complexity of their medications as well as diminished cognitive ability. Hayes gives guidelines for assessing the elderly in an emergency room visit. They visit more often with more serious problems, multiple problems, and yet less well-defined problems than others. Hayes encourages treating the symptoms of the elderly with increased suspicion and not with any presupposition that it is just aging. Joiner studies the attitudes of general internists to geriatric medicine. It is recommended as a good specialty. Larson makes a similar appeal. Kaganski says that high lipids are not normal for the elderly and should be treated. Data shows that abnormal lipid results are risk factors for CHD and stroke even in the elderly. Sowers makes the same point about cholesterol and high blood pressure. Sutor discusses dealing with the behavioral problems of nursing home residents with dementia.

Medical Significance of Aging

It is very important to know what constitutes normal human aging. This knowledge must be at the core of treatment guidelines and even public policy. The articles in this section and the following show a surprising lack of knowledge or agreement. Interestingly, most seniors are excluded from most medical research. Sometimes this is direct as only subjects under age N are chosen. Often it is indirect as patients with complications are excluded. Seniors usually have comorbidities. Then, using age as a variable in the research, it is determined how age correlates with the disease or treatment effect. Guidelines for treating the elderly have thus often been extrapolated from data on the middle-aged. This has been true even for some diseases that mainly affect the elderly. There is a trend toward improving this situation by studying seniors even with, or especially with, comorbidities.

Baumgartner describes the incidences of sarcopenia (loss of muscle mass), obesity, and both in elderly populations. The analysis of sarcopenic obesity is claimed to be a first. The condition is grossly underreported as obesity hides sarcopenia. The Fultz paper represents many papers written on urinary incontinence. This recommends a holistic approach dealing with patients' general well being and lifestyle. Liao studied fatigue in the elderly and its relation to many variables concluding that it is underreported and under treated. Roghmann studied the fever of pneumonia patients over the course of the disease. They generally found the elderly to have lower temperatures. Raymond studies the incidence of surgical infection in the elderly. Greatly increased mortality is noted for the elderly with surgical infection. Stern discusses hopelessness in the elderly. It is a significant predictor of mortality.

Theoretical Aging

These are theoretical, biological articles on the causes of aging. There is only remote speculation that this research could lead to treatment that would alter or slow the aging process. These articles usually describe work done in laboratories on animals. Goto finds protein degradation at the core of the aging process. It is associated with Alzheimers, Parkinsons, and cataracts. The two processes for clearing faulty protein are described and the effects of exercise are reviewed. Hayflick says projections of continued mortality improvement are faulty. Elimination of important diseases can now add only fifteen years to our life expectancy before we bump up against a maximum lifespan that has not been increasing. Kitani describes work similar to Goto's with antioxidant strategies. Joaquin studies apoptosis, or cell death, and also finds a role for proteins. Both the Goto and Kitani articles review similar literature.

Baumgartner, R. N. (2000). "Body Composition In Healthy Aging." Annals of the New York Academy of Sciences **904**: 437-448.

Keywords: Aging, obesity, atrophy
Purpose: This argues that definitions of normal measurements must be modified for the elderly. Sarcopenia (muscle atrophy) and obesity, especially in combination, cause much disability and are difficult to identify.
Data: Data is from two studies. The New Mexico Aging Process Study (NMAPS) included 400 initially healthy, elderly white men and women and has tracked them for over 20 years. The New Mexico Elder Health Survey (NMEHS) began in the early 1990s and included a broader cross section of the elderly society. The NMAPS is intended to model successful aging while the NMEHS represents typical aging.
Methods: Numerous parallel health tests have been conducted on these two groups allowing comparative analysis. For instance, the NMAPS group has much less diabetes but similar cardiovascular illness. The article focuses on bone, muscle, and fat composition using dual-energy X-ray absorptiometry (DXA). Methods of measuring obesity and sarcopenia are discussed, as are impacts of sarcopenia and obesity.
Results: The paper claims to be the first to identify the often undiagnosed sarcopenic obese. Obesity hides sarcopenia unless difficult muscle mass tests or strength tests are completed. The combination of sarcopenia and obesity has more than an additive effect on the probabilities of functional impairments, disabilities, and falls. Sarcopenia increases with age, as does sarcopenic obesity. The portion of the population showing only obesity declines between 60 and 80, partly due to conversions to the sarcopenic obese group.
Uses: The authors want to increase awareness of sarcopenic obesity.
Limitations: The terms sarcopenic and obese are not well-defined.

Bodenheimer, T., E. H. Wagner, et al. (2002). "Improving Primary Care for Patients With Chronic Illness." Journal of the American Medical Association **288**(14): 1775-9.

Keywords: chronic illness, primary care
Purpose: The authors describe "The Chronic Care Model" which they have designed and use in their practice.
Data/Methods: This is an advocacy piece aimed at physicians.
Results: The authors' view is that typical physician practice is too much aimed at acute care which they call the tyranny of the urgent. The Model is intended to increase focus on chronic care. It does this by emphasizing community resource coordination, the incentives and goals of the provider, the education of the patient and family, a provider team approach, following guidelines, and an elaborate information system. Chronic care is not a narrow specialty but includes 75% of all care in the US. Most patients live with their chronic illness a long time so their education can really assist in their disease management. The article describes several implementations of this program and the results with diabetes or other patients.
Uses: Several implementations of the Chronic Care Model show that it is practical and improves results.

Limitations: The results are not research oriented. The providers who implemented the plan are quite large. None has achieved full implementation.

Bodenheimer, T., E. H. Wagner, et al. (2002). "Improving Primary Care for Patients With Chronic Illness: The Chronic Care Model, Part 2." Journal of the American Medical Association **288**(15): 1909-1914.

Keywords: chronic care, chronic illness, aging, primary care
Purpose: This is a review of research literature. Each article included had a randomized control trial of at least one of four components of the Chronic Care Model: self-management, decision support, delivery system design, and clinical information systems.
Data: Forty eight articles from Cochrane reviews were initially used. Four were excluded for inadequate statistics and two newer articles were added for 46 total.
Methods: Results were summarized as to whether the chronic model methods achieved an improvement in diabetes care or costs. Improvements in care could be measured by either more consistent following of guidelines or improved results. Meta analysis was not possible due to data inconsistencies.
Results: 20 of 28 studies showed improved outcomes and 16 of twenty studies showed improved processes. In all, 32 of 39 studies showed improvement in one or the other. No single one of the Chronic Care Model components was necessary or sufficient to get improvement. Using multiple components only showed slightly better results than fewer components. Unlike the authors' first article on the Chronic Care Model, the importance of the provider's income source was paramount. Several of the studies failed because the improved methods were reducing fee-for-service income. The provider that invests in improving care must get some benefit from the improvement. Capitation allows the improved results to benefit the provider. The authors are concerned that the recent trend back to fee-for-service reimbursement will discourage better care. The authors briefly note some results of the component methods applied to other diseases. Quicker return on investment may be achieved with other diseases such as congestive heart failure or asthma.
Uses: The Chronic Care Model improves care results and costs and is practical. It works best in a capitation environment.
Limitations: The authors note two. The studies chosen focus on only one chronic disease, diabetes. The studies are usually in a research environment. There is some question about how long improvements will persist in the field. The authors' do not acknowledge that their "Chronic Care Model" is somewhat loosely defined and these studies that test components of it are not really using consistent procedures.

Bottomley, J. M. (2001). "Politics of Health Care and the Needs of the Older Adult: The Social Context of Changes in the Delivery System." Topics in Geriatric Rehabilitation **16** (4): 28-44.

Keywords: Aging, home health care, social needs, disability
Purpose: Bottomley advocates more comprehensive coverage of services to the elderly as a step toward universal healthcare. She says the programs and services

provided to the elderly have not changed as demographics, medicine, and needs have changed. She blames an institutional focus on cost containment rather than meeting needs. She also blames a pattern of targeting programs at specific needs of specific populations.

Data/Methods: This is an opinion piece with considerable secondary demographic and economic data.

Results: The author reviews data on the elderly. Demographically, females predominate. Half of the females are married but three-fourths of the males are married. The elderly are becoming more diverse as minority mortality has improved more, relatively, than white mortality. (Minority mortality still lags.) The elderly are a rapidly growing segment of society. The mean and median have a reasonable income and living standard. Subgroups do not: half of black single or widowed females live below the poverty line. The average and median also fare well health wise. Eighty-five percent of those under 65-69 have no trouble with self care or walking. Only half of those over 84 report similar well-being. About one-third live alone. Only 4% live in nursing homes (20% of those over 84). Those over 64 spend 12% of their incomes on healthcare compared to 4% for those under 65. Insurance, home services, drugs, dental, and eyeglasses are mentioned as out-of-pocket expenses. Bottomley resents economic implications that society must make choices, that there is a limited amount of care to be allocated (rationed), or that groups (disabled, children, elderly) must compete for resources. She says we are so concerned that we not benefit those unwilling to work that only these piecemeal approaches to healthcare are acceptable. Ignoring PACE, she bemoans that no government program has paid for home health care. She says our cost containment goals, rigid institutional structure, and medical developments are shifting medical costs to the elderly.

Uses: She wants medical providers to campaign for universal healthcare.

Limitations: The view is from a home healthcare provider and it shows.

Clarfield, A. J., H. Bergman, et al. (2001). "Fragmentation of Care for Frail Older People - an International Problem. Experience from Three Countries: Israel, Canada, and the United States." Journal of the American Geriatrics Society **49**(12): 1714-1721.

Keywords: fragmentation of care, older, continuity of care, geriatric services, international

Purpose: The authors compare the discontinuities of care provided older citizens due to the fragmentation of health financing systems in three countries.

Data/methods: This is descriptive/analytical rather than original research.

Results: There are splits between acute and continuous care, between community and hospital care, and between social and medical care. These splits prevent seamless, efficient and appropriate care. The splits often have little to do with needed care but are the result of different funding sources. Older patients have more complications and more chronic disease than younger patients. They also have more social problems as a result of their diseases. Proper care of older

patients requires a continuous team approach. The differing funding sources discourage teamwork and continuity. There have been great advances in geriatric medicine in recent years but fragmented care makes it's implementation difficult. The general situation is worse in the US (with more hand offs of the patient to a new caregiver with new rules) but does not seem that much better in the more integrated systems of care in Israel and Canada. Actually, the Israeli system is described as midway between the US and Canadian systems. Common problems in all three systems include the transfer from hospital care to whatever comes next. In Israel and the US, financial concerns accelerate this transfer. In Canada, the need to free up hospital beds forces some patients out more quickly. Each country has difficulty providing primary care needs to nursing home residents. Nursing homes and hospitals in each country assert that the other provides inadequate patient information. Generally, each country's medical care system is based on an acute care model. Each encounter with the system is an independent event with a distinct beginning and end. Newer geriatric methods are based on continuity of care. The more fragmented US system does allow more opportunity for experimentation and those involved in geriatric medicine have taken advantage of it. For instance, the profession of geriatric nurse practitioner (GNP) has developed in the US. Managed care (which exists in the US and Israel but not Canada has some unrealized potential for providing appropriate care. The Program for All-inclusive Care for the Elderly (PACE) in the US attempts to combine Medicare and Medicaid programs for nursing home qualified patients who chose to live at home. Artificial barriers between social and medical needs are removed. Coordinated care from a team approach is the goal. EverCare is a coordinated hospital-nursing home approach using GNPs. Social Health Maintenance Organizations (SHMOs) are another Medicare experimental effort at providing coordinated care.

Uses: Artificial barriers between types of care are created by differing funding mechanisms. Some experiments and some individual caregivers are working to overcome these barriers. Each country needs a more coordinated financing mechanism to improve care and efficiency.

Limitations: Although somewhat convincing, this is still an opinion piece on which others could differ. The type of system that would overcome the artificial barriers is not described. Only the existing systems and their deficiencies are described.

Cohen-Almogar, R. (2002). "A Critique of Callahan's Utilitarian Approach to Resource Allocation in Health Care." Issues in Law and Medicine **17**.

Keywords: Aging, resource allocation, utilitarian

Purpose: This is a rebuttal to the thinking of Daniel Callahan as expressed in several works such as Setting Limits or What Kind of Life.

Data/Methods: This is an essay and rebuttal to Callahan. No data is used. Numerous quotes of Callahan and others are used.

Results: Callahan is claimed to take a utilitarian view (the greatest good for the greatest number). He is claimed to use age in an absolute sense to determine utility. Medical care for those beyond age N would be denied. The author would agree with an argument that limited resources should be spent on the younger patient, all else being equal. But Callahan ignores the all else. Even if the elder of two

candidates is medically determined to have more likely benefit from the only available liver, Callahan would deny it if he is over age N. Individual circumstances do not matter. The author finds Callahan totally ignores the individual and presumes a benefit for society at large of such a system. He is not interested in reward or fairness for past contributions. The old have won the game in Callahan's view. Now we must help others to win. There is some similar discussion of the terminally vegetative state or coma. Callahan would deny care. The author likes our current approach based on age, time in the state, and medical opinion. The author defends a right-to-die but only when determined by the patient, not by others or especially, by age.

Uses: In the unlikely event that Callahan is ever taken seriously, some groundwork for defense is laid.

Limitations: Callahan and the author fail to discuss another situation/argument for withholding care, the time-consistency problem. What may seem to be the right thing to do in a given case may not be the right thing to do in all cases.

Dzankic, S., D. Pastor, et al. (2001). "The Prevalence and Predictive Value of Abnormal Preoperative Laboratory Tests in Elderly Surgical Patients." Anesthesia & Analgesia **93** (2): 301-308.

Aging, blood tests, geriatric medicine

Purpose: The authors challenge the standard presurgery recommendation of standard blood tests for elderly patients.

Data: Five-hundred forty-four geriatric (age 70+), anesthetic, noncardiac surgeries are studied using medical charts and other information. Almost four percent died. Twenty percent had complications.

Methods: The ability of numerous variables to predict surgical complications is studied. Multivariate techniques are used to determine the independent impact of each variable. Additional studies were done to see if test results changed the operative procedure.

Results: Contrary to standard operative procedure (for those 60+), several routine lab tests had no predictive value for complications and no changes in operation management were made to compensate for abnormal values. Preoperative lab tests in the US cost between three billion and eleven billion annually. Much more than one-third is for geriatric patients. (Thirteen percent of the population is over 64, but they receive 35% of surgeries with more labwork per surgery.) Perhaps half the geriatric blood testing is not useful. The recommendations were due to earlier studies that correlated lab results with complications for the population in general and found certain results had increasing predictive value as age increased. The authors suggest why the earlier results may not have been as meaningful as the current study. Other earlier studies were more consistent with this research. Physical condition and medical history were predictive of complications.

Uses: The authors want guidelines for geriatric surgery revised.

Limitations: The authors are thorough in their self-criticism: Some lab tests that are not currently recommended may have value. Some abnormal test results were rare so predictive value tests are not precise. Some data was missing. The determination of physical condition may have been influenced by test results.

The definition of geriatric age differs in the studies.

Fultz, N. H. and A. R. Herzog (2001). "Self-Reported Social and Emotional Impact of Urinary Incontinence." Journal of the American Geriatrics Society **49**(7): 892-899.

Keywords: Aging, incontinence
Purpose: The authors study and advocate a more systemic or global view of urinary incontinence (UI).
Data: They do phone interviews with 1,116 continent and 206 incontinent respondents, all aged 40+. They also use secondary data from a monthly national consumer survey.
Methods: They regress a number of quality of life and satisfaction variables on UI variables, controlling for many socioeconomic variables.
Results: This is a popular research topic. The authors mention focused literature reviews. The authors describe other studies' results as contradictory although "the potential for UI to diminish social and emotional well-being seems obvious." The authors distinguish studies in which specific UI questions seem to find more impact than questions about general well-being. The authors also find sample selection to be a problem. Patient studies would find worse impacts because the patients had sought help. The authors' study asks both specific UI impact questions and generic depression, loneliness, and sadness questions. UI respondents tended to be older, female, and in generally poorer health. Eighty percent said UI did not impact social activities. Sixty percent said it did not affect feelings about themselves. This study found greater impact on the generic well-being variables. UI combined with younger age, lower education, males, or poorer health is predictive of depression. Stronger UI leads to worse problems. The authors note that a range of conclusions are possible.
Uses: Clinicians should consider UI and general psychosocial well-being, not just UI related impacts, of their patients.
Limitations: Clearly, more work needs to be done to resolve the impact of UI on psychosocial health. Understanding the role of a host of confounding variables is part of the task.

Ghezzi, E. M. and J. A. Ship (2000). "Dementia and oral health." Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology and Endodontics **89**(1): 2-5.

Keywords: aging, dementia, dentistry
Purpose: The authors note the increasing number of the elderly and the increasing portion of them that suffer from dementia. They give implications for dental care.
Data/Methods: This is an essay without primary research.
Results: Alzheimer's disease (as well as other dementia) has been statistically associated with increased dental problems. The causes are fairly obvious. The victims are less able and less concerned about caring for themselves. Further, common Alzheimer's disease drugs are known to cause saliva gland problems that lead to dental problems. Dentists need to be aware of the symptoms of dementia and aware of the drugs their patients are taking. They can adapt their treatments to the patient's drug use. They must establish relationships with the daily caregivers to discuss proper dental hygiene and the patient's difficulties.

They can adapt to the patient's problems with more frequent, shorter visits. Lengthy, complex treatment should be avoided, and the focus should be pain relief and nutritional consequences. Certain sedatives are more effective at dealing with these patients' uncooperative behavior.

Uses: This provides practical advice for dentists whose patients suffer dementia. It is thought-provoking for the rest of us concerning the widespread implications of the increase in dementia.

Limitations: No concern with costs is expressed.

Gloth, F. M. (2001). "Pain Management in Older Adults: Prevention and Treatment." Journal of the American Geriatrics Society **49**(2): 188-199.

Keywords: Aging, pain managment, pharmacy

Purpose: This is a literature review of geriatric pain management research.

Data/Methods: No primary research is done.

Results: Guidelines for geriatric pain management were first released in 1998. Due to great progress since then, revision is in order. Twenty-five to fifty percent of seniors suffer pain that interferes with ADLs. Forty to fifty percent take pain medication. A study of pain management in cancer patients showed the top risk factor for inadequate control was age over 70. Drug effects and side effects differ for the elderly. The elderly are much more likely to be taking other medications requiring consideration of interactions. An elderly patient taking six medications (the average is seven) is 14 times as likely to have an adverse reaction to a new drug as a younger patient on no prior medication. Depression interacts with pain in complex ways. It is inaccurate to think that removing pain will remove depression. The opposite may also work. Treat depression. Other psychological impacts are important and have not been well studied in seniors. Physicians must be aware of alternative medicines, if only to give objective information. Nonpharmacy interventions may work: heat, cold, relaxation, biofeedback, and vitamins. Much of the article is devoted to indications for drugs including a flowchart for determining what to try in what order. Cost must be considered. It does little good to control pain in the hospital if the patient cannot afford the drugs after leaving the hospital. Less effective, more affordable alternatives must be considered for patients paying out of pocket. Patients may not volunteer information on affordability. Warnings about polypharmacy, even with Tylenol, are provided. When pain control must procede to opiates, the elderly are more inclined to attach stigma to such use and to fear addiction (even if terminally ill). Less than 0.1% of prescription opiate use results in addiction and prior drug use is a key factor. Education and communication are important. Monitoring of all pain treatment is important. Improved scales for measurement of pain should be used. Side effects are discussed again emphasizing communication of expectations and monitoring. The authors mention new federal and state pain relief laws as a hopeful sign but also as an expression of the public's and scientific community's dissatisfaction with current pain relief.

Uses: This is rich with information for practicing physicians and for those who can modify guidelines for pain management in seniors. It educates the rest of us about the complexity of pain management and the need for different approaches for the elderly.

Limitations: The need for further research is mentioned in numerous areas.

Goto, S., R. Takahashi, et al. (2001). "Implications of Protein Degradation in Aging." Annals of the New York Academy of Sciences **928**: 54-64.

Keywords: aging, diet, protein degradation
Purpose: The authors describe their research, combining it with other research, and speculate on causes of aging and the potential for slowing the aging process.
Data: This is a highly technical chemical/biological article. Much of the authors' own research is described, as well as that of others, but the article does not focus on a single experiment or study.
Methods: The authors are laboratory researchers working mostly with animals. They extrapolate what they learn about chemical/biological changes in animals to speculate on aging in humans.
Results: Cells degrade and are replaced (except neurons and heart muscle). The protein within cells degrades and is accumulated in some instances. In humans, Alzheimer's disease, Parkinson's disease, and cataracts are associated with faulty protein accumulation. Increasing age is associated with slower turnover of the faulty protein. Two chemical paths for clearing proteins are described and their interactions with age are discussed. Dietary restriction is one clear approach to improving the altered protein situation and has been associated with longer life in many experiments. Exercise causes an immediate increase in altered protein. Since exercise has been shown to prolong life and to increase cognition, the biochemical basis needs further study. The authors speculate that altered protein clearing is also promoted by exercise.
Uses: The actual results suggest restricting diets to far below current levels.
Limitations: Most of the experiments described were conducted on lab rats. Extension to humans is speculative. The effects of exercise on altered proteins requires more study.

Gurwitz, J. H. and P. Rochon (2000). "Considerations in designing an ideal medication-use system: Lessons from caring for the elderly." American Journal of Health-System Pharmacy **57**(6): 548-551.

Keywords: Aging, medication, pharmacy
Purpose: The authors describe the need for general medication use improvements for the elderly.
Data/Methods: Little secondary data is used in this opinion piece.
Results: Drug prescription is the most common medical intervention. The elderly are more likely to use inappropriate amounts, have adverse reactions and interactions, and unwanted results. The elderly suffer more chronic conditions and take far more drugs yet many trials and experiments exclude them. Thus research may not determine the best regimen for the elderly. The research is not often converted to widespread guidelines. Many elderly fail to take the prescribed regimen due to complexity or cost. The "prescription cascade" is described: an inappropriate prescription (or an appropriate prescription taken inappropriately) fails to get the desired result or causes an unexpected side effect. A second drug is prescribed to compensate for the problem with the first. Further problems are

dealt with by further prescriptions. The 80/20 rule applies: 80% of inappropriate prescribing is done by 20% of doctors. Monitoring for inappropriate prescribing by HMOs or drug stores could help target training. Improved prescribing might increase costs in the short run (since many errors are underprescribing) but fewer hospitalizations, etc., could offset it in the long run.
Uses: Encourages a holistic view of the medication of seniors.
Limitations: Little data backs up the claims. Others may differ in opinion.

Guyer, B., M. A. Freedman, et al. (2000). "Annual Summary of Vital Statistics: Trends in the Health of Americans During the 20th Century." Pediatrics **106**(6): 1307-1318.

Keywords: Aging, dependency ratio, children
Purpose: The authors wish to show how the increasing dependency ratio of the elderly combined with the steady or declining dependency ratio of the children may pose a threat to funding of programs such as healthcare for the children.
Data/Methods: This is secondary research based on the Vital Statistics of the United States developed by the National Center for Health Statistics.
Results: The dependency ratios of the elderly (number of retirees divided by the number in the labor force) and the children (number under age 18 divided by the number in the labor force) are discussed. Birth rates, mortality rates by various causes, and medical progress are tracked through the 20th century along with the resulting dependency ratios. The child dependency ratio far exceeded the elderly dependency ratio during the first seventy years of the last century. The elderly ratio has been gaining since and the gap will close greatly between 2010 and 2030. Care of the elderly will require great resources in the next century. The authors also have concern that the political will of the numerous elderly will steer resources their way.
Uses: The authors wish to encourage "advocacy for the needs of our most vulnerable population" (children).
Limitations: The authors view a zero-sum game of resource allocation between seniors and children. They don't consider mutually beneficial possibilities.

Hayes, K. S. (2000). "Geriatric assessment in the emergency department." Journal of Emergency Nursing **26**(5): 430-435.

Keywords: Aging, assessment, emergency room,
Purpose: The elderly arrive at the emergency room with multiple and more serious problems than younger patients. And, of course, they have relatively more visits. This article points out problems in their assessment and recommends best practices.
Data/Methods: Although some secondary data is referenced, this is practical guidance for practioners.
Results: The author often cautions against attributing abnormalities to "old age". She wants he elderly treated with a heightened awareness or suspicion. She provides a list of blood test readings that do and do not vary with age. She describes ways that disease states can be altered or made less specific by the multiple chronic problems of the elderly. She also deals with social, psychological, and neurological problems of the elderly that can mask, cause or be caused by

physical problems. The "chief complaint" of the elderly is often less specific than that of the younger patient. She mentions that drug interactions or failure to adhere to the prescription appropriately cause many visits. She warns against the "drug cascades" in which each unwanted side effect of a drug is treated with another drug. Documentation of medication history is emphasized. She lists popular drugs that are more likely to cause adverse reactions in the elderly. She calls geriatric assessment an essential nursing skill.

Uses: This is practical guidance specifically for those in the emergency department assessing elderly patients but it is also useful for others dealing with the elderly.

Limitations: It is not research and the advice given does not have the weight of standards of practice.

Hayflick, L. (2001). "Longevity Determination and Aging." SOA Living to 100 Symposium.

Keywords: aging, disease, genes, longevity determination, life expectation, life span, senescence

Purpose: This is a theoretical paper that clarifies definitions of a number of aging issues and argues against the possibility of a large increase in life expectancy in the near future. Of the papers presented at the SOA Living to 100 Symposium, it is most relavent to healthcare.

Data and Methods: Not applicable.

Results: Hayfleck argues that most research on aging is really research on the diseases associated with aging. When these diseases (mostly cancer and cardiovascular) are eliminated, aging will still remain and life expectancy will have grown by some fifteen years. Aging is a deterioration in molecular order that is seen in almost all animals and inanimate objects. Very little research is funded in its study. We could study the few animals that do not appear to age (certain turtles and other animals that do not cease growing in adulthood). Aging is seldom seen in nature because death usually occurs by some natural cause long before aging is evident. Aging is thus a human artifact reserved for humans and a few animals that we protect. The aging process determines our lifespan and has been about 120 years for 100,000 years. The diseases that we become more vulnerable to as we age are what has determined our life expectancy. Biogerontology studies aging and is poorly funded. Geriatric medicine studies the diseases of aging and is well funded. Hayfleck gives a list of five ways to distinguish aging from the diseases of aging. He also argues that evolution and natural selection have almost nothing to do with aging.

Uses: Public policy regarding aging should have more carefully defined goals. A limited lifespan should be accepted as a fact and funds spent on improving its quality rather than quantity.

Limitations: Hayfleck speaks writes authoritatively but other experts hold contrary opinions.

Joaquin, A. M., MD; Gollapudi, Sastry, PhD (2001). "Functional Decline in Aging and Disease: A Role for Apoptosis." American Geriatrics Society **49**(9): 1234-1240.

Keywords: Aging, apoptosis, functional decline,

Purpose: The purpose of this article is to summarize apoptosis, or programmed cell death, and to speculate about the relation between the dysregulation of apoptosis and the functional decline that accompanies aging.
Data/Methods: No primary research is done. The ideas of this paper are based on consideration of generally established knowledge about the interworkings of cells, proteins, etc., with occasional reference to conclusions espoused by other researchers.
Results: Joaquin and Gollapudi believe that there is good evidence that dysregulation of apoptosis is associated with decline in the aging process, such as increased incidence of cancer, autoimmune disease, and neurodegenerative disorders. The studies on which they base their conclusions reveal age-associated changes in the level of proteins that modulate apoptosis. They advocate further research to understand apoptosis, hoping that the future holds methods for regulating apoptosis in order to prevent the functional decline that is correlated with aging.
Uses: Apoptosis is an important factor to be considered by anyone involved in the project of alleviating the general decline in organ and system functioning that accompanies the aging process.
Limitations: Further study on the process of apoptosis alone is necessary before its role in the aging process can be conjectured with any confidence.

Joiner, K. A., MD; Haponik, Edward, MD; High, Kevin P., MD (2002). "Integrating Geriatrics and Subspecialty Internal Medicine: Results of a Survey on Patient Care Practices, Training, Attitudes, and Research." The American Journal of Medicine **112** (3): 249-254.

Keywords: Aging, geriatric medicine
Purpose: This article reports the results of a survey aiming to assess patient care practices, training, attitudes, and research at the geriatrics/subspecialty internal medicine interface.
Data: A survey seeking to evaluate patient care practices, training, attitudes, and research at the intersection of geriatrics and subspecialty internal medicines from the perspective of the subspecialty fellows in training and the faculty also involved in this training was prepared and sent to the departments of certain subspecialty fellows. A total of 344 responses were obtained.
Methods: The 30 subspecialty fellows scheduled to attend an upcoming Association of Subspecialty Professors (ASP) were asked to distribute the survey to all fellows in subspecialty training and faculty involved in the fellowship training at their institution. Participants were asked to rate 1 through 5 their agreement with 44 questions pertaining to the aforementioned issues. Responses were submitted at the conference.
Results: Regarding patient care practices, patient age was seen as an important consideration in approaches to diagnosis, in drug interactions, in ease of drug administration, and in drug toxicity, while drug cost was considered less important. Patient age was also viewed as more noteworthy in considering invasive procedures, treatment options, and treatment goals, while it was less noteworthy in considering intensive care unit (ICU) use or follow-up approaches. Pertaining to training, survey participants were in strong agreement that the principles of geriatrics should be included in formal fellowship training, which

would best be done in interaction between subspecialists and geriatricians in direct patient care. Regarding attitude, there was general consensus that the concept of interaction between subspecialists and geriatricians improves care of elderly patients. Lastly, pertaining to research, there was agreement that subspecialty fellows should be encouraged to undertake research in geriatric issues and even that this is a feasible career path. Further more specified results are given under each category.

Uses: This paper serves to make available to the medical and academic communities a general overview of the practices and perspectives of subspecialty fellows and faculty toward geriatrics. It may be able to serves as the foundational research for further enquiry into this issue.

Limitations: The authors note several of their own limitations: The short response time precluded replies from the busiest clinicians, a response rate could not be calculated, the representation of some subspecialties were dominated by one or two institutions (thus possibly the particular bias or attitude of that institution was overemphasized in the results), the survey was distributed only to institutions with at least one member already committed to attending the ASP Conference (maybe tending the results toward those already concerned with the integration of geriatrics into subspecialty training and research), 26% of respondents did not identify whether they were fellows or faculty, and the difference between true neutrality and indifference could not be ascertained when the neutral response was marked.

Kagansky, N. L., S.; Berner, Y.; Rimon, E.; Knobler, H. (2001). "Cholesterol lowering in the older population: time for reassessment?" QJM **94**(9): 457-463.

Keywords: Aging, cholesterol, statins

Purpose: This article seeks to demonstrate that older people with hypercholesterolaemia should be treated with statins, not only to reduce the risk of coronary heart disease, but also to reduce the risk of stroke.

Data: The authors review data about the role of cholesterol as a risk factor in cardiovascular disease in the older population and the results of clinical tests with statins. Their data is from the Medline and Cochrane Library, 1989 to present.

Methods: Association between cholesterol, coronary heart disease, stroke, and the preventative measure of statins in the elderly based on studies by Framington Heart Study, the EPESE study, the Kaiser Permanente CHD in the Elderly study, and several others, were studied in hope of extricating the relationship between cholesterol and stroke.

Results: According to the authors, the studies reveal high cholesterol levels accompanying the occurrence of non-hemorrhagic strokes, and use of statins is a helpful prevention against stroke.

Uses: The authors hope to broaden the scope of motivating factors for treating hypercholesterolaemia with statins.

Limitations: Their conclusions are drawn from gaging implications of clinical trials serving other primary purposes.

Katz, S. J., M. Kabeto, et al. (2000). "Gender Disparities in the Receipt of Home Care for Elderly People With Disability in the United States." Journal of the American Medical

Association **284**(23): 3022-3027.

Keywords: Chronic Care, Home Care, Gender.
Purpose: This article substitutes facts for impressions by analyzing significant data on the home care of the elderly disabled. The providers and those cared for are studied. Although the majority of such care is unpaid, the paid care amounted to $18 billion in 1997 and has been rising at 20% per year.
Data: From the National Institute on Aging's Asset and Health Dynamics Among the Oldest Old (Ahead) database, 3,109 respondents who were over age 70, disabled, and living at home were studied. Disability was defined as having had the need for assistance with one or more Activity of Daily Living (ADL) in the prior month.
Methods: Statistical analysis was used to find predictors of amounts of informal (family and friends) and formal (paid) home care received.
Results: The women were older, poorer, more likely disabled, and more likely to be living alone than the men. Women received less informal but more formal care than men. When women received informal care, it was usually from children, but especially, daughters. When men received informal care, it was usually from their wife. Many men received informal care from a wife who was also classified as disabled. About 56% of those over 70 and disabled received some informal assistance with ADLs. Formal (paid) care amounts to only one sixth of the total care provided. It is almost gender neutral with women receiving slightly more care. Within married couples, men receive far more care than the women. Married men receive far more care than single men.
Uses: The results may confirm impressions about the caregiving social role of women and its impact on elderly care arrangements. This should be considered in developing public policy regarding support for the home health care of the elderly disabled. The current and developing situation places a considerable burden on elderly women as caregivers for men. It also places a burden on the children of elderly women, especially the daughters and their extended families, as caregivers for their mothers.
Limitations: The authors wished to focus on only ADLs but the influence of Instrumental ADLs (buying groceries, balancing a checkbook) may not have been entirely excluded. Their data was for one year only (1995-6) because the longitudinal AHEAD study dropped questions about informal home care after the first wave.

Kitani, K. M., Chiyoko;, Yamamoto, Takako; Maruyama, Wakako; Kanai, Setsuko; Ivy, Gwen O.; Carrillo, Maria-Cristina (2001). "Do Antioxidant Strategies Work against Aging and Age-associated Disorders?: Propargylamines: A Possible Antioxidant Strategy." Annals of the New York Academy of Sciences **928**: 248-260.

Keywords: Aging, proparglyamines, protein oxidation, life span
Purpose: The authors propose that a successful approach to prolonging life span is possibly to be found in the administration of propargylamines, which are oxidase inhibitors. These have been shown to increase endogenous antioxidant enzyme activities. The authors hope that a further effect of this increase will eventually be shown to be the prolongation of life span.
Data: In this paper they review observations of propargylamines battling disease and

deterioration in past experiments and consider possible implications for the battle against aging.
Methods: Experiments were conducted on rats at the Tokyo Metropolitan Institute of Gerontology and the National Institute for Longevity Sciences (Obu, Japan). For example, three groups of F-344/Du rats - young males, young females, and old females - were injected with deprenyl (a propargylamine) at a dosage of 2.0mg/kg/day for 3 consecutive weeks. Further variations in experimenting with the injection of deprenyl are outlined.
Results: Deprenyl, when not exceeding optimal dosage, increased antioxidant activities in the brain, as well as in the heart and kidneys. The authors conclude with strong speculation that these effects of modulating antioxidant enzyme activities will produce the further effect of prolonged life span.
Uses: The authors hope to see the modulation of endogenous antioxodant enzyme activities by propargylamines, such as (-)deprenyl, gain more of an audience and hence be considered further as an antioxidant strategy to fight aging and age-related diseases.
Limitations: Despite seeking to observe effects of propargylamines on life span, along with effects on tissues and organs, in these experiments no strong evidence has been observed regarding life span. Hence the hope for this further causal relationship is only speculation at the moment.

Larson, E. B., MD, MPH (2001). "General Internal Medicine at the Crossroads of Prosperity and Despair: Caring for Patients with Chronic Diseases in an Aging Society." Annals of Internal Medicine **134**(10): 997-1000.

Keywords: Aging, chronic disease, general medicine, primary care
Purpose: Larson seeks to support his view that general internal medicine is at a crossroads at which it would do well to pursue opportunities to use its skills in the field of geriatrics.
Data/Methods: This is an opinion piece.
Results: Despite the general importance and the growing excellence of the field of general internal medicine, the practitioners within this field collectively are having a more difficult time sustaining themselves financially. Larson sees greater integration of geriatrics into general internal medicine as a possible savior to general internal medicine, but one that will also benefit geriatrics. He discusses how he sees this synergism at play in patient care, research, and education.
Uses: Larson's paper contains opinions worthy of attention from those in general internal medicine or considering entrance into the field, especially if geriatrics is a further interest.
Limitations: The paper is solely the author's ideas of how general internal medicine has many bright opportunities within geriatrics.

Lee, R. and J. Skinner (1999). "Will Aging Baby Boomers Bust the Federal Budget." Journal of Economic Perspectives **13**(1): 117-140.

Keywords: Aging, Social Security, Medicare
Purpose: Lee and Skinner conjecture what will happen to the federal budget as the baby boom generation ages.

Data/Methods: This is a perspective piece with various data included from external sources.
Results: The declining mortality rate and its economic implications are discussed, followed by the authors' predictions for elderly health status in the coming decades and likewise their implications for the economy. The authors believe that potential for longevity is greater than predicted by the Social Security Administration. They also predict that this will be accompanied by greater health. Unfortunately, the economic implications of this are highly uncertain, and it is possible that the result will not be good. Social Security and Medicare trust funds face a likely possibility of stress over the next several decades, regardless of what reforms are pursued. They conclude with the suggestion that the proper response to the potential depletion of trust funds is to respond according to the cause of the depletion. They cover several example scenarios of what circumstances might precipitate this.
Uses: This article contains information pertinent to everyone in the baby boom generation and younger, as its topic will come to fruition in some form. The concluding suggestion is something to consider.
Limitations: Conjectures on this issue are coupled with great uncertainty.

Liao, S., MD; Ferrell, Bruce A., MD (2000). "Fatigue in the Older Population." American Geriatrics Society **48**(4): 426-430.

Keywords: Aging, fatigue
Purpose: A survey was conducted to assess the symptoms of fatigue in relation to demographic and medical characteristics within the older population in a place of long-term care.
Data: A total of 199 (65% of initial potential participants) ambulatory residents of single residential care settings completed the trial. The mean age was 88 years old. Females comprised 82%. The median duration was 44 weeks.
Methods: An interviewer-assisted survey was initiated with 308 subjects of the Los Angeles Jewish Home for the Aging. Liao and Ferrell looked for fatigue in the participants in relation to mental status, activities of daily living, depression, a three-minute walk, a seven-item pain scale, and the modified Piper Fatigue Scale.
Results: Of the 199 who completed the trial, 195 (98%) reported some amount of fatigue symptoms. Fatigue was found to be closely connected to depression, a three-minute walk, activities of daily living, pain, and numbers of medication. This was not the case with age, sex, mental status, or number of medical diagnoses. The authors conclude that fatigue, a common problem, is "poorly recognized and undertreated" among the elderly (430).
Uses: This article demonstrates several possible ways to measure fatigue.
Limitations: The survey was restricted to one living facility. Also, as the authors note, methods for measurement of fatigue are not established, and subsequent work is needed to define the causes of fatigue and to develop treatment strategies.

Lindeman, R. D., MD; Romero, Linda J., MD; Allen, Andrew S., MS; Liang, Hwa Chi, MS; Baumgartner, Richard N., PhD; Koehler, Kathleen M., PhD; Garry, Philip J., PhD (1999). "Alcohol Consumption is Negatively Associated with the Prevalence of Coronary

Heart Disease in the New Mexico Elder Health Survey." American Geriatrics Society **47** (4): 396-401.

Keywords: Aging, alcoholism, coronary heart disease
Purpose: This paper reports the findings of a clinical investigation into the relation of coronary heart disease (CHD) to alcohol consumption and other risk factors.
Data: A total of 883 volunteers comprised a cross-sectional study of equal numbers of Hispanic and non-Hispanic white males and females. They were randomly selected from Medicare rolls and recruited to participate. All were at least 65 years old. The study was conducted in Bernalillo County, New Mexico.
Methods: A home interview and a 4-hour examination in a senior health clinic were used to obtain measurements. Interview and electrocardiogram were used to identify CHD. Interview was used to identify the risk factors of hypertension, diabetes, medications, smoking, and alcohol consumption. Direct measurement was used to identify risk factors of glucose tolerance, serum lipids, blood pressure, and anthropometry.
Results: Ethnicity, age, smoking, education, and serum lipid concentrations do not seem to affect the level of risk. Alcohol consumption is a very strong corollary to prevalence of CHD. Other significant risk factors include hypertension, diabetes mellitus, and male gender. An incidental finding is a greater prevalence of diabetes in abstainers from drink. Several specific comparison results are included in charts and discussion of results.
Uses: This is valuable information for anyone, given the possibility of strong correlation between drinking and CHD, regardless of sex or ethnicity.
Limitations: Since the study was cross-sectional, no certain causal relationship between alcohol consumption and CHD can be deduced.

Lubitz, J. G., Linda G.; Gorina, Yelena; Wartzman, Lynne; Gibson, David (2001). "Three Decades of Health Care Use by the Elderly, 1965-1998: Medicare appears to have improved the health of the elderly - something its architects didn't necessarily foresee." Health Affairs **20**(2).

Keywords: Aging, Medicare
Purpose: This article discusses the impact of Medicare on health care use and costs between 1965-1998, as well as the health status of the elderly.
Data: The authors include statistics on elderly use of health care and the costs available from the Health Care Financing Administration (HCFA) and the National Center for Health Statistics (NCHS).
Methods: Trends in health care use and spending in persons over 65 are compared to those under 65 to examine the effects of Medicare. To compare trends in the age groups, the ratio of per capita rates of use and costs for one age group to another was used. Certain groups of Medicare benficiaries were excluded. Those enrolled in health maintenance organizations (HMO) were excluded. Those without parts A and B of Medicare coverage were excluded. Medicare beneficiaries under 65 enrolled for disability were excluded.
Results: In the three-decade period, Medicare per capita spending rose from $217 to $5439. From 1967 to 1998, Medicare spending for hospital inpatient services declined from 70% to 49%, while spending for home health and skilled nursing

facility services greatly increased. Several other statistics are noted. Overall, health care spending for persons over 65 has increased greatly in comparison to health care spending for persons under 65. The authors conclude that the health of the elderly has improved over the past three decades greatly due to the effects of Medicare coverage.

Uses: The statistics of this study are important data in considering the future of Medicare.

Limitations: Limitations due to minor nuances in category descriptions and comparisons are mentioned in the paper. Also, topics such as out-of-pocket payments and use of services not covered by Medicare are not addressed.

Raymond, D. P. P., Shawn J.; Crabtree, Traves D.; Shulman, Andrew M.; Pruett, Timothy L., Sawyer, Robert G. (2001). "Surgical Infection and the Aging Population." American Surgeon **67**(9): 827.

Keywords: Aging, surgery, infection

Purpose: The authors seek to gain understanding about the association between surgical infection and the elderly population compared to the younger population.

Data: The study was conducted between December 1996 and May 2000. The number of consecutive episodes of surgical infection identified was 1913; 1512 occurred in patients under 70 years of age and 401 occurred in patients over or equal to 70 years of age. The following parameters were recorded for each patient: Age, gender, Acute Physiology and Chronic Health Evaluation (APACHE) II score, comorbidities, patient location at diagnosis, maximum temperature, maximum white blood cell count within 24 hours of initiation of treatment for infection, primary diagnosis, procedures, site of infection, organism, organism susceptibilities, antibiotic therapy, time from admission until antibiotic treatment, duration of therapy, time to defervescence, time to resolution of leukocytosis, length of stay, and crude mortality.

Methods: Elderly patients with surgical infection occurring on the general or trauma surgery services at the University of Virginia Health Sciences Center, who had the surgical infection diagnosed by isolation of a predominant organism from a standardly sterile site by standard culture techniques or on a clinical basis without cultures, were included in this study. The characteristics, comorbidities, and outcomes of patients under 70 were compared with those over or equal to 70 years of age.

Results: APACHE II scores were much higher in the elderly population (i.e., those over 70 years of age). Likewise the older population had a greater number of comorbidities than the younger age group. While Acute Physiology score, infecting organisms, and rates of pneumonia and intra-abdominal, central line, and bloodstream infection were similar between the two groups, crude mortality, mortality associated with pneumonia, central venous catheter infection, bloodstream infection, and intra-abdominal infection were much higher in the older population. The authors conclude that surgical infection in the older population is correlated with high mortality and therefore treating infection in this population requires special care.

Uses: These data and results are strong evidence for the advocation of the authors' conclusion: that special care is necessary when treating surgical infection in the

elderly population.
Limitations: The term "elderly" is not well-defined. The dividing line between the elderly and non-elderly populations had to be drawn arbitrarily for this study.

Roghmann, M.-C., MD, MS; Warner, John, PhD; Mackowiak, Philip A., MD (2001). "The Relationship between Age and Fever Magnitude." American Journal of Medical Science **322**(2): 68-70.

Keywords: Aging, fever, pneumonia
Purpose: The authors conducted a study to analyze the effect of age on the symptom of fever in hospitalized patients with moderate-to-severe pneumonia.
Data: The study involved 320 hospitalized patients with a median age of 64 and a range of 18 to 97. Men comprised 70%. The mean duration of hospital stay was 31 days and the range was 4 to 519. The data came from a study initially assessing the efficacy of ciprofloxacin in the treatment of hospitalized pneumonia patients.
Methods: The temperature data recorded for patients during the first study was analyzed for this study. Researchers recorded the highest temperature on the day the infection began, the two days following, and the date of hospital discharge. Anatomic sites at which temperatures were taken were also recorded. Data results were then analyzed using linear regression.
Results: Maximum temperature on the first and second days of infection was found to be inversely proportional to age (when adjusted for anatomic site of temperature measurement). Furthermore, for each age-increase of a decade, the average temperature for the first three days of infection had an average decrease of .15 degrees Celsius (.27 degrees Fahrenheit).
Uses: The data and results of this study illustrate the way medical attention should adjust to the increase of age in patients. It especially concerns assessment of febrile symptoms in the elderly.
Limitations: This study admits to certain limitations caused by its retrospective nature. Primarily, confounding variables were not available. For example, lack of data on daily antipyretic use during the first two days of infection adds uncertainty to the degree of fever. Also, temperature data were often missing from the records.

Rothmann, A. A. and E. H. Wagner (2003). "Chronic Illness Management: What is the Role of Primary Care?" Annals of Internal Medicine **138**(3): 256-262.

Keywords: chronic illness, primary care, continuity, coordination, comprehensiveness
Purpose: The authors discuss whether primary care or specialty care physicians are better prepared or positioned to provide chronic care.
Data/methods: This is an opinion piece.
Results: The Institute of Medicine's definition of primary care includes descriptions of its continuity, comprehensiveness, and role in the coordination of other caregivers. This is the type of care needed by those with chronic illness. Further, most chronic illness is less severe and easily handled by general practitioners. Chronic illness is often associated with comorbidities and the general practitioner again is more qualified than the narrow specialist to coordinate care and think comprehensively. Empirical, comparative results of outcomes by specialists and

generalists providing chronic care are mixed with each showing better results with specific diseases. Those cared for by a team involving both produced the best results. Disease management firms are a largely untested alternative. There is some evidence that clinical case management may improve outcomes if "they reinforce rather than undermine continuity and coordination of care." The authors say there is an urgent need for research in this area. The authors say the problem with both generalists and specialists is their training focused on acute care. Medicine is organized around acute care. "The care of chronic illness is often a poorly connected string of episodes determined by patient problems." Effective care is defined by coordination and organization of care and assistance for the patient in self management of all conditions. Specific studies of research into improved care for diabetes and depression are discussed. No single specific intervention, in either illness, achieved the improvement that multifaceted team care achieved. "Most successful chronic care illness interventions include major roles for nonphysicians".

Uses: The existence of an ongoing, coordinated team is more important to chronic care than the question of specialty of its leader.

Limitations: This is an article about medical practice and not its financing. In fact, in one line it dismisses financial impacts by stating that the recommended care can be provided under any financial arrangement. However, in another area it notes that these changes to team oriented practice cannot occur without appropriate incentives.

Sowers, J. R. L., Mel (2000). "Hypertension, hormones, and aging." The Journal of Laboratory and Clinical Medicine **135**(5): 379-386.

Keywords: Aging, dislipidemia, hypertension,

Purpose: This review aims to outline key elements of the presence, causes, and treatment of hypertension and dyslipidemia in the elderly.

Data/Methods: The authors conducted a review of literature and clinical trials from various sources regarding hypertension and dyslipidemia in the aging population.

Results: The authors found that typical causes of hypertension, which increases in occurrence with age, include obesity, sedentary lifestyle, structural alteration in the aging cardiovascular system, and diminution in kidney function. Hypertension and dyslipidemia (caused by lipid abnormalities), as well as diabetes mellitus, are major risk factors for coronary heart disease and stroke. The authors conclude with discussions of lifestyle modifications and pharmacologic therapies that appear to reduce elderly morbidity and mortality linked with hypertension and dyslipidemia.

Uses: This review provides several references to further information and studies regarding the hypertension and dyslipidemia prevention and treatment in the elderly. Because all people experience increased risk with increased age, the information is universally valuable.

Limitations: Results are based on an amalgam of results from other sources.

Stallard, E. "Retirement and Health: Estimates and Projections of Acute and Long-Term Needs and Expenditures of the U. S. Elderly Population."

Keywords: Retirement planning, Medicare projections, mortality projections, disability projections
Purpose: Stallard discusses static projections of retiree health care needs and contrasts them with dynamic models. The static models use current mortality projections, current healthcare and disability rates, and project the future population benefits. Various ways in which mortality improvement may continue are not specifically reflected in the health and long term care costs. Stallard presents a model which begins to reflect the interrelationships of mortality, health, and disability. Ultimately, Stallard intends that the model be useful for retirement planning.
Data: Extensive use is made of various data from public programs and the National Long Term Care Surveys.
Methods: Static projections and dynamic projections are contrasted. The dynamic model uses Markov chains and focuses on transitions between states of active life, disabled life, and death.
Results: Stallard discusses the role and the determination of benefit eligibility under Medicare, Medicaid, and HIPAA's definition of Long Term Care. He reviews the Social Security Administration (SSA) projections and some criticism of them such as the potential for greater mortality improvement. The SSA Medicare projections do not link mortality improvement with health costs or disability rates. He shows a wide range of potential results in the unlinked models. The linked model is more capable of modeling program changes or cost shifting within the programs. It is more consistent with a theory of disability as a progressive phenomina. Forty percent of new nursing home residents are on Medicaid. Stallard sees this as a failure rather than a planning success.
Uses: Better long term forecasts of healthcare costs should coordinate mortality, disability, and heath assumptions over time. Long term care costs should not be ignored in financial planning. The continuing and increasing pressure of future Medicare Part A insolvency make dependency on it, at least at its current benefit level, problematic.
Limitations: Stallard generally accepts the financial system's imposition of defintions of long term care and short term care. He says his model building is a work in progress.

Starfield, B. (2000). "Is US Health Really the Best in the World?" Journal of the American Medical Association **284**(4): 483-5.

Keywords: Health, international comparisons, quality, primary care
Purpose: Starfield compares the US to thirteen other developed countries and finds we rank last on many indicators of health quality. She analyzes the complex reasons.
Data/Methods: This is secondary research.
Results: The US ranks behind most developed countries on indicators of health care such as neonatal mortality and life expectancy. We do a little better at elder care since we rank seventh out of the thirteen countries in life expectancy at age 65 and third in life expectancy at age 80. Our relatively good performance with he elderly is slipping as we were in a better position in the 1980s than the 1990s. The poor US result is not entirely due to lifestyle. We rank in the middle in smoking, alcohol consumption, and blood cholesterol. Starfield explores three

possibilities. One is income differentials. There are numerous studies that indicate that overall health is poorer when income differentials are greater. An explanatory theory is not offered but is required in order to know how to combat this effect. The second possibility is the poor quality of medical care in the US. In particular, we practice too much medicine. Medical care that goes beyond doing good for the patient is called iatrogenic. Starfield estimates that errors and iatrogenic medicine kill 225,000 US patients annually. The third factor that causes US healthcare to perform poorly is that our system is too much based on specialty care and not enough on primary care. Some studies show that a specialist provides better care than a generalist when dealing with a specific illness. Overall results indicate otherwise. More research is needed.

Uses: The harmful effects of unnecessary medical intervention may explain the excess deaths in the US relative to other developed countries. The usual lifestyle arguments don't hold up.

Limitations: Starfield acknowledges that these aren't answers but directions for further research.

Stern, S. L., MD; Dhanda, Rahul, PhD; and Hazuda, Helen P., PhD. (2001). "Hopelessness Predicts Mortality in Older Mexican and European Americans." Psychomatic Medicine **63**(3): 344-351.

Keywords: Aging, hopelessness, mortality

Purpose: This study was conducted in order to assess the relationship between hopelessness and mortality in elderly Mexican and European Americans.

Data: The main survey included 795 people, ages 64 to 79 with a mean age of 69.1. The randomly selected sample included 31.2% Mexican American women and 26.8% European American women and 23.1% Mexican American men and 18.9% European American men. The survey was conducted between the years 1992 and 1996. (Other surveys were briefly covered before the discussion of this one.)

Methods: When participants entered the San Antonio Longitudinal Study of Aging, they completed the 30-item Geriatric Depression Scale survey. Participants responding "no" to the question, "Are you hopeful about the future?" were categorized as hopeless. The hopeless included 73 persons (9.1%) and the hopeful included 722 persons (90.9%). Hopelessness was generally equal between men and women, but it was more common in Mexican Americans than in European Americans. The data was analyzed by a stepwise regression method using Cox proportional hazards models.

Results: By August 1999, 29% of the 73 hopeless participants had died, while only 11% of the 722 of the hopeful. The analyzed data revealed a positive correlation between hopelessness and the demographic and health variables. No correlation was shown with other important variables, such as blood pressure, body mass index, current drinking status, and probable alcoholism. The authors conclude that these findings, along with those of others, indicate hopelessness as a valuable prognostication of mortality in older adults of various ethnic backgrounds.

Uses: These results can be used as bases for further research into the relationship between hopelessness and mortality, which the authors believe is needed.

Especially still to be researched in greater depth is the relation between hopelessness and particular causes of death, both cardiovascular and noncardiovascular.

Limitations: The evaluation of hopelessness was based on a single yes/no question that did not allow comparison of moderate with severe hopelessness, which might have a significant disparity in mortality rates. Also, assessments of cause of death were based on death certificates, not always a reliable method.

Sutor, B., MD; Rummans, Teresa A., MD; Smith, Glenn E., PhD (2001). "Assessment and Management of Behavioral Disturbances in Nursing Home Patients with Dementia." Mayo Clinic Proceedings **76**(5): 540-550.

Keywords: Aging, behavior, dementia, nursing homes

Purpose: The purpose of this article is to assess the medical, environmental, and psychological factors contributing to behavioral disturbances caused by nursing home patients with dementia and then to consider integrating pharmacological and behavior treatment plans in order to optimize management of these behaviors.

Data/Methods: This opinion piece draws its data from a variety of sources.

Results: Since the causes behind behavior disturbances in nursing home patients with dementia can vary greatly and be multifaceted, a variegated management approach is necessary. With each elderly person with dementia, medical, psychiatric, behavioral, and environmental considerations must be factored into the formulation of a response.

Uses: The article paints a rich picture of various factors and their interrelation in behavioral disturbances caused by patients with dementia and stresses the importance of the integration of these factors in treatment.

Limitations: This is an opinion piece.

Wolf, D. A. (2001). "Population Change: Friend or Foe of the Chronic Care System?: Growing racial/ethnic diversity and childlessness among the elderly will likely exacerbate problems in the chronic care system." Health Affairs **20**(6).

Keywords: Aging, chronic care, disability, projections

Purpose: The author sets out to determine whether population change is more likely to be beneficial or detrimental to the chronic care system.

Data/Methods: This is an opinion piece.

Results: Wolf reviews evidence that suggests that both supply and demand pressures on the chronic care system will increase, due to population growth of the elderly and shrinking families to care for them. Then he reviews evidence that the pressures will decrease, which consist in recent trends in the reduction of old-age disability. Regarding the demand for chronic care services caused by demographic change, Wolf considers the size of the older population, racial and ethnic composition, prevalence of chronic care needs, trends and compositional change, and the role of education. Regarding the supply of chronic care services, Wolf considers geographic mobility, female labor-force participation, marriage and divorce patterns, and fertility patterns. He concludes that population change will be a foe to the chronic care system for several decades.

Uses: This article raises many issues that are important to factor in, as Wolf did, in trying to determine an answer to the same question Wolf sets out to answer. His evidence and reasons for his conclusion appear strong.

Limitations: It is an opinion piece making conjectures about the future for the chronic care system, and it must argue from projected trends.