Abdominal Pain

Clifford D. Packer

Abdominal pain is a common problem for people in all age groups, and leads to frequent visits to physicians' offices, emergency rooms, and hospitals. Causes of abdominal pain are manifold, and can range from trivial to acutely life-threatening. Evaluation of acute abdominal pain is one of the most challenging tasks a physician can face. In the elderly, diagnosis can be even more difficult because the causes, signs, and symptoms of abdominal pain are often different than in young and middle-aged patients.

Abdominal pain may have many anatomic causes, from skin (herpes zoster or "shingles"), muscle (abdominal muscle strains), inflammation of the lining of the abdominal cavity (peritonitis), diseased internal organs in the abdomen (gastritis, peptic ulcer disease, pancreatitis, appendicitis, diverticulitis, cholecystitis), to the blood vessels that pass through the abdomen or supply the abdominal organs (abdominal aortic dissection and mesenteric artery thrombosis). Rarely, abdominal pain can be caused by metabolic diseases such as diabetic ketoacidosis.

Pain from many of these conditions may be referred to other areas such as the back, neck, scapula, flank, or groin, and the pattern of radiation can be an important diagnostic clue. Gall bladder colic, for instance, causes right upper abdominal pain that typically radiates to a point just below the right scapula. The upper abdominal pain of pancreatitis often radiates to the midback. In early appendicitis, the pain is usually mid-abdominal and then migrates over time to the right lower abdomen. In addition, the quality of abdominal pain (e.g., sharp, dull, colicky, or constant) and the accompanying symptoms (e.g., nausea, vomiting, fever, diarrhea, constipation, and blood in the stool) must be considered. Patients should also be asked what makes the pain better or worse; for instance, antacids will often give prompt but temporary relief of pain from peptic ulcer disease, esophagitis, or gastroesophageal reflux. Patients with peritonitis, or generalized abdominal pain due to perforation, feel better when they lie completely still; those with pancreatitis usually prefer to sit upright.

Abdominal colic (or "colicky" pain) is important to recognize because many of its causes are serious and can require surgical treatment. This pain is caused by stretching or distention of a hollow tube due to obstruction, and worsens as the involuntary bowel contractions increase to overcome the obstruction. Examples include obstruction of the bile ducts or the neck of the gallbladder by gallstones, blockage of the ureters by kidney stones, and obstruction of the intestines by tumor or adhesions from previous surgery. Colicky pain is acute, agonizing, and builds to spasms of unbearable intensity before gradually easing. Patients with abdominal colic are usually doubled up, writhing in pain, and unable to find a comfortable position, and may have nausea and vomiting. Although the abdominal muscles may be rigid during paroxysms of pain, the abdominal wall softens between attacks and the clinician can palpate the abdomen without undue discomfort.

In contrast, the abdominal muscles are constantly rigid with acute peritonitis, which carries a very high mortality if diagnosis is delayed even for a few hours. Acute peritonitis always requires emergent surgical treatment. It may be caused by perforation of any hollow organ in the abdomen, including the stomach or duodenum from peptic ulcer disease, the gallbladder from cholecystitis, the appendix as a complication of acute appendicitis, or the colon in the case of diverticulitis. It may also be caused by gangrene of the intestines or rupture of an abscess in the liver or spleen. Peritonitis may be generalized or localized; for instance, in most cases of diverticulitis (an inflamed outpouching of the colon) there is a tiny perforation that is quickly walled off by adjacent tissue and leads to only localized peritoneal irritation, usually in the left lower abdomen. On the other hand, perforation of the appendix or of a peptic ulcer may lead very quickly to generalized peritonitis, with abdominal rigidity, vomiting, quiet bowel sounds, and unstable vital signs. An important sign of peritonitis is free air seen under the diaphragms on an upright abdominal x-ray, caused by air from the gut leaking into the abdominal cavity.

Abdominal x-rays are an extremely important part of the rapid abdominal pain workup. In addition to free air, they can show kidney or gallbladder stones, air-fluid levels, and dilated loops suggesting bowel obstruction, "thumbprinting" of the colonic wall with mesenteric ischemia, and vascular calcifications outlining an aortic aneurysm.

Laboratory testing is essential for patients with abdominal pain. A high white blood cell count usually indicates infection or inflammation, and a drop in hematocrit might be due to blood loss from gastrointestinal hemorrhage. Abnormal liver function

tests can be useful in diagnosing hepatitis and biliary tract disease. Amylase and lipase are elevated in pancreatitis, and urinalysis in a patient with colicky flank pain from kidney stones usually shows red blood cells. In addition, all women of childbearing age with abdominal pain (regardless of the menstrual and sexual history) should have a urine or serum pregnancy test, because ectopic pregnancy is a life-threatening condition, and the history can be unreliable for a variety of reasons.

Computed tomography (CT) scanning is now the standard in evaluating patients with suspected appendicitis, diverticulitis, pancreatitis, intra-abdominal abscess, and kidney stones. Ultrasound is a better and less expensive test for initial evaluation of the gallbladder and biliary tract. Gallstones, dilated bile ducts, and thickening of the gallbladder wall or fluid collecting around the gallbladder are all easily visualized with ultrasound. In addition, ultrasound is better than CT in ruling out ovarian torsion (twisting) as a source of pelvic pain in women. The hepatobiliary iminodiacetic acid (HIDA) scan, a nuclear medicine test, can detect gallbladder inflammation even in the absence of gallstones (acalculous cholecystitis), and can help differentiate this disorder from pancreatitis.

Elderly patients with abdominal pain have high rates of morbidity and mortality. Recently, investigators at George Washington University prospectively followed 360 patients above the age of 60 who presented to an emergency department with abdominal pain. They found that nearly 60% were hospitalized, 20% underwent operative or invasive procedures, 10% had return emergency department visits, and 5% died within 2 weeks. Leading causes of pain were nonspecific (14.8%), urinary tract infection (8.6%), bowel obstruction (8%), gastroenteritis (6.8%), and diverticulitis (6.5%). The emergency department and final diagnoses matched 82% of the time—in contrast with other studies that have shown emergency department misdiagnosis in up to 40% of elderly patients with abdominal pain.

Diagnosis is difficult in the elderly because they often present with vague symptoms and nonspecific findings on examination; for example, elderly, debilitated patients with acute peritonitis often do not have generalized abdominal rigidity. In addition, they are less likely to have fever and leukocytosis, even with serious conditions such as diverticulitis or cholecystitis. Furthermore, the underlying chronic diseases of the elderly complicate both diagnosis and treatment.

Patients with diabetes mellitus may not have the typical patterns of pain radiation, and may be unable to mount an adequate immune response to infection. Patients with cardiovascular disease (especially atrial fibrillation) are more prone to mesenteric artery thrombosis and consequent ischemic colitis, which can be extremely difficult to diagnose and treat. About 5–10% may also have abdominal aortic aneurysms, which can dissect or rupture. Pneumonia, myocardial infarction, pericarditis, and pulmonary embolism can all cause upper abdominal pain. In addition, 30–50% of elderly patients have gallstones, and 50% have diverticulosis, so the risk for complications of these conditions is particularly high. Many elderly patients have had prior abdominal surgery, which increases the risk for bowel obstruction from surgical adhesions. This combination of high risk, serious underlying illnesses, nonspecific symptoms, and frequent lack of fever and leukocytosis greatly increases the danger of misdiagnosis.

Classically, the diagnosis of acute cholecystitis (acute inflammation of the gallbladder) requires the triad of right upper abdominal pain, fever, and leukocytosis. Unfortunately, 25% of elderly patients with acute cholecystitis have no pain, and less than 50% have fever, vomiting, or leukocytosis. A similarly low percentage of elderly patients with acute appendicitis have the classic fever, leukocytosis, and right lower quadrant pain. It follows that complications due to delayed diagnosis—perforation and abscess—are twice as common in the elderly. In fact, one-quarter of all emergency abdominal surgeries are performed in people above the age of 80. Surgical mortality in the above-75 age group is double that of the middle-aged, largely due to serious underlying or complicating conditions such as pneumonia, emphysema, congestive heart failure, myocardial infarction, and pulmonary embolism.

A careful and meticulous medical history and physical examination will suggest the cause of abdominal pain in most patients, even the elderly, and will usually lead to the specific tests needed to make a diagnosis. In no other medical condition is the skill and judgment of the physician more important and timely diagnosis more critical.

Related Topics

Bowel obstruction, Pancreatitis

Suggested Readings

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Abstract Thinking

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Abstract thinking refers to a cognitive concept involving higher-order, or complex, thoughts. To be able to think in an abstract manner implies that one is able to draw conclusions or illustrate relationships among concepts in a manner beyond what is obvious. Often the terms "abstract thought" and "concept formation" are used interchangeably. In the past, the term "fluid intelligence" has been used to refer to the ability to reason. The generation of concepts, or abstract ideas, indicates an ability to progress beyond concrete thinking. The concrete interpretation of a concept involves a focus on the salient, obvious characteristics. Progressing beyond the tangible characteristics in order to conceptualize theoretical relationships between items or processes involves abstract thought.

Abstract thinking occurs conceptually, categorically, and generally. Conceptual relationships are developed in order to explain the theoretical basis behind why one idea or item is related to another. Categorical abstract thought includes the recognition that broader theoretical categories apply to the relationships between things, over and above the concrete and tangible characteristics that may seem similar. Generalized abstract thought includes the ability to conceptualize a statement, event, or item in a manner providing a broader understanding that is not directly relatable to concrete characteristics.

Executive Functions

Executive functions are those aspects of cognitive ability allowing us to plan, organize, shift, and reason through our behaviors. Abstract reasoning, or the application of abstract thought through our behaviors, is a vital component of these important skills. In the past, abstract thinking and concept formation were considered all-encompassing terms for executive abilities. Executive functions are now considered to comprise multiple complex cognitive processes, and numerous subdomains exist. Abstract reasoning remains one important subcomponent of executive functioning. Without an ability to conceptualize beyond the concrete nature of a relationship, additional planning, organizing, and self-regulation of behaviors becomes complicated.

The development of abstract reasoning, in addition to other executive functions, occurs throughout childhood and adolescence, and appears directly related to neurological development of corticofrontal systems. The frontal lobes, particularly dorsofrontal areas and subcortical connections, or more primitive brain regions, play an important role not only in the development of these skills but also in their maintenance over time.

Aging versus Decline

While some mild decline in cognitive functions may be associated with normal aging, significant decline of abstract reasoning skills appears primarily restricted to incidences of problematic aging. All individuals may experience some level of cognitive decline as they age, affecting speed of processing information, as well as some aspects of learning and memory. Language functions remain generally intact through the aging process. Any mild decline in abstract thinking that may be seen in normal aging is almost imperceptible to the individual, and may be related to the general decline in speed of cognitive processing. Due to slower mental speed, concentration may be more difficult, resulting in what can appear in formal testing to be a decrease in abstract thought. Such mediated changes in abstract thinking, related to mild declines in other executive functions, likely do not severely impact daily functioning. When individuals begin to experience declines in social and occupational functioning, such that they demonstrate a decline from

prior levels of functioning, they are likely experiencing more than normal age-related declines.

In the *Diagnostic and Statistical Manual of Mental Disorders*, Fourth Edition, Text Revision (2000), the formal diagnosis of dementia, regardless of etiology, includes the "development of multiple cognitive deficits manifested by both (1) memory impairment . . . and (2) one (or more) of the following cognitive disturbances: (a) aphasia (b) apraxia (c) agnosia (d) disturbance in executive functioning." Executive dysfunction in this diagnosis includes disturbances in "planning, organizing, sequencing, [and] abstracting." In the discussion of these disturbances, the text specifies that impairments in abstract thinking may be indicated in individuals struggling to process novel situations and cope with novel tasks. Aging individuals can experience dementia for many reasons, including Alzheimer-type dementia, vascular dementia, and numerous other general medical conditions. Prevalence rates of dementia vary depending on the age of the sample being studied. Suggestions indicate that 20–30% of the population at a given time may experience neuropsychological decline without associated significant impairments in social or occupational functioning. Many of these individuals likely experience some decline in executive functioning, including abstract thinking. It remains unclear at this time how many of these people go on to develop a diagnosable syndrome of dementia. It is similarly unclear how many of these individuals experience a decline in abstract thought resulting in functioning impairment.

Assessment

Assessment of abstract thinking, and its possible decline, can take many forms including standardized questionnaires, interviews, bedside assessments, and formal neuropsychological assessments. Consideration of the person's educational background is an important component of any assessment. Up to a quarter of the variability seen in cognitive functions assessed in older adulthood is directly related to the level of educational experience. Those individuals with lower levels (less than high school) of educational attainment often perform poorly on tasks of executive functioning, including abstract thinking. This may be in part due to lack of exposure to this type of thought, and also may be related to lower levels of ability that are lifelong and not indicative of a decline in functioning.

Formal assessment of abstract thinking can involve both verbal and nonverbal measures. Verbal abstract reasoning is often assessed utilizing proverb and similarity tasks. Proverbs tap an individual's ability to move from concrete sayings into abstract, metaphorical thought. When using this method to assess an individual's level of abstract reasoning skills, the proverbs provided must be novel, otherwise responses may be based on rote memory rather than allegorical representations. Asking a person to identify similarities between words assesses his or her ability to identify the broader conceptual relationships among words. This task can be negatively impacted by other neurological and neuropsychological conditions such as aphasia. Visually based abstract reasoning skills are often assessed using category tasks, requiring a person to recognize conceptual categorical relationships among visual pictures. Additionally, pattern tasks can assist in assessing an individual's ability to identify symbolic relationships among items.

Formal testing of abstract thinking should always be accompanied by a clinical interview of the individual and the family members. The inclusion of family members in the evaluation process is important in order to attempt to identify if an individual has experienced a decline in functioning from prior levels. It may be difficult to interpret what poor performances on some but not all formal tests may imply. Therefore, monitoring an individual's daily functioning, including the ability to complete complex tasks, understand and resolve new situations as they arise, and demonstrate adequate reasoning skills day-to-day, likely remains the best method for assessing abstract thinking skills.

Related Topics

Alzheimer's disease, Cognitive theory of aging, Dementia, Dementia Advocacy International, Frontal lobe dysfunction, Memory

Suggested Readings

American Psychiatric Association (2000) Diagnostic and statistical manual of mental disorders, 4th ed., Text Revision. American Psychiatric Association, Washington, DC

Schönknecht P, Pantel J, Kruse A, Schröder J (2005) Prevalence and natural course of aging-associated cognitive decline in a population-based sample of young-old subjects. Am J Psychiatry 162(11):2071–2077

Teri L, McCurry SM, Longsdon RG (1997) Memory, thinking, and aging: what we know about what we know. West J Med 167(4):269–275

Suggested Resources

Alzheimer's Disease Education&Referral Center (ADEAR). www.alzheimers.org/index.html
Administration on Aging (AOA). www.aoa.gov/eldfam/eldfam.asp
National Council on Aging (NCOA), article referencing dementia and Alzheimer's type. www.ncoa.org/content.cfm?sectionID=109&detail=65

Access to Health Care

Beth E. Quill

Access to health care has dominated the health policy scene for several decades. In the early 1990s national legislation, "universal access" to health care was introduced by former president, Clinton, and the Congress as a way to provide health security for all Americans. Lively debates were generated and the topic commanded national attention. The effort, although unsuccessful, has kept the problem of health care access on the public agenda.

Access to care generally refers to the timely use of personal health services to achieve the best possible outcomes. Initially, the premise was access to physicians and hospitals. Recently the analysis of health care access has required accounting for a variety of providers, services, and facilities. In addition, access describes the actual use of health services and factors that facilitate or impede health care.

Aday (2001) and Anderson (1996) describe six types of access:

1. Potential access refers to health care system characteristics that influence the use of services.
2. Realized access is the actual use of health services.
3. Equitable access is the use of health services determined by demographic characteristics and need.
4. Inequitable access refers to the use of health services that is determined by social characters and available resources.
5. Effective access is the use of health services that improves health status or satisfaction.
6. Efficient access minimizes the cost of health care services and maximizes health status or satisfaction.

Thus, each type of access to care is influenced by a number of characteristics and events. In an effort to understand the influences on access to health care, numerous studies have examined the barriers to care in specific populations.

Personal and Family Barriers

Acceptability Services must be desirable and viewed as acceptable to the patient/client and family. Physical setting, demeanor, and scope of services must all be acceptable. A recent study of barriers to health care for elderly noted that the most common barrier was the physician's lack of responsiveness to their concerns (33%).

Language and Literacy Patients/clients experience significant barriers when important information is complex and not in their native language. Complicated systems such as application for Medicaid present perceived and real barriers in literacy and native language. The lack of providers who speak the language and are from the same culture as the populations they serve further exacerbates language barriers.

Culture Health care providers and facilities that do not understand the cultural expectations and norms of the service populations present obstacles to accessing care. Lack of knowledge about the culture further creates difficulty in achieving compliance with necessary medical treatments. Treatment and lack of adherence to medication for tuberculosis among Hispanic immigrants is one example.

Attitudes, Beliefs The relationship between the provider of services and the patient/client involves mutual respect and understanding. Barriers occur when patients/clients perceive attitudes and beliefs about the nature of their health as negative. This results in lack of compliance that undermines successful treatment outcomes. Negative attitude on the provider's part (homophobia, discomfort of dying patients) toward HIV or AIDS patients is one example.

Humans Behaviors Individual characteristics may serve as barriers to treatment. Patients with physical or emotional disabilities may have difficulty in finding services that meet their needs. Health care providers, on the other hand, behaving in a courteous and respectful manner, are likely to facilitate the engagement of at-risk patients/clients and the elderly.

Education and Income Individuals with lower incomes or education do not access the health care system to the same extent as the more affluent or those with higher education do. Utilization of certain services and quality of care are notably lower for some groups, whereas there is higher utilization (such as emergency rooms) in other populations. With increasing health care costs, more of the population is experiencing "out-of-pocket expenses" as a barrier to obtaining services. This is especially true for the elderly.

Financial Barriers

Insurance Coverage Insurance coverage is the "admission ticket" to health services. Although there is a perception of greater equality regarding health care access for the elderly because of Medicare, financial barriers for this group emerge from lack of sufficient supplementary insurance and out-of-pocket expenses for prescription drugs. Recent changes in Medicare and Medicaid present efforts to "close this gap." However, premiums, deductibles, and co-pays pose a barrier to access for the elderly, especially for those with low incomes. Patients/clients are reluctant to seek care without adequate insurance, and providers and facilities are reluctant to provide care since services may not be adequately reimbursed.

Reimbursement Levels Low levels of reimbursement for health services by government programs have been a major disincentive for providers and health care facilities, exacerbating existing barriers that vulnerable populations may experience.

Structural Barriers

Availability Access to health services, particularly a regular source of medical care, is contingent upon services being available where and when needed by the service population. Barriers based on availability occur when services are located only in more urban areas creating barriers for remote rural populations or during hours when the elderly are unable to come for services. At least 11% of the elderly report not seeking care because they did not have a regular source of care.

Transporation Lack of transportation is cited by as many as 23% of the elderly as a barrier to access care. While many elderly rely on family, friends, or public transportation, special accommodations are required to assist those who may be functionally impaired. Although innovative approaches have been developed, they cannot be sustained if services must be paid for by clients who may be socially disadvantaged.

It is clear that groups and individuals at risk may experience multiple barriers in trying to access health care. These are often individuals and groups who are vulnerable and need multiple services. Aday (2001) notes that the principal health needs of vulnerable populations are *physical* (chronically ill and disabled, persons living with HIV or AIDS); *psychological* (mentally ill and disabled, alcohol or substance abusers, suicide- or homicide-prone individuals); and *social* (abusing families, homeless persons, immigrants and refugees). Many of these vulnerable groups have crosscutting health needs such as battered elderly women or substance-abusing elderly. The elderly are at increased risk to experience multiple barriers to accessing care. For example, an elderly woman with diabetes, living alone in a rural area, likely experiences the following barriers: fewer providers in rural areas; co-pays and deductibles with significant out-of-pocket expenses for medication; fear of a physician discovering other medical problems or complications; and transportation that accommodates her functional impairments (mobility, vision).

Access to timely care, immunization, preventive screening, chronic disease management, and dental visit in the elderly are all personal examples of health services that contribute to favorable health outcomes. Thus, measurement of these indicators provides useful clues to how inadequate access to health care yields disparities in health outcomes. For example:

- Persons from poor areas are two-thirds as likely as those in high-income areas to have access to hospital admission and referral services.
- Those with dental insurance make an average of one more visit to the dentist than those without insurance. Medicaid beneficiaries are less likely to

visit a dentist compared to low-income privately insured individuals, and Medicaid reimbursements for dentist visits are notably low.
- Poverty is associated with limited access to preventive, primary, or specialty care, and therefore with poor health outcomes.
- Americans without health insurance are generally sicker and die sooner. In addition, when they receive care, it is likely to be of poorer quality than those with insurance. The Medicare program provides health care for those above 65 years. With an expanding elderly population that has an increased life expectancy, more resources are required to provide adequate care for those with chronic diseases and disabilities, and those who require medication and technological support to maintain their health.

A major barrier to access for the elderly is the gap between coverage by Medicare, Medicaid, and private insurance. Long-term care and prescription drugs are the top "uncovered" benefits. While 65% of those on Medicare have supplemental insurance, out-of-pocket expenses for deductibles, premiums, and co-pays force many elderly to forgo necessary treatment. Recent changes to Medicare provide supplemental prescription drug coverage (Part D). Medicaid beneficiaries will have drug coverage through Part D. More benefits for home and community care for the elderly as well as preventive services will be provided. Both Medicare and Medicaid programs are major components of state and federal budgets with expenditures exceeding the budget. Benefits of both programs are therefore vulnerable to economic changes. Growth in the elderly population and technological medical advances will require policy actions to keep pace with the increased demand in services. Access to health care for the elderly will continue to be a major concern for policymakers and public health practitioners.

Related Topics

Health insurance, Long-term care insurance, Medicaid, Medicare

Suggested Readings

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Institute of Medicine (2002) Unequal treatment: confronting racial and ethnic disparities in health. National Academy Press, Washington, DC

Millman M (ed) (1993) Access to health care in America. National Academy Press, Washington, DC

Accidents

Gail E. Souare

Accidents and unintentional injuries among older adults are a major public health problem that, with the exception of falls, has received relatively little attention compared to their occurrence in other age groups and to other health problems among seniors. Injuries to older adults are costly to the health-care system and often have serious consequences to the individual. Injuries can lead to an irreversible decline in function, institutionalization, and even death.

Many injuries are related to physical changes that accompany the aging process. These include changes in eyesight that reduce depth and color perception, increased susceptibility to glare, and alterations in blood circulation that can result in dizziness and loss of balance. Changes in walking patterns, for example taking shorter and shallower steps, increase the risk of tripping. In addition, reaction times can increase, resulting in a reduced ability to rapidly react to danger. Other changes that may contribute to accidents include decreased cognitive skills and reduction or loss of the senses.

Falls

The most common type of accident in older persons is falling. Persons above 75 have relatively more injury-related deaths than any other age group; people aged 65 through 74 follow close behind. According to the Centers for Disease Control and Prevention (CDC), in 2003 more than 1.8 million older adults (aged 65 and older) were treated in emergency departments for fall-related injuries and more than 421,000 were hospitalized.

Automobile-Related Accidents

The second most common type of injury results from automobile-related accidents. According to the Institute of Transportation Engineers, older drivers are increasingly mobile and most Americans continue to drive as they age, with 75% aged 70 and older reporting that they still drove in 2001, up from 73% in 1995. Per mile driven, elderly drivers (those above 80) are more likely to die in a crash than any other age group. Although older drivers drive far fewer miles than younger drivers, in a crash of the same severity, they are more likely to be injured or to die because of their frailty.

The increase in the number of older drivers killed in traffic accidents is occurring as older Americans form a greater portion of the overall population. The older segment of the population (65 and older) grew nearly twice as fast as the total population between 1990 and 2000, and the number of older Americans will only increase as baby boomers start to turn 65 in 2011. The US Census Bureau estimates that one in five people will be 65 or older by 2030.

Accidental Poisoning and Overdose

When speaking of accidental poisoning, we often think of children, but more unintentional poisoning deaths actually occur among the elderly than among young children. The elderly are at particular risk for misuse of prescribed medication due to the large number of medications they may be required to take, interactions between or among medications, and decreased cognitive abilities to understand the doctor's instructions. Older adults may receive prescriptions from more than one physician and purchase medications from different pharmacies without informing either doctors or pharmacists about the other medications they are taking. Unfortunately, since mixing medications may result in hospitalization and/or death, the problem of mixing prescription medications is underdiagnosed. In addition, some older adults may drink alcohol, which interacts adversely with many medications, particularly with such drugs as barbiturates, sedatives, and tranquilizers, and the combined effects can be deadly.

Burns

Burns are another cause of accidents in the home. These may result from water heaters being set too high, house fires caused by smoking, unsafe heaters or frayed electrical cords, and scald injuries from hot foods, grease, and cooking liquids. Older persons may be at greater risk for these types of accidents due to decreased cognitive skills and reaction time.

Other Causes of Injury or Accidents

There are many other causes of accidents that affect older persons. During winter months, unventilated heaters may be used causing accidental carbon monoxide poisoning. Older adults may be at greater risk for accidental cuts while using knives or other sharp instruments while preparing meals due to decreased reactions or reduced depth perception. Active older adults are also susceptible to sports injuries, drowning, and other accidents that affect the general population.

Related Topics

Adverse drug reaction, Driving safety, Falling

Suggested Resources

McGurkin N, Liss S (2005) Aging cars, aging drivers: important findings from the National Household Travel Survey. ITE J 9. http://www.findarticles.com/p/articles/mi_qa3734/is_200509/ai_n15614527

Schletty A (1984) Home injuries are no accident! Aging. April–May. http://www.findarticles.com/p/articles/mi_m1000/is_1984_April-May/ai_3199306

Public Health Agency of Canada (2001) Prevention of unintentional injuries among seniors workshop on healthy aging, November 28–30, 2001. http://www.phac-aspc.gc.ca/seniors-aines/pubs/workshop_healthyaging/injury/injury2_e.htm

Acculturation

Anamaria Tejada

When immigrants establish themselves in a new host culture, they start a process of cultural change that allows them to function effectively in the new culture without giving up their own. This process can happen at the group and the individual level. At the group

level, a large number of members of a community immigrate together and their community dynamics are transformed through acculturation. At the individual level, each member of the immigrant community experiences changes in values, behaviors, and competences to adjust to the new culture. Researchers also differentiate between acculturation and assimilation. In acculturation, people incorporate and integrate into the culture of the host community while maintaining aspects of their original culture. In assimilation, people completely blend in the host community, adopting its culture while renouncing their original one. For example, some groups like Jewish and Cuban elders function effectively in mainstream culture while maintaining their language and ethnic and religious values.

Acculturation is a dynamic process and depends on the characteristics of the immigrant, the host community, and the circumstances of the immigration. It involves a series of losses and changes, so it can be stressful. Acculturation is a process mostly related to immigrant communities, but it can also be applied to any minority community that is at different levels of integration to the mainstream culture. With the growing diversity in the aging population, the concept of acculturation becomes relevant for older adults of minority groups, including African Americans, Hispanics, Asians and Pacific Islanders, and Native Americans. These four groups in general struggle with poverty, low education level, more health problems, and multiple challenges like language barriers and lack of legal residency status. These circumstances interfere with the ability of minority elders to fully participate in the community since they are pressed to face more urgent priorities like shelter, health, and income.

It will be important to differentiate three groups of ethnic minority elders depending on their level of acculturation. The first includes native blacks, Hispanics, Asians and Pacific Islanders, as well as American Indians; the second includes elders who belong to these same ethnic groups but who immigrated when they were children or young adults; and the third includes those who immigrated as older persons. Depending on their membership in one of these groups or cohorts, elders will display variations in their attitudes, beliefs, values, and behaviors that have an impact on their health and their access to community resources. Aging itself might have different meanings for men and women and for people from different cultures. They might have different expectations and norms for people at each stage of the life span.

The resources and skills of immigrants will vary depending on how old they were when they immigrated and this will affect how they cope with growing old in America. The current characteristics of minority elders will be determined by the particular process of acculturation that they have gone through since immigration. Highly acculturated or bicultural elders have a better understanding of the language and dominant culture that in turn allows them greater access to social and health resources in the community. They also feel more empowered to advocate for themselves and to request needed services. Elders with lower levels of acculturation experience more barriers to access necessary services and have a higher need for advocacy. However; acculturation to American norms may not be always the ideal; in some situations it may be harmful. For example, changes in diet to high-fat and low-fiber common in American food might create health problems for those acculturating to American lifestyle and make immigrants more susceptible to diabetes, obesity, and heart disease.

Proficiency in the English language might be the most important factor for successful acculturation as it has an overall positive impact on the immigrants' health and well-being. Lack of proficiency is associated with social isolation and limited access to health care and other social services, which in turn diminish the immigrants' sense of self-efficacy and increase distress. Therefore, helping immigrants to learn the language has become a priority for those providing services to this population. It is necessary, however, to deliver those services while considering the specific needs of aging immigrants. For example, it is not helpful to have immigrants of all ages in the same classroom when English as a Second Language classes are offered, because individuals' expectations and abilities to learn will vary significantly. Older adults in the same classroom with younger individuals may feel ashamed and humiliated, which may discourage them from learning.

Older adults who are learning how to function in the new culture and are facing the immediate demands of adjusting to, and learning, a new language might neglect their previous life goals. After this first stage of acculturation, they may be more able to address other issues associated with the immigration experience, such as loss, grief, and the redefinition of their cultural identity. It is important for health care professionals, especially those in the mental health field, to be aware of this process and its challenges. It is also helpful for older adults to remain involved in activities with other members of their own culture. This helps them

maintain their ethnic identity and self-esteem while learning to use their abilities in the new environment.

The integration of social, health, and mental health services in one location could also lower the barriers for minority elders to access those services. This is particularly important in their acculturation process since the mental health and well-being of minority elders is strongly connected to their physical health status. Good physical and mental health is the result of a balance with their faith, spirituality, family, and everyday life.

Related Topics

Asians and Pacific Islanders, Immigrant health, Latinos

Suggested Readings

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Accumulative Waste Theory of Aging

Jessica Diggs

The accumulative waste theory of aging, also known as the waste accumulation or garbage accumulation theory of aging, proposes that molecules damaged by oxidation and their byproducts (e.g., aged collagen, damaged enzymes), and damaged mitochondria (organelles responsible for cellular energy production) accumulate in postmitotic (nondividing cells) causing dysfunction, toxicity, aging, and cell death (see Free-Radical Theory of Aging). There are several mechanisms by which garbage accumulation affects cells. The presence of waste products changes the structural organization of the cell. Cellular components are displaced by these waste products and cellular functions such as cell signaling, transport of cellular molecules, and metabolic functions are impeded. Accumulation of waste materials within the cell can also cause damage, secondary to their toxicity, for example by the accumulation of toxic protein oxidation products in the cell or by an increased amount of reactive oxygen species (highly reactive molecules that react with, and damage, cell components) produced by damaged mitochondria.

Postmitotic cells, for example cardiac and skeletal muscle cells as well as nerve cells, are particularly susceptible to the accumulation of damaged cellular components and nondegradable waste products, due to their lack of turnover. Actively dividing cells are capable of "diluting" the amount of damage during cell division. Cells like those of the intestinal tract and blood cells experience rapid turnover, and die or are replaced before waste materials can accumulate to a detrimental level within the cell; in this regard, mitosis and rapid turnover of cells are protective against aging. This mechanism of waste accumulation and protection has been shown in experimental studies, by comparing the waste accumulation in dividing cells with that of nondividing cells.

Lipofuscin

Lipofuscin, composed of brownish yellow oblong granules, is a cellular waste product caused by the peroxidation (free-radical reaction) of proteins with lipid molecules. This waste product appears to play a key role in the accumulative waste process, both by its own accumulation and by associated events (e.g., oxidative damage) that produce a cycle of waste accumulation. Under normal conditions, waste molecules are taken up and degraded by cellular lysosomes (organelles within the cell that contain an acidic material for digestion of foreign and damaged cellular materials). Because of their molecular structure, lipofuscin molecules are not effectively digested within lysosomes, leading to lipofuscin accumulation over time. This results in the reduced ability of the lysosome to perform its normal functions, both due to ineffective use

of lysosomal enzymes as well as by causing dysfunction of the proton pump (acid pump like those present in the stomach) necessary for lysosomes to create an internal environment capable of digestion. Lipofuscin molecules also contain a small percentage of metals like iron. Accumulation and concentration of iron in the lysosome can contribute to free-radical reactions, leading to a vicious cycle resulting in increased lipofuscin accumulation, in addition to increased free-radical damage of other cellular components. Lipofuscin preferentially accumulates in postmitotic cells, accelerating the aging process and level of dysfunction in these cell types, with minimal damage to mitotic cells.

Waste Accumulation and Aging

In general, aging cells have a decreased ability to properly degrade cellular waste products; however, there may be interindividual variation in the efficiency of waste degradation and the amount of lipofuscin accumulation that will occur. One explanation may be variability in an individual's genetic profile that will determine the properties and digestive capabilities of the person's cellular lysosomes. The variation may be reflective of the environment or the health and nutritional status of the person.

Public Health Perspective

Waste accumulation has been the target of antiaging remedies. Methods to increase the functionality of the cellular waste degradation process may show promise for preventing the effects of cellular waste accumulation on cellular aging and cell death. These measures may involve nutritional or enzyme supplementation, to reduce lipofuscin accumulation or to prevent the excess production of free radicals in the cell; however, more research is necessary in the development and testing of these products. As is a common theme in the prevention of cellular damage and aging, every individual (young and old) should strive to live a healthy lifestyle including regular physical activity and endurance training, with a balanced diet, rich in antioxidants and essential nutrients. Even small positive lifestyle modifications have the potential to result in significant improvements in the health, well-being, and longevity of our population.

Related Topics

Anti-aging remedies, Diet, Exercise, Free-radical theory of aging, Nutrition, Vitamins

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Acquired Immunodeficiency Syndrome (AIDS)

Daniel J. O'Shea

The number of seniors with human immunodeficiency virus (HIV) or acquired immunodeficiency syndrome (AIDS) continues to grow rapidly both through new infections among older adults and the natural aging of adults infected at younger ages. The World Health Organization estimates that the total number of people living with HIV or AIDS worldwide is rapidly approaching 50 million. In some countries, seniors aged 50 and above comprise between 5% and 11% of the HIV-positive population. However, many more seniors are *affected* by this pandemic while providing care to infected family members and at the same time losing potential sources for their own support.

In the United States, an estimated 1.1 million people were living with HIV or AIDS at the end of 2003. In 2004 alone 10% of all reported AIDS cases and 15% of all HIV or AIDS cases diagnosed and reported were 50 years and above, with a quarter of these above 60 years.

The incidence rates are higher among older women than older men, with persons of color at particular risk. As in other countries, many noninfected seniors are also challenged to become caregivers for infected children, other family members, or friends, or to care for grandchildren or other relatives orphaned by AIDS. Dramatic advances in understanding the natural history of HIV disease and developing life-saving HIV treatments within the past 10 years have reduced death rates and slowed progression to end-stage AIDS, but have not eradicated the virus from those infected. The result is a growing epidemic that is relentlessly aging. Even so, little research has historically focused on seniors living with HIV and AIDS.

What Is AIDS?

AIDS is a medical diagnosis by a physician of a set of symptoms or conditions based on specific criteria established by the Centers for Disease Control and Prevention (CDC). This includes infection with HIV *and* either the presence of one or more defined AIDS indicator diseases or other indicators of a suppressed immune system based on certain blood tests (CD4+ counts). The "opportunistic" diseases associated with AIDS occur following the depression of an individual's immune system, allowing susceptibility to unusual infections or malignancies.

AIDS, the end stage of HIV disease, is caused by the infection and spread of HIV within the body. A positive HIV test result alone does not mean that a person has AIDS, but only that HIV infection has occurred. HIV destroys CD4+ T blood cells, which are crucial to the normal function of the human immune system. Most HIV-infected people carry the virus for years before the immune system is damaged enough for AIDS to develop. There is a direct correlation between the amount of HIV in the blood, the decline in CD4+ T cell numbers, and the onset of AIDS. Progression from initial HIV infection to AIDS may take 10 years or more, but varies greatly depending on many factors including a person's health status and health-related behaviors. Reducing the amount of virus in the body with anti-HIV drugs can slow down the rate at which HIV weakens and destroys the immune system.

Although the natural history of HIV infection in adults is well documented, the impact of age on the outcome of HIV infection is still being investigated. HIV appears in some studies to progress more rapidly in seniors than in those infected at a younger age, with survival rates in inverse proportion to age at infection or diagnosis. The natural process of immune system breakdown and the onset of other comorbidities with aging are likely contributing factors.

HIV Transmission

HIV can be transmitted through blood, semen (including preseminal fluid or "precum"), vaginal fluid, or breast milk. The most common modes are: sexual intercourse (anal, vaginal, or oral sex) with an HIV-infected person; sharing needles, syringes, or injection equipment with an injecting drug user (IDU) infected with HIV; and from HIV-infected women to babies before or during birth, or through breast-feeding after birth. HIV can also be transmitted through transfusions of infected blood or blood-clotting factors, but routine screening of all donated blood since 1985 has made this risk extremely low. Some health care workers have become infected after being stuck with needles containing HIV-infected blood.

Transmission of HIV can be influenced by several factors, including characteristics of the HIV-infected host, the recipient, and the quantity and infectivity of the virus. Having a sexually transmitted disease (STD) can increase a person's risk of becoming infected with HIV. In addition, if an HIV-infected person is infected with another STD, that person is three to five times more likely to transmit HIV through sexual contact. HIV cannot be transmitted from casual (i.e., hugging or shaking hands) or surface (i.e., toilet seats) contact, or from insect bites. Intact, healthy skin is an excellent barrier against HIV and other viruses and bacteria.

HIV Testing

Testing for HIV is the only way to determine whether someone is infected with HIV. Many infected individuals do not have symptoms for many years. The tests commonly used detect antibodies produced by the body to fight HIV. Most people develop detectable antibodies within 3 months after infection, with the average at 25 days; in rare cases, it can take up to 6 months. HIV testing and counseling provides an opportunity for infected seniors to find out that

they are infected and gain access to medical treatment that may help to delay disease progression; for those not infected, counseling offers an opportunity for prevention education.

Many seniors in care are not routinely screened for HIV. They are less likely than younger individuals to talk about their sex lives or drug use with their doctors, and their doctors may be less likely to ask or talk with them about risky behaviors or HIV.

Preventing HIV Transmission

Abstaining from any behavior that carries risk of acquiring HIV (e.g., sexual intercourse or using and injecting drugs) is the most effective way to avoid HIV, but not always the most realistic (for recommendations on safer sex activities, see Safer Sex). For IDUs, the following steps are recommended to reduce risk:

- Never reuse or "share" syringes, water, or drug preparation equipment.
- Only use syringes from a reliable source (i.e., pharmacies or needle exchange programs).
- Use a new, sterile syringe to prepare and inject drugs.
- Use sterile water to prepare drugs if possible; otherwise, use clean water from a reliable source (i.e., fresh tap water).
- Use a new or disinfected container ("cooker") and a new filter ("cotton") to prepare drugs.
- Clean the injection site prior to injection with a new alcohol swab.
- Safely dispose of syringes after one use; if new, sterile syringes and other drug preparation and injection equipment are not available, boil previously used equipment in water or disinfect with bleach before reuse.

Older people have specific health challenges related to aging (Alzheimer's disease, osteoporosis, etc.) and may not be aware of the risks of HIV infection or how to protect themselves. Informed awareness of risk is essential to making positive decisions to prevent HIV infection, but, despite increasing prevalence, few prevention efforts or materials have been specifically tailored or targeted for this age group. Health-care providers rarely consider seniors to be at risk, assuming they are not sexually active or, if they are, they know how to avoid infection.

Care and Treatment

Early medical treatment and a healthy lifestyle can help an individual with HIV stay well, delay the onset of AIDS, and prevent life-threatening conditions. Over 20 antiretroviral drugs are available in the United States to fight HIV disease by breaking into CD4 T cells and interrupting one of the stages of the HIV replication cycle. Recommendations for treatment continue to evolve rapidly as new medications are developed and additional data from clinical trials are presented. With clinical care for HIV and AIDS advancing at a breathtaking speed, any treatment protocols described here would be quickly outdated (current treatment guidelines are available on the US Department of Health and Human Services HIV/AIDS Information Internet website: http://www.aidsinfo.nih.gov/).

Although specific HIV treatment guidelines have been created for children, pregnant women, and other populations, no specific recommendations exist for older adults. This presents a challenge for physicians treating patients with other age-related illnesses. As people age, other co-occurring illnesses become more common. Alzheimer's disease, arthritis, diabetes, high blood pressure (hypertension), heart disease, depression, dementia and other mental health issues, high cholesterol and triglycerides (hyperlipidemia), osteoporosis, various forms of cancer, and vision and hearing loss affect millions of older adults each year, with many of these sharing common symptoms with HIV and/or AIDS. Lack of discussion about risk factors and HIV-related symptoms can lead to misdiagnosis or a delayed diagnosis of HIV and a potentially critical lag in beginning anti-HIV treatment. Older people often take a variety of medications to deal with their health problems, and many interact negatively with anti-HIV drugs. Some HIV medications may even increase the risk of diabetes, high blood pressure, or osteoporosis. These complications make it difficult to choose appropriate and effective anti-HIV drugs.

Increasing costs of all these medications and related care will continue to be a problem for most Americans, especially those aging with HIV. Funding for the safety nets of Medicaid and the Ryan White CARE Act will likely continue to erode while the rollout of the new Medicare drug benefit presents additional uncertainties and confusion, potentially increasing cost and limiting options and access for vulnerable seniors and people with HIV or AIDS.

Social and Psychosocial Challenges

Many social and psychosocial issues, including homosexuality, drug use, mental illness, racism, homelessness, and poverty, are linked inextricably to HIV or AIDS by association with the communities the disease has heavily impacted. In addition, older adults also face ageism, that is, discrimination based on negative attitudes toward aging and older people.

Social support—emotional and practical assistance provided by family members and friends—is a particularly important resource for people as they age. Social support boosts psychological well-being and can reduce the number and intensity of physical symptoms related to HIV. Unfortunately, as people get older, their networks shrink: friends die, and friends or family may move away or fail to provide needed support. Some may choose to isolate themselves from their social network due to real or perceived stigma related to HIV disease; others may do so to ensure an appropriate environment in which to get healthy or stay in substance abuse recovery.

Related Topics

Depression, Harm reduction, Safer sex, Sexually transmitted diseases, Substance use

Suggested Readings

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Suggested Resources

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Activities of Daily Living

Patrick K. Murray

Activities of daily living (ADLs) are a key link in the description of the relationship between human disease and the ability of an individual to perform normal physical and social activities. While models of this relationship are still being debated, the concept that diseases may cause impairments, which may in turn cause disability, is generally accepted. Disability is generally measured in terms of an individual's ability to perform ADLs.

ADLs are the tasks that are required for a person to be able to live in the community. Basic ADLs include eating, dressing, bathing, transferring, toileting, and mobility. When a person is unable to perform one or more of these basic activities, he or she will generally require daily support from a caregiver to live in the community. Instrumental ADLs include housework, cooking, shopping, management of finances, use of the telephone, and transporting oneself outside the home. When a person is unable to perform one or more instrumental ADLs, he or she will generally require assistance to live in the community, but on a less than daily basis.

The measurement of ADLs or functional ability has been an important research activity over the past 20 years. Scales have been developed that describe the level of dependency in either basic or instrumental ADLs. Most of these scales are ordinal in nature. Recent advances in the development of some of these scales allow for an interval type of measurement to be described. Such interval measures, however, require the ADLs to be categorized into more than one domain, e.g., physical activity and cognitive skills.

Measurement of ADLs is important in clinical care of older persons. Geriatric assessment programs have used ADL instruments both to identify changes in

condition that require intervention and to monitor the success of interventions implemented. In inpatient rehabilitation settings, the initial ADL status is evaluated and progress toward independence tracked on a regular basis. The resources available to the person to meet the dependencies identified coupled with measurement of ADL progress assist the rehabilitation professionals and the family in determining the safety of discharge from the rehabilitation setting.

Measurement of ADL levels is important in evaluating the efficiency of rehabilitation programs. Evaluators examine the improvement in ADL scores and the number of days receiving services to determine efficiency. These efficiency scores will vary based on the etiologic cause of the dependency. For example, ADL improvements are achieved much more quickly after a hip replacement than after a spinal cord injury.

Another important use of ADL evaluation is as a component in determining reimbursement for care. In the nursing home setting, studies have demonstrated that a key determinant of a patient's need for nursing and nursing assistant care is the functional ability as measured by ADLs. The nursing home reimbursement system employed by many states and the federal government, the Resource Utilization Groups, uses the ADL instrument imbedded in the federally mandated resident assessment instrument as an important element in determining reimbursement for care. In the inpatient rehabilitation setting, the reimbursement system employed by Medicare, the Functional Related Groups, uses the ADL score, etiology of the dependency, age, and comorbidity to determine reimbursement for care.

Dependency as defined by inability to perform one or more basic or instrumental ADLs has declined from 25% in 1984 to 19% in 1999 in the US population above 65 years according to national surveys of the health status. However, dependency is highly related to age, with 10% of persons aged 65–74 being dependent and this rate increasing to 60% of persons above 85 years. This decline in dependency over time has been ascribed to improvements in medical care, changes in health behavior (less smoking, better diets), development of assistive devices, economic affluence, decreased exposure to disease, and improved social supports. The decline in dependency is important for social planning concerning the needs of the growing elderly population.

Related Topics

Assisted living, Disability, Medicare, Nursing home, Rehabilitation

Suggested Readings

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World Health Organization (2001) International classification of functioning, disability, and health. World Health Organization, Geneva, Switzerland

Activity Theory of Aging

Jessica Diggs

Introduction

According to the activity theory of aging (also referred to as the implicit theory of aging, normal theory of aging, and lay theory of aging), there is a positive relationship between a person's level of activity and life satisfaction, which in turn increases how positively a person views himself or herself (self-concept) and improves adjustment in later life. Although these two theories are not mutually exclusive, activity theory is often contrasted with disengagement theory. Proposed by Cummings and Henry in 1961, disengagement theory describes social disengagement as an adaptive response to aging in which elderly persons relinquish roles while maintaining a sense of self-worth. This voluntary surrender of activities is thought to permit the orderly transfer of power from older to younger generations and is beneficial for both the aging individual and society.

Activity theory was introduced by Havighurst and colleagues in 1961 and is rooted in symbolic interactionist theory. According to symbolic interactionism, a person's identity or self-concept is defined in part by interactions with others and in part by the environment. These interactions can impact on behavior, thought patterns, and the aging process. In their statement of activity theory, Havighurst and colleagues

assert that older individuals have the same psychological and social needs as middle-aged people and that the social withdrawal that characterizes old age is contrary to the needs of the aging individual. When social withdrawal or role loss occurs, whether by retirement, widowhood, or loss of ability to participate in past activities, the aging person may experience a loss of personal identity and well-being, low-self esteem, shame, or isolation. According to this theory, a person most likely to age successfully would continue to be active through middle age and beyond, by taking on productive roles in society and replacing roles that were lost as they aged. Productive roles might include membership in organizations, volunteering, or participation in social groups or activities.

Further study of activity theory has shown that activity is associated with morale and that people who are most active are happier at all stages of life. While it has been shown that the quantity of activity is important in achieving life satisfaction, the type and quality of activity may also play a role. Sustained intimate interpersonal activity or activity of an informal nature may be more beneficial by increasing the opportunities for reinforcement of the individual's positive self-concept.

Applying Activity Theory to Aging Individuals

Remaining active beyond middle age and finding replacements for lost roles and social positions is one solution for maintaining life satisfaction; however, critics of this theory would state that achieving this may be difficult. Aging persons may be limited in their ability to continue many activities due to physical or cognitive decline or disability. They may face age discrimination when seeking employment, may lack self-esteem or interpersonal skills, or may not have the social or financial resources to seek alternative activities. Finding new mates may not be easy or desirable for those who have been widowed. It may also be difficult to acquire new skills in a continuously changing, technology-driven environment. Early retirement planning, support of family members, and the development of social programs to involve elders in meaningful roles might lead to greater opportunities for aging people to maintain active lifestyles.

Limitations of Activity Theory

Critics also highlight that activity theory lacks consideration about other factors that may influence the relationship between activity and life satisfaction such as personality traits, socioeconomic status, and lifestyle characteristics. Given the heterogeneity of aging people, it is important to take these other factors into account, because while involvement in many social activities may be beneficial to one person, another may prefer solitary activities due to personality differences. People with limited financial resources might be overburdened financially by participation in certain activities, which may limit the satisfaction they gain from participation. There are also many other individual and cultural factors that will dictate which activities would be most appropriate and lead to the most satisfaction for any given person.

Researchers have shown that while in general activity can be beneficial, the activity must be meaningful to the individual; engaging in activity that is not meaningful to the participant can actually lead to negative consequences. Studies have also found that a sense of subjective well-being can result from an individual solely having a perception of being socially integrated, independent of the actual level of social integration. Given that the benefits of activity are a function of individual perception and preferences, there is no one formula for all, and individuals must therefore choose to participate in the activities that they feel benefit them most.

Public Health Perspective

Public health professionals are likely one of the largest proponents of activity theory, especially when considering health-promoting activities, since these activities are specifically targeted to improve health and can have a significant impact on well-being beyond that of life satisfaction. While gaining the benefits of social interaction, members of health education groups or support groups can gain valuable knowledge to assist them in managing their health and in improving their health behavior. Regular exercise or other physical activity, in addition to promoting general well-being, can also have a host of physical benefits from improving cardiovascular health to improving bone density. Regular physical activity can also help to improve muscle mass,

strength, flexibility, and balance, and to prevent injury. Engaging in such activities can have the additional benefit of preventing premature mortality from diseases such as hypertension and may reduce a person's dependence on pharmaceutical treatments for illnesses such as diabetes or high cholesterol.

Related Topics

Altruism and volunteerism, Continuity theory of aging, Exchange theory of aging, Exercise, Identity, Role loss, Self-esteem

Suggested Readings

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Acupuncture

Douglas Flagg

Acupuncture is a medical treatment that emerged from the naturalist school of thought in China over 2,000 years ago. Its practice continues to be modified and adapted, in light of modern thought and medical knowledge. Acupuncture is one part of a complete Chinese medical system based on the production and flow of Qi (pronounced "chi"), which may be loosely described as vital energy. Qi circulates through channels called meridians as well as organs in an orderly fashion, and it is the disruption in the production and flow of Qi that results in disease and pain. As a system of medicine quite different than the Western system, acupuncture has its own distinctive language. In this system references to organs and their function and influence may be thought of as metaphorical when compared with the Western definitions of organ function.

Traditional acupuncture treatment consists of the insertion of thin sterile needles at specific locations along the meridians. The acupuncturist determines the exact locations by making a careful assessment of the patient and the problem being treated. This assessment involves questioning, observing the patient, examining the pulse and tongue, and locating areas of tenderness through palpation. In essence, a history and physical exam, similar to that done in Western medicine, is performed but with a different emphasis. Treatments are thus individualized, such that the same Western diagnosis may be treated quite differently in different patients.

In Western countries, acupuncture has been primarily used to treat pain, but is increasingly receiving attention for treatment of other conditions. Due to the nature of the individualized treatments, and difficulty in defining an appropriate placebo, acupuncture treatments do not lend themselves well to the constraints of controlled clinical studies, leading many Western trained physicians to doubt or underestimate their effectiveness. Recent studies have demonstrated that "sham" needling, in which a point that is not thought to be effective for a given condition is needled, provides a benefit over nontreatment. This in turn would dilute the significance of a benefit in the true acupuncture wing of a study. Additionally, for the purpose of study, treatments are often formulaic as opposed to the individualized ones usually given clinically. Thus the literature contains very few well-designed, controlled clinical studies of acupuncture as it is actually practiced, and the methods of those that are available are open to debate. Despite these limitations, efforts to clarify the role of acupuncture are receiving more attention. A consensus panel of the National Institutes of Health has concluded that acupuncture is probably effective for postoperative and chemotherapy-induced nausea as well as postoperative dental pain. It was further stated that acupuncture might be an acceptable alternative treatment for a number of other conditions including headache, menstrual cramps, low back pain, osteoarthritis, carpal tunnel syndrome, addiction, stroke rehabilitation, tennis elbow, fibromyalgia, myofascial pain, and asthma. Recent studies in major medical journals have suggested benefit in

osteoarthritis of the knee, low back pain, and migraine headaches.

During an acupuncture treatment, needles are inserted at various points along a meridian. This usually involves the use of both local and distal points. A local point is a point at, or near, the location where the discomfort or pain is present. Distal points, which are frequently around the wrists and ankles, are chosen for their traditional effects and are distant from the location of pain. Acupuncture needles are extremely thin and solid, unlike the hollow needles used to draw blood.

Although treatments involve minimal discomfort, an aching or radiating sensation may be noted. This phenomenon of "De Qi" is often sought by the practitioner and is thought by many to be important for a treatment to be effective. Needles may then be manipulated manually or stimulated by low-level electricity. A smoldering herb may also be used to warm the needles in the technique known as moxibustion. As acupuncture has evolved, multiple different styles and approaches have emerged. One such approach involves the use of "reflex microsystems." Reflex microsystems are localized areas of the body that have representations of the entire body within them. The most commonly used microsystem is the ear. Thus, for example, treatment of the ear can have effects on the entire body. Other microsystems commonly used include the scalp and the hand. These are frequently stimulated in conjunction with other acupuncture treatments. In addition to the use of needles, stimulation of acupuncture points with lasers, magnets, and pressure show considerable promise.

A treatment may last up to 45 minutes and the patient not uncommonly experiences a sense of relaxed well-being following a treatment. Transient fatigue or euphoria is a less common effect. Other side effects may include bruising and pain at the needle insertion site, and a transient aggravation of the underlying problem. A mild increase in symptoms is often seen followed by improvement in the treated condition. Fainting, while not common, may occur, especially during a first treatment, but future treatments can usually be continued with caution. Serious complications are exceedingly rare, but could include bleeding, infection, and puncture of an organ. While one treatment may on occasion produce dramatic results, acupuncture is not magic, and it is not unusual for 8–12 treatments to be required. Periodic treatments may be necessary to maintain a response.

Acupuncture is appropriately used in conjunction with Western medicine and recommendations to discontinue other treatments should be regarded with suspicion. Acupuncture practitioners may be medical doctors who have received further training in acupuncture, or licensed acupuncturists who have undergone extensive training. Further study should help to elucidate more clearly the role of acupuncture. For now it can be said that acupuncture has been shown to be safe and effective for a number of different conditions.

Related Topics

Back pain, Complementary and alternative health practices

Suggested Readings

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Kaptchuk TJ (2000) The web that has no weaver: understanding Chinese medicine, 2nd ed. Contemporary Books, Chicago, IL

Suggested Resources

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Adaptation

Karen J. Berte · Kathleen Patterson

Adaptation can be defined as the act of process of change. With almost one fifth of the US citizenry considered elderly, the issue of adaptation in aging is a central one. Aging is a universal phenomenon that can be quantified in several domains; however, the definition of "successful" aging is often more subjectively defined. Successful aging is a multidimensional and integrative state of being, encompassing the domains of physical, psychological, functional, and social health.

Rather than a discrete event or landmark, aging is a developmental phase on a continuum. The quality of this process of transition and the heterogeneity of outcomes reflect the impact and diversity of each person's personality structure. Likewise, personal history of psychological, physiological, and socioeconomic development affects the various outcomes of aging. Not only past but also current health status and goal selection impacts on outcome.

In an older population without significant mental and/or physical impairment, a useful metamodel of successful aging can be summarized as "selective optimization with compensation." In this model, losses are minimized and gains are maximized. Rather than focusing on declines and losses, strengths are optimized and compensatory mechanisms are emphasized. For example, an aging driver might have once had the goal of traveling with family throughout the United States in a motor home after retirement. However, given diminished levels of sustained energy, decline in visual acuity and reaction time, lack of interest from children and grandchildren, and perhaps loss of a spouse, this goal might be altered. A transformed goal might include briefer trips with friends or other relatives, or an alternative form of transportation. Goals and their achievement contribute to a sense of meaning and purpose in life and are unique to each individual. Selection, or the focus of one's energies and resources on the most compelling goals or interests, is a principle of development across the life span.

An integrative model of successful aging includes accepting oneself, maintaining positive relationships with others, keeping as much autonomy and control of one's life as possible, dealing appropriately with the environment, identifying a purpose in life, and insuring personal growth in salient domains. These become greater challenges when frailty and especially progressive visual degeneration are present. Dealing with these issues is more effective when positive affect is evident.

Hope and optimism enrich the quality of social relationships, increase the personal perception of being in control of one's life, and facilitate use of adaptive coping mechanisms. Moreover, positive affect predicts greater functional independence and mobility and less morbidity and mortality. Research has demonstrated that positive affect is involved in maintaining an internal equilibrium through chemical and neural changes, as is evidenced by the effects on such functions as the immune response. Once again, selectivity of goals and substitution of more attainable goals come into play. Although most people strive for a sense of internal control over important aspects of their lives and health, perceiving control as external to oneself can also be adaptive in select situations and may enhance the perception of control over chosen goals. Psychological resilience—the capacity to adapt to, and successfully transcend, the multiple challenges and changes across the life span—is a defining feature of healthy and successful aging. One's appraisal of life events and sense of self strongly influence coping style and are central to this resilience.

Aging is no longer viewed in negative terms of loss and decline in function, but rather in the positive sense; aging represents potential development of new abilities and goals through continued education, good nutrition, exercise, involvement with others, and satisfaction with self. Presenescent positive affect predicts greater success in achieving one's goals. Flexibility and plasticity in personality and daily living facilitate successful aging. Diminishing opportunities for autonomy and achievement in the aging population through restrictive or overprotective environments lacking mental and physical stimulation discourages neural plasticity and inhibits optimization. Overall, "old age holds the potentials to be a time when the accumulated knowledge and expertise of a lifetime is invested in the realization of a distilled set of highly meaningful domains and goals."

Related Topics

Ageism, Adult development, Emotions, Geriatric medicine, Geriatric psychiatry

Suggested Readings

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Phelan EA, Anderson LA, LaCroix AZ, Larson EB (2004) Older adults' views of "successful aging": how do they compare with researchers' definitions? J Am Geriatr Soc 52:211–216

Ryff CD (1989) Beyond Ponce de Leon and life satisfaction: new directions in quest of successful aging. Int J Behav Dev 12(1): 35–55

Wahl HW, Becker S, Burmedi D, Schilling O (2004) The role of primary and secondary control in adaptation to age-related vision loss: A study of older adults with macular degeneration. Psychol Aging 19(1):235–239
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Suggested Resources

Alliance for Aging Research. http://www.agingresearch.org
National Council on Aging. http://www.ncoa.org
US National Institutes on Health, National Institute on Aging. http://nia.nih.gov

Addiction

Ted Parran Jr.

Addiction or "chemical dependence" is clearly a chronic disease of the brain that bears no relationship with morality, education, social class, or ethnicity. It is a primarily genetic illness that clusters fairly heavily in families. Addiction is characterized by the repetitive, intermittent loss of control over the use of a euphoria-producing drug that causes problems in a person's life. As a consequence, addiction is generally not defined in terms of quantity and frequency of use, but rather in terms of patterns (loss of control) and consequences (repeated problems) of use. The essential problem in addiction is this loss of control, and the resulting bizarre, uncharacteristic, erratic, irresponsible behaviors.

The domains in a person's life where problems from addiction arise tend to be the following:

1. Early symptoms or dysfunction—self-respect, close love relationships, social relationships
2. Middle symptoms or dysfunction—financial problems, legal problems
3. Late symptoms or dysfunction—work problems, medical or psychiatric problems

Individuals with a diagnosis of addiction or chemical dependence develop and maintain one or more alcohol-related or drug-related problems in their lives, such as family problems, other behavioral consequences, a conviction or charge of driving under the influence (DUI), or medical complications. The types of problems range from minimal, such as one or two blackouts in young adulthood, followed by family concern about the person's drinking, to severe, including loss of work, divorce, or loss of other family relationships. The *Diagnostic and Statistical Manual of Mental Disorders*, Fourth Edition (DSM-IV) has specific diagnostic criteria for a diagnosis of addiction outlined in Table 2. Three or more criteria must be met to qualify for a diagnosis.

The societal costs of addictions are overwhelming. Tobacco dependence is the leading preventable cause of death in America, with 430,000 premature deaths per year. Fetal alcohol syndrome is the leading cause of preventable birth defects in our country. Over 70% of domestic violence is addiction-related, and 70% of child abuse and 90% of child sexual abuse are thought to be addiction-related. In the elderly, falls, progression of dementia, and incontinence are commonly associated with, or worsened by, addictive disease. Also, since the process of aging can commonly involve the loss of substantial portions of one's physical, mental, psychological, or social "reserves," small functional impairments triggered by addictive disease in the elderly can produce a disproportionably large effect. The economic costs of addiction are estimated at $80–110 billion per year, and addictions are considered the nation's number one health problem!

Epidemiology

The prevalence of nontobacco addictive disease in the elderly is quite variable based upon sex and peer group norm, and thus age. Alcohol dependence is clearly the most common, followed by prescription drug abuse. Addiction to other drugs (nonalcohol and nonprescription) in the elderly has always been nearly negligible. However, for generations who "came of age" in the 1960s and later matured into elderly Americans, these rates are expected to increase. Current rates of addiction to alcohol or prescription drugs in older men are in the 10–13% range. In very elderly women (older than 75) the rate is approximately 5% for alcoholism or prescription drug dependence; in younger elderly women (aged 65–75) the rates resemble those of their male counterparts; and among women in the 45–55 age group the rates are the same as for men. The historical lower rates in very elderly women probably reflect a societal or cultural taboo, prevalent when they were young adults, toward the use of alcohol and drugs

by women. The result of this cultural prohibition against use has been a lifelong disproportional high rate of abstinence in this group (very elderly women), and consequently a low rate of addictive disease.

Screening, Intervention, and Treatment of Addiction

Screening Screening for addictive disease in the elderly is surprisingly difficult due to two unrelated phenomena: societal bias and normal aging process complicated by addictive disease. American society has historically believed that addiction was a moral issue, a question of good versus evil, a problem with self-control and will power. These beliefs were especially prevalent when the current elderly were in their formative years. Consequently, the amount of stigma associated with addiction is tremendous, and even more so among the elderly. This leads to underutilization of screening for addictive disease in the elderly by health-care and social service agencies, underreporting of addictive disease by older patients and their families, and greater reluctance to receive treatment by the addicted elderly. In addition, the normal process of aging in our society, especially when exacerbated by addictive disease, tends to be one of gradually increasing isolation and withdrawal from some daily activities (such as full-time employment). This process can contribute to "false negative" results of addiction screening tests or, in other words, screening that fails to detect an addiction problem even when it is present and quite active.

The best screening approach for alcohol or prescription drug dependence in the elderly utilizes information from three general areas: (1) evidence of loss of control over use and adverse consequences (unsuccessful or repeated efforts to cut down on use, comments and concern from loved ones over use, feeling remorse about use); (2) information about quantity and frequency of use beyond the "sensible drinking" guidelines; (3) collateral information from family, friends, or caregivers. Since even small amounts of excessive alcohol or prescription drug use can cause major problems in the elderly, even mild suspicion of a problem should be thoroughly evaluated by a health-care professional.

Intervention and Treatment The treatment of addictive disease in the elderly requires special care due to the frequent co-occurrence of other medical or mental health problems. A full medical evaluation is necessary, and often detoxification of the problematic substance. Short-term rehabilitation stays on inpatient or residential units are more often necessary for the elderly with addiction issues than with younger clients. Change in housing or supervision of the home environment is more possible and necessary with the elderly than with younger persons. Participation in counseling and self-help meetings appear just as effective in the elderly as they are with other persons recovering from addictive disease.

Related Topics

Alcohol use, Substance use

Suggested Readings

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Liberto JG, Oslin DW, Ruskin PE (1992) Alcoholism in older persons: a review of the literature. Hosp Commun Psychiat 43:975–984

Rigler SK (2000) Alcoholism in the elderly. Am Fam Physician 61(6):1710–1883

Suggested Resources

http://www.niaaa.nih.gov/
http://www.nida.nih.gov/
www.netwellness.org

Adherence

Martha Sajatovic

In medicine, a major concern with respect to medical care and medical outcomes is patient adherence with prescribed treatments. Treatment adherence refers to behavior in which individuals adhere to a prescribed treatment regimen for an illness. Adherence is most often thought of with respect to adherence with medication regimens, but adherence behaviors can also include other types of care such as office visits or

psychotherapy. Treatment nonadherence is a recognized problem in medicine, accounting for 125,000 deaths annually and 10–25% of hospital and nursing home admissions. Treatment nonadherence is associated with negative consequences such as relapse, disease worsening or progression, need for rehospitalization, or even death.

In recent years, research and understanding of the treatment adherence issues have grown. A key shift within the medical profession has been to conceptualize adherence with treatment as a collaborative process between patients and care providers such that patient and providers are allies who work together to achieve the best possible outcome for the individual who has a medical condition or disorder. In the past, the term "compliance" was commonly used to refer to how closely a patient did or did not follow medical advice. The use of the term "adherence" is now generally preferred over the older term "compliance" as it better communicates the model of collaborative care in which patients are key players in the management of their own illness.

Adherence is a multidetermined, complex phenomenon and is influenced by a number of illness, patient, provider, and system-level factors. Patient demographic factors that appear to be associated with adherence include age, marital status, gender, ethnicity, and educational level. Most studies indicate that patients who are younger, unmarried, male, and with fewer years of education are more likely to be poorly adherent with medications.

Patients' types and chronicity of illness, as well as types and severity of symptoms, are also associated with treatment adherence. For example, individuals with earlier onset of the disorder have been noted to have more difficulties with adherence. Those with chronic illness, for example diabetes, may have more difficulty adhering to a treatment regimen that encompasses months or years of treatment, compared to briefer, time-limited treatments such as treatment for acute infectious illness. In cases where treatments are highly effective and adherence is closely linked to quality of life (e.g., treatment of migraine headaches), treatment adherence may be better compared to situations in which individuals may be asymptomatic, and treatment effects may not have an immediate impact on the individuals' quality of life (e.g., treatment of hypertension).

Concurrent substance abuse and comorbid psychiatric disorders appear to strongly influence adherence. A number of investigators have noted that concurrent substance use disorders are associated with poorer adherence explanation for treatment nonadherence. Individuals who do not accept their illness or who have poor insight or understanding of illness may likewise be at high risk for treatment nonadherence. Finally, those with psychiatric illness may be less adherent with treatment compared to those with medical illness—reasons for this are not entirely clear although insight into illness and the stigmatizing effects of mental disorders may be contributing factors.

Other treatment factors such as medication side effects or tolerability may affect adherence. Some studies have noted that poorer adherence is associated with higher reported side effect burden from medications, although this is not uniformly supported in the treatment adherence literature. Other treatments and environmental factors, such as psychosocial support, access to care, and the complexity of the medication regimen, have been reported to be associated with adherence.

Models of health behaviors, such as the Health Belief Model that focus on proximal determinants of adherence, note the influence of the above factors on patients' perceptions of their susceptibility to the illness, the severity of their illness, the benefits of treatment, and the costs of treatment (side effects, time, monetary outlay). These patient beliefs, in turn, influence adherence behaviors.

An important point in attempting to improve treatment adherence is to insure that the issue is addressed between patients and care providers. Patients may not share with their providers that they are nonadherent with treatment. Alternatively, among some populations such as older individuals with cognitive impairments, the individuals may not be aware themselves that they are missing some or all of prescribed treatments. It is critical that providers be well informed with respect to treatment adherence. Ways that providers can assess treatment adherence for a specific individual under their care include direct questioning of the individual, and involvement of family members or significant others in care planning. Adherence with some medications can be evaluated with blood levels. Continued symptoms or progression of illness may also occur among patients who are not adherent with prescribed treatment.

Once nonadherence is identified, the next steps include identification of possible barriers to treatment adherence and, if possible, removal or lessening of

barriers. For individuals who are nonadherent because they are uninformed about illness and the consequences of nonadherence, education can be beneficial. Generally this is a process that over time can enhance treatment adherence. Printed materials such as brochures or posters can be useful, as can television or Internet sources of information. Support or consumer groups may provide important education regarding the disease and treatment. Finally, in-home training, such as a visiting nurse might provide, can be of great assistance to older adults who are unable to access information in other ways.

Pragmatic strategies to enhance treatment adherence include treatment regimen simplification, "reminders" such as pillboxes, and linking medication taking into routine daily activities such as meals or daily hygiene. Telephone calls or mail reminders can optimize adherence with appointments and prescription refills. Involving family members in constructive ways may further reinforce adherence.

Providers may minimize adherence that is related to side effects by candid discussion of tolerability of adverse effects with patients, including domains that patients may not readily volunteer such as medication-related sexual dysfunction. In some cases, dosage reduction or medication substitution may improve treatment adherence while still optimizing illness management. Older adults who are unable to afford medications may not fill prescriptions or may attempt to "spread out" prescriptions, thus reducing efficacy of medication treatments. In some circumstances individuals who cannot afford medication may be eligible for patient assistance programs. Alternatively, there may be generic formulations or less costly prescription alternatives, which should be considered by care providers as appropriate.

Assessment and optimization of treatment adherence is an on going dynamic process in which patients, families, and care providers can all participate. Adherence attitudes and behaviors can change over time and, particularly in older adults, may be affected by cognitive status and medical disability. Individuals may suddenly become nonadherent with treatment, sometimes with serious consequences. However, close attention to the issue of treatment adherence, and prompt focus on barriers to adherence are likely to improve medical outcomes.

Related Topics

Doctor–patient relationship, Medication management, Patient–provider communication

Suggested Readings

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Adult Day Care

Mitzi J. Dearborn

Adult day care programs are community-based group programs that provide daytime services in a protective setting outside of the home. Adult day care includes social and health care services for a population of adults with physical, mental, and/or social disabilities. With the help of adult day care services, chronically disabled individuals are able to continue to live at home. Origins of adult day care include geriatric day programs in Russia in the 1930s and programs in Great Britain post World War II. In the United States, during the deinstitutionalization movement of the 1960s, adult day programs significantly developed in conjunction with federal and state initiatives to contain rising costs of long-term care residential facilities. The term adult day care evolved to be called adult day services (ADS).

Programs and Services

Adult day programs are described by three primary service models: the medical model (21%), the social model with no medical care (37%), and the combination model (42%). The specific services provided may include a combination of health monitoring, social services, personal care services, meals, therapeutic activities, transportation, nursing services, medication management, caregiver support services, rehabilitative

therapy, medical services, overnight care, and/or emergency services. More than 75% of the programs are open at least 5 days a week, with participants attending in a combination of days to meet their needs. Recent national trends in ADS include increased availability of ancillary components, such as personal care, "up and tuck," weekend or overnight respite, up to 2 weeks of overnight stays, rehabilitation therapy, and/or subacute care. As participants' and caregivers' needs change over time, ADS can provide a continuum of care over time and can serve as a connecting link between acute care and nursing home care.

ADS programs have grown significantly during the last 20 years; however, the growth in number still lags behind the need for services. Recently, national trends show increased frequency in for-profit programs. In urban areas, one program may serve one specific market area, such as dementia, multiple sclerosis, or traumatic brain injury. In rural areas, the market size typically is not large enough to focus on a particular market niche. In the last two decades there has been a significant increase in ADS programs that provide dementia services, whereas less than 3% of programs had specialized in dementia care in 1984. Because the number of elderly in the population is continuing to increase, there is additional demand for ADS.

Participants

The average participant age is at least 72, with the average age range at 45–91. Most participants are white, female, and unmarried. Participants have physical, mental, and/or social disabilities, and they prefer to live at home with a family member or friend. The participants' most frequent living situations are residence with adult child (35%) and residence with spouse (20%). The two most prevalent conditions in ADS participants are dementia and frail elderly (adults above 60 with no dementia but with need for supervision and/or risk for social isolation). Most participants are dependent for at least one activity of daily living (ADL).

A few studies have provided comparative information about private pay versus public pay consumers. Compared with public pay participants, private pay participants were more likely to be white, to have memory losses, and to have cognitive decline within the 90 days prior to starting ADS. Private pay participants tended to have less impairment in ADLs.

Participants' length of stay in ADS ranges from short term to long term, providing a continuum of care for older adults. Participants' average length of stay in ADS is 2 years, with a range from a few weeks up to 8 years. The primary reasons for disenrolling from ADS are need for long-term institutional residential placement and death. Nonwhite participants tend to disenroll at higher rates than whites.

Caregivers

Adult day centers offer important respite for caregivers. ADS are particularly useful for family caregivers who work during the day, and these services are less expensive than nursing home placements. ADS programs do not serve as a substitute for nursing home care but provide an important supplement to informal caregiving.

Caregivers in the family often experience emotional and psychological distress. By utilizing ADS over time, caregivers have reduced stress levels and improved psychological well-being. Findings show that there is a demand in the community for ADS, and families do value services highly enough that they will pay out of pocket for services.

Funding

Most ADS facilities are not-for-profit and operate under a parent organization such as a nursing home, religious group, or hospital. Payment from public sources is typically made for 40–50% of participants. Reimbursement provided by public sources may include Medicaid, social service block grants, Medicare monies for rehabilitative services, Department of Aging food program, Veterans Affairs (VA) medical centers, and state general fund monies. Average daily fee was found to be $46, varying by type of services and location. There is a public pay eligibility gap that frequently impacts individuals with dementia. Some of the public sources require that the ADS facility must provide medical services to receive funding.

The number of private pay consumers using ADS has been increasing. The private pay market is mainly found in middle and upper incomes. Approximately 25–35% of ADS consumers are private pay. In recent years there also has been a growth in the number of private long-term care insurance plans that cover ADS.

Utilization and Essential Components

During 1987–2002 Robert Wood Johnson Foundation funded several major national projects regarding ADS, and they developed teaching centers, website, toll-free hotline, and training modules. Results of these studies yielded extensive data regarding utilization and critical components of ADS facilities. The projects verified active operation of 3,407 adult day centers in the United States in 2002. The service group analysis showed that 56% of 3,141 counties in the United States are underserved. Suggested avenues for better serving and improving this situation included: (1) increasing public awareness in underutilized sites; (2) increasing availability of ADS in areas where there are no services; and (3) increasing knowledge at the ADS provider level regarding predictors of success for ADS programs.

Essential components for success were identified: open a full day Monday through Friday, providing or arranging for participant transport to the program, allowing everyone opportunity to pay and to select appropriate services according to participant and caregiver needs, and including a range of services and revenue streams. The number of hours open per day was a very important predictor of financial success and consumer satisfaction. Programs met customer needs best by having a full day of engaging activities with choices that focus on interest and abilities of participants. The variety of activities accommodated participants' varied backgrounds, preferences, and abilities. ADS must be responsive to the needs and wants of both the participants and caregivers. The need to incorporate a continuum of care services and to create partnerships with other community service providers has been highlighted.

Outcomes and Future Research

The need for rigorous outcome studies has been emphasized in the past few years. Because the number of elderly in the population is continuing to increase, additional demand for ADS is expected. Earlier outcome studies had mixed findings with varied methodological factors such as small sample sizes, diverse program formats, insufficient experimental design, and nongeneralizable populations. The range of outcome topics has included caregiver stress and adaptation, improvement in participant functioning, delayed institutionalization, and cost–benefit effects. Overall outcomes show that elderly participants are satisfied with ADS, and family caregivers have lower stress levels and better psychological well-being when utilizing ADS over time. Findings show that programs are most effective for dementia caregivers when the services are used consistently over a longer period of time. In many cases participants started ADS later in the progression of the illness and used brief (less than 3 months) periods of service, so caregivers did not obtain full benefit. Studies are being completed regarding cost–benefit analysis for ADS, and results thus far show that benefits of ADS exceed costs.

There are several research directions that will be useful. Important areas of future study include: cost–benefit analysis for decisions about expanding ADS programming into underserved areas, level of effectiveness comparisons between ADS and in-home or other respite care, causal factors regarding why some caregivers wait so long to start using ADS, key components providing optimal culturally sensitive ADS, the extent to which cultural issues and programmatic factors may contribute to nonwhites disenrolling from ADS sooner than whites, and how different services in the continuum of ADS may be more effective at different points in time according to caregivers' situations and participants' stages of illness.

Related Topics

Activities of daily living, Caregiver burden, Caregiving and caregiver burden, Dementia, Respite care

Suggested Readings

Dabelko HI (2004) Individual and environmental factors that influence length of stay in adult day health care programs. J Gerontol Soc Work 43(1):83–105

Gaugler JE, Zarit SH, Townsend A, Stephens MP, Greene R (2003) Evaluating community-based programs for dementia caregivers: the cost implications of adult day services. J Appl Gerontol 22(1):118–133

National Council on the Aging/National Adult Day Services Association (1997) Standards and guidelines for adult day services. National Council on Aging, Washington, DC

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analysis based on functional autonomy changes. Age Aging 32:53–59
Travis S, McAuley W (2000) Private pay clients in adult day services. Nursing Econ 18(1):23–29
Woodhead EL, Zarit SH, Braungart ER, Rovine MR, Femia EE (2005) Behavioral and psychological symptoms of dementia: the effects of physical activity at adult day service centers. Am J Alzh Dis Other Dem 20(3):171–179

Suggested Resources

Children of Aging Parents Organization; www.caps4caregivers.org
International Association of Homes and Services for the Aging; www.iahsa.net/
National Adult Day Services Association; www.nadsa.org
Robert Wood Johnson Foundation adult day services news and reports; www.rwjf.org/newsroom and www.rwjf.org/research.

Adult Development

Clare A. Gideon

Historically, human development has focused primarily on describing, explaining, and predicting changes in early childhood. However, recent research efforts have been extended beyond childhood into adulthood as the definition of development has become more inclusive than merely the physiological changes that occur in early life. Yet adulthood encompasses a wide range of ages, starting from 18 and ending at death. Consequently, many researchers study adult development in general age brackets: young adulthood (18–40 years), middle adulthood (40–65 years), and late adulthood (65 years and above), with these distinctions determined by societal landmarks such as graduation from high school and retirement age.

It is widely recognized that development can occur not just in biological processes, but in multiple domains of functioning, including physiological, cognitive, psychological, and social. Nevertheless, the complexity of adult development lies in the observation that changes in these areas do not occur in isolation, but may interact and influence one another. For example, how an individual may adapt to a biological change (e.g., menopause) that occurs much earlier than expected (e.g., age 40) may be strongly influenced by the individual's social context and cultural expectations (e.g., childbearing should be complete by age 40) or psychological state (e.g., nurturing and maternal feelings).

Most individuals can expect to encounter a number of developmental changes related to their chronological age and biological development. These age changes are influenced by three primary processes: biological, environmental, and psychological. Physiological aging processes, such as menopause, occur at generally predictable age ranges as heritable genes are expressed. Environmental influences, such as social norms and cultural values, influence one's attitude toward taking developmental steps, such as marriage and childbirth, at particular ages. Furthermore, psychological changes may occur in reaction to physical and environmental influences or independently, as an individual's sense of self undergoes developmental transitions.

These three primary processes (biological, environmental, and psychological) influence an adult's development regardless of the year he or she was born; however, some environmental or social events may be unique to a particular culture or generation. An individual's cohort may experience influential social changes (e.g., disease epidemics, economic hardships, or war) that may alter the trajectory or timing of his or her adult development. Physiological, environmental, psychological, generational, and individual processes can all influence adult development to different degrees and may interact with one another to produce more or less pronounced developmental changes. An adult's development may be greatly altered by events that are unique and specific to the individual, such as experiencing a traumatic or life-threatening event. Finally, an adult's development may also be affected by the timing of events, such that "off-time" events (i.e., events that occur significantly earlier or later than expected) may have more pronounced or even reduced developmental impact.

Erik Erikson and Jane Loevinger propose sequential and progressive theories of adult development. Erikson believes that there are eight distinct psychosocial stages of development, each characterized by a different psychological "crisis" at different developmental phases of life. For example, Erikson's psychosocial crisis of generativity versus stagnation generally occurs between the ages of 40 and 65, and is prompted by social demands such as marriage, parenthood, and career. Successful resolution of this stage results in an individual's desire to assist younger generations in

developing and leading productive and fulfilling lives, whereas unresolved crisis results in selfish and self-centered tendencies. For Erikson, each crisis occurs at different phases of life, regardless of successful resolution of earlier crises. Loevinger agrees that stages of development are consecutive and progressive, but believes that an adult must successfully complete a current stage of development in order to advance to the next developmental stage.

In contrast, change theorists agree that significant changes occur over the adult years, but do not view these changes as a progression toward more mature, integrated, or sophisticated ends. George Vaillant and Daniel Levinson present theories of nonlinear change in stages, while Leonard Pearlin presents his theory of adult change without a staged structure. Vaillant agrees with much of Erikson's work, but focuses primarily on internal defense mechanisms, or an individual's typical means of integrating or adapting to life changes. Levinson's theory of adult development, however, focuses heavily on social and cultural influences, defining an individual by the social structure that surrounds him or her. Finally, Pearlin theorizes that an adult's development will be influenced by four main factors, including individual demographic differences (e.g., socioeconomic status), adaptability or variety of coping strategies, efficacy of social support, and type and timing of life events. Consequently, this theory posits that an individual's development is entirely nonlinear and unique.

In summary, researchers study various aspects of human development across the life span and recognize that development continues throughout the life course, not just in early phases of life as previously theorized. Adult development is defined as the patterns of change and continuity that occur in mid and late life and many social scientists have developed a variety of theories to describe, predict, and influence this development. Each theory has value in understanding the nature of adult development as differential emphasis is placed on the primary processes that influence lifelong developmental changes.

Related Topics

Developmental disabilities and aging, Gerontology, Psychotherapy, Psychosomatic disorder

Suggested Readings

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Adult Education

Dahlia Fuentes

The 2001 Adult Education and Lifelong Learning Survey revealed that 46% of the adult population in the United States (approximately 92 million adults) participated in one or more types of formal educational activities in the 12 months prior to being surveyed. Although the overall participation rate in formal educational activities was found to be lower among adults above 65 compared with other age groups (22% compared with 41% of those aged 51–65, or 55% of those aged 41–50), there has been a marked increase in the participation of older adults in educational activities over time. This increase can be attributed to a combination of factors, including the changing demographics, needs, and interests of the aging population.

Studies have shown that as life expectancy increases, people are working longer or returning to work after retirement. It is expected that in 2012,

19.1% of the working population will comprise older adults aged 55 and above, up from 11.8% in 1992 and 14.3% in 2002. A recent national WorkTrends survey found that nearly seven out of ten Americans plan to continue to work at least part-time for pay following retirement from their main job. This leads to a growing interest and demand for various types of training and educational activities, including skills in technology. Moreover, the concepts of retirement and learning have evolved over the years, where retirement is no longer a time of nonproductivity and gradual disengagement from life. Older adults participate in various types of educational activities not only to socialize, but also to learn basic or English language skills, earn a college or advanced degree, or acquire knowledge and improve the skills necessary to succeed in the workplace. Many older adults are finding a greater purpose for learning and are engaging in educational activities for enrichment and to improve their overall quality of life.

The growing interest and demand for older adult educational opportunities have been met by a variety of organizations that have supplemented the more traditional providers such as adult education programs at senior centers, libraries, colleges, and universities. Examples of programs that have come up in the last 30 years include Elderhostel, a travel-learning program offering weeklong residencies at educational centers in the United States and abroad; lifelong learning Institutes (LLIs) and institutes for learning in retirement (ILRs), largely managed by the older adult participants who also help develop the curricula, teach, and govern the hundreds of programs connected to universities; a department store–based senior center–type program called Older Adult Service and Information Systems (OASIS) institutes that offers programs in the arts, humanities, wellness, technology, and volunteer services to more than 300,000 seniors nationwide; SeniorNet, a senior-user network with over 240 centers where computer courses are taught by peer members nationwide; and Shepherd's Centers of America, a network of interfaith community-based organizations that provide learning programs through the community service and education centers located in churches and synagogues.

Education programs offered through libraries and senior centers have also evolved to accommodate new interests and needs. Advancing technology has attributed to the development of a variety of programs that help older adults stay connected through the Internet, enabling older adults to access more information on health and well-being than ever before. Teleconferencing has played a large role in making learning opportunities accessible to frail older adults in a variety of settings, including their home or nursing home.

As more retirees seek meaning and opportunities to enrich their lives, the concept of learning centers has evolved to include expressions such as "sage-ing," "life-option," and "wisdom centers," and there is a greater appreciation and attention being paid to the role of learning in maintaining health and quality of life.

Related Topics

Education

Suggested Readings

Kim K, Collins Hagedorn M, Williamson J, Chapman C (2004) Participation in adult education and lifelong learning: 2000–01 (NCES 2004–050). US Department of Education, National Center for Education Statistics, US Government Printing Office, Washington, DC

Manheimer RJ (1999) The promise and politics of older adult education. Res Aging 20:391–414

Scott R, Neil R, Van Horn CE (2005) A work-filled retirement: workers' changing views on employment and leisure. WorkTrends Survey 8.1. http://www.heldrich.rutgers.edu/Resources/Publication/191/WT16.pdf

Toossi M (2004) Labor force projections to 2012: the graying of the U.S. workforce. Monthly Labor Rev 127:37–57

Suggested Resources

Older Adult Services and Information Systems (OASIS) Institutes (2005). www.oasisnet.org

Adult Foster Care

Tambra K. Cain

Seniors aged 55 and above make up approximately 43% of the American population. As the number of American seniors grows, so does the need for living

facilities designed with the senior adult in mind. Adult foster care homes are licensed facilities that provide family setting living arrangements. Adult foster homes may also provide assistance with medication, supervision, and personal care. Adult foster care facilities are also sometimes known as long-term care facilities, assisted living facilities, retirement homes, and nursing homes.

There are generally two types of adult foster care facilities. The first is an in-home family setting. In the family type of adult foster care, the caregiver provides care in his or her home and lives on site. Usually these family placements have only a limited number of residents. The second type is where the caregivers are trained and licensed professionals who do not live on site. These types of facilities range from small to quite large. Adult foster care participants often include not only the elderly but also disabled adults.

In addition to full-time adult foster care, there are adult day care services that usually operate during normal business hours, and a few have extended evening hours. Adult day care services provide much the same type of care as adult foster care facilities, only for shorter periods. Adult day care services typically provide meals, transportation, supervision, recreation, and limited medical and therapeutic services. Adult day care services are a good alternative for the senior adult who desires to remain at home, but needs some assistance. Adult day care services also provide an opportunity for respite to caregivers.

As the senior population continues to grow, adult foster care is becoming increasingly widespread, whether it is full-time residential care or part-time adult day care. Adult foster care services vary widely, from residential facilities with all the options to part-time adult day care facilities.

Related Topics

Adult day care, Caregiver burden, Caregiving and caregiver burden, Respite care, Senior centers

Suggested Readings

Beisgen BA (2003) Senior centers: opportunities for successful aging. Springer, New York

Harris PJ (2002) The national directory of adult day care centers, 3rd ed. Health Resources Publishing, Manasquan, NJ

Lieberman T, Consumer Reports (ed) (2000) Consumer reports complete guide to health services for seniors: what your family needs to know about finding and financing Medicare, assisted living, nursing homes, home care, adult day care; with ratings of Medicare HMOs and supplemental policies. Three Rivers Press, New York

Newman ES, Sherman SR (1988) Foster families for adults: a community alternative in long-term care. Columbia University Press, New York

Tate LA (1988) Adult day care: a practical guidebook and manual. Haworth Press, New York

Suggested Resources

The 2000 US Census, November 2005. http://www.census.gov/prod/cen2000/phc-1–1-pt1.pdf

Adult Protective Services

Tambra K. Cain

As the elder population grows in America, elder abuse becomes more of a concern. Elder abuse may be either intentional or negligent, and can take many different forms. Some types of elder abuse are physical, emotional, sexual, neglect/abandonment, and financial exploitation.

Self-neglect is also a concern among our senior population. This occurs when an elder neglects his or her own care. It can be failure to take necessary medications, lack of personal hygiene, malnutrition, and dehydration.

In an effort to combat elder abuse and elder self-neglect, adult protective services were formed. All 50 states and the District of Columbia have laws authorizing adult protective services in elder abuse situations. However, these laws vary widely. Some are very restrictive and only apply to older adults living alone; others are quite broad and encompass residential care facilities. The age at which a person qualifies for adult protective services also varies widely. Another difference is that some states have enacted mandatory reporting laws, while other states allow permissive reporting.

The Older Americans Act enacted in 1965 by President Lyndon B. Johnson was the first national law to provide protection for older adults. It remained essentially the same until 2000, when the Older Americans Act Amendments were signed into law. The amendments broadened the scope of the Act and added a provision creating the National Family Caregiver Support Program, in order to recognize the valuable role that caregivers play in the support of our older population.

Adult protective services provide a wide variety of services. Usually adult protective services workers are the first responders to an incident of abuse. The adult protective services worker can investigate allegations of abuse, assist the older adults in developing a safety plan, arrange for emergency shelter, and provide ongoing service.

Victims of elder abuse are sometimes unwilling to seek help, or to report abuse, especially if the abuser is a necessary caregiver or close family member. Pride and dignity are also factors that might lead to an unwillingness to seek assistance. In this situation, the adult protective services worker must accept the refusal of the abuse victim, if he or she has the capacity to understand the circumstances.

Related Topics

Elder abuse and neglect, Financial abuse, Older Americans Act, Sexual abuse, Sexual assault

Suggested Readings

Camille P (1996) Getting older, getting fleeced: the national shame of financial elder abuse and how to avoid it. Fithian Press, Santa Barbara, CA

Pillemer KA, Wolfe RS (1989) Helping elderly victims: the reality of elder abuse. Columbia University Press, New York

Wolf RS (1986) Elder abuse: conflict in the family. Auburn House, Dover, MA

Suggested Resources

The National Center on Elder Abuse (NCEA) Official Website, November 2005. http://www.elderabusecenter.org

The 2000 US Census, November 2005. http://www.census.gov/prod/cen2000/phc-1-1-pt1.pdf

Advance Directives

Marshall B. Kapp

Over the last three decades, much attention has been focused on advance or prospective health care planning as a way for individuals to maintain some degree of control over their future medical treatment even if they eventually become physically and/or mentally incapable of making and expressing important decisions about their own care. Proponents of advance care planning also claim that it may help individuals and their families avoid court involvement in medical treatment decisions (the 2005 Florida litigation melodrama involving Teresa Shiavo that was a model of the sort of court experience to be avoided), conserve limited health care resources (a significant public health concern) in a way that is consistent with patient autonomy or self-determination, and reduce the emotional or psychological stress on family and friends in difficult crisis situations. These goals are especially important for the older population. It must be noted, however, that a growing number of health care practitioners and observers have expressed skepticism, based on disappointing experience, regarding the ability of advance directives to effectively achieve these objectives.

There are two main legal mechanisms available for use in prospective (i.e., before-the-fact) health care planning. One is the proxy directive, usually in the form of a durable power of attorney (DPOA); the other is the instruction directive, ordinarily termed living will, health care declaration, or natural death declaration. In the United States, these legal mechanisms have their foundations in various statutes enacted by state legislatures. A number of state statutes are modeled on the Uniform Health Care Decisions Act adopted by the National Conference of Commissioners on Uniform State Laws in 1993. In some countries (e.g., Great Britain), advance directives have been recognized by the courts even though they have not been codified in statutory form. Advance directives may be utilized by then-competent individuals either to limit future medical treatments or, conversely, to demand the provision of specific interventions in the future.

Many state advance directive statutes have tried to draw distinctions between artificial methods of feeding and hydration on one hand, and other types of life-sustaining medical treatments (such as ventilators, antibiotics, and dialysis) on the other. Specifically, a

number of statutes try to make it harder procedurally for families or other decision makers of patients incapable of making decisions to refuse or withdraw artificial feeding or hydration than to refuse or withdraw other forms of life-sustaining medical treatment. Some groups contend that these legal provisions are necessary to protect highly vulnerable, dependent patients from unfair undertreatment and medical neglect. It is likely, however, that advance directive statutes that discriminate on the basis of the kind of medical treatment being refused by the patient (or surrogate) are both unconstitutional under the 14th Amendment Equal Protection clause and violative of the federal Americans With Disabilities Act.

Consistently, courts and state legislatures have made it clear that state advance directive statutes are not intended to be the only means by which patients may exercise the right to make future decisions about medical treatment. For example, a patient might convey issues regarding future medical treatment orally to the physician during an office visit, with the physician documenting the patient's words in the medical chart. When that patient subsequently becomes unable to make personal medical decisions, the patient's oral instructions are just as legally valid as would be a written document executed in compliance with all the statutory formalities contained in the state's advance directive statute.

There is a continually growing body of evidence that, quite often, patients' previously stated wishes concerning life-sustaining medical treatment are not respected and implemented by families and/or health care providers. In reality, critically ill patients frequently receive more aggressive medical treatment than they earlier had said they would want.

State advance directive statutes specifically excuse a health care provider who decides, for reasons of personal conscience, not to carry out the explicitly stated treatment preferences of a patient or surrogate, as long as that provider does not impede efforts to have the patient transferred to the care of a different provider who is willing to respect the patient's advance directive. In the same vein, courts have declined to hold health care providers liable for monetary damages for failure to follow a patient's or surrogate's instructions to withdraw or withhold particular forms of treatment, on the grounds that providing life-prolonging intervention cannot cause the sort of injury or harm for which the tort system is designed to provide compensation.

Related Topics

Durable power of attorney, Informed consent, Living will, Patients' rights

Suggested Readings

Gillick MR (2004) Advance care planning. N Engl J Med 350(1):7–8

Hardin SB, Yusafaly YA (2004) Difficult end-of-life treatment decisions: do other factors trump advance directives? Arch Intern Med 164(14):1531–1533

Kahana B, Dan A, Kahana E, Kercher K (2004) The personal and social context of planning for end-of-life care. J Am Geriatr Soc 52(7):1163–1167

Kass-Bartelmes BL, Highes R, Rutherford MK (2003) Advance care planning: preferences for care at the end of life. AHRQ Pub. No. 03—0018. Agency for Healthcare Research and Quality, Rockville, MD

Lo B, Steinbrook R (2004) Resuscitating advance directives. Arch Intern Med 164(14):1501–1506

Pearlman RA, Starks H, Cain KC, Cole WG (2005) Improvements in advance care planning in the Veterans Affairs system. Arch Intern Med 165(6):667–674

Suggested Resources

www.abanet.org/aging
www.caringinfo.org

Adverse Drug Reactions

Matthew A. Fuller

Adverse drug reactions (ADRs) are undesirable effects of medications that occur at a high rate in older adults for a variety of reasons. In the elderly, changes occur in how the body affects medications, known as pharmacokinetics, and how a drug affects the body, known as pharmacodynamics. Both of these processes influence the potency and duration of a medication as well as unintended effects.

Aging produces changes in the body's composition of fat, water, and muscle; this causes differences in pharmacokinetics—the way drugs are distributed throughout the body, metabolized, and excreted. Changes in drug distribution occur because certain medications

prefer to remain in the body's fat stores (lipophilic) while others prefer to seek water-containing areas of the body (hydrophilic). As one ages, the area or volume in which drugs distribute decreases, potentially leading to increased effects of hydrophilic drugs due to higher blood concentrations. These differences become important as they may result in ADRs when dosing drugs in the older adult.

Examples of drugs that are affected by this change in volume of distribution include digoxin, lithium, theophylline, and morphine. These commonly used medications need to be dosed lower in the older adult to avoid potential ADRs. Coinciding with this decrease in volume of distribution is a decrease in lean body mass and an increase in total body fat. These body changes may lead to accumulation and increased effects of lipophilic drugs. Examples of lipophilic drugs include diazepam, haloperidol, amitriptyline, and verapamil. These medications will also require dosage adjustments when used in the older adult.

The liver is the body's main organ for drug metabolism and changes in several ways during aging, resulting in increased drug effect and adverse reaction potential. First, there is a decrease in size or mass of the liver and this may slow metabolism. Second, blood flow through the liver is also decreased, leading to a decreased clearance or removal of drugs from the body, for example with lidocaine, estrogens, and propranolol. Third, a specific cellular function of the liver called phase I metabolism (oxidation) is decreased. Examples of drugs that undergo phase 1 metabolism are diazepam, ibuprofen, diphenhydramine, and warfarin.

Drug excretion is also impacted in the older adult. Drug excretion through the kidney is decreased secondary to an age-related decline in function. The decline in kidney (renal) function results in increased drug concentrations and potential for ADRs. Many drugs are impacted by declining renal function and require dosage adjustment. Classes of drugs that are affected include analgesics, psychotropics, cardiovascular medications, antibiotics, and other miscellaneous medications.

In addition to pharmacokinetic changes that occur with aging, pharmacodynamic parameters are also impacted. Older adults display an increased sensitivity to drugs that act on the central nervous system such as benzodiazepines, antipsychotics, antidepressants, opiate analgesics, barbiturates, and drugs with intrinsic anticholinergic properties. The effects of these drugs are increased and may lead to adverse effects such as dizziness, confusion, or falls. In addition, an increased sensitivity to fluid medicines (diuretics) may lead to an increased risk of decreased blood pressure (orthostasis), resulting in increased fall and injuries. Dosages of these medications will need to be individually adjusted to maximize the desired therapeutic effect while minimizing potential adverse effects.

While a decline in renal function may result in pharmacokinetic changes in certain medications, the kidneys are also affected by age-related decrements in aldosterone and renin. The result is a greater risk of high potassium that may lead to heart rhythm disturbances such as heart block or sudden death. Drugs commonly used in older adults that may accentuate this include the nonsteroidal anti-inflammatory drugs (NSAIDs) ibuprofen and naprosyn, and angiotensin-converting enzyme (ACE) inhibitors lisinopril or captopril. Additional pharmacodynamic changes include an increased sensitivity of coagulation systems. This results in a greater risk of bleeding with warfarin in older adults. The use of warfarin requires careful dose titration and monitoring, especially as one ages and sensitivity to its blood-thinning effects are enhanced.

A decline in mental (cognitive) function occurs with aging. While many factors may be involved in cognitive function decline, drugs are often identified as the causative factor. A very large number of medications have been implicated. Drugs with anticholinergic effects are well known for producing cognitive impairment in older adults. Other classes of medications that have been implicated include analgesics, sedative-hypnotics, cardiovascular and respiratory drugs, gastrointestinal drugs, and antibiotic and antiviral drugs.

Unfortunately, ADRs sometimes go undetected because symptoms may mimic problems associated with older age. ADRs may also be misinterpreted as a medical condition resulting in the addition of other drugs to treat the condition. For example, an antipsychotic agent may produce adverse effects prompting the provider to initiate a medication to treat this adverse reaction, leading to additional therapy when a simple dose reduction may have mitigated the reaction.

Antibiotics, anticoagulants, digoxin, diuretics, hypoglycemic drugs, antineoplastic drugs, and NSAIDs are responsible for 60% of ADRs leading to hospital admission and 70% of ADRs occurring during

hospitalization; therefore, special attention should be paid to the use of these medications in the older adult.

There is a direct correlation between the number of drugs taken and the risk of ADRs. In addition, for patients who had ADRs, the length of hospital stay was increased by 2–3 days and hospital costs were increased by $3244–4655 compared with patients who did not have ADRs. Fortunately, there is evidence suggesting that many ADRs are preventable.

ADRs are especially common in older adults. This population exhibits physiological changes associated with aging that impact pharmacokinetic and pharmacodynamic attributes. Awareness of these changes, careful evaluation of medication regimens, and use of medications only when indicated and at the lowest effective dose will aid in the prevention of ADRs that produce morbidity and mortality.

Related Topics

Drug interactions, Polypharmacy

Suggested Readings

Cooper JW (1999) Adverse drug reactions-related hospitalizations of nursing facility patients. South Med J 92:485–490

Routledge PA, O'Mahony MS, Woodhouse KW (2004) Adverse drug reactions in elderly patients. Br J Clin Pharmacol 57: 121–126

Suh DC, Woodall B, Shin SK, Hermes-De Santis ER (2000) Clinical and economic impact of adverse drug reactions in hospitalized patients. Ann Pharmacother 34:1373–1379

Veebof L J, Stewart RE, Meyboom-de Jong B, Haaijer-Ruskamp FM (1999) Adverse drugs reactions and polypharmacy in the elderly in general practice. Eur J Clin Pharmacol 55:533–536

Affirmative Action

Michael P. Ruiz

Affirmative action, which has also been known as "equal opportunity," is a term used to describe a policy created to ensure that individuals who fall into a protected class have equal opportunity or access to a position or program. While age discrimination in employment is prohibited under the Age Discrimination in Employment Act (ADEA), the elderly are not generally considered a "protected class" for purposes of affirmative action. Consequently, whether older persons may benefit from an affirmative action program depends upon whether the policymaker is using a broad interpretation of "protected class" that includes all groups protected against discrimination by federal legislation.

The phrase "affirmative action" is thought to have first appeared in an order issued in 1961 by the then president of the United States, John F. Kennedy. In addition to creating the Committee on Equal Employment Opportunity, Executive Order 10925 mandated that projects financed with federal funds "take affirmative action" to ensure that applicants "are employed without regard to their race, creed, color, or national origin."

After the passage of the Civil Rights Act of 1964, President Lyndon Johnson issued. This order superseded Executive Order 10925, and helped to clarify the meaning of "affirmative action" and added an important rule-making provision. Specifically, Order 11246 (1) defined what "action" an employer must take including employment, upgrading, demotion, transfer, recruitment, termination, compensation, and training; (2) required the heads of departments in the executive branch of the federal government to establish and maintain a program of equal employment opportunity; (3) required federal contractors to file compliance reports; (4) abolished the Committee on Equal Employment Opportunity and placed enforcement of affirmative action under the US Department of Labor; and (5) required the Secretary of Labor to implement "rules and regulations" to enforce the Order.

In 1966, the Department of Labor created the Office of Federal Contract Compliance Programs to administer Order 11246, which continues to exist today. In 1967, Order 11246 was amended to cover discrimination on the basis of gender. In 1968, the Office of Federal Contract Compliance began issuing "rules and regulations" to enforce Order 11246.

In 1970, President Richard Nixon's secretary of the US Department of Labor issued Order No. 4, a rule to enforce Order 11246. Order No. 4 is arguably the most important development in affirmative action policy and framed the issues of the debate over affirmative action that still exist today. Under Order No. 4, federal

contractors with 50 or more employees are required to develop a written affirmative action plan aimed to achieve prompt and full utilization of minorities and women in all areas of the covered workforce. The plan must include an analysis of areas in which the contractor is deficient in the utilization of minority groups and how they plan to correct this deficiency. The Order further requires contractors to make special efforts to recruit, employ, and promote qualified persons who are members of groups that have been "excluded," "underutilized," or "underrepresented." These groups are defined as "protected classes." The phrase "protected class" would later be expanded to include women.

Amendments to Order No. 4 notwithstanding, there is an ongoing debate over whether the federal government should require contractors and recipients of federal funds to take "affirmative action" and what kinds of "affirmative action" should be taken. Phrases like "affirmative action," "equal opportunity," "protected classes," "underutilized," and "underrepresented" continue to be defined by the legislative, executive, and judicial branches of government at both the state and federal levels.

The debate over affirmative action has moved beyond employment into other areas, especially access to higher education. In response to movements for and against affirmative action, state governments have begun to redefine affirmative action policies covering employment and education through laws, referenda, and even their state constitutions. This debate has also given rise to an entire new area of law and employment. Most recipients of federal funds have an equal opportunity compliance office to monitor changes in the law and their institutional affirmative action policies.

Related Topics

Ageism, Discrimination

Suggested Resources

United States Equal Employment Opportunity Commission. www.eeoc.gov

Title 41, Chapter 60, Code of Federal Regulations. www.gpoaccess.gov/cfr/index.html

United States Department of Labor: www.dol.gov

African Americans

Shelley A. Francis

Knowledge is better than riches.

African proverb

American Red Cross. "African American HIV/AIDS Prevention Curriculum, 1998."

African Americans or black people are those who have origins dating back to black racial groups on the African continent. According to the 2000 US Census, people who identify as African Americans constitute approximately 12% of the US population, representing almost 35 million people. According to the Census, by the year 2035 there will be more than 50 million African American individuals in the United States, comprising 14.3% of the total population.

African Americans have a long history in the United States. Some African American families have been in the United States for many generations, whereas others are recent immigrants from places such as Africa, the Caribbean, and Canada. Health disparities between African Americans and other racial groups are very pronounced and are apparent in life expectancy, cancer, human imunodeficiency virus (HIV) or acquired immunodeficiency syndrome (AIDS), heart disease, and other measures of health status. In regard to life expectancy, in 1999 the average American could expect to live 76.9 years, whereas the average African American could only expect to live 71.4 years. Factors contributing to health outcomes among African Americans include discrimination, lack of awareness and knowledge about health issues, cultural barriers, lack of health insurance, and difficult or nonaccess to medical care. This chapter focuses on a variety of health issues that are prevalent among African Americans above 50. We focus on health issues that are not frequently discussed but have a significant impact on this population.

It is a well-known fact that the American population is aging. This ideology is often referred to in the media as the "graying of America." The percentage of the US population that is 65 or older will rise from the current 12% to 20% by 2030. In terms of real numbers, African Americans are the third largest minority group in this country, following people of Latino descent. There are approximately 3 million African Americans aged 65 and above, and by 2050, it is projected that this number will increase to 8.6 million.

Health Insurance

Access to health care continues to be an important issue contributing to the health status of older African Americans. Many vulnerable older, urban adults disproportionately receive care from academic medical institutions typically located in urban centers. These medical institutions tend to offer high-quality care, improved outcomes, potentially greater expertise, and more technology. However, numerous older adults with inadequate or no health insurance are less likely to receive consistent primary care and preventive services and management of chronic diseases. Studies have found that older African Americans receive fewer preventive services than older whites, and that the least affluent receive fewer preventive services than the more affluent do. For example, older African Americans are less likely to receive influenza vaccinations than whites are. The federally funded Medicare program assists those with limited health insurance by providing hospitalization, medical care, and some related health services for seniors above 65 and younger people with disabilities. Therefore, people between the ages of 50 and 64 without health insurance may have no regular source of medical care. Even the Medicare program has limitations. Studies have found that many African American Medicare beneficiaries aged 65 and older are more than twice as likely as elderly white beneficiaries to report that they could not afford to fill at least one prescription in the last year, according to a new study by the Center for Studying Health System Change (HSC). Older African American beneficiaries are more likely to be poor and to lack supplemental insurance. They are also more likely to live with certain chronic conditions such as heart disease, high blood pressure, and diabetes that generally require prescription drug treatment. However, recent changes to the Medicare program may reduce the prescription drug gap between white and African American seniors. In 2003 the federal government revamped the Medicare to add prescription drug overage, which will provide protection for people who have very high drug costs.

Alzheimer's Disease

There is a growing public health epidemic among African Americans referred to as the "silent epidemic" of Alzheimer's disease. Alzheimer's disease is a progressive brain disorder that gradually destroys a person's memory and ability to learn, reason, make judgments, communicate, and carry out daily activities. As Alzheimer's progresses, individuals may also experience changes in personality and behavior, such as anxiety, suspiciousness, or agitation, as well as delusions or hallucinations. Alzheimer's is the most common form of dementia—a group of conditions that all gradually destroy brain cells and lead to progressive decline in mental function. Recent data from the Cardiovascular Health Study indicate that vascular disease is a much more common cause of dementia than previously thought. African Americans have a 60% higher risk of type 2 diabetes—a condition that contributes directly to vascular disease.

According to the Alzheimer's Association, findings from recent empirical studies have found that Alzheimer's is more prevalent among African Americans than among whites: estimates range from 14% to almost 100% higher; there is a greater familial risk of Alzheimer's in African Americans; and genetic and environmental factors may work differently to cause Alzheimer's disease in African Americans. Data from longitudinal studies also suggest that high cholesterol and high blood pressure may be significant risk factors. Data indicate that persons with a history of either high blood pressure or high cholesterol levels are twice as likely to get Alzheimer's disease, whereas individuals with both risk factors are four times as likely to become demented. African Americans tend to be diagnosed at a later stage of Alzheimer's disease, limiting the effectiveness of treatments that depend on early intervention. Furthermore, African Americans are often underrepresented in current clinical trials of potential treatments, particularly in trials conducted by drug companies. This phenomenon may be in part due to a level of distrust that many African Americans have toward the medical establishment. Although numerous lessons have been learned from the Tuskegee Syphilis Study, the memory of this study may be ever present in older African Americans and may contribute to their reluctance to participate in clinical trials, and lack of awareness of available treatments may also be a contributing factor. The implications from these recent empirical studies are profound for African Americans among whom vascular disease and other risk factors are disproportionately present. Effective strategies for primary and secondary preventions include cholesterol-lowering drugs, antihypertensive medication, exercise, and diet modification. These clinical strategies as well as the use of culturally specific media

campaigns that may serve to inform African Americans about signs, symptoms, and treatment for Alzheimer's disease should be emphasized.

Sexual Health

We are all sexual beings from the time that we are born until we move beyond this life. Although the male and female reproductive systems go through various changes during the life course, people above 50 should not let changes to their body or their age stand in the way of having a healthy and active sex life. As a result of the physiological and psychological changes, people above 50 may not fully embrace safer sex. For instance, women who may have experienced menopause may not feel that they have to worry about pregnancy and contraception. Although they may not need contraception, they do need to think about how to protect themselves from sexually transmitted infections (STIs). Despite myths and stereotypes, many seniors are sexually active and some are drug users; therefore, their behaviors can put them at risk for HIV infection. While men who have sex with men form the largest group of AIDS cases in the above-50 population, the number of cases in women infected heterosexually has been rising at a higher rate and comprises a greater percentage in the 60 and older population. In many cases, health care and service providers as well as older adults themselves do not realize that seniors are at the same risk as other populations; furthermore, professionals are often reluctant to discuss or question matters of sexuality with aging patients or clients.

African Americans are especially disproportionately affected by STIs including HIV. Numerous studies have found that African American women are disproportionately affected by HIV. Dr. Tonji Durant of the Centers for Disease Control and Prevention examined data from 33 states and found that of 156,000 new cases of HIV infection between 2001 and 2004, 51% were in non-Hispanic blacks although blacks only made up 13% of the population in those states. These findings emphasize that HIV and AIDS pose a significant threat to the African American community.

Rates of HIV infection in seniors are especially difficult to determine because older people are not routinely tested. Many older people are first diagnosed with HIV at a late stage of infection, and often become ill with AIDS-related complications and die sooner than their younger counterparts; these deaths can be attributed to original misdiagnoses and immune systems that naturally weaken with age. In addition, sexually active seniors are unlikely to consistently use condoms during sex because of a generational mindset and unfamiliarity with HIV or STI prevention methods. Research indicates that HIV will become more prevalent among older adults in the coming years, and will continue to disproportionately affect urban communities. Already, 11–15% of Americans diagnosed with HIV are at least 50 years old. As many as 49% of men above 50 with AIDS and 70% of women above 50 with AIDS are black or Latino. According to the National Association on HIV over Fifty (NAHOF), the number of cases is expected to increase as people live longer due to triple combination drug therapy. Between 1991 and 1996, AIDS cases in the above-50 population rose more than twice as fast as those among younger adults. Older individuals with HIV infection or AIDS are usually invisible, isolated, and often ignored.

When developing preventive strategies for African Americans above 50, public health professionals must consider that older people face stigma in regard to HIV and AIDS: ageism and infection with a sexually transmitted or IV-drug-transmitted disease. Because of this stigma it may be difficult for seniors including women to disclose their HIV status to their family, friends, and community as well as discuss HIV and AIDS questions with their health-care provider. Furthermore, due to the general lack of HIV and AIDS awareness among elders, this segment of the population for the most part has been omitted from research, clinical trials, and prevention and intervention programs. It is critical that programs are developed and implemented that will address the needs of older adults in order to inform them about HIV and AIDS transmission and prevention. Outreach programs should provide basic information about safer sex, drug-using practices, and negotiation skills in relationship to aging. In addition, more research needs to examine seniors' sexual and drug-using behaviors in order to determine HIV progression and treatments for the above-50 population. Health-care providers must also be educated on all levels on how to talk with senior clients about their sexual health and HIV and AIDS prevention. In addition, social marketing and media campaigns should focus on raising awareness of HIV and AIDS not only among younger populations but also among older populations while promoting respect and validation for them.

Related Topics

Access to health care, Acquired immunodeficiency syndrome, Ageism, Alzheimer's disease, Dementia, Diabetes, Discrimination, Health insurance, Hypertension, Race, Safer sex, Stigma

Suggested Readings

Galea S, Vlahov D (eds) (2005) Handbook of urban health: populations, methods, and practice. Springer Science, New York

La Veist T (2002) Race, ethnicity, and health: a public health reader. Jossey-Bass, San Francisco, CA

Suggested Resources

http://alz.org/Resource/Diversity/downloads/AA_OUTtipswithcitations.pdf (accessed February 8, 2006)

http://www.aarp.org (accessed February 8, 2006)

http://www.caps.ucsf.edu/over50.html (accessed February 8, 2006)

http://www.cdc.gov/omh/Populations/BAA/BAA.htm (accessed February 7, 2006)

http://www.hivoverfifty.org/tip.html(accessed February 7, 2006)

National Institute on Aging: www.NIHSeniorHealth.gov (accessed February 7, 2006)

Age-Related Macular Degeneration

Craig A. Lemley · Judy E. Kim

Age-related macular degeneration (AMD) is a progressive disorder of the retina and underlying tissues due to the aging process of the eye. The macula is the central portion of the retina and has the highest concentration of photoreceptors, providing the area of highest visual acuity in our field of vision. In AMD, the macula is preferentially affected. Thus, people with advanced AMD lose their high-resolution central vision affecting the ability to read or drive, but they usually retain useful peripheral vision that allows for ambulation.

In early AMD, ophthalmoscopic evaluation reveals yellow deposits, termed drusen, located below the retina and underlying retinal pigmented epithelium (RPE). Drusen are initially asymptomatic, but increasing number and size of drusen are associated with pigmentary change and localized detachment of the RPE. Progression can lead to atrophy of the retina, RPE, and underlying choriocapillaris. Central macular involvement causes vision loss. This form is known as dry (or nonexudative) AMD, and it often occurs gradually over many years. Dry AMD may be categorized as mild, intermediate, or advanced based on the number and size of drusen or the size and location of atrophic changes.

In the wet (or exudative) form of AMD, severe vision changes can occur suddenly. Membranes of abnormal new blood vessels termed choroidal neovascular membranes (CNVM) grow from the choriocapillaris and leak serous fluid, exudate, or blood into the sub-RPE or subretinal space. This often leads to end-stage macular scarring with fibrosis. Wet AMD often occurs from advanced cases of dry AMD but can sometimes occur with few signs of AMD.

Epidemiology

A recent meta-analysis by the Eye Diseases Prevalence Research Group (EDPRG) estimated US prevalence by pooling data from almost 30,000 individuals in a number of international population-based studies. The data were related to the 2000 US Census. The estimated US prevalence of intermediate AMD, namely those with large drusen only, was 3.97% in those aged 55–59 but increased to 23.56% in those above 80. Prevalence of advanced AMD, including both dry and wet forms, was 0.39% in those aged 55–59 and 11.77% in those above 80. More than half of the individuals with advanced AMD had wet forms. The prevalence of advanced AMD increased with each 5-year age increment over 50 years, but rose most substantially after age 70.

A population-based census performed in Beaver Dam, Wisconsin, investigated 10-year incidence and progression. Individuals aged 55–64 had a 10.7% risk of advancing to early AMD in 10 years, whereas those above 75 had a 36.7% chance of similar advancement. Incidence and risk of progression to advanced AMD over 10 years was 1.0% in those aged 55–64 and 9.5% in those above 75.

According to EDPRG data (Friedman et al. 2004), the total number of individuals in the United States with advanced AMD was estimated to be 1.75 million

in 2000. The number of American individuals with advanced AMD is projected to be almost 3 million in 2020.

Risk Factors

Increased age is strongly associated with increased prevalence, incidence, and progression of AMD. Those with white European background also have increased chance of vision loss from advanced AMD compared to those of African or Hispanic ancestry. In the meta-analysis by the EDPRG, a white male above 80 is over 7.5 times more likely to have advanced AMD than a black male of the same age. Smoking has also been associated with vision loss from both dry and wet AMD in multiple studies. Hereditary factors also appear to play a role in AMD but the relative role of genetic and environmental factors remains unclear.

Other risk factors show mixed results. For example, an increased prevalence of AMD in women over men was seen in some studies, but not in others, after controlling for age. Other factors such as increased exposure to sunlight, obesity, cardiovascular disease, hypertension, hypercholesterolemia, and alcohol intake have been inconsistently associated with AMD. Additionally, inflammation and mediators such as complement factor H are suspected to play a role in AMD, an area of active investigation.

Symptoms, Detection, and Diagnosis

Early AMD changes are often asymptomatic. The first symptoms may be blurriness or difficulty reading. Patients may develop a central blurry or blind spot (termed scotomas) as atrophy progresses. With wet AMD, patients may notice that straight lines appear distorted or wavy (termed metamorphopsia).

It is not uncommon for patients with advanced AMD in one eye to remain asymptomatic until both eyes are affected, since the better eye can accommodate for the contralateral vision changes. An Amsler grid, which resembles a checkerboard with a dot in the center, is an excellent tool to detect scotomas or metamorphopsia. A patient monitors his or her central vision by looking at the dot with one eye open and noting any missing lines or distortion on the grid.

AMD is diagnosed by a full ophthalmologic examination. Dilated funduscopic examination is required to detect characteristic AMD findings. If wet AMD is suspected on examination, a fluorescein angiogram can be performed in the clinic to detect leakage of CNVM and assess for appropriateness of treatment. Because most available treatments stabilize rather than improve vision, the most important factor in AMD is early detection.

Treatment

The primary goal has been to prevent or halt vision loss and progression to advanced stages of AMD. A study sponsored by the National Institutes of Health (Age-Related Eye Disease Study Group [AREDS]) investigated the effect of taking high doses of zinc, vitamin C, vitamin E, and beta-carotene on AMD progression. Individuals with moderate AMD who took the supplements had a modest but statistically significant reduction in progression to severe vision loss compared with those who took placebo. A formulation of vitamins and minerals based on AREDS is often recommended for those with moderate AMD. Those with no AMD, early AMD, or advanced AMD in both eyes did not benefit from this formulation compared with those who took placebo.

The majority of current treatments act to arrest the growth of CNVM in wet AMD. A multicentered trial of the Macular Photocoagulation Study Group investigated thermal laser to ablate CNVM. There was a statistically significant benefit of treatment over observation but it still had a 50% recurrence rate over 3 years. Although patients benefited in the long run, lesions treated directly under the central macula produced immediate, treatment-related scotomas and visual acuity loss since the thermal laser destroys retina along with the underlying CNVM. Thus, treatment is now generally restricted to lesions away from the center of the macula.

Photodynamic therapy (PDT) is one of the modalities for treating CNVM under the center of the macula. This treatment involves injecting the patient with verteporforin, a photosensitive drug, and applying a nonthermal laser to the CNV lesion. The laser activates the drug, creating free radicals that preferentially damage endothelial cells of the CNVM. This treatment is performed at 3-month intervals until leakage from the CNVM ceases or advancement precludes further treatment. The Treatment of Age Related Macular Degeneration with Photodynamic Therapy

Study Group and Verteporfin in Photodynamic Therapy Study Group studies established a reduction of vision loss over placebo for some forms of CNVM. Few patients improve vision and many forms of CNVM do not meet criteria for benefiting from PDT. Recently, combining intravitreal steroid injection with PDT has shown a visual benefit and a reduction in need for retreatment. Intravitreal steroid injection, however, does add potential morbidities such as intraocular pressure elevation, traumatic lens injury, cataract, retinal detachment, and infection.

Recent advances have been made in treating CNVM with antiangiogenic factors. Pegaptanib sodium (Macugen) was recently approved to treat wet AMD. It is a synthetic oligonucleotide that binds to, and deactivates, vascular endothelial growth factor (VEGF), which is implicated in CNVM growth. It is injected into the vitreous cavity of the eye at 6-week intervals. Clinical trials showed a reduction of severe vision loss when compared to sham injections 1 year after initiating treatment. Adverse events such as lens injury, retinal detachment, and infection were low (<2%). Other anti-VEGF therapies in various stages of development and clinical trials have also shown benefits in wet AMD. In addition, various drug delivery methods including systemic, periocular, intravitreal, and sustained drug delivery are being actively researched.

Even with current treatment, AMD can lead to severe loss of central vision and difficulty with everyday tasks. Evaluation and treatment by low vision specialists is key in helping patients with AMD improve their visual function. Optimal spectacle correction and visual aids such as magnifiers and handheld telescopes can be helpful in regaining function. Other high-magnification aids such as close-circuit televisions can allow some end-stage patients to regain the ability to read books or newsprint.

AMD is an extremely active area of research, with new treatment modalities and advancements being reported frequently. The not-too-distant future presents much hope for new therapies or combination therapies that may improve the outcome for many people who will develop this devastating disease.

Related Topics

Perception, Vision

Suggested Readings

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Verteporfin in Photodynamic Therapy Study Group (2001) Verteporfin therapy of subfoveal choroidal neovascularization in age-related macular degeneration: two-year results of a randomized clinical trial including lesions with occult with no classic choroidal neovascularization: verteporfin in photodynamic therapy report 2. Am J Ophthalmol 131(5):541–560

Suggested Resources

National Eye Institute. http://www.nei.nih.gov/health/maculardegen/armd_facts.asp#1

Ageism

Teresa Trogdon Anderson

"Ageism" refers to stereotyping, holding prejudicial views, or discriminating against individuals or groups based on chronological age. Ageism is a term most commonly used in relation to elders or older

populations, but may pertain to negative attitudes toward other ages as well (e.g., adolescents). In contrast with other cultures in which aging is associated with wisdom and depth of experience, elders in this country may be seen as nonproductive, burdensome, and diminished in comparison with younger individuals.

A variety of social benchmarks are used in perceiving age, and the line that divides the "young" from the "old" in a particular context may seem arbitrary. Retirement from the workforce, for instance, often connotes elder status in the United States. However, membership in the American Association for Retired Persons may begin as early as age 50, while eligibility for Social Security retirement benefits begins at 62, 65, or 67 years. People aged 65 or older may be designated as "senior citizens" in many communities, receiving discounts in restaurants, movie theaters, and stores. However, in the medical literature, advanced chronological age is now categorized into two groups: the younger old (aged 51–75) and the older old (aged 76 and older).

Because of public health and medical advances, the expected human life span has increased over the last century. Indeed, each of us is likely to experience the social phenomenon of being viewed as elderly during the course of our lives. The composition of the United States has shifted, with 70 million individuals on the threshold of age 65 ("baby boomers") and an additional 33 million above 65. The emergence of such large numbers of people in their seventh decade of life, and beyond, and the increasingly recognized diversity of roles and activities of these individuals have challenged ageist assumptions in our society.

Studies of elders have demonstrated that chronological age does not determine health or well-being, and that there is tremendous heterogeneity in the lifestyles of elders. Encouraging data suggest that much can be done to improve symptoms and functional limitations of older adults—as well as their personal satisfaction and quality of life—even in the context of serious health concerns. In addition, adults who have sustained lifestyles that include regular exercise, healthy weight, and abstinence from tobacco have much less likelihood of developing chronic conditions such as heart disease, stroke, or diabetes by age 65, according to data from the Centers for Disease Control (CDC). Finally, negative stereotypes that portray elders as unwilling to learn new information or to use information technology are being reversed through empirical findings. One study in Idaho found that older adults were no less likely, and sometimes more likely, to use health information resources such as a health or self-care book, a toll-free telephone advice line, or a computer for health information.

Ageist attitudes may nevertheless adversely affect the health care of elders. The top three causes of death in the United States among older adults are heart disease, cancer, and stroke; these illness processes are optimally managed by early detection and treatment, and yet these services may be underutilized due to an incorrect belief that such interventions have limited value for elders. Preventive health measures such as vaccines and cholesterol testing may not routinely be offered to elder patients. Depression may not be considered as the cause of poor sleep or weight loss and may therefore be misdiagnosed or treated inappropriately. Hearing loss is common in the above-65 age group, but screening and intervention may not be practiced routinely. Medical research has tended to exclude elders in clinical trials; therefore, treatments offered to younger adults for such problems as heart disease or cancer may not be offered to the old. Conversely, medications tested on younger patients may be prescribed to older adults without due consideration of potential adverse effects.

There is growing concern at a national level that aging populations will cause skyrocketing health care costs. A 2001 report showed that there was decreasing support among the general population for expanding programs for elders and increasing support for cutting costs and benefits. This is consistent with one researcher's observation that ageism is "a deep and profound prejudice against the elderly which is found to some degree in all of us." For these reasons, ageism is increasingly recognized as a health disparity issue of great significance for this country, now and in the future.

Related Topics

Baby boomers, National Council on Aging, Quality of life, Retirement, Stigma

Suggested Readings

Butler RN (2002) Why survive? Being old in America. Johns Hopkins University Press, Baltimore, MD

Friedan B (1993) The fountain of age. Simon & Schuster, New York
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Suggested Resources

Alliance for Aging Research (2003) Ageism: how healthcare fails the elderly. http://agingresearch.org
Centers for Disease Control and Prevention (2004) The state of aging and health in America. http://www.cdc.gov/aging
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Alcohol Use

Michelle M. Cornette · Benjamin D'Angelo

Barry et al. (2001) have devised a classification system for varying degrees of alcohol use. They define abstinence as no ingestion of alcohol in the previous year, low-risk drinking as "drinking, which does not lead to problems," and at-risk drinking as "alcohol use which does not yet cause problems, but may lead to adverse consequences for the drinker or others." Problem drinking has been defined as "alcohol consumption to a degree that has resulted in negative medical, psychological, or social consequences," whereas alcohol dependence typically involves the sense that one's drinking is "out of control," preoccupation with acquiring alcohol, continued use despite negative consequences, and tolerance and/or withdrawal.

Research does indicate that problem drinking is a significant issue for older adults, contradicting the common belief that problem drinking is an issue only for younger adults that tends to resolve as functional responsibilities increase. Estimates of the prevalence of alcohol abuse and dependence for the population in general indicate that the 1-year occurrence of these problems is about 1 in 10 persons. Estimates of problem drinking among older adults range from 1% to 15%. Research suggests that prevalence of alcoholism among those seeking treatment for medical or mental health issues ranges from 15% to 58%. Research has suggested that African American, Hispanic, and Asian older adults experience similar or lower rates of alcohol abuse and dependence relative to Caucasian older adults, with higher rates among men than among women, and that the prevalence of problem drinking increases with increased acculturation, approaching rates in the United States. Research suggests that women develop alcohol-related diseases more quickly than men, and that among older adults with problem drinking behaviors, a greater proportion of women than of men began their problem drinking as older adults. Older adult women problem drinkers are four times more likely than adult men to experience comorbid depression. Research indicates that genetic risk accounts for about 60% of the variability in problem drinking. A consistent trend across the life span is that people with concurrent mental illness are at increased risk for alcohol and other drug-related problems. Alcohol use reflecting an attempt to cope with symptoms of anxiety (e.g., self-medicating) is not uncommon. Age-related decline in liver functioning and overall physical health can affect how the body processes alcohol; thus, a person drinking the same amount of alcohol as when he or she was younger could begin to experience negative sequelae as an older adult that they had not experienced previously. Risk factors for late-life onset of alcohol use or problem drinking include stressful life events such as unemployment, physical illness, and interpersonal loss. The role of socioeconomic status is less clear, although in one study it was determined that older adult residents of public housing possess higher current rates of substance use disorders than a general epidemiological sample. Although the disinhibiting and sedating effects of alcohol may seem to provide temporary relief from life stressors, longer-term, chronic use has been found to increase life stress.

Negative Health Sequelae of Problem Drinking

Problem drinking can both contribute to the development of chronic medical conditions and exacerbate preexisting problems. For example, chronic alcohol use can cause certain cancers, liver cirrhosis, cardiomyopathy, hypertension, immune system disorders, and brain damage. Among women, problem drinking can lead to increased risk of osteopenia, and research has suggested that excessive daily alcohol consumption increases the risk of breast cancer among women. Alcohol consumption further affects blood sugar levels in those with diabetes, and can also exacerbate high blood pressure and ulcers. Research has indicated that

problem drinking is a contributing factor in 21–24% of cases of dementia, a disorder seen primarily in older adults. Negative sequelae of problem drinking on physical health can also be exacerbated by physical health issues frequently occurring in older adulthood. A related concern is that chronic alcohol abuse can make identification of physical health conditions more difficult. For example, alcohol causes changes in the heart and blood vessels, which can minimize pain that might otherwise signal a heart attack. As some degree of cognitive and psychomotor slowing is normal when adults move into older age, older adults are more vulnerable to some of the effects of alcohol on cognition, memory, judgment, coordination, and reaction time. Alcohol can contribute to risk for falls and hip fractures among older adults, as well as to risk for occupational and motor vehicle accidents, each of which independently increases risk for fractures and hematomas (bruising or blood-collection in the brain). Alcohol use has further been associated with sleep difficulties. Because the average adult above 65 is prescribed at least two medications per day, concerns regarding alcohol–medication interactions are significant. The National Institute on Aging cites several examples of dangerous drug–alcohol interactions. For example, alcohol can exacerbate risk for hemorrhaging in the stomach and intestines with aspirin, for drowsiness with antihistamines, and for liver damage with acetaminophen. Finally, the effects of alcohol can be compounded when consumed with medications that have high alcohol content, such as cough syrups and laxatives.

Positive Health Sequelae of Moderate Drinking

While the case has been made for the negative health effects of excessive drinking, some positive effects have been associated with moderate drinking. Research has suggested that moderate alcohol consumption may have a protective effect against cardiovascular illness, ischemic strokes, cancer, and vascular dementias. It has also suggested that moderate alcohol use (less than one drink per day) has been associated with fewer falls, improved mobility, improved physical functioning, and higher bone mineral density among postmenopausal women.

Assessment and Treatment

Symptoms of alcohol abuse and dependence can be more difficult to identify in older adults for several reasons. First, symptoms of alcohol abuse can mask as physical or mental decline, which can accompany aging. For example, confusion and memory loss secondary to alcohol consumption might be mistaken for symptoms of Alzheimer's disease. Second, older adults are less likely to seek help for mental health and substance abuse issues than their younger cohorts, though some research suggests that older problem drinkers who do seek treatment are benefitted as much as younger alcohol abusers are.

Traditional Treatment Approaches

Although relatively little is known about the efficacy of traditional treatment paradigms for older adults, alcohol abuse treatment approaches utilized across the life span include 12-step help programs, detoxification, cognitive–behavioral psychotherapy, motivational enhancement, family therapy, Al-anon, and aftercare programs that link individuals with important community resources. In terms of pharmacotherapy, naltraxone has been found to be effective and safe among older adults. Other medications that may hold promise based on their demonstrated efficacy among younger adults include acamprosate and a number of the selective serotonin reuptake inhibitors. Disulfiram has been deemed effective in younger adults, thought its use has been limited in older adults due to the higher prevalence of heart and liver disease in this population. Research has revealed that traditional alcohol treatment is effective for about one of three individuals who seek treatment across the life span. Unfortunately, the most common pattern demonstrated for people with alcohol problems is one of alteration between periods of abstinence, asymptomatic drinking, and problematic drinking regardless of whether treatment is provided. Further, less than one of three people with an alcohol problem seek professional help for their problem, and data suggest that older adults are even less likely to seek treatment for mental health issues; thus, there appears to be a calling for innovative treatments in order to address this important public health concern.

Harm Reduction

Harm reduction refers to a set of diverse programs that share a key distinguishing feature: reduction of harmful consequences of drug use while users continue use. Harm reduction was designed to alleviate perceived flaws in traditional substance abuse treatment programs, such as a heavy reliance on a patient's willingness to accept lifelong abstinence as the ultimate goal of treatment, and an inability to treat people who are ambivalent about their drug use. Harm reduction proponents argue that the concept of denial, predominant in other models of treatment, should be replaced with an appreciation of ambivalence. Addiction and drug use are viewed as existing on a continuum of severity, rather than dichotomizing addiction in terms of "using" versus "sober." The identified benefits of moderate alcohol consumption provide further support for a harm reduction or "controlled drinking" approach to treatment. However, harm reduction interventions remain controversial and continue to be the subject of scrutiny in terms of their efficacy.

Recommendations

Is it possible for older adults to drink safely? The National Institute on Alcohol Abuse and Alcoholism (NIAAA) recommends that older adults (especially those above 65) who choose to drink have no more than one drink a day, noting that alcohol consumption to this moderate degree is usually not associated with health risks, but rather may be associated with some health benefits. However, alcohol consumption risk varies depending on an individual's age, gender, medical status and what other medicators he or she is taking. Individuals are advised to discuss alcohol consumption with their own health care provider.

Related Topics

Substance use and chemical dependence abuse

Suggested Readings

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Galanter M, Kleber HD (2004) Textbook of substance abuse treatment, 3rd ed. American Psychiatric Publishing, Washington, DC

Gomberg E (2003) Treatment for alcohol related problems: special populations: research opportunities. Recent Dev Alcoholism 16:313–333

Marlatt GA, Donovan DM (2005) Relapse prevention: maintenance strategies in the treatment of addictive behavior. Guilford Press, New York

Suggested Resources

Al-Anon/Alateen. http://www.al-anon.alateen.org/

National Center for Health Statistics. http://www.cdc.gov/nchs/fastats/alcohol.htm

National Institute on Alcohol Abuse and Alcoholism. http://www.niaaa.nih.gov/

US Department of Health and Human Services and Substance Abuse and Mental Health Services Administration (SAMSHA) Clearinghouse for Drug and Alcohol Information. http://www.health.org/

Alopecia

Robert S. Haber

More than 100 million Americans currently experience hair loss, and there are dozens of distinct causes and at least 300 medications that are the culprits. While a detailed discussion of each is outside the scope of this entry from the standpoint of the normal aging process, the relevant hair loss etiologies include male pattern hair loss (MPHL), female pattern hair loss (FPHL), telogen effluvium (hair loss due to a traumatic event), and senescent alopecia (hair loss due to aging). Hair loss is a cause of great distress for both men and women, producing significant psychosocial discomfort, and studies reveal that balding men are looked upon more negatively than nonbalding men. Few physical attributes are more associated with aging than hair loss, and unfortunately along with the lost hair it may be presumed that virility, strength, and attractiveness are lost as well.

Male Pattern Hair Loss

This condition is also commonly referred to as androgenetic alopecia, and represents an inherited condition in which progressive hair thinning occurs due to the actions of androgens on susceptible hair follicles. The androgen most closely implicated in the expression of MPHL is dihydrotestosterone (DHT).

Onset can be as early as the teenage years, with prevalence between 50% and 98% by age 50. Current understanding of the genetics of MPHL implicates both maternal and paternal ancestry, and can involve either an autosomal dominant and/or a polygenic inheritance pattern.

Typically, men experience elevation of the hairline, deepening of the temporal recessions, thinning of the crown, and eventual thinning and loss of hair from the front and top of the head. Many variations of hair loss occur, as diagrammed in the widely published Hamilton–Norwood hair loss scale.

Treatment consists of the topical medication minoxidil, and the systemic medication finasteride. Both medications work best to prevent ongoing hair loss; therefore, individuals with hair loss should be encouraged to begin treatment as soon as hair thinning is noted. Topical minoxidil is a nonspecific biologic response modifier with an unknown mechanism of action in hair growth. Men should use the 5% topical minoxidil solution twice daily to maximize efficacy. Finasteride, dosed at 1 mg daily, reduces serum prostate-specific antigen (PSA) levels by 30–50%; therefore, men above 40 are advised to have their PSA levels doubled for interpretation (PSA is measured as part of cancer screening in men). Long-term finasteride use may reduce a man's risk of developing prostate cancer. Current data should be reviewed with a specialist.

Female Pattern Hair Loss

The exact mechanism of FPHL has yet to be elucidated, but since nonandrogenetic (non-male-hormone) pathways are likely to predominate, the older term of female androgenetic alopecia should no longer be used. FPHL can present as early as in the teens, or be delayed until much later in life. For most women, the history is one of gradual thinning over many years. Typically, FPHL presents with a retained frontal hairline, and frontal or diffuse thinning of the vertex and crown (top of the head). Unlike MPHL, a significant number of women also experience thinning in the occipital zone (back of the head). Although many women with this disorder believe they are unique, in fact, MPHL may have an incidence as high as 86% by age 50. Women go to great lengths to conceal hair thinning, thus contributing to the belief that the condition is not common.

Treatment for FPHL consists of the topical medication minoxidil, and the systemic medication spironolactone. Women should use the 2% topical minoxidil solution, not the 5% topical solution, to minimize side effects, particularly inflammation and hypertrichosis. For maximum efficacy, the medication should be used twice daily.

Spironolactone is a potassium-sparing diuretic (water pill) with antiandrogen properties that has also demonstrated some effectiveness for FPHL. As its antiandrogenic properties are weak, high dosages of 100–200 mg/day and long-term therapy will be necessary to see any clinical benefit. Stabilization of hair loss is more likely than an increase in hair density. Spironolactone can produce menstrual irregularities and feminization of a male fetus, so oral contraceptives must be used by women of childbearing potential. As hyperkalemia can also occur, baseline and monthly monitoring of electrolytes is an important preventive measure.

Telogen Effluvium

In this condition, diffuse hair loss occurs, often preceded by a significant stress such as fever, childbirth, illness, psychological stress, or other disease state. In most cases, full hair regrowth can be seen, but a chronic form of the condition exists, and a careful clinical and laboratory investigation is warranted. Prompt identification of treatable conditions including endocrine abnormalities, anemia, nutritional deficits, and other systemic illnesses will improve the prognosis.

Sensescent Alopecia

Also termed senile alopecia, this is a relatively new hair loss category that recognizes the inevitable effects of the aging process on the hair follicle independent of any other factors. In this condition, both men and women experience slowly progressive hair loss in a

nonpatterned distribution, generally after the seventh decade. There is no scalp inflammation, and the hairs are simply reduced in number and size. It may be that depletion of the stem cell reservoir required for hair follicle regeneration produces this condition.

Related Topics

Body image, Hair care, Skin disorders

Suggested Readings

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Altruism and Volunteerism

Stephen G. Post

Altruism is behavior that is primarily "other-regarding," in contrast to self-centered or egoistic. Although the agent of altruism may benefit indirectly from altruism in so far as he or she experiences contentment and fulfillment in doing good for others, this does not diminish from the authenticity of altruistic motivation because neither reciprocal nor reputational gain is sought.

There are five reasons for benefits to older adults who engage in altruistic behavior: enhanced social integration; distraction from the agent's own problems; enhanced meaningfulness; increased perception of self-efficacy and competence; and improved mood or more physically active lifestyle. Adult altruism (i.e., voluntary behavior that is "motivated by concern for the welfare of the other, rather than by anticipation of rewards") has been associated with improved morale, self-esteem, positive affect, and well-being. The links between altruism and mental and physical health have been studied.

Mental Health

Well-being consists of feeling hopeful, happy, and good about oneself, as well as energetic and connected to others. An early study compared retirees above 65 who volunteered with those who did not. Volunteers scored significantly higher in life satisfaction and will to live, and had fewer symptoms of depression, anxiety, and somatization. Because there were no differences in demographic or other background variables between the groups, the researchers concluded that volunteer activity helped explain these mental health benefits. The nonvolunteers did spend more days in the hospital and were taking more medications, which may have prevented them from volunteering. However, the mental health benefits persisted after controlling for disability.

Physical Health

A review of existing studies indicates that research on the effect of kindness and volunteerism on health may have begun in 1956, when a team of researchers from Cornell University School of Medicine began monitoring 427 married women with children under the hypothesis that housewives with more children would be under greater stress and die earlier than women with fewer children. Surprisingly, they found that number of children, education, class, and work status did not affect longevity. After observing these women for 30 years, however, it was found that 52% of those who did not belong to a volunteer organization had experienced a major illness compared with 36% of those who did belong to one.

Another study examined the hypothesis that older volunteers benefit in terms of health in addition to well-being. With the help of data from a nationally representative sample, the study estimated the effects of volunteering on the rate of mortality among persons 65 and older. The data are representative of the noninstitutionalized US population aged 25 and older; the response rate was 67% of sampled individuals and 68% for sampled households. Data were collected

over three waves: 1986 ($N = 3{,}617$); 1989 ($N = 2{,}867$); 1994 ($N = 2{,}348$). Face-to-face interviews were conducted in the respondents' homes. From mid-1986 through March 1994, deaths were ascertained through tracking and interview processes and via the National Death Index. Respondents were asked whether they had volunteered in the past year through a religious, educational, political, senior citizen, or other organization. Respondents who had volunteered were asked how much time they had devoted to volunteerism. Controlled analysis indicated that the protective effects of volunteering were "strongest among those volunteering for one organization or for less than forty hours," and among those who lacked other social supports. Moderate amounts of volunteerism were associated with lowered risk of death. Indeed, simply adding the volunteering role was protective. One need not volunteer to a great extent to have benefits, and too much volunteering to the point of strain "incurs just enough detriments to offset the potential beneficial effects of the activity."

On a cross-cultural level, researchers at the University of Michigan studied a sample of 2,153 older adults in Japan, examining the relationships between religion, providing help to others, and health. They found that those who provided more assistance to others were significantly more likely to indicate that their physical health was better. The authors concluded that the relationship between religion and better health could be at least partly explained by the increased likelihood of religious persons helping others.

Another 5-year study involved 423 older couples. Each couple was asked what type of practical support they provided for friends or relatives, if they could count on help from others when needed, and what type of emotional support they gave each other. A total of 134 people died over the 5 years. After adjusting for a variety of factors—including age, gender, and physical and emotional health—the researchers found an association between reduced risk of dying and giving help, but no association between receiving help and reduced risk of death. A researcher at the University of Michigan's Institute for Social Research concluded that those who provided no instrumental or emotional support to others were more than twice as likely to die in the 5 years as people who helped spouses, friends, relatives, and neighbors. Despite concerns that the longevity effects might be due to a healthier individual's greater ability to provide help, the results remained the same after the researchers controlled for functional health, health satisfaction, health behaviors, age, income, education level, and other possible confounders. The researchers concluded: "If giving, rather than receiving, promotes longevity, then interventions that are currently designed to help people feel supported may need to be redesigned so that the emphasis is on what people do to help others."

Implications

Altruism results in deeper and more positive social integration, distraction from personal problems and the anxiety of self-preoccupation, and enhanced meaning. Research on the benefits of doing good could spark a movement in public health that focuses on civic engagement and helping behavior within communities. Therefore, much of public health is rightly focused on environmental toxins and the control of epidemics. Yet a positive vision of public health must nurture benevolent affect and helping behavior.

Related Topics

Gender role, Geriatric psychiatry, Identity, Life expectancy, Mortality

Suggested Readings

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Musick MA, Herzog AR, House JS (1999) Volunteering and mortality among older adults: findings from a national sample. J Gerontol: Social Sci 54B 3:S173–S180

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Alzheimer's Disease

Mustafa K. Warsi · Helen C. Kales

The dementia syndrome refers to a group of symptoms related to a sustained decrease in intellectual function from previous levels. Memory decline is always a part of this syndrome along with combinations of other impairments such as problems with judgment, language, recognition, or performing tasks. Personality change can also occur as a component. There are multiple causes of the dementia syndrome, with more than 60 disorders that are associated with dementia. Alzheimer's disease is the most common form of dementia and represents up to 75% of cases. It is characterized by a gradual onset and a progressive cognitive function decline. The condition is named after Alois Alzheimer who in 1907 described the clinical progression of a 51-year-old woman with a 4.5-year course of a sustained loss of intellectual function from her previous levels.

The risk of Alzheimer's is age-related, with the risk above 65 at about 5–8% and the risk above 85 increasing to 25–50%. With the advent of better health care and the "baby boomer" population growing older, the 65 and above subset of the population is growing at a fast pace. Currently 4 million individuals are above 65. By 2030 this number is expected to double. Epidemiological studies show that 10% of the US population above 65 and 40% of those aged 80 and above meet criteria for the diagnosis of Alzheimer's. Currently, Alzheimer's affects four million individuals in the United States and 16 million worldwide. There has been debate in the past about the prevalence being higher in women. However, follow-up studies in the United States did not support this hypothesis and have shown no difference with respect to gender.

Alzheimer's disease is a devastating illness, which not only affects the cognition of the individual but also increases caregiver burden. Over $100 billion a year is spent on individuals with Alzheimer's. Most patients with Alzheimer's still live at home. The average nationwide cost of living in a nursing home is $42,000 a year, which is not covered by third-party insurers. The average lifetime cost for an individual can exceed $174,000. With figures like these, it is not surprising that research is going on at an extraordinary pace. A search in the National Institutes of Health Alzheimer's database (Medline/ Pubmed) in December 2005 of the term "Alzheimer's dementia" brought up 36,425 current research citations. Although there is still no cure for Alzheimer's, available medications help to slow disease progression.

Other risk factors for developing Alzheimer's disease include Down's syndrome, a history of head injury, and a family history of dementia. Epidemiological studies have related low educational level and socioeconomic as well as marital status as other possible risk factors. While the risk for Alzheimer's appears inherited in some cases, in others there is no family history. The cause of Alzheimer's is not known, but is currently thought to be related to the genetically determined overproduction of abnormal brain proteins ("beta-amyloid") or abnormal brain protein processing and deposition. Microscopically, the brains of Alzheimer's sufferers show abnormal "plaques" and neurofibrillary "tangles." The impact of Alzheimer's on brain chemistry is a prominent degeneration of systems involving the neurotransmitter "acetylcholine," which is critical to intact cognitive function, although other neurotransmitters are also involved. Low levels of acetylcholine within synapses of neurons cause cholinergic neuron death. Acetylcholinesterase inhibitor medications work to interrupt this pathway. However, neither plaques nor tangles are exclusive to Alzheimer's and can be seen in other conditions such as Down's syndrome, and to a certain extent, in normal aging.

The clinical picture of a typical Alzheimer's patient describes a gradual decline that may not have been noted by family members until difficulties became obvious several years after onset (e.g., getting lost while driving, leaving the stove burners on). The course is a slow progressive one, with memory loss being the first indicator. Language, motor, and sensory losses follow, often several years later. Some people with Alzheimer's show personality changes and symptoms of irritability early in the course of disease that can worsen as the illness becomes more manifest. The illness progresses to eventual death about 8–10 years after initial diagnosis.

It is important to note that memory loss is essential to make the diagnosis of Alzheimer's disease, but this disorder cannot be diagnosed with memory loss alone. According to the *Diagnostic and Statistical Manual of Mental Disorders*, Fourth Edition, criteria for dementia of the Alzheimer's type (DAT) specify that the individual must have a memory impairment and one of the following four cognitive disturbances: (1) language disturbance (difficulty with word comprehension or

expression); (2) inability to perform a motor task despite having no motor deficits (e.g., difficulty with bathing or dressing); (3) inability to recognize items despite having no sensory (hearing or visual) deficits; or (4) deficits in carrying out more complex tasks involving planning, abstraction, and organizing (e.g., difficulty with driving or cooking). There is no single test to determine if a person has Alzheimer's disease. The diagnosis is made by a physician reviewing a detailed history of the person and the results of several tests such as a complete physical and neurological examination including a mental status evaluation, a psychiatric assessment, and laboratory tests (including blood count and chemistries, vitamin B12, folate and thyroid hormone levels, and often computed tomography [CT] or magnetic resonance imaging [MRI] of the brain). Neuropsychological testing may also be done to test memory, reasoning, writing, vision–motor coordination, and the ability to express ideas. Once this is completed, a diagnosis of "probable" Alzheimer's disease can be made by the process of elimination. A definite diagnosis of Alzheimer's dementia is impossible without confirmation by postmortem (after death) examination of the brain.

Other causes of dementia that should be excluded are vascular causes such as a stroke, dementia secondary to Parkinson's syndrome, dementia secondary to Huntington's disease, human immunodeficiency virus (HIV), head trauma, Pick's disease, Creutzfeldt–Jakob disease, and neurosyphillis to name a few. Laboratory testing can detect medical problems (anemia, thyroid problems, vitamin deficiencies, etc.) that can cause confusion or cognitive impairment. As depression can cause cognitive impairment and coexist with dementia, a psychiatric assessment is important to rule out the presence of mood disorders. It may also be helpful to conduct a separate interview of the caregiver to gain additional perspective on the person's functioning.

At this time, there is no medical treatment to cure or stop the progression of Alzheimer's disease, though the US Food and Drug Administration (FDA)-approved medications may temporarily improve or stabilize memory and thinking skills in some people. Ultimately, it is thought that actual disease modification in DAT will occur from preventing accumulation of abnormal brain protein (beta-amyloid). There are two classes of drugs that are currently approved to treat the cognitive symptoms of Alzheimer's: the cholinesterase inhibitors (donepezil, rivastigmine, galantamine) and memantine. Cholinesterase inhibitors are indicated for mild to moderate dementia. These drugs are generally well tolerated, and common side effects include nausea, vomiting, and diarrhea. The body soon develops tolerance to these side effects. It must be emphasized that these medications do not treat Alzheimer's disease or change mortality rates, but rather only delay the progression of disease. "Turning the clock back by 6 months" is a common term used by clinicians to describe the effects of these medications. In about 20% of patients, deterioration may be delayed for about a year. Some anecdotal reports also suggest improvement of disturbed behaviors with these medications. Donepezil has a once-a-day regimen, whereas rivastigmine and galantamine are to be given twice a day. Galantamine should not be used in patients with kidney or liver problems. Memantine is a newer medication available to stabilize symptoms of moderate to severe Alzheimer's. It acts as an *N*-methyl-D-aspartate (NMDA) receptor antagonist, which has been shown to limit glutamate-induced toxicity to brain cells. Memantine may protect cells against excess glutamate by partially blocking NMDA receptors. This medication has good tolerability and is dosed twice a day. Therefore, it is increasingly being used as an adjunct to cholinesterase inhibitors in the management of moderate to severe Alzheimer's disease.

Vitamin E may also reduce the rate of decline in patients with Alzheimer's. It is an antioxidant that has been thought to inhibit the inflammatory effects of plaque formation, thus helping the brain defend itself against the effects of oxidative damage. A prior study examining the use of vitamin E in Alzheimer's disease and time to nursing home placement showed promising results; however, a recent reanalysis of this study (which corrected for differences in patient groups in the earlier study) revealed no benefits and an added risk of side effects. People who take blood-thinners may not be able to take vitamin E, or will need to be monitored closely by a physician. Other medications such as selegiline, nonsteroidal anti-inflammatory drugs, and statins have been tested for Alzheimer's disease, but as yet the evidence for benefit is not clear.

Herbal remedies and other dietary supplements have been promoted as effective treatments for Alzheimer's disease and related disorders. However, claims about the safety and effectiveness of these products are based largely on individual testimonials, traditional use, and a rather small body of scientific research.

The rigorous scientific research required by the US FDA for the approval of a prescription medication is not required by law for the marketing of dietary supplements. Given this lack of FDA oversight, concerns with such alternative therapies include: (1) unknown effectiveness and safety; (2) unknown purity of such substances; (3) lack of routine monitoring of side effects; and (4) the possibility of serious interactions with prescribed medications. *Ginkgo biloba* is a plant extract containing several compounds that may have positive effects on cells within the brain and the body; it has been promoted as having both antioxidant and anti-inflammatory properties, and effects in protecting cell membranes and in regulating neurotransmitter function. *Ginkgo* has been used for centuries in traditional Chinese medicine and is currently used in Europe to alleviate cognitive symptoms associated with some neurological conditions. Results from some studies show that *Ginkgo* may help some individuals with Alzheimer's disease, but further research is needed to determine the exact mechanisms by which it works in the body. Few side effects are associated with the use of *Ginkgo*, but it is known to reduce the ability of blood to clot, potentially leading to more serious conditions such as internal bleeding. This risk may increase if it is taken in combination with other blood-thinning drugs (e.g., aspirin and warfarin). A current multicenter trial with about 3,000 participants is investigating whether *Ginkgo* may help prevent or delay the onset of Alzheimer's disease or vascular dementia.

Pharmacological treatment of Alzheimer's also often involves treatment of the behavioral and psychological symptoms of dementia (BPSD) that occur at least to some degree in many people with the disease. In the early stages of Alzheimer's, people may experience personality changes such as irritability, anxiety, or depression. In later stages, BPSD may occur such as sleep disturbances, agitation (physical or verbal aggression, restlessness, pacing, yelling), delusions (firmly held beliefs in things that are not real), or hallucinations (seeing or hearing things that are not there). Many families find the BPSD to be the most challenging and distressing effects of Alzheimer's disease. BPSD are often the determining factor in a family's decision to place a loved one in long-term residential care. For individuals living in long-term care facilities, BPSD often have tremendous impact on the care they receive and on quality of life. People with Alzheimer's exhibiting BPSD should receive a thorough medical evaluation, especially when symptoms occur suddenly. Treatment depends upon the types of behavior the person is experiencing as well as a careful determination of the possible causes of the change in behavior. Symptoms may reflect an underlying infection or medical illness; for example, the pain or discomfort caused by pneumonia or a urinary tract infection or the side effects of some prescription and over-the-counter medications can cause "delirium" (an acute change in mental status). People experiencing delirium may manifest many different BPSD (agitation, paranoia, hallucinations), which resolve when the medical cause of delirium is properly treated. With proper treatment and intervention, significant reduction or stabilization of BPSD can often be achieved.

There are two different types of treatments for BPSD: nondrug interventions and prescription medications. Nondrug interventions (e.g., simplifying the person's environment, tasks, and routines; allowing adequate rest between stimulating events; using labels to cue or remind the person; equipping doors and gates with safety locks; and using lighting to reduce confusion and restlessness at night) should be tried first. Steps to managing agitation include: (1) identifying the behavior; (2) understanding its cause; and (3) adapting the caregiving environment to remedy the situation. Often the trigger may be a change in the person's environment (change in caregiver or living arrangements, hospitalization, etc). It is not helpful, and often may worsen the BPSD, to argue, disagree, or confront the person who is confused, agitated, or paranoid; a far better way for caregivers to intervene is to redirect the affected individual's attention to another topic or activity.

Medications should target specific symptoms (hallucinations, paranoia, depression) so their effects can be monitored. In general, it is best to start with a low dose of a single drug. People with dementia are susceptible to serious side effects, including a slightly increased risk of death from antipsychotic medications. Risk and potential benefits of a drug should be carefully analyzed for any individual. Medications should be tailored to both the individual patient and the accompanying constellation of symptoms and may include: neuroleptics or antipsychotics (used to treat hallucinations, paranoia, or delusions); antidepressants (used to treat depression and anxiety); anticonvulsants (used for mood stabilization and for agitation); and trazodone or Desyrel (used for sleep difficulties and for agitation). Benzodiazepines (diazepam or Valium, alprazolam or Xanax, lorazepam or Ativan, etc.) should

generally be avoided or minimized due to concern of side effects (worsened cognition, falls) and especially of "paradoxical disinhibition" (reaction of agitation or worsened behaviors as opposed to the desired calming effect).

In treating individuals with Alzheimer's disease, it is common practice to include the caregiver and family. Alzheimer's affects entire families, especially as the disease progresses and affected individuals become more dependent upon their primary caregivers. Caregivers often experience feelings of depression, anxiety, stress, and helplessness that need to be assessed by a clinician, and referred as appropriate. Many of these symptoms can be alleviated by appropriate treatment.

Related Topics

Caregiving and caregiver burden, Delirium, Dementia Advocacy International, Disruptive behaviors, Frontal lobe dysfunction, Long-term care, Pseudodementia

Suggested Readings

Clark CM (2005) Clinical manifestations and diagnostic evaluation of patients with Alzheimer's disease. In: Clark CM, Trojanowski JQ (eds) Neurodegenerative dementias: clinical features and pathological mechanisms. McGraw-Hill, New York, pp 95–114

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Tabet N, Birks J, Grimley EJ, Orrel M, Spector A (2003) Vitamin E for Alzheimer's dementia. Cochrane Alzheimer's Dementia Base Sys Rev CD000442

Suggested Resources

Alzheimer's Association (800) 272–3900. www.alz.org

Alzheimer's Disease Education and Referral Center (800) 438–4380. www.alzheimers.org

American Association for Geriatric Psychiatry. www.aagpgpa.org

Ambiguous Loss

Sana Loue

Ambiguous loss refers to the loss of a loved one who is both simultaneously present and absent. Consequently, the loss is ambiguous and closure appears unattainable.

There are two types of ambiguous loss. In the first type, the loved individual is psychologically present, but physically absent under conditions that make it unclear whether they are dead or alive. This may happen, for instance, when a family member is serving in the armed forces and is reported missing in action, or when family members emigrate to another country, leaving behind relatives who are unable to communicate with them. It may also occur as the result of a natural disaster, when family members are separated from each other and mechanisms of communication are interrupted.

The second type of loss occurs when a loved one is perceived as being physically present, but is psychologically absent. This often happens when a loved one suffers from advanced Alzheimer's disease or suddenly suffers cognitive impairment as the result of a traumatic injury or the onset of a severe mental illness. This type of ambiguous loss may especially affect older adults, as aging friends and family members develop illnesses that affect their abilities to interact with, and relate to, others.

The uncertainty that surrounds such a loss prevents the individuals who are affected by it from moving forward with their lives because they do not know if the loss is temporary or permanent. Unlike a loss that results from death, individuals who are confronted by an ambiguous loss do not have the same rituals such as a funeral or wake that could potentially provide support and opportunity for validation of their loss. In addition, because of its ambiguous nature, the loss is continuous, resulting in physical and emotional exhaustion.

Individuals who are confronted with an ambiguous loss may feel depressed, helpless, and/or incompetent. Individuals may blame themselves for the situation, even if they had no part in its creation, believing that if they had only said or done something differently, the situation would be better. A variety of strategies have been suggested to help individuals cope with this type of loss and to overcome some of these feelings. The methods include counseling, prayer, and participation in a support group.

Related Topics

Alzheimer's disease, Attachment theory, Capacity, Caregiver burden, Caregiving and caregiver burden, Disability, Migration, Stress

Suggested Readings

Boss P (1999) Ambiguous loss. Harvard University Press, Cambridge, MA

Americans with Disabilities Act

Janet L. Lowder · Lisa M. Montoni

The Americans with Disabilities Act (ADA), signed in July 1990, provides individuals with disabilities protections similar to those that prohibit discrimination on the basis of sex, national origin, race, religion, and veteran status. An individual is protected under the ADA if: (1) the ability to perform one or more major life activities (e.g., hearing, sight, self-care, walking, breathing, speaking, or learning) are hampered by a physical or mental condition; (2) if an individual has a record of having such a physical or mental condition; or (3) if an individual is thought of as having such a condition. The ADA is designed to open up employment opportunities, government services, public accommodations, transportation services, and telecommunications to the disabled on an equal-opportunity basis.

The ADA prohibits discrimination against qualified disabled people in private employment-related activities such as hiring, promotion, training, and compensation. A disability cannot be used as a basis for employment-related decisions unless a person's disability poses a direct threat to his own and/or others' health and safety in the performance of a job. Additionally, organizations with 15 or more employees must provide reasonable accommodations to disabled employees and job applicants as those persons request or indicate, except where reasonable accommodations are not feasible or impose a significant expense, or an "undue hardship," on the employer. Reasonable accommodations may include accessibility modifications to existing facilities, changing work schedules, providing adaptive or modified work equipment, or modifying employment training.

The ADA also obligates federal, state, and local governments, as well as agencies and departments to provide equal access to government employment, programs, and services for persons with disabilities. State and local government entities, just like private employers, are subject to employment and facility access rules. These public entities must also remove discriminatory barriers to the disabled for participation in, and eligibility for, government services. Additionally, government organizations must guarantee "public accessibility" to all persons with disabilities by providing government services in accessible locations, either in the public entity's own facilities or at an alternative off-site location.

The ADA includes "public accommodations" provisions that apply to private companies and other organizations that own or operate facilities open for public access such as movie theaters, restaurants, shopping malls, parks, and museums. Construction of new buildings, and major renovations of existing buildings, must ensure accessibility to disabled persons. A variety of access-minded features must be included such as parking lots with curb cuts and designated "handicapped" parking spaces, elevators, barrier-free facility designs and layouts, accessible bathrooms, tables of wheelchair-appropriate clearance and height, and sufficiently wide doorways. Reasonable accommodations for such public establishments under the ADA go beyond just physical access. Facility owners and operators must also be prepared to provide services such as reading a price tag to a blind customer; retrieving a book from an unreachable shelf for a wheelchair user; and permitting individuals requiring the assistance of service animals, for example trained guide or mobility dogs, to enter restaurants and grocery stores.

Public and private transportation service providers must also refrain from discriminatory behavior against disabled patrons under the ADA. Airlines, taxis, trains, and bus lines must provide an equal, or at least equally effective, level of service as that provided to nondisabled patrons. Telecommunication service providers such as telephone companies must provide access to services for individuals with hearing and/or speech impairments as well.

Related Topics

Disability, Discrimination, Employment, Medicare

Suggested Readings

US Department of Justice, Civil Rights Division, Equal Employment Opportunities Commission (2002) The Americans with Disabilities Act: a primer for small business, September 10, 2002

US Department of Justice, Civil Rights Division, Disability Rights Section (2001) A guide to disability rights laws, August 2001

US Department of Justice, Civil Rights Division, Equal Employment Opportunities Commission (2002) Americans with Disabilities Act: questions and answers, August 23, 2002

Suggested Resources

US Department of Justice (2005) ADA Home Page, Washington, DC, November 17. www.ada.gov

American Association of Retired Persons

Thomas E. Bucher

The American Association of Retired Persons (AARP) is a Washington, DC-based nonprofit, nonpartisan organization dedicated to "enriching the experience of aging" for people aged 50 and above. The organization was founded in 1958 by Dr. Ethel Percy Andrus, the first woman high school principal in California and a pioneer in the field of gerontology. It changed its name in recent years because only about half of its 35 million members are fully retired. AARP evolved from the National Retired Teachers Association, founded in 1947 and now an affiliated organization, to respond to the need for affordable health insurance for seniors and to address the problem of age discrimination in society. The organization envisions "a society in which everyone ages with dignity and purpose and in which AARP helps people fulfill their goals and dreams."

AARP, through its Internal Revenue Code 501 (c)(4) status, has become widely known for advancing the interests of aging populations through lobbying efforts at the state and national levels, working to influence legislation that affects older citizens, particularly Social Security and Medicare. The organization's signature issue has been to oppose President Bush's proposal to privatize Social Security, a plan that would allow the creation of private accounts financed through payroll taxes. The organization argues that private accounts drain money out of Social Security, cut benefits, and pass the bill on to future generations. Additionally, AARP worked to influence the Medicare Modernization Act of 2003 with its new Part D, the outpatient prescription drug benefit, with effect from January 1, 2006. Their large membership, combined with higher voting rates among elderly Americans, help to make AARP one of the most powerful advocacy groups in the United States. One critic has even called AARP the "800-lb. gorilla of American politics."

In addition to their intensive lobbying efforts, AARP offers a broad range of services and benefits to its members. It publishes and distributes educational materials about Social Security, Medicare, and other public policy issues, as well as sponsors community-service programs in such areas as crime prevention, defensive driving, adult education, consumer affairs, retirement planning, and counseling of widowed persons. The organization offers automobile and group health insurance plans, a credit union, pharmacy and travel services, and also negotiates reduced rates for members at various tourist attractions, automobile rental companies, motel and hotel chains, and other establishments. It also strives to inform and educate the members about possible scams targeting the elderly such as predatory lending and refinancing. AARP publishes *Modern Maturity* and *My Generation* magazines, and a members' bulletin.

Related Topics

Medicare, Social Security, Social support

Suggested Resources

Modern Maturity
My Generation
www.aarp.org

American Indians and Alaskan Natives

Christina M. Saunders Sturm

The 2000 Census reports a population count of 4.1 million American Indian and Alaskan Natives (AIANs). However, as is now understood to be common among minorities, this number is likely to be an undercount; AIANs who live on reservations are particularly likely to not be counted in the decennial census.

This population is relatively young with a median age of 28.8, 5 years younger than the national median age of 35.4. Approximately 1% of AIANs are 65 and above, a number that is predicted to rise to 3% by 2050. This expected growth in the older AIAN population will be the largest relative increase in any US racial or ethnic group except Asians, and therefore deserves special attention. The age category of 65 and older is used here as the common definition of older in the United States. However, it is important to note that within AIAN communities, elderhood may start at much younger chronological ages and, in fact, some tribes have designated Medicaid eligibility at ages less than 65 under treaty authority. Age is also important in that it has been reported that diseases such as diabetes are showing patterns of prevalence and complications in younger AIANs age groups that are more typical of patients 65 and older.

AIANs have the worst health in the nation, with older AIANs suffering from some of the highest levels of disability and disease. Contrary to the goals of Healthy People 2000, AIANs have not experienced significant improvements in health status indicators (HSIs). Risk factors and health conditions show persistent and even increasing disparities that need to be addressed if elder AIANs, as well their communities at large, are to gain better health and increased life expectancy.

Clear empirical data about older AIANs' health are very limited. The National Center for Health Statistics (NCHS) provides the best data to date, but even here AIANs are often left out of comparative analyses due to insufficient numbers or problematic racial categorization. For example, research has demonstrated that AIANs are frequently (15–20% on average) misassigned to other racial categories in health data, particularly mortality data, resulting in the underestimation of risk in this population. It is particularly difficult to obtain data on AIANs who do not live on reservations (approximately 60% of the population); these individuals are among the most likely to be misclassified in terms of race in health data documentation. Agencies that collect health data need to have procedures in place to maximize correct racial/ethnic category assignment.

The data that are available indicate that older AIANs suffer disproportionately from a variety of chronic diseases that contribute to their relative poor health. The NCHS reports that the three leading causes of death among older AIANs are diseases of the heart, unintentional injuries, and malignant neoplasm; diabetes is the fourth leading cause of death. However, diabetes is also a chronic disease that can cause significant disability and suffering. AIANs have the highest rate of diabetes in the nation (close to 100% in some subgroups) and one of the highest globally. High rates of obesity, lack of exercise, and smoking are reported in geographically limited studies as well as significant levels of eye and dental problems; the latter is particularly problematic among Alaskan Natives where service delivery can be very difficult. In addition, disability rates are the highest in the nation and it has been reported that qualified AIANs often are not receiving disability benefits to which they are entitled. Life expectancy is approximately 4 years lower than that of the general US population.

A significant contributor to the health problems seen in AIAN communities is access to, as well as quality of, care. AIANs often lack basic health services available to their non-AIAN neighbors. A total of 92% of rural counties in which AIANs are the majority residents are health professional shortage areas (HPSA) compared with 65% nationally. For older AIANs, most of who depend upon the Indian Health Service (IHS), access to geriatric health-care services is even more limited.

The IHS, part of the US Public Health Service since 1955, has played a critical role in providing services to the older AIAN population. It currently serves 1.5 million registered AIANs of all ages in 35 states through IHS hospitals and health centers. These individuals as well as the remaining 2–3 million self-identified AIANs are served by tribally managed services, urban Indian health programs, and general health services not geared specifically toward the AIAN population. Few older AIANs have private

insurance, relying primarily on IHS facilities and providers. Unfortunately, the IHS is chronically underfunded despite the legal obligation of the federal government to provide health services to AIAN peoples. As a clear example of structural inequality, IHS expenditures are 46% less than that of federal employee health benefit plans. The IHS budget is set by appropriation and is consequently subject to annual change and political pressures. The system is also increasingly dependent upon Medicaid reimbursement to fund itself. Because Medicaid eligibility and expenditures are set by the state, access to services and overall funding of the system varies greatly depending upon state residency. In addition, urban Indian health service centers do not qualify for the same level of federal Medicaid matching dollars as do IHS services, so AIANs who use urban service centers may have even fewer services available for certain needs than those who live on reservations.

On the positive side, the IHS and tribal leadership have built a record of successfully collaborating to maximize tribal involvement in meeting the health care needs and improving the health outcomes of the registered AIAN populations. This collaborative work, along with that developing with tribal nations, Indian colleges, and 4-year universities, has been successful at identifying community priorities as well as recruiting and maintaining tribal members in important roles in the system—two key elements of cultural competency in health care. Cultural competency is critical to the delivery of quality health care services; three out of four of the major identified probable causes of disparities in health care identified by the National Healthcare Disparities Report are strongly related to issues of communication and interaction between providers and patients. This effort is complicated in a population that embodies vast internal cultural diversity.

With more than 550 tribes with distinct cultural, genetic, and environmental pressures, it should be unsurprising that there are strong regional differences in risk factors. The Healthy People 2000 Report for 2002 reported rising rates of lung cancer in the AIAN population. However, smoking rates vary greatly. Nez Henderson and colleagues reported in 2005 that 19% of AIAN men living in the Southwest and 10% of Southwest AIAN women were smokers compared with 49% of Northern Plains men and 51% of Northern Plains women. Consequently, local tribal differences are critical to designing and implementing any prevention campaigns or clinical care programs. Close collaboration and cooperation with tribal leaders and health care providers experienced with working in a particular AIAN community is imperative. Culturally competent care must be based upon close familiarity with, understanding of, and acceptance of, the community or communities in which one is working. Providers must strive to develop strong, collaborative relationships with key stakeholders in the community such as the tribal leadership, existing health care providers, and the older population itself. AIAN communities hold natural gatherings at specific times each year during which AIANs congregate; these gatherings are wonderful opportunities to meet and network with key stakeholders, to engage with the community on its own terms, and to disseminate health promotion and prevention messages to the community at large as well as to elders and their caregivers.

Diversity emerges in more than tribal differences in risk factors and disease patterns. Tribal peoples often have experience with various healing systems and practices. Part of working with any AIAN community is recognizing and accepting that there is likely to be more than one healing system at work. In addition to allopathic providers, there may be traditional and faith-based healers. These healers often take a holistic approach in which spirituality plays a critical role. They may treat everything seen by the allopathic provider as well as diseases and ailments not recognized by Western medicine. Health care providers may view these systems and their representatives as competition and a hindrance to compliance with the allopathic medicine non-AIAN providers typically advocate. However, a more useful approach would be to assess each individual situation, potentially even working collaboratively with a traditional or spiritual healer to provide holistic care to the patient or the community.

Careful attention should be given to individual elders' belief and value systems. Providers need to learn the specific vocabulary, modality, and context through which elders express the signs and symptoms of disease and work together with their patients to elicit ideas about appropriate healing and interventions. A reasonably detailed understanding of the healing systems functioning in their clients' community should help providers work with elders and their families to create an integrative approach that respects the communities' belief systems, provides better health care, creates greater cooperation with medical regimens, and works toward developing and maintaining relationships of trust with elders, their families, and the

greater community. Particularly in a context where trust between communities and bureaucracies has been repeatedly undermined, the establishment of trust between providers, their agencies, and AIAN communities will be a critical component for the successful implementation of public health programs for these elders.

Cultural competency and holism reach beyond the boundaries of tribal membership. The cultural boundaries of class are also important with the disproportionate numbers of AIANs living in poverty in this nation. Many older AIANs do not have retirement benefits and have difficulty navigating the paperwork to enroll in the federal or state programs for which they are eligible. According to the 2000 Census, only 16.8% of AIAN households have members aged 65 and above (compared with 31.3% nationally) and 50.3% have members aged below 18 (compared with 36.5% nationally). However, AIAN communities typically hold strong cultural values that encourage and support families providing for elders in a way that creates an immediate support group in which public health workers and clinicians can pool in to work to an elder's advantage. However, it is important to remember that just because an AIAN elder lives with his or her family, he or she does not automatically have a safe environment in which to live. Given the higher rates of poverty in AIAN communities, families that provide housing and care for an elder can be stretched beyond their limited resources, with elders creating a drain on resources that weakens and threatens the family. Special services may need to be made available to link elders with appropriate social service programs. Web-based resources such as the National Indian Council on Aging may be useful as a starting point but ultimately it is the providers' knowledge of local services and their ability to link up elders and their families with services that could make an important difference.

It is very important that research be conducted to collect and analyze health data on AIANs so that we can understand what is happening in AIAN populations compared with other populations over time. Given the emphasis on evidence-based practice and policymaking, the dearth of hard data on health indicators in the AIAN population is dangerous. AIANs are more often than not a silent nonpresence in the national reports. This makes lobbying for funds and policy changes problematic, to say the least. Data on key health indicators must be systematically collected for all AIANs, registered tribal members or not, reservation residents or urban dwellers, and it must be made available for analysis. Careful consideration must be made of how race is assigned in health data collection and systems developed to more accurately assign membership to AIANs. The disparity in health status reported by Healthy People 2000 is ongoing and increasing. This fact in combination with the significant impact of obesity, diabetes, heart disease, and disability in this population indicates that there is a great deal of work still to be done to improve the health of AIAN elders. Culturally appropriate, accessible, affordable, quality care, which is designed to meet the special needs of AIAN elders, is sorely needed. Public health providers working with this population may well need to take on an active advocacy role, pushing for higher appropriations, restructured financing, and expanded quality services directed to elder AIANs.

Related Topics

Access to health care, Diabetes, Disability, Medicaid, Minority seniors, Rural health, Smoking

Suggested Readings

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Paakka E, Stehr-Green P, Becker TM (2005) Measuring the health status gap for American Indians/Alaska natives: getting closer to the truth. Am J Pub Halth 95:838–843

Probst JC, Glover CG (2004) Person and place: the compounding effects of race/ethnicity and rurality on health. AM J Pub Health 2004:1695–1703

Suggested Resources

Achieving Cultural Competence: A Guidebook for Providers of Services to Older Americans and Their Families. http://www.aoa.gov/prof/adddiv/cultural/CC-guidebook.pdf

AHRQ 2003 National Healthcare Disparities Report. http://www.qualitytools.ahrq.gov/disparitiesreport/archive/2003/download/download_report.aspx

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Indian Health Service, Trends in Indian Health 1998–1999. http://www.ihs.gov/PublicInfo/Publications/index.asp
National Archive of Computerized Data on Aging. http://www.icpsr.umich.edu/NACDA/
National Indian Council on Aging. http://www.nicoa.org/
US Department of Health and Human Services, Indian Health Service. www.ihs.gov/MedicalPrograms/ElderCare/index.asp

Amputation

Janet M. Blanchard

The word amputation refers to loss of a limb or body part. This is a feared complication of accidents and some medical disorders. Fortunately, the causes that lead up to amputation can, in many instances, be avoided. The major causes of amputation include traumatic injury, ischemic event (loss of blood supply), and metabolic disorders.

Traumatic Amputations

These amputations are caused by accidents, many of which can be avoided—snowblowers and lawn mowers are a prime cause. Everyone realizes they should not put their hands or feet into either machine while they are running—however slips, falls, or accidents using sticks or other objects with a mower or blower running can easily be associated with a traumatic incident that can lead to amputation.

Ischemic Amputations

This type of amputation can occur when arteries to extremities are compromised. A classic example of this is frostbite. When an extremity is exposed to extreme cold, the blood vessels to the extremities constrict. This in turn shuts down the blood supply (oxygen) to the tissues. When the tissue no longer receives oxygen, it dies. The extremity turns black and it either self-amputates or must be surgically removed. The extremities most commonly affected are the hands and feet, but the ears are also susceptible. The most common cause of ischemia that leads to amputation is smoking. This is an avoidable situation and much attention is being directed toward cessation. The offending constituent of smoke is nicotine, which causes blood vessels to constrict and form plaques. In turn, the vessel narrows and decreases the blood supply to the extremity. Eventually, the blood vessel may close down. A warning sign may be cramping of the calf muscle (claudication) with exercise. The extremity may eventually lose total blood supply and, if not addressed, can lead to amputation. There are state-of-the-art evaluations to help diagnose, and surgical procedures available to treat, this condition.

Metabolic (Diabetic) Amputations

Diabetes is becoming an epidemic in the United States, both in children and adults. Although diabetes can be hereditary, obesity is fast becoming the primary cause. Diabetes causes two problems: (1) damage to the peripheral (end) vessels, which can lead to reduced feeling in the foot (neuropathy)—a phenomenon that is most commonly found in the foot; and (2) damage to the peripheral blood vessels, which in turn decreases the oxygen and necessary nutrients going to the tissues. The combination of these two can lead to tissue breakdown, which is termed an ulcer. A classic example is wearing a shoe that can cause a blister. When a person without diabetes has a blister, it feels very sore and he or she will generally take appropriate steps to alleviate this phenomenon. Diabetics, however, will not feel this, and instead of developing a blister, they will experience tissue breakdown and possible infection. This can lead to gangrene and bone infection. If the damage is severe enough, it can lead to amputation. Approximately 40–60% of all amputations occur in patients with diabetes.

Some of the above phenomena can be avoided by careful control of blood sugar with proper medication, monitoring blood sugar, losing weight, exercising, etc. Education about proper diabetes care is essential, that is, wearing correct shoes, checking the feet on a regular basis, and good skin hygiene. There are many diabetic clinics dedicated to this education. In summary, although some of the factors that lead to eventual amputation are hereditary, many can be avoided with appropriate lifestyle and health-care behaviors.

Related Topics

Accidents, Diabetes, Foot care, Smoking

Suggested Readings

Apelqvist J, Larsen J (2000) What is the most effective way to reduce incidence of amputation in the diabetic foot? Diab Metabol Res 16(Suppl l):875–883

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Anemia

Linda Mileti

According to the Centers for Disease Control and Prevention, anemia affects approximately 3.4 million Americans. It is common in women with heavy menstrual periods, pregnancy, persons with chronic diseases, and older age. The exact prevalence in older adults is unclear; however, one study estimates that in persons aged 65 and older, anemia is present in 11% of men and 10% of women. The prevalence rises with increasing age. Among older persons, anemia is associated with greater physical decline, which in turn can lead to increased falls. It is also associated with depression, impaired cognitive function, and in severe cases congestive heart failure.

Anemia is defined as a lower than normal number of red blood cells (RBCs) in the blood, usually measured by a decrease in the amount of hemoglobin. Hemoglobin is an iron-rich protein in RBCs that transports oxygen to the body's muscles and organs. With anemia, the body produces too few healthy RBCs, loses them, or destroys them. Some examples of underproduction include iron deficiency anemia, vitamin deficiency anemia, anemia of chronic disease, and anemia associated with bone marrow disease. Blood loss is most common with menstrual bleeding and bleeding from the gastrointestinal (GI) tract. Finally, examples of destruction include hemolysis from autoimmune disorders, medications, or sickle cell anemia.

Iron deficiency is the most common form of anemia. The bone marrow needs iron to make hemoglobin. In older adults, common causes of iron deficiency include chronic blood loss from an ulcer, colonic polyp, or colon cancer. A diet poor in iron causes anemia as well.

Deficiencies in vitamin B12 and folate may cause anemia is which the bone marrow makes large, abnormal RBCs. This is seen in patients with intestinal disorders or with malnutrition. Anemia of chronic disease is seen most commonly with cancer, rheumatoid arthritis, other chronic inflammatory disorders, and kidney failure. Bone marrow diseases that cause anemia include leukemia and myelodysplasia, a preleukemic condition. Other cancers of the blood or bone marrow such as multiple myeloma or lymphoma can also cause anemia.

Anemia from blood loss most commonly occurs with heavy menstruation and bleeding from the GI tract such as from an ulcer, polyp, or cancer. One way the body gets iron is by recycling it from RBCs that die. However, with blood loss, iron is lost. Anemia from blood loss often presents as iron deficiency anemia.

Finally, destruction of RBCs can occur with autoimmune disorders, in which the body attacks its own RBCs. Certain medications can cause this as well. Initially the signs and symptoms of anemia can be subtle. As it progresses, individuals may report fatigue, pale skin, dizziness, and shortness of breath. Some, particularly those with coronary artery disease, may feel chest pain. Older persons in particular may experience cognitive impairment such as confusion. If severe, patients may go into congestive heart failure. On physical exam, patients may have pale skin, tachycardia, or low blood pressure. Other findings may include inflammation of the tongue called glossitis and is seen with iron, folate, or vitamin B12 deficiency. Jaundice or an enlarged spleen may be seen with hemolytic anemias. Neurologic abnormalities such as numbness, tingling, or loss of balance may be seen with vitamin B12 deficiency.

The way to diagnose anemia is by doing a through history, physical exam, and complete blood count (CBC). The CBC will show the hemoglobin concentration in the blood. It can also give information about the size of the RBCs. For example, with iron deficiency anemia or anemia of chronic disease, the size of the RBCs will be smaller, known as microcystosis. In contrast, with vitamin B12 or folate deficiencies, the RBCs will be larger, known as macrocystosis. Iron studies can be checked as well and, if consistent with iron deficiency anemia, a colonoscopy may be necessary to look for colon cancer or precancerous lesions. A procedure known as an esophagogastroduodenoscopy (EGD) in which a small scope is guided to the stomach may be necessary to look for an ulcer. In some cases, a bone marrow biopsy may be done to diagnose anemias associated with bone marrow disease.

Treatment depends on the cause of the anemia. With iron deficiency, iron supplements can be used. If the iron deficiency is caused by a bleed in the GI tract, further treatment of an ulcer, polyp, or cancer is necessary. Vitamin B12 and folate deficiencies can be treated by improving the diet, taking oral supplements, or treating the intestinal disorder. Anemia of chronic disease and anemias associated with bone marrow diseases may improve by treating the underlying disease. Erythropoetin, a hormone produced by the kidneys that stimulates the bone marrow to produce RBCs, may be injected to help patients with these conditions. With some hemolytic anemias, removal of the spleen may be necessary. Transfusion of RBCs may be necessary to improve the blood pressure, heart rate, or symptoms; however, this should be done after the cause of the anemia is determined. Many types of anemia cannot be prevented. However, making sure of a diet rich in iron, folate, and B12, and careful follow-up with the primary care doctor are helpful.

Related Topics

Colonoscopy, Endoscopy, Gastroesophageal reflux disease

Suggested Readings

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Anger

Carol I. Tsao

Anger is characterized as an emotional state that assigns blame for some real or perceived wrong and has the adaptive purpose of seeking to correct the wrong and/or prevent its repetition. This definition of anger presupposes that the "perceived wrong" was unjustified and the response ("correction" and/or "prevention") must be proportionate to the provocation. According to this view, anger is socially important because it attempts to limit the original wrong, thereby potentially reducing the overall damage. Interpersonally, anger holds another accountable for his or her wrongful actions. Optimally, the wrongdoer will come to realize his or her own error and gain an understanding of the angry person's perspective.

Anger is a common emotion. On average, people report becoming angry once or twice a week. The most frequent targets of anger are intimates, family, or friends. Anger may be expressed in a variety of ways depending on the person and circumstances. Common responses include discussion with the wrongdoer, verbal rebukes, and verbal withdrawal. Angry responses may escalate to include raising one's voice and physical departure. Among emotionally healthy adults, only rarely does anger result in direct physical battery against the wrongdoer.

Anger needs to be distinguished from hostility. From the perspective of emotion, hostility includes feelings of anger. Hostility, as noted by Barefoot and other behavioral scientists, is associated with other negative feelings as well, usually contempt and disgust. Although hostility may have been instigated by a perceived wrong, the hostile person usually holds preexistent skeptical or cynical beliefs about others. These feelings lead to a different motivation on the part of the hostile person. Whereas the motivation of the angry person is to correct or prevent recurrence of the wrong,

the motivation of the hostile person is to hurt the perceived wrongdoer.

Anger, unlike hostility, may have positive adaptive value. For instance, Averill contended that anger could have a positive impact on health if the angry person acknowledges the anger and uses it in the service of positive action. Patients with cancer have been shown to have a better prognosis if they become angry at their disease and not merely afraid or demoralized. A possible explanation for their superior outcome is that the angry person is more likely to take a proactive role in treatment. On the other hand, Barefoot has suggested that considerable evidence exists to show that chronic hostility has deleterious effects on health. Hostility, the critical component of the so-called type A behavior pattern, increases risk for coronary heart disease. It has also been shown to be related to other forms of cardiovascular disease and early mortality from these disease entities as well. Hostility may impair health through one or more mechanisms. These include cultivation of poorer health habits, increased levels of stress, and decreased social support.

Anger and Aging

Little is known about the links between anger and aging. Some researchers have observed that, in general, older people are less angry than younger people. Schieman's work suggests that among older people, work and family status, social and personal circumstances, and socioemotional orientation may be important variables that determine the amount of anger expressed or experienced. In one of two surveyed populations, he found that married or widowed elders were less angry than divorced or separated elders. In all populations he examined, employed or retired older people were found to be less angry than unemployed people. Schieman also found that fewer persons living in the household, less economic hardship, and less interpersonal conflict were related to less anger on the part of older people. Finally, he found that older people with a greater sense of control or mastery and less sense of shame experienced less anger.

Mastery of anger has been shown to be related to early-life parental permission to experience anger. When young, those who mastered their anger had parents who tolerated and "held" their anger. These parents did not treat their child's anger as something impermissible or something to be eradicated. As a result, these children grew up to be adults who learned to express their anger by healthily transforming it into play or competition.

Mastery of anger is important to the successful engagement of major life tasks. In early, middle, and late adulthood, the major tasks to be engaged are intimacy, career consolidation, and generativity, respectively. In the Harvard University Study of Adult Development, Vaillant followed longitudinally and interviewed 89 adults, finding that ill and unhappy 70-year-old men were several times more likely to have reported, at age 47, that they expressed anger "either through explosive outbursts or by burying it deep within themselves." In contrast, three quarters of healthy and happy 70-year-old men reported, at age 47, "graceful and attenuated ways of expressing anger."

Related Topics

Accidents, Alcohol use, Crime, Emotions, Generativity, Social stress

Suggested Readings

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Angioplasty

Robert Stern · Christopher Allen · Gus Beck

Heart disease has been the leading cause of death in the United States since 1990. Nearly 13 million Americans are afflicted with coronary artery disease (CAD), which causes nearly 30% of deaths in the United States. The total annual cost of CAD, including coronary angioplasty and stenting, coronary artery bypass grafting, medications, and hospitalizations, exceeds $50 billion. The Centers for Disease Control and Prevention (CDC)

in Atlanta estimates that nearly 61 million Americans (almost one fourth of the population) suffer from disability as a result of CAD. It is also a leading cause of premature, permanent disability among working adults. Key risk factors for CAD include advanced age, male gender, elevated low-density lipoprotein (LDL) cholesterol levels, low high-density lipoprotein (HDL) cholesterol levels, diabetes mellitus, and smoking (Hurst).

Myocardial (heart muscle) ischemia and infarction are the end result of progressive CAD, or blockage of the coronary arteries in the heart. Ischemia produces reversible damage to myocardial cells, whereas infarction is permanent cell death. Both are caused by an imbalance in myocardial oxygen supply and demand. Usually this imbalance is caused by atherosclerotic cholesterol plaques that reduce blood flow to the heart muscle. Survival of heart muscle is dependent on the level and duration of ischemia (Hurst). Restoration of blood flow to the heart is often crucial in limiting overall myocardial damage and preventing death. Therapies to restore heart blood flow include clot-busting medications, coronary artery bypass graft (CABG, open heart surgery), and angiography with angioplasty.

Angiography is a method of utilizing x-ray to visualize blood vessels. The procedure, performed by a cardiologist, involves injecting a contrast medium or x-ray dye into the blood vessels, thus allowing the vessels to be easily visualized. Angioplasty involves attaching a tiny balloon to a catheter, and using angiography to guide the placement of the balloon within a coronary artery blockage. The balloon is then inflated, thus opening the blocked artery. Recently, stents have been inserted into the newly opened artery to help preserve blood flow. Patients are usually sedated or given analgesia at the site of catheter insertion into an artery; however, they remain awake for the procedure. Angioplasty can usually be completed in approximately 30 minutes, and the average hospital stay is less than 2 days. More than two million angioplasties are performed worldwide each year and angiography has become the gold standard for diagnosing CAD.

The main indication for cardiac angiography and angioplasty is angina pectoris or chest pain. Symptoms may include a heavy, crushing pain or pressure behind the sternum or over the heart. The pain may radiate to either of, or both, the arms, usually the left arm. It may also be felt in the throat, jaw, or less commonly between the shoulder blades. Associated symptoms may also include sweating and shortness of breath. The symptoms are commonly experienced during physical exertion, psychological stress, extreme cold, or a heavy meal, and often resolve in 2–10 minutes. Cardiac angiography and angioplasty are also very effective treatments to open a blocked artery during an acute heart attack.

There are many benefits associated with cardiac angiography and angioplasty. Angiography can be used to diagnose the extent of coronary artery obstruction and help guide cardiac angioplasty or CABG. Cardiac angioplasty also improves survival rates when used during an acute myocardial infarction, or heart attack. Angioplasty is also useful in preventing chest pain and improving physical functioning, with overall success rates as high as 96–99%.

The risks of cardiac angioplasty are similar to any invasive procedure and include infection and bleeding. Additional risks are uncommon and include complete blockage of one of the heart arteries, stroke, arrhythmia, kidney failure, allergic reaction to the x-ray dye, need for immediate bypass surgery, and death. Significant complications are extremely rare and occur in approximately 2% of patients, with death occurring in less than 0.5% of cases (Hurst).

One of the disappointments of cardiac angioplasty is its failure to reduce mortality rates and future heart attacks. While angioplasty has been useful in relieving symptoms associated with heart disease and improving quality of life, other treatments such as medications and open-heart bypass surgery have achieved reductions in mortality. Today, the standard of care dictates that most patients diagnosed with blockages that can be treated by angioplasty techniques will receive a stent (American Heart Association [AHA]/Food and Drug Administration [FDA]). Cardiologists now utilize stents coated with a medication, which helps reduce the possibility of future blockages in that artery. In the future, we can expect further technologies to be used to treat patients who suffer from CAD and help deliver other therapies to the heart arteries and muscle.

Related Topics

Cardiovascular disease, Coronary heart disease

Suggested Readings

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Suggested Resources

Heart Disease. www.cdc.gov/nccdphp/bb_heartdisese/

Heart Info. www.heartinfo.org/ms/guides/17/main.html

Percutaneous transluminal coronary angioplasty (PTCA). www.ptca.org

Anti-aging Remedies

David L. Larson

In order to make sound decisions in dealing with the remedies to alter and "control" the aging process, it is important to appreciate the factors that contribute to the aging process. Some of these remedies might be apparent to the most casual observer—do not smoke, stay out of the sun, eat the right foods, and exercise regularly—but others are less intuitive and should be considered. The key to antiaging is not just to live longer but to combine that longevity with good health, so that those extra years can be fully enjoyed. It is as much a matter of attaining and maintaining a good quality of life. Of course, there is no single "magic bullet," but rather a number of remedies that work together to affect the quality of life lived.

Aging occurs in organ systems, tissues, cells, organelles, and molecules of any living thing. Forces that cause aging in humans can be divided into two general categories: internal and external. Internal forces that cause aging include oxidative stress caused by free radicals (the modern term is "reactive oxygen species" [ROS]), and may be the primary cause of aging. This free-radical oxidative stress is like the damage from the wind and water erosion on the pyramids, except that it occurs in a far briefer time frame in humans. Internally produced ROS have been found to damage macromolecules like deoxyribonucleic acid (DNA), proteins, and lipids inside cells. These damaged macromolecules may, in some cases, be subsequently removed by the action of antiaging forces (discussed later), or they may irreversibly accumulate, thus constituting aging forces.

Among the external forces that produce aging are unhealthy diet, inappropriate lifestyle, unhealthy social habits, environmental pollution, and stress. Alterations in gene expression are also considered a major cause of cancer and aging by allowing the accumulation of DNA damage and mutations in cells as they reproduce. These internal and external forces can combine to work in a synergistic manner to accelerate the aging process (e.g., an "unfavorable" gene pool from one's parents in a person who smokes and drinks alcohol excessively will produce premature aging). Likewise, these internal and external forces can work together in a positive way, combining a "favorable" gene pool and healthy personal habits.

Although the gene pool inherited from one's parents cannot be altered, and most of the time we can do little about the urban environment in which we work and live, there are significant areas that can be controlled and thereby make a real difference in longevity and its life quality.

There are four proven methods of extending life and a fifth that is implied. Some of these have been proven in laboratory animals and then applied to humans, but many have been confirmed by prospective, longitudinal studies in humans. All are reported in peer-reviewed literature and readily accessible in medical journals.

Nutrition

Eating the proper foods is vital to controlling the aging process. Most peoples' diets are not healthy and substantially contribute to the aging process. Sensible eating includes daily dietary portions of fresh vegetables and fruit, while minimizing the intake of white bread, pasta, rice, and potatoes (a good eating rule is taking these as one would a condiment), and entirely eliminating the intake of any "fast foods," which contain

animal-based "trans" fats. Fresh fish, poultry, and lean red meat one or two times a week, all in portions that are about the size of the palm of one's hand, will provide the right amount of protein for healthy living. The ideal diet contains about 25% protein, 50% carbohydrates, and 25% fats. Other healthy foods include olive oil, legumes, nuts, and a glass of wine daily.

Restricting Calories

Caloric restriction and fasting extends life span and decreases overall morbidity and mortality. This works not just by reducing weight but also by decreasing the oxidative stress on the cells, allowing them to survive longer. There is also good evidence that this restriction favorably impacts diabetes, hypertension and stroke, skin disorders, asthma, arthritis, cancer, chronic fatigue syndrome, sleeping disorders, infertility, allergies, and a host of other maladies common to the human condition. The decrease in mortality has been confirmed repeatedly in monkey, mouse, and rat studies. The translation of these findings to the human condition is not a direct correlation, but there are some parallels. Fasting and caloric restriction produces positive biologic effects on energy, protein, and lipid metabolism, as well as impacting the immune, hormonal, and reproductive systems. The mechanisms of this action include diminishing of aging forces by lowering the rate of gene damage and reducing free-radical production while enhancing gene reparation, neutralizing free radicals, enhancing immune response, and increasing elimination of damaged cells. Before engaging in fasting it is important that a physician be consulted.

Dietary Supplements

Regarding antiaging drugs and supplements, most labeled foods give a detailed percentage of recommended daily allowances (RDA) contained in the food. These are accurate, but there are many scientists who feel that there should be a supplement to the RDA. Among the most important are antioxidants and fatty acids. Antioxidants are by far the most potent antiaging agents. The theory of free radicals and free-radical scavengers (substances that break the chain of free radicals and disperse it) has evolved as an important theory of aging. What is known is that antioxidants decrease disease susceptibility and should certainly be part of a healthy antiaging regimen. Among the recommended vitamins and mineral supplements are a standard multivitamin tablet with mineral supplements; vitamin C (1000 mg), which is a strong water-soluble antioxidant; and vitamin E (300 international units), the most significant fat-soluble, chain-breaking antioxidant in human blood. Another supplement agreed upon by most scientists is a daily intake of omega-3 fatty acids found in fish oil. A daily supplement of calcium is particularly useful for women in preventing osteoporosis. There is controversy in this subject and it is therefore important that a person work with a nutritionist and/or a physician to determine what is best and appropriate for individual needs.

Exercise

The relation of physical activity and aging has been well established in longitudinal studies of both men and women, and is considered essential for anyone serious in antiaging efforts. We know that moderate exercise (three times/week), rather than a strenuous workout, improves one's health and extends healthy quality years to a life span. Regular physical activity positively impacts the body by lowering stress levels, lowering blood pressure, strengthening the heart muscle and improving circulation, burning fat and redistributing it in the body, and increasing the level of endorphins, which induces a greater feeling of happiness, well-being, and self-confidence. Additionally, exercise reduces the level of glucose and cholesterol in blood, improves the respiratory system, and helps maintain healthy levels of calcium in the bones, thereby reducing the effects of osteoporosis.

Mind–Body Relationship

The link between "quality of life" and longevity is harder to prove from a scientific basis, and most of the information we have is more intuitive and deduced by considering the negative effects of poverty, poor dietary habits, and living under excessive amounts of stress. The "mind–body" link will be better understood when there is a better grasp of hormonal control mechanisms. One reasonable conclusion is that we

should pay attention to the need for relaxation, taking time away from work or other activities that predictably cause stress to our body's systems.

There is much that can be done to lengthen and enhance quality of life; some of these are controllable such as developing a healthy lifestyle and minimizing exposure to environmental habits that cause premature aging. Those aging elements inherent in our gene makeup will work synergistically for either a positive or negative effect on aging, primarily based on the choices of one's personal habits. Overall, it is important to make wise decisions based on one's desires, abilities, and needs, combined with professional input from health-care providers.

Related Topics

Baby boomers, Cellular theory of aging, Continuity theory of aging, Cross-linkage theory of aging, Diet, Early retirement, Exercise, Gerontology, Life expectancy, Nutrition

Suggested Readings

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Kant AK, Schatzkin A, Graubard BI, Schairer C (2000) A prospective study of diet quality and mortality in women. JAMA 283:2109–2115

Koenig HG, Hays JC, Larson DB, George LK, Cohen HJ, McCullough ME, Meador KG, Blazer DG (1999) Does religious attendance prolong survival? A six-year follow-up study of 3,968 older adults. J Gerontol 54:M370–M376

Roizen MF, Stephenson EA (1999) Real age: are you as young as you can be? HarperCollins, New York

Suggested Resources

National Heart, Lung, and Blood Institute, National Institute of Health, NHLBI Health Information Center, 30105 Bethesda, MD. Tel: 20824–0105 (301)592–8573. www.nhlbi.nih.gov

National Institute on Aging, Building 31, Room 5C27, 41 Center Drive, MSC 2292 Bethesda, MD 20892. Tel: (301) 496–1752. www.nih.gov/nia

Anxiety Disorders

Virginia E. Ayres

The term "anxiety disorders" refers to a category of psychiatric illnesses that are more chronic than substance use or affective (mood) disorders, with 28.8% of the general population having had some type of anxiety disorder in their lifetime. The *Diagnostic and Statistical Manual of Mental Disorders*, Fourth Edition, Text Revision (DSM-IV-TR) classifies 12 anxiety disorders: panic disorder without agoraphobia, panic disorder with agoraphobia, agoraphobia without history of panic disorder, specific phobia, social phobia, obsessive–compulsive disorder, posttraumatic stress disorder, generalized anxiety disorder, acute stress disorder, anxiety disorder due to a general medical condition, substance-induced anxiety disorder, and anxiety disorder not otherwise specified.

Although lifetime prevalence rates based on a random community survey for any anxiety disorder in older adults (above 60) range from 10% to 15.3%, anxiety disorders receive less clinical and research attention in this age group than depression or dementia. One reason for this is that anxiety that co-occurs with primary depression is seen as symptomatic of the depression; thus a clear picture of the anxiety may not be achieved and the anxiety may be undertreated. Additionally, medical conditions or drug side effects and substance use (alcohol, stimulants, etc.) may confound the assessment of anxiety. The cost to society is significant as older adults with anxiety disorders report an increase in the use of health services and a decrease in mental well-being and health.

The two most common anxiety disorders in the general population are social phobia (12.1% lifetime prevalence) and simple phobia (12.5% lifetime prevalence). Adults between the ages of 25 and 34 have the highest prevalence rates. In older adults, phobic and generalized anxiety appear most frequently for the first time when compared with other anxiety diagnoses. Women are twice as likely to have any anxiety diagnosis, except social phobia where the ratio is three women to two men. Risk factors for anxiety disorders include lower socioeconomic status, female gender, and living in the northeast region of the United States. Older men (aged 55–85) with anxiety disorders have a higher mortality risk than women. There are no

differences among races. Individuals with anxiety disorders of any age are highly likely to have another coexisting mental disorder, but only a small number actually seek treatment.

Anxiety is a universal feeling that is normal and adaptive in the right circumstances. However, a problem exists when the level of anxiety begins to interfere with functioning or causes considerable emotional distress. In most of the disorders outlined here, the level of anxiety experienced causes the suffering person to seek refuge by avoiding the source of anxiety or by performing some neutralizing behavior until the lifestyle is drastically hampered, or to experience intense anxiety in the face of the source.

Panic attacks are a central feature of several of the anxiety disorders. These are episodes of intense anxiety in which at least 4 of the following 13 symptoms peak very quickly: increased heart rate, sweating, shakiness, short of breath, choking feelings, chest pain, abdominal distress, dizziness, feelings of unreality or detachment from self, fear of losing control or dying, tingling, chills, and hot flushes. Panic-like symptoms are fewer in number than are required for a full-fledged panic attack, but can also include other incapacitating symptoms (e.g., severe headache). Panic attacks or panic-like symptoms can be unexpected, situationally bound, or situationally predisposed. The first type occurs unpredictably, whereas the second occurs in the presence of a trigger, and the third can be in response to some stimulus although at other times attacks do not occur with the same stimulus (e.g., an attack may occur after entering a mall but at other times this may not happen).

A diagnosis of panic disorder with agoraphobia is given when agoraphobia occurs along with unexpected full-fledged panic attacks during a month of concern about one of the following: fears of another attack, the implications of the attack, or a marked change in behavior associated with the attacks. Panic disorder without agoraphobia has the same criteria for diagnosis, except that it occurs in the absence of agoraphobia symptoms. On the other hand, a diagnosis of agoraphobia without history of panic disorder is made when agoraphobia symptoms are related to fears of developing the panic-like symptoms without a history of full-fledged panic attacks. Prevalence rates of panic disorder in older adults range from 0.1% to 1%, with the onset of new cases in old age as rare and symptoms less severe than in younger age groups. Agoraphobia prevalence rates are estimated at 7.8% in adults above 65. Lifetime prevalence rates for agoraphobia without panic in those aged 60 and older is 1%. Agoraphobia in old age is usually triggered by some type of acute physical illness or traumatic experience.

Specific phobia and social phobia are similar in that the increased anxiety is situationally bound to a specific trigger(s). In specific phobia this can be anything from animals, to storms, to public transportation. Older adults report flying, lightning, and heights most often as a focus of phobia. When these triggers can be easily avoided, functioning is rarely impaired (e.g., fear of buses, but no need to travel by bus). However, when the specific phobia is something occurring in everyday life, the impairment can be considerable, such as fear of tunnels when living in New York City. In social phobia, the anxiety arousal is linked to social interactions and feared negative evaluations by others. Since anyone can speak to one at any time, individuals may experience more of a general anxiety arousal than those with other anxiety disorders. Individuals with this disorder will adopt a range of avoidance behaviors to manage their anxiety, at times with significant consequences (e.g., turning down a promotion that requires more social interaction).

For adults 65 and older, the prevalence rate for any phobic disorder is higher in women (6.1%) than men (2.9%), with overall rates at about 4.8%. One study found social phobia to be less common (1.3%) than specific phobia (2.1%) in older adults. Lifetime prevalence rates for those aged 60 and older are 7.5% for specific phobia and 6.6% for social phobia. There is some evidence that older adults with phobias have more medical and psychiatric problems when compared to control subjects.

Individuals who worry excessively and are unable to control it may be experiencing generalized anxiety disorder (GAD). Associated body symptoms include feeling restless, irritable, and easily fatigued. Sore muscles and sleep disturbance may also accompany the anxiety. The focus of worry is usually everyday things like work, school, or family finances but it is severe enough to cause impairment in functioning or cause significant distress. Prevalence rates of GAD in elderly adults are estimated to range from 2% to 7%, with a lifetime prevalence rate of 3.6% in those aged 60 and older. An epidemiological study indicates that 7% of adults report the onset of GAD above the age of 60. In older adults seeking treatment, 25% reported a GAD

onset above the age of 60. When older adults develop GAD with comorbid depression, which occurs in 25–48% of cases, they report greater symptom severity and suicidal ideation than those with a sole diagnosis of major depression. In these instances the depression is usually treated as the primary problem. Due to the significant overlap of these disorders, researchers continue to investigate whether GAD and depression are separate disorders or a single disorder along a continuum.

Individuals with obsessive–compulsive disorder (OCD) experience recurrent intrusive thoughts or behaviors that are time-consuming enough to impair functioning or cause significant distress. Obsessions are not worries about everyday problems, but instead can be about contamination (touching a public door handle), order (distress when objects are asymmetrical), or aggressive imagery (hurting a child). Attempts are made to ignore these thoughts or to neutralize them with some repeated action (e.g., hand washing). These repeated actions (compulsions) serve to lower the anxiety associated with the unwanted thoughts or impulses. At times this may also take the form of mental acts (e.g., repeating words to oneself or counting). Compulsions can be related to the obsession (e.g., checking that the iron is unplugged in response to fear that the iron was left on and may start a fire) but in other cases, may have nothing to do with them (such as counting backwards from 100 to neutralize fear of hitting someone while driving). Attempts to avoid provoking situations or objects can lead to greater decrease in functioning. Older adults have an OCD prevalence rate of 0.6% in random community surveys to as high as 1.4% for men and 4.7% for women in institutional samples. Lifetime prevalence rates are lower (0.7%) in those aged 60 and older. The onset of obsessive orderliness in old age may indicate the presence of dementia. For some elderly adults, there may be a development of OCD behavior that occurs in the context of a depressive illness.

Posttraumatic stress disorder (PTSD) develops after exposure to some extreme traumatic stressor, which was experienced directly, witnessed, or learned about, that involved either actual or threatened death or injury or threat to physical integrity of others or self. The person's reaction to the event is one of intense horror. Triggers can be anything reminiscent of the original event including similar sounds, smells, dreams, or internal body sensations. Symptoms include a feeling that one is reexperiencing the event, avoidance of any cues that are related to the original trauma, and increased arousal (e.g., sleep difficulties, irritability) that persist for more than a month. Those who develop PTSD continue to experience a myriad of symptoms long after a typical recovery period. Lifetime prevalence rates for PTSD in those aged 60 and older is 2.5%. There is little research on PTSD in older adults. Available information is conflicting with some studies reporting no qualitative differences between young and old, whereas others challenge those conclusions reporting that older adults experience less severe symptoms overall but more estrangement from others. Acute stress disorder is similar to PTSD but it involves significant dissociative symptoms (e.g., dazed, numb) and the duration is shorter, that is, a minimum of 2 days and a maximum of 4 weeks after the traumatic event occurs.

Anxiety disorder due to a general medical condition and substance-induced anxiety disorder are diagnosed when anxiety symptoms from panic, GAD, or OCD occur in direct relation to a medical condition in the former or, in the latter, as a response to a medication or drug. Pulmonary, neurologic, and cardiovascular medical conditions are the most frequently cited as producing anxiety in older populations. Substances most often associated with increased anxiety symptoms in the elderly are stimulants, alcohol, antidepressants, steroids, and anticholinergic medications. A diagnosis of anxiety disorder not otherwise specified is made when anxiety symptoms are predominant but do not meet criteria for any of the specific disorders listed above.

Hypotheses regarding individual differences in vulnerability to anxiety include genetic, cultural, and personality factors, early childhood experiences, and other learned factors. When assessing anxiety symptoms in elderly adults, it is important to conduct a clinical evaluation that includes a detailed history of medications and substances used along with laboratory tests that can assist with diagnosing underlying medical conditions.

Various pharmacologic and psychologic interventions are available to target specific anxiety symptoms. Numerous medications are available to treat specific anxiety disorders, most notably the selective serotonin reuptake inhibitors (SSRIs), serotonin/norepinephrine uptake inhibitors (SNRIs), monoamine oxidase inhibitors (MAOIs), buspirone, tricyclics, beta-blockers,

carbamazepine, and benzodiazepines. These medications appear to have the same efficacy in both older and younger adults. The newer medications such as the SSRIs (sertraline, paroxetine, fluoxetine, and fluvoxamine) and SNRIs (venlafaxine, also available in extended release) are the most frequently prescribed anxiety medications, replacing benzodiazepines in both young and old. These newer medications are less toxic in overdose, better tolerated, and have a lower risk of anticholinergic and cardiovascular side effects (orthostatic hypotension, tachycardia, confusion, etc.). This is particularly relevant in the treatment of older adults who are more sensitive to physiologic changes.

Benzodiazepines continue to be used as an acute treatment and as an adjunct to other more effective anxiolytics. To reduce the risk of adverse effects in older adults, it is beneficial to use benzodiazepines that have a short half-life and are inactivated by hepatic (liver) metabolism (e.g., lorazepam). Long-term use of benzodiazepines in the elderly is not recommended due to a number of hazardous complications that may arise such as the potential for dependence, drowsiness, respiratory problems, and cognitive and psychomotor impairment that may lead to falls. Clinical trials have shown buspirone to be an alternative to benzodiazepines in the treatment of GAD. Although it can take up to 4 weeks to achieve therapeutic benefit, it appears to be better tolerated in older adults and produces fewer, if any, side effects when given with other medications the older adult may be taking for medical conditions. Despite these benefits, it is not used often in clinical settings, which may be due to a lack of consistent therapeutic response. When prescribing medications to elderly adults, it is important to consider a number of issues such as physiologic changes associated with aging, presence of medical conditions, and other medications being taken at the time. To reduce side effects, it is generally recommended that medications be started out at a low dose and increased gradually over time.

Common psychotherapeutic treatments include exposure-based therapies, behavioral therapy, cognitive restructuring, and relaxation training. Cognitive behavioral therapy (CBT) has been found helpful in the treatment of GAD to a limited degree with elderly adults, although discussion groups and supportive psychotherapy had similar effects. There is also some evidence that CBT is helpful in treating personality disorders (PDs) in the elderly, lowering both anxiety and depressive symptoms.

Related Topics

Cognitive behavioral therapy, Depression, Emotions, Psychotherapy, Stress

Suggested Readings

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Stanley MA, Beck JG, Novy DM, Averill PM, Swann AC, Diefenbach GJ, Hopko DR (2003) Cognitive-behavioral treatment of late-life generalized anxiety disorder. J Consult Clin Psychol 71 (2):309–319

Suggested Resources

American Association for Geriatric Psychiatry. www.aagpgpa.org

Aphasia

Nimish J. Thakore

Aphasia (also known as dysphasia) implies an acquired disorder of speech or language resulting from brain damage (lesion) or pathology. Aphasia must be distinguished from developmental disorders of language (e.g., developmental dyslexia), dysarthria (abnormal articulation with normal content, such as slurred

speech), dysphonia (abnormal vocalization), and mutism (absence of speech). Aphasia can result from a variety of lesions, usually of the left side of the brain (left hemisphere), such as stroke, trauma, tumor, and infection. Aphasia from stroke has been studied the most. Aphasia can also be a manifestation of diffuse degenerative disorders of the brain such as Alzheimer's disease. Primary progressive aphasia represents a distinctive degenerative process in which there is relatively circumscribed loss of language function.

The prevalence of aphasia is unknown. It is estimated that more than one million individuals in the United States suffer from aphasia. The majority of cases result from stroke or head injury. Stroke alone causes more than 80,000 new cases of aphasia annually in the United States. About 20–30% of stroke survivors are left with persistent aphasia. Because the incidence of stroke and Alzheimer's disease rises with age, aphasia is probably more prevalent in older people. Impaired communication from aphasia results in disproportionately severe loss of autonomy, function, quality of life, and self-esteem.

Historically, our understanding of cerebral function has advanced greatly through the study of aphasia. Pierre Paul Broca (1861) is credited with localizing speech to the left hemisphere. More than 95% of right-handed and up to two thirds of left-handed individuals have language function residing in the left hemisphere. Karl Wernicke (1874) developed a model of language, which was subsequently refined by Ludwig Lichtheim (1885). According to this model, speech areas are located in a region of the left hemisphere surrounding the sylvian fissure (perisylvian region). Within this region, a receptive or sensory area (Wernicke's area) in the left upper temporal lobe recognizes speech that is heard or read. The lower frontal lobe contains the expressive or motor area (Broca's area), which works with spoken or written speech. For understanding speech, Wernicke's area communicates with numerous brain areas farther away from the sylvian fissure (association cortex). Association cortex generates thoughts, which are communicated to Broca's area to be expressed as spoken or written speech. Repetition of speech takes place through a direct communication (arcuate fasciculus) between Wernicke and Broca's areas, and does not need to involve the association cortex. Despite criticism and failings, elements of this classical model have survived for more than a century Recent advances in neurologic x-ray techniques reveal a more complex network of cortical areas in both hemispheres involved in the understanding and production of speech.

Aphasia is assessed by neurologists, speech pathologists and therapists, neurolinguists, neuropsychologists, physiatrists, and other experts who work with stroke or head injury patients. The bedside examination of aphasia involves a systematic study of various aspects of speech including (1) spontaneous speech and fluency, (2) comprehension, (3) repetition, (4) naming, (5) reading, and (6) writing. The presence of pauses, indirect speech, paraphasic errors (word substitutions), or neologisms (nonsensical words) is assessed. Formal assessment of speech involves examination of these modalities using a standardized testing tool, such as the Boston Diagnostic Aphasia Examination or Western Aphasia Battery.

Depending upon the pattern of deficits, aphasia can be classified into types. Motor, expressive, or Broca's aphasia manifests as markedly reduced fluency of spontaneous speech with relatively preserved meaning, preserved comprehension, and impaired repetition. Motor aphasia usually results from a large left frontal lesion. Sensory, receptive, or Wernicke's aphasia presents with poor comprehension, poor repetition, and fluent and sometimes excessive speech output, often with nonsense-type content because of paraphasias and neologisms. Sensory aphasia usually results from a lesion of the left upper temporal region. Conduction aphasia represents a disorder of impaired repetition with relatively preserved comprehension and fluency, attributed to interruption of the arcuate fasciculus (disconnection syndrome). Other disconnection syndromes are transcortical motor and sensory aphasias, from lesions disconnecting motor and sensory areas respectively from the association cortex. Transcortical aphasias differ from corresponding sensory and motor aphasias in that repetition is relatively preserved. Unlike sensory, motor, and conduction aphasias, which result from perisylvian lesions, transcortical aphasias usually result from more peripheral lesions in the left hemisphere. Global aphasia implies loss of all aspects of language function, and usually results from a large left hemispheric lesion. Transcortical sensorimotor aphasia, also known as isolation of the speech area, resembles global aphasia, but repetition without understanding is preserved (echolalia). For most major aphasia types, reading and writing are affected in parallel with verbal language. In addition to these major types, limited syndromes may result from smaller lesions. Word-finding difficulty without significant impairment of fluency,

comprehension, or repetition is also termed anomia or dysnomia. This pattern is not specific to a particular lesion location in the left hemisphere. It is a common language manifestation of Alzheimer's disease. Of interest is alexia (inability to read) without agraphia (inability to write). This unusual disconnection syndrome results from a lesion in the area connecting the two hemispheres and left occipital lobe. Aphasia usually occurs from a cortical lesion (surface lesion of the hemisphere), but may also result from a deep hemispheric lesion. Crossed aphasia refers to the rare occurrence of aphasia from a right hemispheric lesion in a right-handed individual.

Aphasia tends to affect both or all languages in bilingual or multilingual individuals. Often, differential involvement or recovery of languages is seen. There is controversy about which language recovers earlier. One theory states that recovery of the most familiar language is earlier. In contrast, another theory is that the recovery of the native language is earlier.

In the setting of a stroke, patterns of speech deficit can change over time. For instance, sensory aphasia at onset can improve to conduction aphasia over weeks. Aphasia spontaneously improves for as long as 1–2 years after stroke, until a permanent state of functioning is reached. Aphasia is usually treated with speech and language therapy, which involves taking subjects through graded repetitive language tasks tailored to specific deficits, targeting associated attention and cognitive deficits, and teaching compensatory or alternative means of communication. Although convincing evidence of efficacy from randomized controlled trials is lacking, meta-analyses, observational data, and expert opinion do suggest that intense speech therapy, particularly in the first 3 months after stroke, has a favorable effect on eventual language recovery. Alternative treatments, such as medications, are in general less proven and not as popular.

Related Topics

Alzheimer's disease, Communication disorders, Dementia, Speech disorders, Stroke

Suggested Readings

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Area Agency on Aging

Sara Ingram

The Area Agencies on Aging are a nationwide network of agencies working together for one common goal. That goal is to plan, coordinate, and offer services to elderly Americans and caregivers. The Agency is an organization in which elderly Americans and their caregivers can gain information and assistance in order to allow the elderly Americans to continue living in their home individually if they choose, and to maintain a certain level of independence. The organization works both on national and state levels to ensure that these citizens have access to relevant information, necessary assistance, and any support that they or their caregivers may need.

The Area Agencies on Aging were created under the Older Americans Act in 1973. This legislation was enacted to assist Americans who were 60 and older to explore care options within their local communities. Later amendments authorized grants to the Area Agencies on Aging.

At the national level, the National Association of Area Agencies on Aging operates as a central facility for the 655 Area Agencies on aging throughout the United States. It is located in Washington, DC, which allows it to advocate for the needs of the organization as a whole. Some of its programs include older driver safety, making the link, and volunteer promotion.

At the state level, the agencies are organized with a central theme in mind, the ability to assist elderly

Americans to live independently in their homes if they choose to do so, as well as to assist their caregivers—whether they are a family member or a close friend. The agencies provide a center for information, programs, and assistance.

Area Agencies on Aging provide numerous services and assistance in a number of areas in services such as referral assistance, health insurance counseling, client assessment, care management, transportation, caregiver support, and retirement planning and education. This type of assistance is given on an individual basis. The client assessment allows individuals to be assessed for their needs and eligibility for certain programs and assistance.

The agencies also provide community-based services that include employment services, senior centers, congregate meals, adult day care services, and volunteer opportunities. The employment services assist elderly Americans in finding employment. The process includes testing, placement, and education. The senior centers and congregate meals allow elderly Americans a place to gather for meals and for social interaction. The agencies also provide various in-home services such as meals-on-wheels, homemakers, chore services, telephone reassurance, friendly visiting, energy assistance and weatherization, emergency response systems, home health services, personal care services, and respite care. These services allow elderly individuals to remain living in their home by bringing meals to their homes, providing cleaning services, and arranging for numerous other services.

The agencies also provide assistance in the area of elder rights such as legal assistance, elder abuse prevention programs, and ombudsmen services for complaint resolution.

The Area Agencies on Aging are used by many different types of people, of which the most common are elderly Americans. Another group that commonly uses the services of the Agencies is that of caregivers. Caregivers are usually family or friends who are ultimately responsible for the care of their elderly loved one. Caregivers use the services to receive information, obtain services such as meals on wheels, and ensure that the elderly individuals in their care are taken care of in the best way possible.

More information about these services and opportunities available to the elderly and their caregivers may be obtained by contacting the community Area Agencies on Aging.

Related Topics

Access to health care, Activities of daily living, Adult day care, Altruism and volunteerism, Assisted living, Caregiving and caregiver burden, Case management, Family relationships, National Council on Aging, Older Americans Act, Social support, Transportation services

Suggested Resources

Administration on Aging. http://www.aoa.gov

Area Agencies on Aging. Mailing address: 1730 Rhode Island Ave, NW, Suite 1200, Washington, DC 20036. Tel: 1-800-677-1116; www.n4a.org

Eldercare Locator. http://www.eldercare.gov/eldercare/Public/network/aaa.asp

Older Americans Act & Amendments 42 USC 3001

Arthritis

Douglas Flagg

The word "arthritis" literally means joint inflammation, but in common usage it has come to mean any condition that adversely affects joints. Joints are highly specialized regions where bones join together, allowing movement with minimal friction. In an order of magnitude, there is actually less friction in the interaction of joint components than is produced by ice moving on ice. This is largely the result of the major components of a joint: cartilage, synovial fluid, and the synovial lining. Cartilage is the substance that lies between the bones at the joints and, combined with the synovial fluid, allows for the very low friction between joint surfaces. Cartilage has no blood supply and receives its nutrients from synovial fluid. The synovial fluid in turn gets these nutrients from the small blood vessels (capillaries) in the synovial lining of the joint. These capillaries are different from most in that they are very porous (fenestrated), which allows nutrients to cross into the joint fluid.

The supporting structures of a joint include the fibrous joint capsule as well as ligaments, which connect bone to bone, and tendons, which connect muscle

to bone. Movement is provided by the action of the muscles, either directly or through the tendons. Bursae are spaces that occur in areas with a lot of movement. They may be visualized as deflated balloons containing a few drops of oil, positioned between other moving structures. The two sides of the "balloon" are then able to move against each other with minimal friction. The terms tendonitis and bursitis refer to pain and inflammation of these structures, respectively.

The major symptoms of arthritis are joint pain and stiffness. These as well as other symptoms and clinical findings can be used to provide an organized approach to the diagnosis and treatment of arthritis, of which it is said there are over 100 different types. Broadly speaking, arthritis may be divided into two major categories: inflammatory and noninflammatory. In inflammatory arthritis, as the name implies, there is an active immune response involving the joint. In contrast, in noninflammatory arthritis, there is minimal if any active immune response. The duration of the arthritis is another critical factor to determine. Acute arthritis usually comes on suddenly and lasts less than 6 weeks, while chronic arthritis is defined as lasting more than 3 months.

Arthritis may be further characterized by the number and type of joint(s) involved, and the symmetry of the arthritis. Polyarthritis involves multiple joints, while oligoarthritis (or pauciarthritis) involves three or less, and monoarthritis involves only one. Symmetric arthritis involves the same joint or group of joints on both sides of the body at the same time, and is contrasted to asymmetric arthritis, in which a given joint is only involved on one side. An example of symmetric arthritis would be one that involves both wrists, while asymmetric arthritis might involve the right ankle and the left wrist. Thus inflammatory arthritis that lasts more than 3 months and involves multiple joints in a symmetric fashion may be referred to as "chronic symmetric inflammatory arthritis." This approach greatly narrows down the types of arthritis that need to be considered in a given patient.

Pain is the symptom of arthritis for which most people seek treatment. The precise location of pain as well as factors that aggravate and improve it is helpful in determining the type of arthritis. Another useful symptom is that of morning stiffness. In inflammatory arthritis the stiffness or "gel" on first arising in the morning will usually last for longer than an hour, while in noninflammatory arthritis it frequently lasts less than 30 minutes. This is the single most useful symptom in differentiating between these two categories, as morning stiffness (with the important exception of fibromyalgia) that lasts more than an hour is almost always a sign of inflammatory arthritis.

Clinical characteristics of all types of arthritis include joint warmth, redness, and swelling. When synovial fluid accumulates to the point that it is clinically apparent, it is referred to as an effusion. In all types of arthritis this synovial fluid can be expected to contain inflammatory cells. These cells are derived from circulating white blood cells (WBCs) and their number and type can be helpful in distinguishing between various types of arthritis. In inflammatory arthritis synovial fluid contains a large number of these cells, while in noninflammatory arthritis their numbers are usually low. Warmth and redness are also more prominent in inflammatory arthritis and are usually a reflection of inflammation of the synovial lining of a joint.

Lab evaluation of arthritis may also be very helpful in determining whether it is inflammatory or not. Tests for inflammation such as the erythrocyte sedimentation rate (ESR) and C-reactive protein (CRP) may be elevated. Anemia may also be prominent. In some types of arthritis the presence of autoantibodies may be diagnostic. Autoantibodies occur when antibodies are formed to normal cellular structures. In some cases, these antibodies are felt to be the cause of the arthritis; in many others, their role is less clear, but they remain useful for diagnostic and prognostic purposes. Many other specific tests for different types of arthritis are also available.

X-rays also help to differentiate types of arthritis. Since cartilage does not show up on x-rays, the condition of the cartilage is inferred by the space remaining between the bones called the joint space. Other signs that may be noted on x-ray include erosions (where the inflamed tissue has eaten into the bone), thickening or sclerosis of the bone beneath the cartilage, bony proliferation, and even bony fusion *(*ankylosis*)* of the joint. Other types of x-rays such as computed tomography (CT) and magnetic resonance imaging (MRI) may also be helpful in select cases.

Table 1 shows some common examples of the different types of arthritis, based on the above criterion. These types of arthritis may be further divided into more specific categories in terms of whether they are acute, symmetric, etc. It is important to note that these differentiations are not absolute and there is much overlap between categories.

Table 1

	Polyarthritis	Monoarthritis
Inflammatory	Rheumatoid arthritis	Gout
	Systemic lupus erythematosus	Infectious arthritis
	Serum sickness	Reactive arthritis
	Viral arthritis	
Noninflammatory	Osteoarthritis	Traumatic arthritis
	Hemochromatosis	Osteoarthritis
	Acromegaly	Osteonecrosis

Treatment of arthritis varies depending on the type of arthritis; however, some basic principles apply. The main goals of treatment are the alleviation of pain, maintenance of joint function, and prevention of further joint damage. Medications play an important role, but should be used in conjunction with physical therapy and exercise when appropriate. Maintaining a proper diet and body weight is also very important. Literally hundreds of treatments, both mainstream and alternative, are available. Some have been shown to be effective and many have not. Given the chronic nature of arthritis pain and the lack of a complete cure, arthritis patients are frequently taken advantage of by those whose interest is more financial than altruistic. Thus it is wise to be wary of treatments that seem too good to be true.

Medications used in the treatment of arthritis begin with those that are least likely to cause side effects. Pain medications such as acetaminophen (Tylenol) are often the first line of therapy. Many patients benefit from nonsteroidal anti-inflammatory drugs (NSAIDs), although increasing attention is being given to their gastrointestinal, cardiac, and other side effects. For those not responding to the above, stronger pain medications such as narcotic analgesics may be considered. In inflammatory arthritis, the use of corticosteroids, which are potent anti-inflammatory medications, may be very beneficial, but their long-term use is limited by side effects. Corticosteroids may also be given by injection directly into a joint or localized area of pain. This allows for immediate benefit with minimal systemic effect. Medicines that suppress or alter the functioning of the immune system, known as immunosuppressive medications, are frequently used in the treatment of inflammatory arthritis.

Physical therapies play an important role in arthritis. Pain is often caused or aggravated by mechanical forces on the joint and muscle imbalances. Muscles act as the shock absorbers for the joints, so maintaining proper muscle strength and balance through carefully selected exercises is critical to restoring proper functioning of the joint. Modalities such as heat, massage, and ultrasound may also provide some benefit.

When the above therapies fail to provide adequate pain relief or restore the joint to an acceptable level of functioning, surgery may be of benefit. Joint replacement surgery is now one of the most commonly performed surgeries with over half a million hip and knee replacements performed each year.

By following a carefully considered approach, accurate diagnosis and effective treatment may be realized in most cases of arthritis. Recent advances in understanding the basic mechanisms for arthritis have led to treatment breakthroughs in many conditions. We can anticipate more such advances in the near future.

Related Topics

Fibromyalgia, Osteoarthritis, Rheumatoid arthritis, Systemic lupus erythematosus

Suggested Readings

Klippel JH (ed) (2001) Primer on rheumatic diseases, 12th ed. Arthritis Foundation, Atlanta, GA

Moskowitz R (ed) (1989) Clinical rheumatology, 3rd ed. Saunders, Philadelphia, PA

Suggested Resources

American College of Rheumatology. www.rheumatology.org

Asians and Pacific Islanders

Christina M. Saunders Sturm

The US Census Bureau estimated that in 2004 approximately 13 million Asian Americans and Pacific Islanders (AAPIs) were residing in the United States, almost 2 million of whom are aged 55 and older.

Approximately 3% of the 65 and older US population is Asian American (AA), and a much smaller percentage is Native Hawaiian and Other Pacific Islander (NHOPI). The percentage of both groups is expected to rise, with AAs growing to 8% by 2050, an estimated 7 million individuals. Although Asians are the smallest of the largest four racial and ethnic groups (white, non-Hispanic; Hispanic; Black and Asian), they are the fastest-growing minority group overall and the second fastest-growing older group.

AAPI elders constitute a highly diverse group of individuals, not only culturally but also in terms of socioeconomic standing, access to health care, acculturation to the United States (including English language proficiency), healthy lifestyle practices, and morbidity and mortality patterns. Current thinking, incorporated into the 2000 Census, differentiates the AAPI political category into two major subgroups: AAs, representing dozens of cultural groups from almost 30 nations of the Far East, Southeast Asia, and the Indian subcontinent; and NHOPIs, representing 20 Pacific Island cultures. Over 100 languages and a multitude of cultural and religious beliefs are held. Older AAPIs in particular are likely to hold fast to their native traditions and beliefs, creating a need for providers to learn how to interact and communicate with their clients in a way that recognizes, acknowledges, and respects the cultural contexts of their lives.

An important rationale for subdividing the AAPI grouping into AAs and NHOPIs is that there are the many important differences in health indicators between these two groups. While the data are very limited, all indications are that AAs as a whole have much better health and life expectancy than NHOPIs, although there is great diversity between AA subgroups as well. Because AAs constitute 95% of the AAPI category, the problems of NHOPIs have been masked. For example, life expectancy is about 80 years for most AAs (5 years higher than that of white Americans), whereas it is only slightly more than 68 years for Native Hawaiians and Samoans. The age-adjusted death rate for all AAPIs is 350 per 100,000, whereas that of Native Hawaiians alone is 901 (compared with 524 for the total US population). The leading causes of death for AAs are cancer, heart disease, and stroke, whereas for NHOPIs they are cancer, heart disease, and diabetes.

Other important mortality risk differences exist between subgroups that need investigation. According to the National Healthcare Disparities Report (NHDR) released in 2004, AAPIs, like other racial and ethnic minorities, tend to have worse health and lower-quality health care when compared to whites, although their overall life expectancy and activity levels are higher. In particular, many AAPIs subgroups tend to suffer disproportionately from cardiovascular disease, certain cancers (liver and stomach), tuberculosis, diabetes, and hepatitis. Older AAPIs appear to suffer disproportionately from dementia and other mental disorders that are very difficult to access care for, especially among non-English proficient elders. Cancer screening rates are significantly lower. AAPIs report longer waits to see their provider, rate their health as being worse, and have difficulty understanding healthcare directions. This population does fare somewhat better than most other minorities even on measures where they lag behind whites; however, indications are that the overall AAPI statistics mask severe disparities with the NHOPI populations. Diabetes, cardiovascular disease, and risk factors such as obesity, smoking, and physical inactivity are present at high levels in these populations.

AAPI, particularly NHOPI communities, are often underserviced, and the services are even further underutilized. For immigrant older adults, there are substantial adjustment issues as they are more likely to experience stress associated with the acculturation process, isolation due to language barriers, devaluation of their status as an elder, and difficulty adjusting to their separation from homeland friends, families, communities, and peers. The NHDR did find that AAPIs do compare well in terms of patient safety, timeliness of care received, and patient-centered quality of care, although the measures for Asians alone are somewhat lower than whites and there is a great deal of variation between subgroups when categorized by national origin.

Baseline data on each unique AAPI subgroup need to be systematically collected in order for empirically based health initiatives such as the goals of Healthy People 2010 to be addressed. The relative dearth of data in combination with the perception of AAPIs as passive, compliant, and without needs has led to the real problems of these communities being ignored. Cultural factors such as an unwillingness to seek public sector care or to express needs contribute to the failure to seek out available resources. Elders may particularly benefit not only from better access to culturally appropriate health care but also from social services and social interaction. A "model minority" that has

additionally been stereotyped as wealthy and educated with relatively good health—AAPIs in general, let alone the older population—has not been closely studied. Although it is clear that data are lacking due to small sample sizes and the concentration of the populations in specific states (California, New York, and Hawaii), there has been little effort to oversample the population or to use other methods that could enable comparative statistical analyses of the AAPI population as a whole or of its many subpopulations.

Elder AAPIs have substantial barriers to good health care and healthy practices. Many live in substandard housing, lack health insurance, and have unreliable transportation options. These issues of poverty are important to many elders as the current estimated 24.1% of AAs living in poverty does not include NHOPIs, who, according to data from the US Census Bureau, tend to be less affluent, and masks the elderly, who also tend to be poorer. In addition, a large percentage of the AA population consists of immigrants who often have difficulty navigating the health-care system, due to the unfamiliarity of the system and, more importantly, limited English proficiency (LEP). While LEP affects each subgroup at different levels, the highest levels are among AA subgroups such as the Hmong and Cambodians and the lowest levels are among NHOPIs.

LEP is an extremely serious barrier for elder AAPIs, particularly those from Southeast Asia. LEP may lead to misunderstanding of directions as well as inability to access educational materials in the patient's native language. Evidence suggests that acculturation level, as measured by language use at home, is an important indicator of access to quality care, with those who are more acculturated having the best care relative to those who are least acculturated.

Cultural barriers are critical to accessible quality care as well. Providers need to understand the cultural context of symptoms in order to interpret their meaning and potential causes as well as to understand the variety of causal understandings and treatment options a particular population may ascribe to. Attitudes about the body as well as the position of the care provider may influence the client–provider interaction in important ways that the provider needs to understand and respond to appropriately. Providers often rely on "on-the-spot" translators such as family members or nonclinical hospital staff, leading to costly and sometimes dangerous results. Fortunately, translation services that provide professionals who are trained advocates and are competent in the cultural as well as the language components of translation are becoming more available.

Use of traditional or complementary and alternative medicines (T/CAM) by older AAPIs appears to be high, especially in a context in which the most accepted forms of T/CAM and the most readily available, such as acupuncture, manipulation, and herbal supplements, tend to have Asian origins. However, many insurers, including Medicaid and Medicare, do not pay for these treatments. It is important that providers be able to establish a relationship of open communication and trust with their clients that allows for discussion of T/CAM options in a context of a holistic approach to healing that will fit with a more culturally appropriate model of health and healing for these communities.

In addition to the need for more research and data collection, there is a pressing need for culturally appropriate services geared toward each distinct older AAPI population's needs and strengths. A holistic approach that values the cultural strengths of the target community and works to build infrastructural capacity as well as identifying, training, and providing culturally competent providers will work toward addressing the many health-care needs of these distinct and widely diverse populations. Working with communities to identify critical concerns and culturally appropriate services should be a core strategy of any intervention effort. Many people concerned with the health of AAPIs also argue that without a special federal designation for institutions and organizations targeting AAPI populations, capacity building within AAPI communities will remain limited as they are denied access to the services and funding available to other designated minority groups.

Related Topics

Acculturation, Minority seniors, Morbidity, Mortality

Suggested Readings

Federal Interagency Forum on Aging Related Statistics (2004). Older Americans 2004: key indicators of well-being. Federal Interagency Forum on Aging Related Statistics. Government Printing Office, Washington, DC

Ghosh C (2003) Healthy people 2010: Asian Americans/Pacific Islanders: defining a baseline of information. Am J Pub Health 93:2093–2098

Hoyert DL, Kung H-C, National Center on Health Statistics (1997) Asian or Pacific Islander mortality, selected states, 1992. Monthly Vital Statistics Report 1997. 46(1)(Suppl). Publication PHS 97–1120

Keppel KG, Pearcy JN, Wagener DK (2002) Trends in racial and ethnic-specific rates for the health status indicators: United States, 1990–1998. Healthy People 2000 Statistical Notes 23

Suggested Resources

AHRQ 2004 National Healthcare Disparities Report. http://www.qualitytools.ahrq.gov/disparitiesreport/archive/2004/download/download_report.aspx

Asian and Pacific Island American Health Forum. http://www.apiahf.org/

Association of Asian Pacific Community Health Organizations. http://www.aapcho.org/site/aapcho/

Centers for Disease Control Office of Minority Health. http://www.cdc.gov/omh/

National Asian Pacific Center on Aging.www.napca.org

National Library of Medicine, Asian American Health. http://asianamericanhealth.nlm.nih.gov/chronic.html

President's Commission on Asian Americans and Pacific Islanders (2003) Asian Americans and Pacific Islanders addressing health disparities: opportunities for building a healthier America. http://www.aapi.gov/Commission_Final_Health_Report.pdf

Understanding Our Users: How to Better Deliver Online Health Information to Asian Americans, Native Hawaiians, and Other Pacific Islanders. http://odphp.osophs.dhhs.gov/projects

US Census Bureau (2002) Health, United States, 2004, table 1. http://www.cdc.gov/nchs/data/hus/hus04trend.pdf#001

For health information resources in Asian and Pacific Island languages, check out http://www.healthfinder.gov/justforyou/justforyou.asp?KeyWordID=217&branch=1

Assisted Living

Mary Jane Nottoli

Older persons today are healthier and with fewer disabilities than their counterparts from previous generations. However, the rapid growth of the segment of the population aged 85 or older poses a challenge relative to service delivery and long-term care policy. In addition to increased prevalence of chronic conditions, individuals in that age group are also likely to experience functional limitations, necessitating help with their activities of daily living.

Services in a nursing home cost, on average, $5,400 a month. Additionally, nursing homes tend to be modeled on hospitals, placing emphasis on efficiency and routine ahead of individual preferences. Assisted living emerged in the 1980s as an alternative to nursing homes to address the needs of these elders.

Assisted living aspires to provide care in a homelike environment while preserving the highest level of independence possible, and with special attention to personal dignity issues. Assisted living residences seek to offer personalized services with activities like bathing, dressing, meals, toileting, and medication management.

Regulations governing assisted living facilities vary across the nation, along with the different types of services and living quarters among such facilities. Most assisted living residences offer an assortment of services in addition to help with activities of daily living, although some facilities might require an additional fee. Living quarters may be as simple as a room located within a larger building or facility, whereas others may be as elaborate as an individual cluster of homes allowing for residents to use their own furniture.

As expected, fees increase with more ornate living quarters and more inclusive services. Although assisted living is usually paid for by the resident and the family, some costs may be reimbursable depending on the nature of the individual's health or long-term care insurance. Public policy, as evidenced by funding regulations, has generally favored nursing home care. However, some states use Medicaid waiver programs to help pay rent on behalf of income-eligible seniors to live in assisted living residences.

Because of the variability of models and services, it is advisable to use a systematic selection process before making a choice once the decision to enter an assisted living residence has been reached. A good beginning is to obtain a list of assisted living facilities in a geographic area from the Department of Health and Human Service's Elder Care Locator. This public service connects individuals with sources of information on senior services in individual states and local communities. Local offices of the Nursing Home Ombudsman maintain lists of assisted living residences as well as nursing homes. The Assisted Living Federation of America provides information about assisted living and a checklist to aid in the selection process. Other sources of information include the local Area Agencies

on Aging and the American Association for Retired Persons.

Some facilities give information and answer questions over the telephone, whereas others send brochures. Some even have information available online. It is sometimes possible to edit a long list of possible facilities based upon information gathered in this way. For example, one can ask about monthly cost, what is included in that cost, and what is available for an added fee; current openings and size of living quarters; geographic location, and its accessibility to shopping, banking, and medical services as well as proximity to family and friends; and the different levels of wellness and independence in their criteria for admission. One can then select a number of possibilities based on the facilities providing favorable answers to relevant questions on the telephone, via their brochures, or through the Internet. A visit in person can then be arranged to the facilities of interest.

Armed with a consumer checklist obtained from one of the helpful agencies or a prepared list of considerations important to the proposed resident, one can evaluate the individual assisted living residences in person. Because of the lack of standardization and regulation, there is no single source of information regarding quality, cost, services included, or accessibility of medical and social services in assisted living facilities. While visiting individual residences, one can inquire about each of these areas, as well as about the average level of dependence of current residents and the type of procedures followed when a resident becomes more dependent. Recalling that assisted living is largely private pay, it is likely that a resident will have to relocate if he or she outlives funds. Therefore, it is important to learn whether that process is facilitated by the assisted living staff.

There are a number of resources with information to help the selection procedure. Geriatric specialists, including physicians, nurses, and social workers, are often knowledgeable and skilled at guiding individuals through the process. Their input helps avoid some of the pitfalls and/or poor choices. The goal is to find an assisted living residence that provides services essential to the individual and in which the resident feels at home.

Assisted living can offer a long-term care option that combines housing, support services, and health care to seniors seeking to live an independent lifestyle with assistance that is customized to meet their needs. As residential care facilities, adult congregate living facilities, personal care homes, or community residences, assisted living offers a unique transition from independent living without care to living with independence and care combined.

Related Topics

Activities of daily living, Area agency on aging, Long-term care, Long-term care insurance, Nursing homes

Suggested Resources

Elder care Locator. www.eldercare.gov/Public/Home.asp
Navigating your way to a Quality Assisted Living Facility, American Association for Retired Persons. www.aarp.org/caregiving
What is Assisted Living? Assisted Living Federation of America. www.alfa.org/public/articles

Attachment Theory

Sara Harkness · Marjolijn Blom

A child's "attachment" to its mother or other caregiver is important for well-being and development; the relevance of attachment to functioning in later life has only recently begun to be recognized and researched. Attachment theory traces its roots to the work of John Bowlby, a British psychoanalyst who, drawing from ethology and other disciplines, proposed that a child's need for protection and proximity to its mother is as fundamental as its need for food or physical comfort. Attachment, he suggested, is an evolutionarily adaptive behavioral system that is activated when fulfillment of this need is threatened, as when the mother departs.

Mary Ainsworth, Bowlby's student and colleague, extended this theory to address the question of variability in infants' attachment-related behaviors, both in naturally occurring situations and in a laboratory procedure called the "strange situation," in which an infant and its mother are put through a controlled series of separations and reunions. Ainsworth identified a behavioral pattern of "secure attachment"

evident in approximately two thirds of infants, in contrast to two different styles of "insecure attachment" (avoidant and anxious) in the remaining third; recently, a fourth pattern called "disorganized attachment" has also been identified. Attachment theorists believe that the most important determinant of a child's attachment style is the mother–child relationship, especially "maternal sensitivity" to the infant's signals of distress. Through repeated experiences of maternal responsiveness (or lack thereof), it is hypothesized that infants develop "internal working models" or expectations of how important others in their environment will respond to their need for protection and security.

Attachment Theory and Adult Health

The relevance of the idea of attachment for adult health and well-being rests on four basic premises:

1. An individual's "internal working model," developed in infancy, becomes integrated into personality and is carried forward throughout the life course, although it may be somewhat modified by other experiences including psychotherapy.
2. "Secure attachment" is essential for the individual's propensity to explore the environment and ultimately become autonomous, necessary for the development of social competence as well as learning and emotion regulation.
3. "Secure attachment" in infancy and early childhood influences the individual's ability, as an adult, to form other successful love relationships such as with a spouse.
4. Patterns of attachment are transmitted to the next generation, such that insecurely attached parents may raise children who are also insecurely attached. Furthermore, insecurely attached mothers are more vulnerable to the effects of loss or other trauma, resulting in caretaking behavior that may confuse or frighten the child and lead to the "disorganized" attachment pattern.

Cultural Considerations

A growing body of research has attempted to test these premises, using a variety of methods including the adult attachment interview (AAI), developed by Mary Main, which elicits memories of childhood and particularly the quality of the early relationship with parents. The results of these studies have demonstrated the usefulness of the attachment construct for understanding disorders such as depression, conflicts in close relationships, and the effects of loss as in bereavement.

At the same time, much attachment research is founded on culturally based ideas about what constitutes "healthy" or "successful" development, and it may thus contribute to a failure to recognize other culturally normative patterns of family interaction and individual development. For example, the emphasis on autonomy and separation, which lies at the core of attachment theory, may be a good representation of current American middle-class beliefs and values, but it fails to capture different cultural pathways of development that emphasize social harmony and interdependence, as in Japan. Furthermore, attachment theorists tend to overemphasize the importance of the pair bond starting in adolescence, to the neglect of other continuing attachments such as those between siblings or between parents and their adult children. Finally, with a few exceptions, attachment theorists have given little attention to the role of other individual differences such as temperament in mental health, thus perpetuating the myth of the mother as the sole source of individuals' socioemotional well-being over the life course. In summary, the study of attachment in adulthood is a field still in its infancy, with much potential for healthy growth and development.

Related Topics

Depression, Family relationships

Suggested Readings

Bowlby J (1980) Attachment and loss: loss, sadness, and depression. Basic Books, New York

Grossman KE, Grossman K, Waters E (eds) (2005) Attachment from infancy to adulthood: the major longitudinal studies. Guilford Press, New York

Magai C, Consedine NS (eds) (2004) Attachment and aging. Attach Hum Dev (Special Issue) 6(4)

Parkes CM, Stevenson-Hinde J, Marris P (1991) Attachment across the life cycle. Tavistock/Routledge, New York

Rothbaum F, Weisz J, Pott M, Miyake K, Morelli G (2000) Attachment and culture: security in the United States and Japan. Am Psychol 55(10):1093–1104

Autoimmune Disorders

Lori B. Siegel

The immune system, which consists of white cells that fight off infection, is a very complex and exquisite mechanism in which the body can rid itself and kill foreign organisms that invade the host (body) while trying not to kill the host. There are specialized cells called T cells and B cells that help recognize these foreign proteins or antigens and then remove them from the body. At times, the immune system may err and attempt to attack the host tissues—as occurs in septic shock and autoimmune diseases. The main task of the immune system, however, is to protect the individual from infectious organisms (nonself) without serious injury to self.

Almost any molecule can elicit an immune response and the body learns tolerance or the ability to tell the difference between itself and foreign tissue, so that it can destroy the latter but not react against the constant exposure to one's own tissues. The immune system is constantly undergoing diverse strategies to avoid autoimmunity, where the body fights against itself. The key mechanism in the peripheral immune system is the cells that gather up the host's dead tissue, react to an invading organism, or display certain patterns of receptors on their surfaces. These patterns of receptors allow the body to recognize whether something is foreign or not. When a white cell finds a foreign protein, the pattern it displays on its surface triggers a strong reaction; the body then communicates via various chemicals and appropriate cells are mobilized to kill that organism. When the white cell encounters normal tissue, there is no reaction. Even though there is a sophisticated and overlapping system in place to avoid autoimmunity, these autoimmune conditions still occur.

Although the direct cause for this to occur is not clear, many theories and clues help in understanding this phenomenon. One theory is that autoimmune disease develops subsequent to immunization. Some foreign proteins may have deoxyribonucleic acid (DNA) protein similarities to the person's own protein and cause confusion in the immune system, and the response is not only against the foreign organism but also against the similar host protein. Another proposed mechanism of autoimmunity is that of an infection initiating autoimmune disease. Some diseases that are considered autoimmune in nature are initially beyond a doubt triggered by a previous exposure to an infection. This is seen with the reactive arthritis that develops after exposure to a nongonococcal urethritis or following gastroenteritis from shigella or salmonella.

It is felt that in these conditions the bacterial antigens are similar to host proteins and the cross-reactivity to the host tissues causes a powerful immune response. Infectious organisms can also alter the immune system directly. Viruses, such as Epstein–Barr, may cause the normal immune system to recognize cells affected by the virus as foreign and set up a path for autoimmunity. Mutations during the development of the immune system or spontaneous mutations may also set up for autoimmune diseases.

Autoimmune disease can affect any body part. Some organs may be affected initially and over time other organs may be affected. The diagnosis of autoimmune disease is not easy and may require repeated histories and physical examinations over time along with blood tests. Patients tend to evolve into a diagnosis than have the diagnosis made at the first visit.

The signs and symptoms of autoimmune diseases are grouped and categorized to help make diagnoses or establish disease conditions. Criteria for each disease or condition have been established but these are primarily for research purposes, and in the real world most people have signs and symptoms from a variety of disease groups. Autoimmune diseases must be diagnosed with extreme caution because many other diseases may mimic them. The danger is in the treatment of autoimmune disease. Because the immune system is hyperactive in autoimmune disease, treatment is aimed at suppressing the immune system. If other mimics of autoimmune disease are treated with immunosuppression, they could rapidly progress and become fatal. Even if the diagnosis of autoimmune disease is certain, the patient must be carefully evaluated to be certain that there is no lurking infection or malignancy.

The classic, prototypic autoimmune disease is systemic lupus erythematosus (SLE). The primary abnormality in SLE is production of autoantibodies to the proteins found in the core of normal cells. SLE may affect the entire body and any organ by either direct antibody attack or precipitation of the antibodies within the organ. The classic symptoms include arthritis, butterfly rash, and inflammation of the lining of the heart and lungs.

Rheumatoid arthritis is another classic autoimmune disease that can cause a symmetric and destructive erosive arthritis. Despite its name, rheumatoid arthritis can affect the entire body, not just the joints. It can cause damage in the skin, lungs, eyes, and heart.

Inflammatory muscle diseases are also autoimmune processes. These conditions cause weakness and breakdown of muscle tissue. The inflammation may be in the muscles themselves or in the blood vessels supplying blood to the muscles. The classic picture in these conditions is a symmetric weakness or pain in the muscles in the shoulder and hip areas. Patients have difficulty getting out of a chair or holding their arms up to comb their hair. In severe cases, patients may have difficulty holding their head up due to neck muscle involvement. If the respiratory muscles are involved, breathing may be compromised. The lungs may also be directly involved with the damage and cause further compromise. With some of the muscle diseases, there is an associated rash on the trunk or over the joints.

Laboratory findings of inflammatory muscle disease reflect breakdown of muscle tissue with elevations in muscle protein. Certain antibodies may be positive and are associated with lung involvement, which carries a worse prognosis. Special electrical tests of the muscles and nerves may be useful in identifying a specific group of muscles that are really inflamed, which may lead to a directed biopsy. The muscle biopsy may reveal chemical abnormalities in the muscle that cannot be detected through routine blood tests. It is important to note that patients with new onset muscle weakness and an associated rash may have dermatomyositis, a disease that is associated with cancer, in 25% of the cases. Many of the patients who present with this condition do not know they have an associated cancer and it is up to the health-care provider to look for a malignancy in patients who have this disease.

Scleroderma is another autoimmune disease that causes hardening and tightening of the skin. The materials that cause scarring and scar tissue formation are deposited in excess in these patients. Patients with scleroderma may have a wide spectrum of disease manifestations and severity. Patients often have Raynaud's phenomenon (sensitivity to cold and color changes associated with cold) or calcium deposits in the skin and muscles. They may have mild skin thickening or widespread skin involvement. Some patients progress to have kidney, lung, and heart involvement as well. The treatment of this disease is limited but research is ongoing.

Another large class of autoimmune conditions are those that cause inflammation of the blood vessels directly or vasculitis. Vasculitis may affect any size of blood vessel, and the clinical features commonly include fever, general malaise, and multiorgan involvement. In cases in which a diagnosis of vasculitis is considered, infection must be thoroughly evaluated and ruled out. The degree of organ involvement must also be thoroughly investigated and all organs examined. Signs of underlying vasculitis may be subtly found in the hands, oral mucosa, skin, and nails. A complete examination of the urine, blood, and stool should be done to look for evidence of vasculitis. Tissue biopsy is often necessary to confirm the diagnosis and allow for disease categorization. Knowing the size of vessel affected helps in determining the type of vasculitis. Small-vessel vasculitis usually involves the skin, joint, and gastrointestinal (GI) tract. Small-vessel vasculitis may also affect the brain and cause subtle behavioral or neurologic conditions. Medium-vessel vasculitis often involves the lungs and kidneys. Some classic conditions are polyarteritis nodosa, Churg–Strauss vasculitis, and Wegener's vasculitis. Large-vessel vasculitis includes Takayasu's vasculitis, polymyalgia rheumatica, and temporal arteritis. A good and detailed history usually reveals classic symptoms of these disorders. Autoimmune disorders may also cause endocrinologic disorders such as diabetes and thyroid conditions. Some neurologic conditions, such as multiple sclerosis, and hematologic conditions are also autoimmune. Interestingly, more than one autoimmune disease may occur in an individual, affecting different areas. These conditions may flare and remit, and the patterns need to be followed to help patients cope with their conditions. Often a full picture of the autoimmune disease may not become clear until years after the initial presentation. Patience and persistence in these complex and confusing patients will, with time, reveal the right diagnosis and allow appropriate treatment.

Related Topics

Giant cell arteritis, Rheumatoid arthritis, Scleroderma, Systemic lupus erythematosus

Suggested Readings

Klippel JH (ed) (2001) Primer on rheumatic diseases, 12th ed. Arthritis Foundation, Atlanta, GA

Klippel JH, Dieppe PA (1998) Rheumatology, 2nd ed. Mosby, St. Louis, MO

Klippel JH, Dieppe PA, Ferri FF (2000) Primary care rheumatology. Harcourt, London

Autoimmune Theory of Aging

Jessica Diggs

The autoimmune theory of aging, introduced by Roy L. Walford in 1969, asserts that with age, the immune system tends to lose efficiency and experiences widespread dysfunction, evidenced by autoimmunity (immune reactions against one's own body proteins) and a decreased ability to respond to infection and other immune challenges. Human immunity is a highly regulated and coordinated process, and is often divided into two components. The first, known as innate immunity, provides a defense against pathogens (potential disease-causing agents) in a nonspecific way; and the second, known as adaptive or protective immunity, involves a specific response to a pathogen that the body has seen before. Once the body is exposed to an antigen (a foreign substance or pathogen capable of causing an immune response), antibodies will be produced that specifically target that antigen.

There are many different types of cells that are involved in protecting the body against infection; the primary cells involved in the adaptive immune response are called B and T cells. B cells, which function to produce antibodies, are produced in the bone marrow. The bone marrow is the tissue located in the inside of larger bones, where red blood cells, white blood cells (immune cells), and platelets are produced. Immature white blood cells mature into T cells in the thymus gland, which lies in the upper part of the chest. There are several types of T cells, including helper T cells that produce chemical signals in order to initiate the immune response, and cytotoxic T cells responsible for destruction of antigen-bearing targets.

Age-Related Changes to the Immune System

As a person ages, the thymus gland progressively shrinks in size and decreases functionality. While the absolute number of cells remains relatively constant, T-cell function and responses are decreased, making the elderly more susceptible to the development of tumors and decreasing a person's ability to fight against viral illnesses. The amount and type of antibodies produced in response to immune stimuli are also decreased with age. This may be due to an increased proportion of senescent (nondividing) cells with age (see Cellular theory of aging) or a general degeneration of the cells of the immune system. The lack of this antibody response makes the elderly more susceptible to infectious diseases.

As a person ages there are several notable changes to the immune system, one of which is an increase in autoantibodies. These are antibodies that have lost their ability to distinguish "self," cells of the individual aging person's body, from "nonself." Examples of "nonself" cells are cells that are infected with a pathogen, cancer cells, pathogenic organisms, or foreign cell types that have infiltrated the body. Instead of having specificity for "nonself" antigens, these antibodies attack "self" antigens, leading to the dysfunction and destruction of normal body tissues—a phenomenon often referred to as autoimmune disease. The development of autoantibodies may potentially result from genetic errors that accumulate with age in cells of the immune system (see Error accumulation theory of aging).

Despite the observed increase in the number of these autoantibodies, the incidence of autoimmune diseases has not been shown to increase with age. Some examples of automimmune diseases are systemic lupus erythematosus, a systemic autoimmune disease affecting many parts of the body including the skin, kidneys, lungs, joints, blood vessels, and brain, and myasthenia gravis, a rare muscular disease associated with progressive weakness of the eyes, face, and neck muscles, in which autoantibodies attack neuromuscular junctions (areas where the nerves that control muscle function and muscle fibers meet). Other more commonly recognized autoimmune diseases include rheumatoid arthritis, insulin-dependent diabetes mellitus, and multiple sclerosis.

Public Health Perspective

Health-care professionals, public health professionals, and personal caregivers responsible for the care of aging adults must be aware and account for the changes in the immune system with age. There is also significant interindividual variability in the immune response, with many elderly individuals having normal immune function. Recognizing this variation may be particularly important for those involved in clinical research with the elderly, since this variability may limit the generalizability of study results. Although studies have not drawn a causal link between immune dysfunction and an increased incidence of autoimmune diseases or increased rates of specific infections, the elderly have been shown to experience disproportionate morbidity and mortality related to these conditions and to decreased immune functioning. Elderly people should therefore be closely monitored for the development of age-associated autoimmune diseases or cancers, and should be treated promptly and aggressively.

Given the potential for reduced defenses against infections, elderly adults should be vaccinated to prevent infections from occurring and should be given additional care as required, when faced with common infections. These precautionary measures are particularly important because the elderly tend to experience more comorbid disease and use more medications. Both comorbidity and medication usage can lead to compromised immune function and limit the ability to cope with infection and disease. Supplementation with immune-stimulating nutrients and vitamins or medications to encourage immune-cell regeneration may prove helpful in preventing some of the negative effects of age-related immune system dysfunction.

Related Topics

Arthritis, Cellular theory of aging, The error catastrophe (accumulation) theory of aging, Immunizations, Multiple sclerosis, Polypharmacy, Vitamins

Suggested Readings

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