CURRENT
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2017

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2017 CURRENT Medical Diagnosis & Treatment

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Preface

Current Medical Diagnosis & Treatment 2017 (CMDT 2017) is the 56th edition of this single-source reference for practitioners in both hospital and ambulatory settings. The book emphasizes the practical features of clinical diagnosis and patient management in all fields of internal medicine and in specialties of interest to primary care practitioners and to subspecialists who provide general care.

Our students have inspired us to look at issues of race and justice, which surely impact people's health. We have therefore reviewed the content of our work to ensure that it contains the dignity and equality that every patient deserves.

INTENDED AUDIENCE FOR *CMDT*

House officers, medical students, and all other health professions students will find the descriptions of diagnostic and therapeutic modalities, with citations to the current literature, of everyday usefulness in patient care.

Internists, family physicians, hospitalists, nurse practitioners, physicians' assistants, and all primary care providers will appreciate *CMDT* as a ready reference and refresher text. Physicians in other specialties, pharmacists, and dentists will find the book a useful basic medical reference text. Nurses, nurse-practitioners, and physicians' assistants will welcome the format and scope of the book as a means of referencing medical diagnosis and treatment.

Patients and their family members who seek information about the nature of specific diseases and their diagnosis and treatment may also find this book to be a valuable resource.

NEW IN THIS EDITION OF *CMDT*

- Updated treatment recommendations for direct-acting oral anticoagulants (dabigatran, rivaroxaban, apixaban, and edoxaban)
- New combination therapy (sacubitril plus valsartan) to improve clinical outcome in heart failure with reduced left ventricular ejection fraction
- New information on Zika virus and infection caused by *Elizabethkingia* species
- Alternative, noninvasive diagnostic tests for the diagnosis of cirrhosis
- Diagnosis of *Clostridium difficile* by PCR tests, including newly recognized NAP1 hypervirulent strains
- Treatment of recurrent *C difficile* infections with fidaxomicin
- Revised USPSTF recommendations for cardiovascular prevention methods
- New information on proprotein convertase subtilisin/kexin type 9 (PCSK9) inhibitors for hypercholesterolemia
- Latest antiviral regimens for chronic hepatitis C and treatment of autoimmune hepatitis
- New pneumococcal, meningococcal vaccines
- Update on influenza vaccines
- Update on MMR and HPV vaccines
- New FDA-approved medications for diabetes mellitus
- Update on anti-TNF and immunomodulatory therapies of inflammatory bowel disease
- New pharmacologic treatment for schizophrenia and bipolar disorder
- Updated recommendations regarding appendicitis
- New table summarizing 2015 Revised Jones Criteria for rheumatic fever
- New table outlining European Society of Cardiology guidelines for defining and diagnosing pericarditis
- Latest information on treatment options for obesity
- Updated information on dilated cardiomyopathy and Tako-Tsubo cardiomyopathy
- Extensive revision of Disorders of Hemostasis, Thrombosis, & Antithrombotic Therapy chapter
- Revised treatment recommendations for infective endocarditis
- Information on increasing deaths due to opioid overdose
- Update on predictors of acute coronary syndrome
- Updated and new treatment recommendations for HIV
- Latest treatment recommendations for latent tuberculosis in HIV-positive and HIV-negative patients
- Substantial revision of Nervous System Disorders chapter
- The combination of PET and CT imaging in preoperative staging and role of programmed cell-death-1 (PD-1) inhibitors (nivolumab and pembrolizumab) for non–small cell lung cancers
- Pharmacologic treatment for female hyposexual desire disorder

- Extensively revised section on Alcohol Use Disorder (Alcoholism)
- Updated treatment options for hepatitis C–associated renal disease and focal segmental glomerulosclerosis
- Revised treatment options for Cushing syndrome and hypercortisolism
- Latest revision of recommended adult immunization schedule from the Centers for Disease Control
- Two new online chapters: Lesbian & Bisexual Women's Health and Transgender Health & Disease Prevention
- Expanded online Podiatry chapter

OUTSTANDING FEATURES OF *CMDT*

- Medical advances up to time of annual publication
- Detailed presentation of primary care topics, including gynecology, obstetrics, dermatology, ophthalmology, otolaryngology, psychiatry, neurology, toxicology, urology, geriatrics, orthopedics, women's health, preventive medicine, and palliative care
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CMDT Online (www.AccessMedicine.com) provides full electronic access to *CMDT 2017* plus expanded basic science information and ten additional chapters. The ten online-only chapters (Anti-Infective Chemotherapeutic & Antibiotic Agents, Fundamentals of Human Genetics & Genomics, Diagnostic Testing & Medical Decision Making, Information Technology in Patient Care, Integrative Medicine, Podiatric Disorders, Women's Health Issues, Lesbian & Bisexual Women's Health, Transgender Health & Disease Prevention, and Appendix: Therapeutic Drug Monitoring & Laboratory Reference Intervals, & Pharmacogenetic Testing) are available at www.AccessMedicine.com/CMDT. CMDT Online is updated throughout the year and includes an expanded, dedicated Media Gallery as well as links to related Web sites. Subscribers also receive access to Diagnosaurus with 1000+ differential diagnoses, *Guide to Diagnostic Tests, Quick Medical Diagnosis & Treatment, and CURRENT Practice Guidelines in Primary Care.*

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Many students and physicians also have contributed useful suggestions to this and previous editions, and we are grateful. We continue to welcome comments and recommendations for future editions in writing or via electronic mail. The editors' e-mail addresses are below and author e-mail addresses are included in the Authors section.

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From inability to let alone; from too much zeal for the new and contempt for what is old; from putting knowledge before wisdom, and science before art and cleverness before common sense; from treating patients as cases; and from making the cure of the disease more grievous than the endurance of the same, Good Lord, deliver us.

—Sir Robert Hutchison

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Disease Prevention & Health Promotion

1

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GENERAL APPROACH TO THE PATIENT

The medical interview serves several functions. It is used to collect information to assist in diagnosis (the "history" of the present illness), to understand patient values, to assess and communicate prognosis, to establish a therapeutic relationship, and to reach agreement with the patient about further diagnostic procedures and therapeutic options. It also serves as an opportunity to influence patient behavior, such as in motivational discussions about smoking cessation or medication adherence. Interviewing techniques that avoid domination by the clinician increase patient involvement in care and patient satisfaction. Effective clinician-patient communication and increased patient involvement can improve health outcomes.

Patient Adherence

For many illnesses, treatment depends on difficult fundamental behavioral changes, including alterations in diet, taking up exercise, giving up smoking, cutting down drinking, and adhering to medication regimens that are often complex. Adherence is a problem in every practice; up to 50% of patients fail to achieve full adherence, and one-third never take their medicines. Many patients with medical problems, even those with access to care, do not seek appropriate care or may drop out of care prematurely. Adherence rates for short-term, self-administered therapies are higher than for long-term therapies and are inversely correlated with the number of interventions, their complexity and cost, and the patient's perception of overmedication.

As an example, in HIV-infected patients, adherence to antiretroviral therapy is a crucial determinant of treatment success. Studies have unequivocally demonstrated a close relationship between patient adherence and plasma HIV RNA levels, CD4 cell counts, and mortality. Adherence levels of more than 95% are needed to maintain virologic suppression. However, studies show that over 60% of patients are less than 90% adherent and that adherence tends to decrease over time.

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Patient reasons for nonadherence include simple forgetfulness, being away from home, being busy, and changes in daily routine. Other reasons include psychiatric disorders (depression or substance abuse), uncertainty about the effectiveness of treatment, lack of knowledge about the consequences of poor adherence, regimen complexity, and treatment side effects.

Patients seem better able to take prescribed medications than to adhere to recommendations to change their diet, exercise habits, or alcohol intake or to perform various self-care activities (such as monitoring blood glucose levels at home). For short-term regimens, adherence to medications can be improved by giving clear instructions. Writing out advice to patients, including changes in medication, may be helpful. Because low functional health literacy is common (almost half of English-speaking US patients are unable to read and understand standard health education materials), other forms of communication—such as illustrated simple text, videotapes, or oral instructions—may be more effective. For non–English-speaking patients, clinicians and health care delivery systems can work to provide culturally and linguistically appropriate health services.

To help improve adherence to long-term regimens, clinicians can work with patients to reach agreement on the goals for therapy, provide information about the regimen, ensure understanding by using the "teach-back" method, counsel about the importance of adherence and how to organize medication-taking, reinforce self-monitoring, provide more convenient care, prescribe a simple dosage regimen for all medications (preferably one or two doses daily), suggest ways to help in remembering to take doses (time of day, mealtime, alarms) and to keep appointments, and provide ways to simplify dosing (medication boxes). Single-unit doses supplied in foil wrappers can increase adherence but should be avoided for patients who have difficulty opening them. Medication boxes with compartments (eg, Medisets) that are filled weekly are useful. Microelectronic devices can provide feedback to show patients whether they have taken doses as scheduled or to notify patients within a day if doses are skipped. Reminders, including cell phone text messages, are another effective means of encouraging adherence. The clinician can also enlist social support from family and friends, recruit

an adherence monitor, provide a more convenient care environment, and provide rewards and recognition for the patient's efforts to follow the regimen. Collaborative programs that utilize pharmacists to help ensure adherence are also effective.

Adherence is also improved when a trusting doctor-patient relationship has been established and when patients actively participate in their care. Clinicians can improve patient adherence by inquiring specifically about the behaviors in question. When asked, many patients admit to incomplete adherence with medication regimens, with advice about giving up cigarettes, or with engaging only in "safer sex" practices. Although difficult, sufficient time must be made available for communication of health messages.

Medication adherence can be assessed generally with a single question: "In the past month, how often did you take your medications as the doctor prescribed?" Other ways of assessing medication adherence include pill counts and refill records; monitoring serum, urine, or saliva levels of drugs or metabolites; watching for appointment nonattendance and treatment nonresponse; and assessing predictable drug effects, such as weight changes with diuretics or bradycardia from beta-blockers. In some conditions, even partial adherence, as with drug treatment of hypertension and diabetes mellitus, improves outcomes compared with nonadherence; in other cases, such as HIV antiretroviral therapy or treatment of tuberculosis, partial adherence may be worse than complete nonadherence.

Guiding Principles of Care

Ethical decisions are often called for in medical practice, at both the "micro" level of the individual patient-clinician relationship and at the "macro" level of the allocation of resources. Ethical principles that guide the successful approach to diagnosis and treatment are honesty, beneficence, justice, avoidance of conflict of interest, and the pledge to do no harm. Increasingly, Western medicine involves patients in important decisions about medical care, eg, which colorectal screening test to obtain or which modality of therapy for breast cancer or how far to proceed with treatment of patients who have terminal illnesses (see Chapter 5).

The clinician's role does not end with diagnosis and treatment. The importance of the empathic clinician in helping patients and their families bear the burden of serious illness and death cannot be overemphasized. "To cure sometimes, to relieve often, and to comfort always" is a French saying as apt today as it was five centuries ago—as is Francis Peabody's admonition: "The secret of the care of the patient is in caring for the patient." Training to improve mindfulness and enhance patient-centered communication increases patient satisfaction and may also improve clinician satisfaction.

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HEALTH MAINTENANCE & DISEASE PREVENTION

Preventive medicine can be categorized as primary, secondary, or tertiary. Primary prevention aims to remove or reduce disease risk factors (eg, immunization, giving up or not starting smoking). Secondary prevention techniques promote early detection of disease or precursor states (eg, routine cervical Papanicolaou screening to detect carcinoma or dysplasia of the cervix). Tertiary prevention measures are aimed at limiting the impact of established disease (eg, partial mastectomy and radiation therapy to remove and control localized breast cancer).

Tables 1–1 and 1–2 give leading causes of death in the United States and estimates of deaths from preventable causes. Mortality rates continue to decline overall, but recent data suggest increased rates of death, mainly from suicide and substance misuse, among less well-educated middle-aged white adults.

Many effective preventive services are underutilized, and few adults receive all of the most strongly recommended services. Several methods, including the use of provider or patient reminder systems (including interactive patient health records), reorganization of care environments, and possibly provision of financial incentives to clinicians (though this remains controversial), can increase

Table 1–1. Leading causes of death in the United States, 2013.

Category	Estimate
All causes	**2,596,993**
1. Diseases of the heart	611,105
2. Malignant neoplasms	584,881
3. Chronic lower respiratory diseases	149,205
4. Accidents (unintentional injuries)	130,557
5. Cerebrovascular diseases	128,978
6. Alzheimer disease	84,767
7. Diabetes mellitus	75,578
8. Influenza and pneumonia	56,979
9. Nephritis, nephrotic syndrome, and nephrosis	47,112
10. Intentional self-harm (suicide)	41,149

Data from National Center for Health Statistics 2015.

Table 1–2. Deaths from all causes attributable to common preventable risk factors. (Numbers given in the thousands.)

Risk Factor	Male (95% CI)	Female (95% CI)	Both Sexes (95% CI)
Tobacco smoking	248 (226–269)	219 (196–244)	467 (436–500)
High blood pressure	164 (153–175)	231 (213–249)	395 (372–414)
Overweight–obesity (high BMI)	114 (95–128)	102 (80–119)	216 (188–237)
Physical inactivity	88 (72–105)	103 (80–128)	191 (164–222)
High blood glucose	102 (80–122)	89 (69–108)	190 (163–217)
High LDL cholesterol	60 (42–70)	53 (44–59)	113 (94–124)
High dietary salt (sodium)	49 (46–51)	54 (50–57)	102 (97–107)
Low dietary omega-3 fatty acids (seafood)	45 (37–52)	39 (31–47)	84 (72–96)
High dietary trans fatty acids	46 (33–58)	35 (23–46)	82 (63–97)
Alcohol use	45 (32–49)	20 (17–22)	64 (51–69)
Low intake of fruits and vegetables	33 (23–45)	24 (15–36)	58 (44–74)
Low dietary polyunsaturated fatty acids (in place of saturated fatty acids)	9 (6–12)	6 (3–9)	15 (11–20)

BMI, body mass index; CI, confidence interval; LDL, low-density lipoprotein.
Note: Numbers of deaths cannot be summed across categories.
Used, with permission, from Danaei G et al. The preventable causes of death in the United States: comparative risk assessment of dietary, lifestyle, and metabolic risk factors. PLoS Med. 2009 Apr 28;6(4):e1000058.

utilization of preventive services, but such methods have not been widely adopted.

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PREVENTION OF INFECTIOUS DISEASES

Much of the decline in the incidence and fatality rates of infectious diseases is attributable to public health measures—especially immunization, improved sanitation, and better nutrition.

Immunization remains the best means of preventing many infectious diseases. Recommended immunization schedules for children and adolescents can be found online at http://www.cdc.gov/vaccines/schedules/hcp/child-adolescent.html, and the schedule for adults is outlined in Table 30–7. Substantial vaccine-preventable morbidity and mortality continue to occur among adults from vaccine-preventable diseases, such as hepatitis A, hepatitis B, influenza, and pneumococcal infections.

Evidence suggests annual **influenza vaccination** is safe and effective with potential benefit in all age groups, and the Advisory Committee on Immunization Practices (ACIP) recommends routine influenza vaccination for all persons aged 6 months and older, including all adults. When vaccine supply is limited, certain groups should be given priority, such as adults 50 years and older, individuals with chronic illness or immunosuppression, and pregnant women. An alternative high-dose inactivated vaccine is available for adults 65 years and older. Adults 65 years and older can receive either the standard-dose or high-dose vaccine, whereas those younger than 65 years should receive a standard-dose preparation.

The ACIP recommends two doses of measles, mumps, and rubella (MMR) vaccine in adults at high risk for exposure and transmission (eg, college students, health care workers). Otherwise, one dose is recommended for adults aged 18 years and older. Physician documentation of disease is not acceptable for evidence of MMR immunity.

Routine use of 13-valent pneumococcal conjugate vaccine (PCV13) is recommended among adults aged 65 and older. Individuals 65 years of age or older who have never received a pneumococcal vaccine should first receive PCV13 followed by a dose of 23-valent pneumococcal polysaccharide vaccine (PPSV23) 6–12 months later. Individuals who

have received more than one dose of PPSV23 should receive a dose of PCV13 more than 1 year after the last dose of PPSV23 was administered.

The ACIP recommends routine use of a single dose of tetanus, diphtheria, and 5-component acellular pertussis vaccine (Tdap) for adults aged 19–64 years to replace the next booster dose of tetanus and diphtheria toxoids vaccine (Td). Due to increasing reports of pertussis in the United States, clinicians may choose to give Tdap to persons aged 65 years and older (particularly to those who might risk transmission to at-risk infants who are most susceptible to complications, including death), despite limited published data on the safety and efficacy of the vaccine in this age group.

Both **hepatitis A vaccine** and **immune globulin** provide protection against hepatitis A; however, administration of immune globulin may provide a modest benefit over vaccination in some settings. Hepatitis B vaccine administered as a three-dose series is recommended for all children aged 0–18 years and high-risk individuals (ie, health care workers, injection drug users, people with end-stage renal disease). Adults with diabetes are also at increased risk for hepatitis B infection, and in October 2011, the ACIP recommended **vaccination for hepatitis B** in diabetic patients aged 19–59 years. In diabetic persons aged 60 and older, hepatitis B vaccination should be considered.

Human papillomavirus (HPV) virus-like particle (VLP) vaccines have demonstrated effectiveness in preventing persistent HPV infections and thus may impact the rate of cervical intraepithelial neoplasia (CIN) II–III. The ACIP recommends routine HPV vaccination (with three doses of the 9-valent [9vHPV], 4-valent [4vHPV], or 2-valent [2vHPV] vaccine) for girls aged 11–12 years. The ACIP also recommends that all unvaccinated girls and women through age 26 years receive the three-dose HPV vaccination. Studies suggest that one dose of vaccine may be as effective as three. The ACIP recommends the routine vaccination with three doses of the 4vHPV or 9vHPV vaccine for boys aged 11 or 12 years, males through age 21 years, and men who have sex with men and immunocompromised men (including those with HIV infection) through age 26 years. Vaccination of males with HPV may lead to indirect protection of women by reducing transmission of HPV and may prevent anal intraepithelial neoplasia and squamous cell carcinoma in men who have sex with men. The use of HPV vaccine in the United States among women aged 18–26 years increased by 22% between 2008 and 2012; however, rates of immunization are low, especially among Latina women and those with limited access to care. Interventions addressing personal beliefs and system barriers to vaccinations may help address the slow adoption of this vaccine.

Persons traveling to countries where infections are endemic should take the precautions described in Chapter 30 and at http://wwwnc.cdc.gov/travel/destinations/list. Immunization registries—confidential, population-based, computerized information systems that collect vaccination data about all residents of a geographic area—can be used to increase and sustain high vaccination coverage.

The rate of tuberculosis in the United States has been declining since 1992. Two blood tests, which are not confounded by prior bacillus Calmette-Guérin (BCG) vaccination, have been developed to detect tuberculosis infection by measuring in vitro T-cell interferon-gamma release in response to two antigens (one, the enzyme-linked immunospot [ELISpot], [T-SPOT.TB], and the other, a quantitative ELISA [QuantiFERON-TBGold] test). These T-cell–based assays have an excellent specificity that is higher than tuberculin skin testing in BCG-vaccinated populations.

Treatment of tuberculosis poses a risk of hepatotoxicity and thus requires close monitoring of liver transaminases. Alanine aminotransferase (ALT) monitoring during the treatment of latent tuberculosis infection is recommended for certain individuals (preexisting liver disease, pregnancy, chronic alcohol consumption). ALT should be monitored in HIV-infected patients during treatment of tuberculosis disease and should be considered in patients over the age of 35. Symptomatic patients with an ALT elevation three times the upper limit of normal or asymptomatic patients with an elevation five times the upper limit of normal should be treated with a modified or alternative regimen.

The US Preventive Services Task Force (USPSTF) recommends behavioral counseling for adolescents and adults who are sexually active and at increased risk for sexually transmitted infections. Sexually active women aged 24 years or younger and older women who are at increased risk for infection should be screened for chlamydia.

HIV infection remains a major infectious disease problem in the world. The Centers for Disease Control and Prevention (CDC) recommends universal HIV screening of all patients aged 13–64, and the USPSTF recommends that clinicians screen adolescents and adults aged 15 to 65 years. Clinicians should integrate biomedical and behavioral approaches for HIV prevention. In addition to reducing sexual transmission of HIV, initiation of antiretroviral therapy reduces the risk for AIDS-defining events and death among patients with less immunologically advanced disease.

Since sexual contact is a common mode of transmission, primary prevention relies on eliminating high-risk sexual behavior by promoting abstinence, later onset of first sexual activity, decreased number of partners, and use of latex condoms. Daily preexposure prophylaxis with the fixed-dose combination of tenofovir 300 mg and emtricitabine 200 mg should be considered for people who are HIV-negative but at substantial risk for HIV infection. Studies of men who have sex with men suggest preexposure prophylaxis therapy is very effective in reducing the risk of contracting HIV. Patients taking preexposure prophylaxis should be encouraged to use other prevention strategies to maximally reduce their risk, such as consistent condom use and choosing less risky sexual behaviors (eg, oral sex). Postexposure prophylaxis is widely used after occupational and nonoccupational contact, and it has been estimated to reduce the risk of transmission by approximately 80%. Postexposure prophylaxis should be initiated within 72 hours of exposure.

In immunocompromised patients, live vaccines are contraindicated, but many killed or component vaccines are safe and recommended. *Asymptomatic* HIV-infected patients have not shown adverse consequences when given live MMR and influenza vaccinations as well as tetanus, hepatitis B, *H influenza* type b, and pneumococcal vaccinations—all should be given. However, if poliomyelitis immunization is required, the inactivated poliomyelitis vaccine is indicated. In *symptomatic* HIV-infected patients, live-virus vaccines, such as MMR, should generally be avoided, but annual influenza vaccination is safe.

Herpes zoster, caused by reactivation from previous varicella zoster virus infection, affects many older adults and people with immune system dysfunction. It can cause postherpetic neuralgia, a potentially debilitating chronic pain syndrome. A varicella vaccine is available for the prevention of herpes zoster. Several clinical trials have shown that this vaccine (Zostavax) is safe, elevates varicella zoster virus–specific cell-mediated immunity, and significantly reduces the incidence of herpes zoster and postherpetic neuralgia in persons older than 60 years. The ACIP recommends routine zoster vaccination, administered as a one-time subcutaneous dose (0.65 mL), of all persons aged 60 years or older. Persons who report a previous episode of zoster can be vaccinated; however, the vaccine is contraindicated in immunocompromised (primary or acquired) individuals. The durability of vaccine response and whether any booster vaccination is needed are still uncertain. Despite its availability, uptake of the vaccine remains low at 2–7% nationally. Financial barriers (cost, limited knowledge of reimbursement) have had a significant impact on its underutilization.

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PREVENTION OF CARDIOVASCULAR DISEASE

Cardiovascular diseases, including coronary heart disease (CHD) and stroke, represent two of the most important causes of morbidity and mortality in developed countries. Several risk factors increase the risk for coronary disease and stroke. These risk factors can be divided into those that are modifiable (eg, lipid disorders, hypertension, cigarette

smoking) and those that are not (eg, age, sex, family history of early coronary disease). Impressive declines in age-specific mortality rates from heart disease and stroke have been achieved in all age groups in North America during the past two decades, in large part through improvement of modifiable risk factors: reductions in cigarette smoking, improvements in lipid levels, and more aggressive detection and treatment of hypertension. This section considers the role of screening for cardiovascular risk and the use of effective therapies to reduce such risk. Key recommendations for cardiovascular prevention are shown in Table 1–3. Guidelines encourage regular assessment of global cardiovascular risk in adults 40–79 years of age without known cardiovascular disease.

Table 1–3. Expert recommendations for cardiovascular risk prevention methods: US Preventive Services Task Force (USPSTF).[1]

Prevention Method	Recommendation/[Year Issued]
Screening for abdominal aortic aneurysm (AAA)	Recommends one-time screening for AAA by ultrasonography in men aged 65–75 years who have ever smoked. (B) Selectively offer screening for AAA in men aged 65–75 years who have never smoked. (C) Current evidence is insufficient to assess the balance of benefits and harms of screening for AAA in women aged 65–75 years who have ever smoked. (I) Recommends against routine screening for AAA in women who have never smoked. (D) [2014]
Aspirin use	Recommends the use of aspirin for men aged 45–79 years when the potential benefit due to a reduction in myocardial infarctions outweighs the potential harm due to an increase in gastrointestinal hemorrhage. (A) Recommends the use of aspirin for women aged 55–79 years when the potential benefit of a reduction in ischemic strokes outweighs the potential harm of an increase in gastrointestinal hemorrhage. (A) Current evidence is insufficient to assess the balance of benefits and harms of aspirin for cardiovascular disease prevention in men and women 80 years or older. (I) Recommends against the use of aspirin for stroke prevention in women younger than 55 years and for myocardial infarction prevention in men younger than 45 years. (D) [2009]
Blood pressure screening	Recommends screening for high blood pressure in adults aged 18 years and older. (A) [2015]
Serum lipid screening	Strongly recommends screening men aged 35 years and older for lipid disorders. (A) Recommends screening men aged 20–35 years for lipid disorders if they are at increased risk for coronary heart disease. (B) Strongly recommends screening women aged 45 years and older for lipid disorders if they are at increased risk for coronary heart disease. (A) Recommends screening women aged 20–45 years for lipid disorders if they are at increased risk for coronary heart disease. (B) No recommendation for or against routine screening for lipid disorders in men aged 20–35 years, or in women aged 20 years and older who are not at increased risk for coronary heart disease. (C) [2008]
Counseling about healthful diet and physical activity for cardiovascular disease (CVD) prevention	Recommends offering or referring adults who are overweight or obese and have additional CVD risk factors to intensive behavioral counseling interventions to promote a healthful diet and physical activity for CVD prevention. (B) [2014]
Screening for diabetes mellitus	Recommends screening for abnormal blood glucose as part of cardiovascular risk assessment in adults aged 40–70 years who are overweight or obese. Clinicians should offer or refer patients with abnormal blood glucose to intensive behavioral counseling interventions to promote a healthful diet and physical activity. (B) [2015]
Screening for smoking and counseling to promote cessation	Recommends that clinicians ask all adults about tobacco use, advise them to stop using tobacco, and provide behavioral interventions and US Food and Drug Administration (FDA)–approved pharmacotherapy for cessation to adults who use tobacco. (A) [2015]

[1]**Recommendation A:** The USPSTF strongly recommends that clinicians routinely provide the service to eligible patients. (The USPSTF found good evidence that the service improves important health outcomes and concludes that benefits substantially outweigh harms.)
Recommendation B: The USPSTF recommends that clinicians routinely provide the service to eligible patients. (The USPSTF found at least fair evidence that the service improves important health outcomes and concludes that benefits substantially outweigh harms.)
Recommendation C: The USPSTF makes no recommendation for or against routine provision of the service.
Recommendation D: The USPSTF recommends against routinely providing the service to asymptomatic patients. (The USPSTF found at least fair evidence that the service is ineffective or that harms outweigh benefits.)
Recommendation I: The USPSTF concludes that the evidence is insufficient to recommend for or against routinely providing the service. http://www.uspreventiveservicestaskforce.org/BrowseRec/Index/browse-recommendations

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Abdominal Aortic Aneurysm

One-time screening for abdominal aortic aneurysm (AAA) by ultrasonography in men aged 65–75 years is associated with a relative reduction in odds of AAA-related mortality of almost 50% and possibly a reduction in all-cause mortality (OR = 0.98, 95% CI, 0.97, 1.00). Women do not appear to benefit from screening, and most of the benefit in men appears to accrue among current or former smokers. Screening men aged 65 years and older is highly cost effective.

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Cigarette Smoking

Cigarette smoking remains the most important cause of preventable morbidity and early mortality. In 2010, there were an estimated 6.3 million premature deaths in the world attributable to smoking and tobacco use. Cigarettes are responsible for one in every five deaths in the United States. From 2005 to 2009, more than 480,000 deaths per year (more than 278,000 in men and more than 201,000 in women) were attributable to smoking. Annual cost of smoking-related health care is approximately $130 billion in the United States, with another $150 billion in productivity losses. Fortunately, US smoking rates are declining; in 2014, 16.8% of US adults were smokers.

Nicotine is highly addictive, raises brain levels of dopamine, and produces withdrawal symptoms on discontinuation. Smokers die 5–8 years earlier than never-smokers. They have twice the risk of fatal heart disease; 10 times the risk of lung cancer; and several times the risk of cancers of the mouth, throat, esophagus, pancreas, kidney, bladder, and cervix. In the United States, over 90% of cases of COPD occur among current or former smokers.

In addition, over 41,000 deaths per year in the United States are attributable to environmental tobacco smoke.

Smoking cessation reduces the risks of death and of myocardial infarction in people with coronary artery disease; reduces the rate of death and acute myocardial infarction in patients who have undergone percutaneous coronary revascularization; lessens the risk of stroke; and is associated with improvement of COPD symptoms. On average, women smokers who quit smoking by age 35 add about 3 years to their life expectancy, and men add more than 2 years to theirs. Smoking cessation can increase life expectancy even for those who stop after the age of 65.

Although tobacco use constitutes the most serious common medical problem, it is undertreated. Almost 40% of smokers attempt to quit each year, but only 4% are successful. Persons whose clinicians advise them to quit are 1.6 times as likely to attempt quitting. Over 70% of smokers see a physician each year, but only 20% of them receive any medical quitting advice or assistance.

Factors associated with successful cessation include having a rule against smoking in the home, being older, and having greater education. Several effective interventions are available to promote smoking cessation, including counseling, pharmacotherapy, and combinations of the two. The five steps for helping smokers quit are summarized in Table 1–4.

Common elements of supportive smoking cessation treatments are reviewed in Table 1–5. A system should be implemented to identify smokers, and advice to quit should be tailored to the patient's level of readiness to change. All patients trying to quit should be offered pharmacotherapy except those with medical contraindications, women who are pregnant or breast-feeding, and adolescents. Weight gain occurs in most patients (80%) following smoking cessation. Average weight gain is 2 kg, but for some (10–15%), major weight gain—over 13 kg—may occur. Planning for the possibility of weight gain, and means of mitigating it, may help with maintenance of cessation.

Several pharmacologic therapies have been shown to be effective in promoting cessation. Nicotine replacement therapy doubles the chance of successful quitting. The nicotine patch, gum, and lozenges are available over the counter and nicotine nasal spray and inhalers by prescription. The sustained-release antidepressant drug bupropion (150–300 mg/day orally) is an effective smoking cessation agent and is associated with minimal weight gain, although seizures are a contraindication. It acts by boosting brain levels of dopamine and norepinephrine, mimicking the effect of nicotine. More recently, varenicline, a partial nicotinic acetylcholine-receptor agonist, has been shown to improve cessation rates; however, its adverse effects, particularly its effects on mood, are not completely understood and warrant careful consideration. No single pharmacotherapy is clearly more effective than others, so patient preferences and data on adverse effects should be taken into account in selecting a treatment. Combination therapy is more effective than a single pharmacologic modality. Recently, e-cigarettes have become popular. Their efficacy in smoking cessation, however, has not been well evaluated, and some users may find them addictive.

Clinicians should not show disapproval of patients who failed to stop smoking or who are not ready to make a quit attempt. Thoughtful advice that emphasizes the benefits of cessation and recognizes common barriers to success can increase motivation to quit and quit rates. An intercurrent illness or hospitalization may motivate even the most addicted smoker to quit.

Table 1–4. Actions and strategies for the primary care clinician to help patients quit smoking.

Action	Strategies for Implementation
	Step 1. Ask—Systematically Identify All Tobacco Users at Every Visit
Implement an officewide system that ensures that for *every* patient at *every* clinic visit, tobacco-use status is queried and documented[1]	Expand the vital signs to include tobacco use. Data should be collected by the health care team. The action should be implemented using preprinted progress note paper that includes the expanded vital signs, a vital signs stamp or, for computerized records, an item assessing tobacco-use status. Alternatives to the vital signs stamp are to place tobacco-use status stickers on all patients' charts or to indicate smoking status using computerized reminder systems.
	Step 2. Advise—Strongly Urge All Smokers to Quit
In a clear, strong, and personalized manner, urge every smoker to quit	Advice should be **Clear:** "I think it is important for you to quit smoking now, and I will help you. Cutting down while you are ill is not enough." **Strong:** "As your clinician, I need you to know that quitting smoking is the most important thing you can do to protect your current and future health." **Personalized:** Tie smoking to current health or illness and/or the social and economic costs of tobacco use, motivational level/readiness to quit, and the impact of smoking on children and others in the household. Encourage clinic staff to reinforce the cessation message and support the patient's quit attempt.
	Step 3. Attempt—Identify Smokers Willing to Make a Quit Attempt
Ask every smoker if he or she is willing to make a quit attempt at this time	If the patient is willing to make a quit attempt at this time, provide assistance (see step 4). If the patient prefers a more intensive treatment or the clinician believes more intensive treatment is appropriate, refer the patient to interventions administered by a smoking cessation specialist and follow up with him or her regarding quitting (see step 5). If the patient clearly states he or she is not willing to make a quit attempt at this time, provide a motivational intervention.
	Step 4. Assist—Aid the Patient in Quitting
A. Help the patient with a quit plan	**Set a quit date.** Ideally, the quit date should be within 2 weeks, taking patient preference into account. **Help the patient prepare for quitting.** The patient must: **Inform** family, friends, and coworkers of quitting and request understanding and support. **Prepare the environment** by removing cigarettes from it. Prior to quitting, the patient should avoid smoking in places where he or she spends a lot of time (eg, home, car). **Review** previous quit attempts. What helped? What led to relapse? **Anticipate** challenges to the planned quit attempt, particularly during the critical first few weeks.
B. Encourage nicotine replacement therapy except in special circumstances	Encourage the use of the nicotine patch or nicotine gum therapy for smoking cessation.
C. Give key advice on successful quitting	**Abstinence:** Total abstinence is essential. Not even a single puff after the quit date. **Alcohol:** Drinking alcohol is highly associated with relapse. Those who stop smoking should review their alcohol use and consider limiting or abstaining from alcohol use during the quit process. **Other smokers in the household:** The presence of other smokers in the household, particularly a spouse, is associated with lower success rates. Patients should consider quitting with their significant others and/or developing specific plans to maintain abstinence in a household where others still smoke.
D. Provide supplementary materials	**Source:** Federal agencies, including the National Cancer Institute and the Agency for Health Care Policy and Research; nonprofit agencies (American Cancer Society, American Lung Association, American Heart Association); or local or state health departments. **Selection concerns:** The material must be culturally, racially, educationally, and age appropriate for the patient. **Location:** Readily available in every clinic office.

(*continued*)

Table 1–4. Actions and strategies for the primary care clinician to help patients quit smoking. (continued)

Action	Strategies for Implementation
Step 5. Arrange—Schedule Follow-Up Contact	
Schedule follow-up contact, either in person or via telephone	**Timing:** Follow-up contact should occur soon after the quit date, preferably during the first week. A second follow-up contact is recommended within the first month. Schedule further follow-up contacts as indicated. **Actions during follow-up:** Congratulate success. If smoking occurred, review the circumstances and elicit recommitment to total abstinence. Remind the patient that a lapse can be used as a learning experience and is not a sign of failure. Identify the problems already encountered and anticipate challenges in the immediate future. Assess nicotine replacement therapy use and problems. Consider referral to a more intense or specialized program.

[1]Repeated assessment is not necessary in the case of the adult who has never smoked or not smoked for many years and for whom the information is clearly documented in the medical record.

Individualized or group counseling is very cost effective, even more so than in treating hypertension. Smoking cessation counseling by telephone ("quitlines") and text messaging–based interventions have both proved effective. An additional strategy is to recommend that any smoking take place out of doors to limit the effects of passive smoke on housemates and coworkers. This can lead to smoking reduction and quitting.

The clinician's role in smoking cessation is summarized in Tables 1–4 and 1-5. Public policies, including higher cigarette taxes and more restrictive public smoking laws, have also been shown to encourage cessation, as have financial incentives directed to patients.

Table 1–5. Common elements of supportive smoking treatments.

Component	Examples
Encouragement of the patient in the quit attempt	Note that effective cessation treatments are now available. Note that half the people who have *ever* smoked have now quit. Communicate belief in the patient's ability to quit.
Communication of caring and concern	Ask how the patient feels about quitting. Directly express concern and a willingness to help. Be open to the patient's expression of fears of quitting, difficulties experienced, and ambivalent feelings.
Encouragement of the patient to talk about the quitting process	Ask about: Reasons that the patient wants to quit. Difficulties encountered while quitting. Success the patient has achieved. Concerns or worries about quitting.
Provision of basic information about smoking and successful quitting	Inform the patient about: The nature and time course of withdrawal. The addictive nature of smoking. The fact that any smoking (even a single puff) increases the likelihood of full relapse.

Cahill K et al. Pharmacological interventions for smoking cessation: an overview and network meta-analysis. Cochrane Database Syst Rev. 2013 May 31;5:CD009329. [PMID: 23728690]

Holford TR et al. Tobacco control and the reduction in smoking-related premature deaths in the United States, 1964–2012. JAMA. 2014 Jan 8;311(2):164–71. [PMID: 24399555]

Jamal A et al. Current cigarette smoking among adults—United States, 2005–2014. MMWR Morb Mortal Wkly Rep. 2015 Nov 13;64(44):1233–40. [PMID: 26562061]

Lindson-Hawley N et al. Reduction versus abrupt cessation in smokers who want to quit. Cochrane Database Syst Rev. 2012 Nov 14;11:CD008033. [PMID: 23152252]

Martín Cantera C et al. Effectiveness of multicomponent interventions in primary healthcare settings to promote continuous smoking cessation in adults: a systematic review. BMJ Open. 2015 Oct 1;5(10):e008807. [PMID: 26428333]

National Center for Chronic Disease Prevention and Health Promotion (US) Office on Smoking and Health. The Health Consequences of Smoking—50 Years of Progress: A Report of the Surgeon General. Atlanta (GA): Centers for Disease Control and Prevention (US); 2014. [PMID: 24455788]

Rahman MA et al. E-cigarettes and smoking cessation: evidence from a systematic review and meta-analysis. PLoS One. 2015 Mar 30;10(3):e0122544. [PMID: 25822251]

Rigotti NA et al. Sustained care intervention and postdischarge smoking cessation among hospitalized adults: a randomized clinical trial. JAMA. 2014 Aug 20;312(7):719–28. [PMID: 25138333]

Rostron BL et al. Estimation of cigarette smoking-attributable morbidity in the United States. JAMA Intern Med. 2014 Dec;174(12):1922–8. [PMID: 25317719]

Stead LF et al. Combined pharmacotherapy and behavioural interventions for smoking cessation. Cochrane Database Syst Rev. 2012 Oct 17;10:CD008286. [PMID: 23076944]

Sugerman DT. JAMA patient page. e-Cigarettes. JAMA. 2014 Jan 8;311(2):212. [PMID: 24399571]

Lipid Disorders (see Chapter 28)

Higher low-density lipoprotein (LDL) cholesterol concentrations and lower high-density lipoprotein (HDL) levels are associated with an increased risk of CHD. Cholesterol-lowering therapy reduces the relative risk of CHD events, with the degree of reduction proportional to the reduction in LDL cholesterol achieved. The absolute benefits of screening for—and treating—abnormal lipid levels depend on the presence and level of other cardiovascular risk factors, including hypertension, diabetes mellitus, smoking, age, and gender. If other risk factors are present, cardiovascular risk is higher and the potential benefits of therapy are greater. Patients with known cardiovascular disease are at higher risk and have larger benefits from reduction in LDL cholesterol.

Evidence for the effectiveness of statin-type drugs is better than for the other classes of lipid-lowering agents or dietary changes specifically for improving lipid levels. Multiple large, randomized, placebo-controlled trials have demonstrated important reductions in total mortality, major coronary events, and strokes with lowering levels of LDL cholesterol by statin therapy for patients with known cardiovascular disease. Statins also reduce cardiovascular events for patients with diabetes mellitus. For patients with no previous history of cardiovascular events or diabetes, meta-analyses have shown important reductions of cardiovascular events.

Guidelines for therapy are discussed in Chapter 28.

Cholesterol Treatment Trialists' (CTT) Collaborators. The effects of lowering LDL cholesterol with statin therapy in people at low risk of vascular disease: meta-analysis of individual data from 27 randomised trials. Lancet. 2012 Aug 11; 380(9841):581–90. [PMID: 22607822]

Mitchell AP et al. Statin cost effectiveness in primary prevention: a systematic review of the recent cost-effectiveness literature in the United States. BMC Res Notes. 2012 Jul 24;5:373. [PMID: 22828389]

Pencina MJ et al. Application of new cholesterol guidelines to a population-based sample. N Engl J Med. 2014 Apr 10;370(15):1422–31. [PMID: 24645848]

Taylor F et al. Statins for the primary prevention of cardiovascular disease. Cochrane Database Syst Rev. 2013 Jan 31; 1:CD004816. [PMID: 23440795]

Hypertension (see Chapter 11)

Over 67 million adults in the United States have hypertension, representing 29% of the adult US population. Hypertension in nearly half of these adults is not controlled (ie, less than 140/90 mm Hg). Among those whose hypertension is not well controlled, nearly 40% are unaware of their elevated blood pressure; almost 16% are aware but not being treated; and 45% are being treated but the hypertension is not controlled. In every adult age group, higher values of systolic and diastolic blood pressure carry greater risks of stroke and heart failure. Systolic blood pressure is a better predictor of morbid events than diastolic blood pressure. Home monitoring is better correlated with target organ damage than clinic-based values. Clinicians can apply specific blood pressure criteria, such as those of the Joint National Committee, along with consideration of the patient's cardiovascular risk and personal values, to decide at what levels treatment should be considered in individual cases. A new trial suggests additional benefit from more intensive blood pressure control (goal systolic blood pressure of 120 mm Hg) in patients at higher risk.

Primary prevention of hypertension can be accomplished by strategies aimed at both the general population and special high-risk populations. The latter include persons with high-normal blood pressure or a family history of hypertension, blacks, and individuals with various behavioral risk factors, such as physical inactivity; excessive consumption of salt, alcohol, or calories; and deficient intake of potassium. Effective interventions for primary prevention of hypertension include reduced sodium and alcohol consumption, weight loss, and regular exercise. Potassium supplementation lowers blood pressure modestly, and a diet high in fresh fruits and vegetables and low in fat, red meats, and sugar-containing beverages also reduces blood pressure. Interventions of unproven efficacy include pill supplementation of potassium, calcium, magnesium, fish oil, or fiber; macronutrient alteration; and stress management.

Improved identification and treatment of hypertension is a major cause of the recent decline in stroke deaths as well as the reduction in incidence of heart failure–related hospitalizations. Because hypertension is usually asymptomatic, screening is strongly recommended to identify patients for treatment. Despite strong recommendations in favor of screening and treatment, hypertension control remains suboptimal. An intervention that included patient education and provider education was more effective than provider education alone in achieving control of hypertension, suggesting the benefits of patient participation; another trial found that home monitoring combined with telephone-based nurse support was more effective than home monitoring alone for blood pressure control. Pharmacologic management of hypertension is discussed in Chapter 11.

Egan BM et al. The growing gap in hypertension control between insured and uninsured adults: National Health and Nutrition Examination Survey 1988 to 2010. Hypertension. 2014 Nov;64(5):997–1004. [PMID: 25185135]

James PA et al. 2014 evidence-based guideline for the management of high blood pressure in adults: report from the panel members appointed to the Eighth Joint National Committee (JNC 8). JAMA. 2014 Feb 5;311(5):507–20. Erratum in: JAMA. 2014 May 7;311(17):1809. [PMID: 24352797]

SPRINT Research Group; Wright JT Jr et al. A randomized trial of intensive versus standard blood-pressure control. N Engl J Med. 2015 Nov 26;373(22):2103–16. [PMID: 26551272]

Yoon SS et al. Trends in blood pressure among adults with hypertension: United States, 2003 to 2012. Hypertension. 2015 Jan;65(1):54–61. [PMID: 25399687]

Chemoprevention

Regular use of low-dose aspirin (81–325 mg) can reduce the incidence of myocardial infarction in men (see Chapter 10). Low-dose aspirin reduces incidence of stroke but not myocardial infarction in middle-aged women (see Chapter 24). Based on its ability to prevent cardiovascular

events, aspirin use appears cost-effective for men and women who are at increased cardiovascular risk, which can be defined as a 10-year risk over 10%. Results from a meta-analysis suggest that aspirin may also reduce the risk of death from several common types of cancer (colorectal, esophageal, gastric, breast, prostate, and possibly lung).

Nonsteroidal anti-inflammatory drugs may reduce the incidence of colorectal adenomas and polyps but may also increase heart disease and gastrointestinal bleeding, and thus are not recommended for colon cancer prevention in average-risk patients.

Antioxidant vitamin (vitamin E, vitamin C, and beta-carotene) supplementation produced no significant reductions in the 5-year incidence of—or mortality from—vascular disease, cancer, or other major outcomes in high-risk individuals with coronary artery disease, other occlusive arterial disease, or diabetes mellitus.

Guirguis-Blake JM et al. Aspirin for the primary prevention of cardiovascular events: a systematic evidence review for the U.S. Preventive Services Task Force [Internet]. 2015 Sep. http://www.ncbi.nlm.nih.gov/books/NBK321623/ [PMID: 26491760]

Moyer VA et al. Vitamin, mineral, and multivitamin supplements for the primary prevention of cardiovascular disease and cancer: U.S. Preventive Services Task Force recommendation statement. Ann Intern Med. 2014 Apr 15;160(8):558–64. [PMID: 24566474]

Sutcliffe P et al. Aspirin for prophylactic use in the primary prevention of cardiovascular disease and cancer: a systematic review and overview of reviews. Health Technol Assess. 2013 Sep;17(43):1–253. [PMID: 24074752]

PREVENTION OF OSTEOPOROSIS

See Chapters 26 and 42.

Osteoporosis, characterized by low bone mineral density, is common and associated with an increased risk of fracture. The lifetime risk of an osteoporotic fracture is approximately 50% for women and 30% for men. Osteoporotic fractures can cause significant pain and disability. As such, research has focused on means of preventing osteoporosis and related fractures. Primary prevention strategies include calcium supplementation, vitamin D supplementation, and exercise programs. The effectiveness of calcium and vitamin D for fracture prevention remain controversial, particularly in non-institutionalized individuals.

Screening for osteoporosis on the basis of low bone mineral density is also recommended for women over age 65, based on indirect evidence that screening can identify women with low bone mineral density and that treatment of women with low bone density with bisphosphonates is effective in reducing fractures. However, real-world adherence to pharmacologic therapy for osteoporosis is low: one-third to one-half of patients do not take their medication as directed. The effectiveness of screening for osteoporosis in younger women and in men has not been established. Concern has been raised that bisphosphonates may increase the risk of certain types of fractures and osteonecrosis of the jaw, making consideration of the benefits and risks of therapy important when considering screening.

Crandall CJ et al. Comparative effectiveness of pharmacologic treatments to prevent fractures: an updated systematic review. Ann Intern Med. 2014 Nov 18;161(10):711–23. [PMID: 25199883]

Golob AL et al. Osteoporosis: screening, prevention, and management. Med Clin North Am. 2015 May;99(3):587–606. [PMID: 25841602]

Moyer VA et al. Vitamin D and calcium supplementation to prevent fractures in adults: U.S. Preventive Services Task Force recommendation statement. Ann Intern Med. 2013 May 7;158(9):691–6. [PMID: 23440163]

PREVENTION OF PHYSICAL INACTIVITY

Lack of sufficient physical activity is the second most important contributor to preventable deaths, trailing only tobacco use. A sedentary lifestyle has been linked to 28% of deaths from leading chronic diseases. Worldwide, approximately 30% of adults are physically inactive. Inactivity rates are higher in women, those from high-income countries (such as the Americas), and increase with age. Among teens aged 13–15, 80% report doing fewer than 60 minutes of physical activity of moderate to vigorous intensity per day, and boys are more active than girls.

The US Department of Health and Human Services and the CDC recommend that adults and older adults engage in 150 minutes of moderate-intensity (such as brisk walking) or 75 minutes of vigorous-intensity (such as jogging or running) aerobic activity or an equivalent mix of moderate- and vigorous-intensity aerobic activity each week. In addition to activity recommendations, the CDC recommends activities to strengthen all major muscle groups (abdomen, arms, back, chest, hips, legs, and shoulders) at least twice a week.

Patients who engage in regular moderate to vigorous exercise have a lower risk of myocardial infarction, stroke, hypertension, hyperlipidemia, type 2 diabetes mellitus, diverticular disease, and osteoporosis. Evidence supports the recommended guidelines of 30 minutes of moderate physical activity on most days of the week in both the primary and secondary prevention of CHD.

In longitudinal cohort studies, individuals who report higher levels of leisure-time physical activity are less likely to gain weight. Conversely, individuals who are overweight are less likely to stay active. However, at least 60 minutes of daily moderate-intensity physical activity may be necessary to maximize weight loss and prevent significant weight regain. Moreover, adequate levels of physical activity appear to be important for the prevention of weight gain and the development of obesity. Physical activity also appears to have an independent effect on health-related outcomes, such as development of type 2 diabetes mellitus in patients with impaired glucose tolerance when compared with body weight, suggesting that adequate levels of activity may counteract the negative influence of body weight on health outcomes.

Physical activity can be incorporated into any person's daily routine. For example, the clinician can advise a patient to take the stairs instead of the elevator, to walk or bike instead of driving, to do housework or yard work, to get off the bus one or two stops earlier and walk the rest of