PART 1

Principles of Health Promotion

Introduction to Health Promotion, Disease Prevention, and Lifestyle Concepts

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The [healthcare provider] of the future will give no medicine but will instruct his patient in the care of the human frame, diet, and the cause and prevention of disease.

Thomas A. Edison

OBJECTIVES

This chapter will enable the reader to:

1. Define lifestyle management and its relationship to lifestyle medicine.
2. Identify the impact of chronic diseases.
3. Determine the economic benefit of lifestyle interventions.
4. Justify a paradigm shift for lifestyle management in practice and education.
5. Assess lifestyle vital signs and risk factors for lifestyle-related chronic diseases.
6. Design a lifestyle management prescription.
7. Using the A-SMART model, apply the lifestyle management strategies to clinical case studies.
8. Synthesize evidence to support improved health outcomes of lifestyle behaviors.

Overview

Worldwide, most morbidity and mortality are caused by the epidemic of chronic diseases, which are preventable by health promotion, disease prevention, and lifestyle behaviors (World Health Organization [WHO], 2021). The reasons for the increase in chronic diseases are multifactorial, including the shift of modern humans from an agrarian society composed of farms and small towns to an industrialized, technological culture. This modern way

of living is associated with increased lifestyle-related disorders, including obesity, cardiovascular disease (CVD), cancer, and type 2 diabetes (T2DM). The modifiable etiology of these and other chronic diseases is attributed to behavioral and environmental determinants, such as the overconsumption of processed foods, inactivity, alcohol consumption, smoking, and chronic stress (Egger et al., 2017). Lifestyle management in mainstream clinical practice is an approach to address these determinants of chronic diseases to improve health outcomes and decrease the chronic disease burden on society.

Lifestyle management, or lifestyle medicine, is the science that works toward integrating health promotion, disease prevention, and healthy lifestyle behaviors into a person's daily choices. It is defined as the use of evidence-informed therapeutic lifestyle prescriptions—eating a whole-food, plant-predominant diet; regular physical activity; restorative sleep; stress management; avoidance of risky substances; and positive social connections—as primary modalities for treatment, prevention, and possibly reversal of chronic diseases (American College of Lifestyle Medicine [ACLM], n.d.). The evidence is overwhelming that health promotion—the process of empowering individuals to increase control over their health through social, environmental, and behavioral interventions—benefits and protects individual health and quality of life by addressing and preventing the root causes of ill health, not just focusing on treatment and cure (WHO, 2016).

Unhealthy lifestyle behaviors are often revealed in patients as increased blood pressure, elevated glucose, hyperlipidemia, and excess weight (WHO, 2021). Tackling these issues is critical to the healthcare sector's battle for better lives for individuals and populations. Advanced practice providers (APPs) are at the forefront of the interprofessional healthcare team to promote health

and prevent diseases. Five key lifestyle modification strategies have been identified to decrease mortality from chronic diseases and prolong life span: a healthy diet, regular physical activity, moderate alcohol intake, an ideal weight, and never smoking (Li et al., 2018). These and other strategic interventions are at the core of chronic disease prevention and management.

However, behavior change is a complex process. It requires that the patient be empowered as a partner within an interprofessional healthcare team to strategically assess, evaluate, and implement the tactics needed to slow the rapid increase of chronic diseases. This chapter will outline chronic conditions and their risk factors, the economic impact of chronic diseases and prevention strategies, principles of lifestyle management, considerations for deprescribing, and the application of lifestyle vital signs and lifestyle prescriptions in clinical practice for improved health outcomes.

Impact of Chronic Diseases

Chronic diseases, also known as noncommunicable diseases, are generally defined as illnesses that last at least one year and are caused by multiple factors, including genes, biology, environment, and behavior (WHO, 2021). Chronic diseases impact individuals of all ages, populations, countries, and socioeconomic groups and cause 41 million deaths annually, equaling 71% of all deaths worldwide. Cardiovascular disorders, such as myocardial infarctions and strokes, account for the most frequent chronic disease deaths, with almost 18 million individuals each year, followed by cancers (9.3 million), respiratory diseases (4.1 million), and T2DM (1.5 million). Interestingly, these four groups of diseases are responsible for more than 80% of all chronic disease deaths globally (Hayes & Gillian, 2020).

These chronic diseases significantly impact society, leading to increased cost of health care and impaired quality of life. Furthermore, chronic diseases affect most adults in the United States and are the leading causes of disability and a foremost driver of the rising cost of health care. Sixty percent of American adults have at least one chronic disease, and 40% have two or more (National Center for Chronic Disease Prevention and Health Promotion [NCCDPHP], 2022a). The increase in chronic diseases and the subsequent rise in healthcare costs are unsustainable. APPs armed with evidence-informed lifestyle management skills can change the trajectory of this problem.

Risk Factors for Chronic Diseases

It is well established that a person's risk for developing a chronic disease is associated with multiple factors, including social determinants of health, genes, and lifestyle behaviors (Hayes & Delk, 2018; Hayes & Gillian, 2020). Social determinants of health include where one lives, works, learns, and plays (Hayes & Delk, 2018). Unfortunately, individuals' zip codes can determine more about their health than other factors. Underrepresented individuals—minorities, those of lower socioeconomic status, and people in low-income countries—are more likely to be negatively impacted by social determinants of health (Nugent et al., 2018; WHO, 2021). These factors result in chronic diseases, driving these populations further into poverty due to increased expenditures attributed to healthcare costs. Individuals who experience poverty tend to have decreased education; face systemic barriers, such as limited access to health care; and have increased incidences of chronic diseases and reduced health outcomes (Hayes & Delk, 2018). Therefore, addressing factors related to social determinants

of health is essential to achieving optimal health outcomes.

According to Hayes and Gillian (2020), chronic diseases flourish in certain families. Such a situation is associated with genetics, features inherited from parents, and epigenetics. Epigenetics are environmental and behavioral factors that affect how genes work (Office of Science, 2022). Evidence exists that genes are not the primary determinants of health outcomes. Instead, health outcomes are more likely determined by epigenetics, which dictate the activity of genes. Individuals in the same family have similar living circumstances; therefore, they tend to engage in identical lifestyle behaviors and experience similar social determinants of health that contribute to the risk of developing chronic illnesses (Hayes & Gillian, 2020). Unhealthy behaviors, such as smoking, inadequate dietary intake, and sedentary habits, may be handed down from generation to generation, affecting the risk of developing chronic diseases.

On the other hand, healthy behaviors, such as physical activity and healthy eating, can decrease chronic disease risks even with a genetic tendency toward a particular chronic condition (Office of Science, 2022). Epigenetic modifications are reversible and can change how the body interprets a genetic code. Therefore, epigenetics (environmental and behavioral factors) significantly influence health outcomes more than genes.

The health consequences of lifestyle behaviors, social determinants, and family and medical history of chronic illnesses increase a person's risk of chronic diseases. It cannot be overlooked that chronic diseases may promote other chronic diseases. For example, individuals with chronic conditions are at increased risk of poor mental health, most commonly depression (Hayes & Gillian, 2020). On the other hand, depression increases the risk of chronic diseases. Though social determinants play an essential role in health outcomes, lifestyle behaviors also significantly influence the

development of chronic conditions. According to the WHO (2021), four lifestyle risk factors, smoking, unhealthy eating, alcohol use, and sedentary behaviors, contribute substantially to the annual deaths associated with chronic diseases (**Table 1.1**). Other lifestyle patterns, such as chronic stress and insufficient sleep, can also adversely affect health outcomes. APPs must appreciate the relationship among these multiple risk factors to create a multifactorial approach to alleviating the burden of chronic conditions on individuals and society.

A recent multicohort prospective study by Nyberg et al. (2020) identified the effect of lifestyle behaviors on developing chronic diseases. The lifestyle behaviors evaluated in the study included smoking, weight status, physical activity, and alcohol consumption correlated to chronic diseases, including T2DM, heart disease, cerebrovascular accident, malignancy, asthma, and chronic obstructive pulmonary disease. The results, based on an analytic sample of 116,043 participants with a mean follow-up of 12.6 years, revealed that those with the healthiest lifestyle scores were younger and of higher socioeconomic status. Furthermore, selected lifestyle behaviors correlated to higher years without chronic

illnesses. The lifestyle factors linked to the most years (about nine years) without chronic diseases were a body mass index (BMI) <25 kg/m^2 and at least two of the following health behaviors: never smoking, regular physical activity (150 minutes of moderate intensity or 75 minutes of vigorous intensity), and moderate alcohol consumption. The researchers concluded that the lifestyle factors studied offered an additive effect, rather than a synergistic effect, regarding life span (Nyberg et al., 2020). Therefore, APPs need to encourage patients to practice more health behaviors for improved health outcomes.

Economic Benefit of Preventing Chronic Diseases

The United States spends twice as much on health care compared to most of the top 10 industrialized countries, including Canada, Australia, New Zealand, and the United Kingdom (Tikkanen & Abrams, 2020). In 2020, the overall cost of caring for individuals with chronic diseases in the United States reached $4.1 trillion, equivalent to $12,000 per person (Hartman et al., 2021). Although much of the increased cost of health care in 2020 can be attributed to the coronavirus pandemic (Hartman et al., 2021), healthcare costs had increased drastically over the five decades before the pandemic, from 5% in 1960 to 18% in 2019 (Martin et al., 2020). Unfortunately, increased spending has not resulted in overall increased health outcomes. Some measures of a country's health, such as obesity, chronic disease burden, avoidable deaths, suicide rates, and life expectancy, are worse in the United States than in the top 10 most industrialized countries (Tikkanen & Abrams, 2020).

In America, more dollars are used to provide health care for the sick and those with risk factors for chronic diseases compared to interventions that promote prevention and wellness. Only 2.9% of U.S. healthcare

Table 1.1 Annual Chronic Disease Deaths Attributed to Lifestyle Behaviors

Lifestyle	Annual Deaths
Tobacco use, including secondhand smoke	7.2 million deaths
Unhealthy dietary patterns, such as excess sodium intake	4.1 million deaths
Alcohol use, particularly alcohol abuse	>3.3 million deaths
Physical inactivity	1.6 million deaths

Data from World Health Organization. (2021, April 21). *Noncommunicable diseases*. https://www.who.int/news-room/fact-sheets/detail/noncommunicable-diseases

spending advances health and prevention (Martin et al., 2020), whereas 27% of healthcare costs are attributed to five chronic disease risk factors: excess weight, elevated blood pressure, increased blood glucose levels, poor dietary habits, and tobacco use (Bolnick et al., 2020). Nevertheless, there is evidence that innovative health promotion and disease prevention programs can be cost-effective and result in decreased incidences of chronic diseases and reduced cost of health care overall (Edington et al., 2020). Furthermore, risk exposure tends to occur decades before the diagnosis of a condition. As adults age, there are increased incidences of chronic diseases and healthcare spending (Papanicolas et al., 2019). Therefore, Bolnick et al. (2020) indicated that health promotion policy to incentivize healthy lifestyle behaviors should target children and young adults to decrease the risk factors that may eventually lead to chronic diseases if left unchecked.

The benefits of cost-effective chronic disease prevention strategies are determined using various measures, such as cost per quality-adjusted life year (QALY). Public health interventions that cost less than $50,000 per QALY are generally considered cost-effective (NCCDPHP, 2022b). High blood pressure, which contributes to one of the greatest chronic disease expenses and is the leading risk factor for cardiovascular and cerebrovascular disease, provides an excellent example of the cost-effectiveness of health promotion. Individuals with high blood pressure usually require $2,500 more in medical expenses than those without high blood pressure, accounting for $29 billion in prescriptions. Fortunately, there are cost-effective programs for managing hypertension, such as team-based care and self-monitoring. Programs that include team-based care to improve high blood pressure have an average cost of $24,472 per QALY, which is 50% less than the threshold for a cost-effective program (Community Preventative Service Taskforce, 2021). Additionally, when patients are engaged in self-monitoring blood pressure in conjunction with other strategies, the average cost ranges from nearly $3,000 to $11,000 per QALY (Jacob et al., 2017). APPs can engage the interprofessional team and integrate these cost-effective strategies into practice to decrease the disease burden of hypertension on individuals and society.

Another measure of the cost-effectiveness of programs is the return on investment (ROI). Lifestyle wellness and health promotion programs have demonstrated a positive monetary return on investment and improved health outcomes (Edington et al., 2020). For instance, Johnson & Johnson reported that from 2002 to 2008, its employer wellness program yielded nearly $2.00 to $4.00 for every dollar invested (Henke et al., 2011, as cited in Edington et al., 2020). The Centers for Disease Control and Prevention (CDC) identified cost-effective programs for screening risk factors and early identification of several chronic diseases, including breast cancer, diabetes, and tobacco (NCCDPHP, 2023). When these issues are identified and treated early, healthcare costs are decreased, quality of life is improved, and longevity is increased. Most notably, evidence exists that lifestyle change programs, such as the CDC's low-cost National Diabetes Prevention Program, can decrease the risk of T2DM by more than half for those at high risk for T2DM (NCCDPHP, 2022b).

Paradigm Shift and Competencies of Lifestyle Management

The rise in preventable chronic diseases, related conditions, and healthcare costs has created a need for a paradigm shift in health care and health education to address the upstream causes of these diseases. Melnyk (2022) stated that "the time is now for shifting this sick-care paradigm to the absolutely essential wellness and prevention model" (p. 1). APPs are vital to this shift. The expanding lifestyle management

field provides the foundational context for APPs to go beyond the traditional approach of "sick" care to "health" care to integrate health promotion interventions and disease prevention into primary care and beyond.

Many professional organizations and governmental agencies, including the American Heart Association, American Diabetes Association, American Cancer Society, and Office of Disease Prevention and Health Promotion, have emphasized lifestyle management principles and practices for preventing or treating health conditions. For instance, the American Cancer Society has developed dietary habits and physical activity guidelines for cancer prevention (Rock et al., 2020). Also, *Healthy People 2030* has identified national goals and objectives to improve Americans health across their life spans, which apply to health promotion, disease prevention, and lifestyle behaviors (Office of Disease Prevention and Health Promotion, n.d.). Examples of *Healthy People 2030* objectives are to increase the number of children, high school students, and adults who get adequate sleep and to reduce motor vehicle accidents due to driving when feeling tired. Providers are encouraged to use sleep health practice guidelines to provide patients with self-care and self-management strategies to treat chronic diseases, improve health outcomes, and decrease healthcare costs.

The paradigm shift also calls for a different approach to patient care, including targeted health promotion and disease prevention interventions (Houlden et al., 2018). According to the WHO (2021), an imperative way to manage chronic diseases is to reduce the risk factors attributed to these conditions using a comprehensive model. Lifestyle management is a comprehensive approach to addressing lifestyle-related chronic diseases.

Additionally, the increased interest in the lifestyle management of diseases is propelled by organizations that promote the education of health professionals, including physicians, nurses, and physician assistants, in lifestyle, health promotion, and disease prevention

principles. Among the many professional organizations is the ACLM, an interprofessional group of health professionals whose mission is to advance evidence-informed lifestyle approaches as a value-based strategy to transform, redefine, and sustain health and health care by treating, reversing, and preventing lifestyle-related chronic diseases (ACLM, n.d.). The ACLM, one of the leaders in lifestyle management, has developed core competencies in lifestyle management for healthcare providers and non-provider healthcare providers (Lianov et al., 2022). The ACLM lifestyle management competencies align with the nurse practitioner (NP) role core competencies (National Organization of Nurse Practitioner Faculties, 2022) and the physician assistant (PA) competencies (Cross-Org Competencies Review Taskforce, 2021). See **Table 1.2** for the mapping of lifestyle management core competencies with selected NP and PA competencies. The educational preparation of APPs provides opportunities for them to become competent in developing innovative lifestyle management principles and techniques in clinical practice.

Background and Role of Lifestyle in Practice

Although lifestyle management is a relatively new subspecialty for health professionals, its practice has existed for centuries (Bodai, 2017). Historical figures, such as Hippocrates (460–370 BC), known as the father of medicine, and Florence Nightingale (1820–1910), the founder of modern nursing, championed concepts of lifestyle management hundreds of years ago. Hippocrates stated, "If we could give every individual the right amount of nourishment and exercise, not too little and not too much, we would have found the safest way to health" (Katz et al., 2018, p. 1452). In 1854, Florence Nightingale addressed the high mortality rate of sick soldiers (Karimi & Alavi, 2015). Nightingale noted a 60% mortality rate from

Table 1.2 Mapping of Lifestyle Management Core Competencies with Selected NP Role Core Competencies and PA Competencies

Common Themes	Lifestyle Medicine Core Competencies[1]	NP Role Core Competencies[2]	PA Competencies[3]
Health promotion	Establish principles of screening, diagnosing, treating and monitoring lifestyle-related diseases and deliver lifestyle medicine-focused anticipatory guidance.	Deliver healthcare services within scope of practice, which includes health promotion, disease prevention, anticipatory guidance, counseling, and disease management.	Employ principles of epidemiology to determine health problems, risk factors, treatment strategies, and disease prevention/health promotion efforts for individuals and populations.
Knowledge and evidence	Determine the evidence that indicates health behaviors are related to key health outcomes.	Apply scientific evidence to improve health outcomes.	■ Apply clinical evidence to diagnose disease. ■ Improve the health of patient populations.
Counseling	Employ motivational interviewing and health coaching approaches.	Apply counseling techniques, such as motivational interviewing, to advance wellness and self-care management.	Counsel, inform, and empower patients and their families to take part in their care and facilitate shared decision-making.
Personal wellness	Create a culture of leadership by developing personal health behaviors.	Establish an environment that fosters self-care and well-being.	Exhibit a commitment to personal wellness and self-care that supports quality patient care.
Collaborative relationship with interprofessional team and stakeholders	Evaluate the evidence for collaborative and chronic care models on improved health behaviors.	Develop a collaborative approach with applicable stakeholders to inform population healthcare needs.	Collaborate with other health professionals to provide effective patient-centered care.

[1]Lianov, L., & Johnson, M. (2010). Physician competencies for prescribing lifestyle medicine. *Journal of the American Medical Association*, 304(2), 202–203. https://doi.org/10.1001/JAMA.2010.903

[2]National Organization of Nurse Practitioner Faculties. (2017). *Advanced practical registered nurse doctoral-level competencies*. https://cdn.ymaws.com/www.nonpf.org/resource/resmgr/competencies/common-aprn-doctoral-compete.pdf

[3]Cross-Org Competencies Review Taskforce. (2020). *Competencies for the physician assistant profession*. https://paeaonline.org/our-work/current-issues/competencies-for-the-pa-profession

communicable and infectious diseases. Interventions such as clean water and adding fruit to the diet drastically changed the soldiers' health outcomes, decreasing the mortality rates to 2.2%.

As a result of vaccination and antibiotics, communicable and infectious diseases are no longer the leading causes of death worldwide. Chronic diseases have become the leading cause of death globally despite substantial evidence that poor lifestyle behaviors are the root cause of the rise in chronic diseases and healthcare costs. Katz et al. (2018) described several landmark publications that provide historical context to support that modifiable lifestyle behavior was the foremost cause of mortality in the mid-20th century and continues to be so in the 21st century. A publication by McGinnis and Foege (1993) identified tobacco, alcohol, eating habits, and physical activity as the leading causes of death, accounting for 8 out of 10 deaths in the United States. Over a decade later, similar findings were identified by Mokdad et al. (2004), who determined that remarkable increases in mortality were related to tobacco use, physical inactivity, unhealthy dietary patterns, and alcohol consumption.

These findings were extended globally by researchers in Potsdam, Germany, and the United Kingdom. Ford et al. (2009) in Germany determined that 80% of chronic illnesses may be prevented by four factors: never smoking; not being obese; being physically active for more than 210 minutes per week; and eating a healthy diet of fruits, vegetables, whole grains, and low meat intake. In the United Kingdom, Kvaavik et al. (2010) identified four risk factors that decreased life span by 12 years: being active for less than two hours per week, consuming less than three fruits and vegetables per day for less than three days per week, tobacco use, and excessive alcohol consumption. Though the lifestyle behaviors in each study vary slightly, they describe similar behaviors and outcomes. These seminal studies support that health promotion, disease

prevention, and healthy lifestyle behaviors can decrease mortality associated with chronic diseases.

Lifestyle management can occur in a variety of populations and settings. It can be effective in helping individuals, families, and targeted groups in the community and clinical settings to identify and make health behavior changes to prevent chronic illnesses (Egger et al., 2017). The primary care setting is ideal for lifestyle management due to the opportunity for the APP to follow up with patients to monitor progress and health outcome metrics. It may also be implemented in the acute care setting when a patient may be in a state of readiness for behavior change due to an exacerbating chronic disease. Changing well-established behaviors requires patients to partner with their healthcare provider to develop person-centered strategies for sustainable lifestyle changes. The challenge is that this process takes time, knowledge of the science of lifestyle management by the healthcare provider, and patient buy-in.

Although patients are more likely to attempt weight loss and achieve clinically significant weight loss when counseled by a healthcare provider, many who need it do not receive counseling (Pool et al., 2014). According to Zoltick et al. (2021), "practitioners counsel obese patients on weight loss less than half the time" (p. 2). The analysis of data from the National Health and Nutrition Examination Surveys, 1999–2016, indicated that overweight individuals were significantly less likely to be notified of their weight status than those with obesity (Hansen et al., 2020). Furthermore, overweight males were 24% less likely to be informed than females, and Black persons were 19% less likely to be informed than White persons. Also, though nearly two-thirds of young adults aged 20 to 34 and 78% of adults aged 50 to 64 with obesity were notified of their weight status, only about one-fourth of young adults 20 to 34 who were overweight were informed of their weight status. These findings are

concerning because addressing overweight status earlier in life may prevent obesity and its comorbidities in early to mid-adulthood. APPs need to communicate weight status and risk factors with patients at all age levels to avert progression to obesity and other chronic diseases.

Evidence shows that most individuals who need lifestyle counseling do not receive it. According to White et al. (2020), "only about 32% of patients receive physical activity counseling from their physician, 28% of smokers reported their provider offered assistance in cessation, and on average less than 1 minute of a patient encounter is spent talking about diet, exercise, or smoking" (p. 271). There are many reasons why providers may not address lifestyle behaviors and provide counseling, including time constraints, lack of knowledge, and insufficient reimbursement (Petrin et al., 2017; Zoltick et al., 2021). These obstacles can be overcome with appropriate training in billing, coding, and innovative practice models, including a value-based reimbursement model, group visits, shared medical appointments, and concierge memberships.

Like any field of concentration, a body of knowledge, skills, and attitudes is required to be competent in health-promoting lifestyle management practices. Therefore, effective lifestyle management also necessitates an adequately educated interprofessional team, including APPs, registered dietitians skilled in comprehensive nutrition counseling, and psychologists for advanced stress management strategies.

Evidence to Support Lifestyle Management

A plethora of scientific evidence exists to support that daily lifestyle behavior significantly impacts short- and long-term health outcomes positively or negatively (Rippe, 2018). The strength of the evidence is underscored by the volume of evidence-based practice

Health Promotion Research Study

Sugar Intake and Sleep Quality in University Students

Background: A study was conducted to investigate the relationship between added sugar intake and sleep quality among university students.

Methodology: One hundred female students (19–25 years old) were randomly selected from a Saudi Arabia university. Students completed the food frequency questionnaire, sleep quality questionnaire, and 24-hour dietary recall.

Results: The results indicated that 83% of participants had poor-quality sleep. There was a significant association between high consumption of added sugars and insufficient sleep quality.

Implications for Advanced Practice: Various factors impact university students' sleep quality, including technological devices, excessive exposure to artificial light, stress students face due to intensive coursework, and the perception that sleep is wasted time. Sleep deprivation is associated with impaired glucose metabolism and elevated blood sugar levels. APPs need to routinely assess sleep quality and provide guidance to individuals for improved sleep.

Reference: Data from Alahmary, S. A., Alduhaylib, S. A., Alkawii, H. A., Olwani, M. M., Shablan, R. A., Ayoub, H. M., Purayidathil, T. S., Abuzaid, O. I., & Khattab, R. Y. (2019). Relationship between added sugar intake and sleep quality among university students: A cross-sectional study. *American Journal of Lifestyle Medicine, 16*(1), 122–129. https://doi.org/10.1177/1559827619870476

guidelines, which include lifestyle behaviors as first-line strategies for the prevention and management of metabolically related conditions (Rippe, 2018). Additionally, there are many randomized controlled trials and various cohort studies that highlight the impact of health behaviors and disease outcomes, including the Nurses' Health Study (NHS) and the Health Professionals Follow-Up Study (HPFS) (Li et al., 2018). The NHS began in 1976 and has contributed extensively to the science of prevention over the past four decades (Colditz et al., 2016). The HPFS began in 1986 and consisted of a sample of men in the health professions as a counterpart to the women's-only NHS (Harvard T. H. Chan School of Public Health, n.d.). The NHS and the HPFS continue to collect data every two years to evaluate similar hypotheses about the relationship between lifestyle behaviors and incidences of illnesses, such as CVD, cancer, and other diseases.

These epidemiological findings are essential to determining disease causality (Colditz et al., 2016). Cohort studies provide a reliable explanation of the cause of illness with less bias than other cause-and-effect designs. **Table 1.3** highlights the NHS's findings

Table 1.3 Important Lifestyle-Related Disease Outcomes from the Nurses' Health Study and Associated Significant Findings

Lifestyle-Related Disease Outcome	Significant Findings
Related to dietary factors:	
T2DM	Increased intake of fruits, vegetables, whole grains, and legumes and decreased red meat, refined sugar, and sugar-sweetened beverages reduce the risk of T2DM.
CVD	Trans fats increase risk.
Breast cancer	Fruits, vegetables, whole grains, low-fat dairy, fish, and chicken lower the risk.
Pancreatic cancer	Fructose and sugar-sweetened soft drinks and low vitamin D increase the risk.
Non-Hodgkin's lymphoma	Trans fats and red meat increase risk.
Cognitive function	Antioxidants, higher nut intake, and Mediterranean diet increase cognitive function.
Related to physical activity:	
T2DM	Sedentary behavior increases risk, and moderate- to high-intensity physical activity decreases the risk of T2DM.
Cardiac disease	Moderate-intensity physical activity decreases cardiac disease risk.
Breast cancer	Moderate to vigorous physical activity >7 hours per week decreases the risk of breast cancer.
Cognitive function	Higher levels of physical activity increase cognitive performance.

Lifestyle-Related Disease Outcome	Significant Findings
Associated with obesity:	
T2DM	Excess weight is the most decisive risk factor for T2DM.
Cardiac disease	Moderate weight gain at age 18 and older increases the risk and mortality from cardiac disease.
Endometrial cancer	Excess weight contributes to 40% of endometrial cancer cases.
Pancreatic cancer	Overweight or inactive women have an increased risk for pancreatic cancer.
Eye disease	Obesity and elevated BMI increase the risk of cataracts.
Related to sleep and shift work:	
T2DM	Too long and too short sleep and decreased sleep quality increase the risk of T2DM.
Cardiac disease	Shift work and not sleeping the optimal 8 hours per day increase risk.

Data from Colditz, G. A., Philpott, S. E., & Hankinson, S. E. (2016). The impact of the Nurses' Health Study on population health: Prevention, translation, and control. *American Journal of Public Health, 106*(9), 1540–1545. https://doi.org/10.2105/AJPH.2016.303343

regarding the association between lifestyle behaviors and chronic diseases. Based on results from the NHS, 8 of 10 heart disease occurrences could be prevented by not smoking, eating a healthy diet, being moderately or vigorously active for a minimum of 30 minutes most days, and limiting alcohol intake to one or fewer drinks per day (Colditz et al., 2016). Additionally, the NHS confirmed increased breast cancer risk even with small amounts of alcohol consumption. Dietary intake was also associated with premenopausal breast cancer: Women who had more consumption of red meat and a lower intake of fiber and fruit as adolescents had higher incidences of breast cancer. Furthermore, the NHS confirmed that excess weight is the strongest predictor of T2DM. Overall, the NHS highlights that lifestyle behaviors can positively or negatively impact the development of chronic diseases such as heart disease, cancer, and T2DM in women.

In another study to analyze cohort data of the NHS (1980–2014) and the HPFS (1986–2014), researchers identified five lifestyle behaviors that could narrow the life-expectancy gap between Americans and individuals in other high-income countries (Li et al., 2018). The five lifestyle factors identified are similar to those previously identified: adhering to a healthy diet, routine physical activity, maintaining BMI within the normal range, moderate alcohol consumption (5 g to 15 g per day for women and 5 g to 30 g per day for men), and never smoking. Overall, those who adhered to the five healthy lifestyle behaviors had lower all-cause, cancer, and CVD mortality than those who did not adhere to the healthy lifestyle behaviors.

Despite the overwhelming evidence that lifestyle practices such as physical activity and healthy eating profoundly affect health outcomes and longevity, only a few Americans adhere to recommended physical activity and

dietary guidelines. Seventy-five percent of Americans do not meet the minimum physical activity recommendations (U.S. Department of Health and Human Services, 2018). Also, only 10% of Americans meet the guidelines for vegetable consumption, and only 20% meet the fruit intake recommendations (U.S. Department of Health and Human Services and U.S. Department of Agriculture, 2020). This gap in behaviors related to the recommendations for physical activity and dietary patterns offers an opportunity for APPs to influence the health behaviors of more than 75% of Americans who see a primary care provider annually (Rippe, 2018). The time has come for APPs to integrate the principles of lifestyle management into the daily care of patients to improve health outcomes and decrease the burden of lifestyle-related chronic diseases on the cost of health care. See **Table 1.4** for a sample of guidelines that integrate lifestyle-related health promotion and disease prevention strategies.

Table 1.4 Sample of Guidelines That Integrate Health Promotion and Disease Prevention Strategies

Condition/ Behavior	Organization/ Authors	Guideline	URL
Cancer	American Cancer Society/Rock et al. (2020)	American Cancer Society Guideline for Diet and Physical Activity for Cancer Prevention	https://acsjournals .onlinelibrary.wiley.com/doi /full/10.3322/caac.21591
CVD	American College of Cardiology (ACC) and American Heart Association (AHA)	2019 ACC/AHA Guideline on the Primary Prevention of Cardiovascular Disease	https://doi.org/10.1161 /CIR.0000000000000678
Childhood obesity	American Academy of Pediatrics	Guidelines from the American Academy of Pediatrics for the Prevention and Treatment of Childhood Obesity	https://doi.org/10.1542 /peds.2007-2329C
Diabetes	American Diabetes Association	Standards of Care in Diabetes—2022	https://professional .diabetes.org/content-page /practice-guidelines -resources
Diet	U.S. Department of Health and Human Services and U.S. Department of Agriculture	Dietary Guidelines for Americans, 2020–2025	https://www .dietaryguidelines.gov /resources/2020-2025 -dietary-guidelines-online -materials
Hypertension	Jones et al. (2021)	Scientific Statement of Management of Stage 1 Hypertension, 2021	https://www.ahajournals .org/doi/10.1161 /HYP.0000000000000195
Hypertension	ACC/AHA Taskforce	2017 ACC/AHA/AAPA/ABC/ ACPM/AGS/APhA/ASH/ASPC/ NMA/PCNA Guideline for the Prevention, Detection, Evaluation, and Management of High Blood Pressure in Adults	https://www.ahajournals .org/doi/10.1161 /hyp.0000000000000065

Condition/ Behavior	Organization/ Authors	Guideline	URL
Obesity	Canadian Medical Association	Obesity in Adults: A Clinical Practice Guideline	https://www.cmaj.ca /content/192/31/E875
Obesity	ACC/AHA Task Force on Practice Guidelines and the Obesity Society	Guidelines (2013) for the Management of Overweight and Obesity in Adults	https://onlinelibrary.wiley .com/doi/10.1002/oby.20660
Physical activity	U.S. Department of Health and Human Services	Physical Activity Guidelines for Americans, Second Edition	https://health.gov/sites /default/files/2019-09 /Physical_Activity _Guidelines_2nd_edition.pdf

Health-Promoting Levels of Prevention

The levels of prevention are related to the natural progression of diseases. There are five stages of usual disease progression: underlying, susceptible, subclinical, clinical, and recovery/disability/death (Kisling & Das, 2022). The health promotion prevention levels related to the disease progression stages are primordial, primary, secondary, tertiary, and quaternary (**Table 1.5**). The combination of these approaches not only addresses the upstream etiology to stop the onset of disease by reducing risk factors but also the downstream adverse health outcomes.

Primordial prevention addresses underlying social and environmental risk factors that promote disease onset. In contrast, *primary* prevention interventions avoid the onset of illness or injury by modifying the risk factor, behavior, or environment before the disease occurs. *Secondary* preventive measures lead to early detection and treatment of disease, with the goal of disease reversal or risk factor mitigation to halt disease progression. *Tertiary* prevention aims to rehabilitate an individual with an illness or disability, prevent relapse, and improve quality of life (Kisling & Das, 2022).

Most recently, *quaternary* prevention was added to the scientific literature and is defined as "an action taken to protect individuals (person/patients) from medical interventions that are likely to cause more harm than good" (Kisling & Das, 2021, para. 6). In particular, quaternary prevention should be foremost in APPs' minds for all interventions they recommend to a patient. Health-promoting lifestyle management can be integrated at each level of prevention to enhance patient outcomes and decrease iatrogenic harm.

Lifestyle Vital Signs

Documenting lifestyle behaviors as *lifestyle vital signs* is essential to provide baseline data and monitor progress (Lenz, 2014). Lifestyle vital signs also guide the APP in engaging the patient to take steps to prevent or manage a specific chronic disease. Additionally, documentation of lifestyle vital signs can be useful for referring patients to an interprofessional team of healthcare providers to support healthy lifestyle behaviors.

Adequate documentation of lifestyle behaviors should extend beyond usually recorded tobacco, alcohol, and illicit drug use to include a more comprehensive overview of lifestyle behaviors to prevent or manage chronic diseases. Every patient record should include routinely assessed fundamental lifestyle vital signs, namely, dietary habits, perceived stress, physical activity, alcohol use, sleep habits, and tobacco use. These essential lifestyle vital signs

Table 1.5 Levels of Prevention and Examples

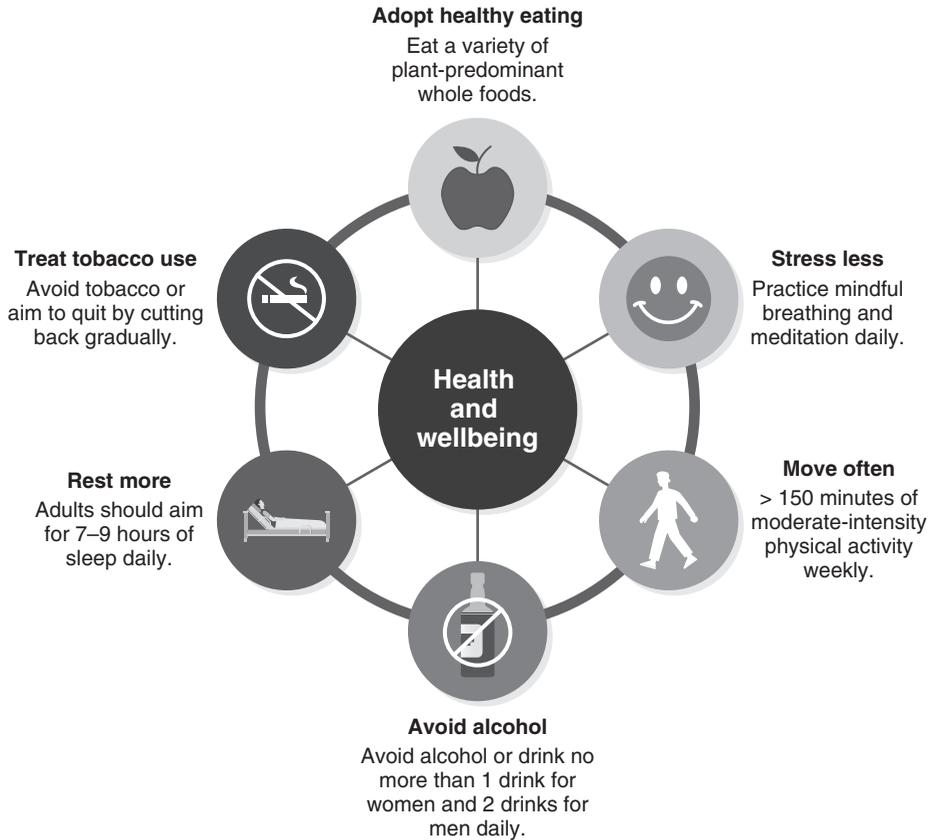| Level of Prevention	Definition	Example	Additional Evidence
Primordial	Prevention of risk factor development	■ Preventing elevation of blood pressure in normotensive patients ■ Prenatal education of mothers ■ Obesity prevention in childhood	Falkner and Lurbe (2020); Lloyd-Jones et al. (2021)
Primary	Prevention of disease or injury before it occurs	■ Vaccinations ■ Altering risky behaviors such as poor nutritional intake, tobacco use, and sedentary behaviors	Cho et al. (2020)
Secondary	Preventive measures aimed at early diagnosis and treatment of a condition to prevent more advanced issues from developing and to strive for disease reversal	■ Blood pressure screening for elevated blood pressure ■ Screening mammograms for breast cancer detection	Lloyd-Jones et al. (2021)
Tertiary	Preventive measures aimed at rehabilitation of individuals after a significant illness	Cardiac rehabilitation in patients after myocardial infarction or coronary artery bypass	Lloyd-Jones et al. (2021)
Quaternary	Preventive measures to avoid harm secondary to medical interventions	Prevention of adverse outcomes from medical interventions throughout the life span and at each level of prevention	Martins et al. (2018)

Data from Kisling, L. A., & Das, J. M. (2022, May 8). Prevention strategies. *StatPearls*. https://www.ncbi.nlm.nih.gov/books/NBK537222

can be summarized by the acronym A-SMART (adopt healthy eating, stress less, move often, avoid alcohol, rest more, treat tobacco use). Additional lifestyle vital signs may include BMI, waist circumference, and waist-to-hip ratio as objective measures to determine the risk of metabolic disorders or to monitor progress in specific circumstances.

The A-SMART lifestyle vital signs correspond with the lifestyle behavior management strategies or prescriptions represented by the A-SMART lifestyle behaviors model (Downes et al., 2021). The A-SMART model was developed as an evidence-informed approach to assess essential lifestyle behaviors and guide lifestyle counseling to promote overall health and well-being (**Figure 1.1**).

Houlden et al. (2018) outlined a series of questions and strategies for obtaining a lifestyle history. These and other sources were used to inform screening questions for assessing the A-SMART lifestyle vital signs. **Figure 1.2** provides an assessment tool with sample screening questions the APP or a healthcare team member can ask to evaluate essential A-SMART lifestyle vital signs. Scores are assigned to each of the A-SMART vital signs, which can be summed for an overall score. Although the A-SMART vital signs are not yet a validated instrument, the overall score will allow for a quick assessment of the patient's lifestyle habits and monitoring progress. When patients are asked questions about their lifestyle, it conveys that the APP places

Figure 1.1 A-SMART lifestyle behaviors model.

Lifestyle Vital Sign	Screening Questions	Score
Adopt healthy eating	1. How many days per week do you eat ≥5 fruits and vegetables?1 Score responses: 6–7 days (0 points), 4–5 days (1 point), 2–3 days (2 points), 0–1 day (3 points). 2. How many days per week do you consume sugary foods/drinks?1 Score responses: 0–1 day (0 points), 2–3 days (1 point), 4–5 days (2 points), 6–7 days (3 points). *Sum scores for questions 1 and 2. A score of ≥3 indicates a need for further screening, counseling, or referral.*	

Figure 1.2 A-SMART lifestyle vital signs assessment.

Lifestyle Vital Sign	Screening Questions	Score
Stress less	3. In the past month, how often have you felt your stress level was not manageable?[2] Score responses: Never (0 points), Almost never (1 point), Sometimes (2 points), Fairly often (3 points), Very often (4 points) 4. Do you feel that you have personal support?2 Score responses: Yes (0 points), No (1 point). *Sum scores for questions 3 and 4. A score of ≥3 indicates a need for further screening, counseling, or referral.*	
Move more	5. On average, how many days a week do you engage in moderate to vigorous physical activity, such as walking?[3] 6. On average, how many minutes do you engage in physical activity at this level?[3] *Multiply responses for questions 6 and 7 for total minutes per week. Score responses: ≥150 minutes of moderate activity or 75 minutes of vigorous activity (0 points), <150 minutes of moderate activity or 75 minutes of vigorous activity (1 point). A score of 1 indicates a need for further screening, counseling, or referral.*	
Avoid alcohol	7. On any single occasion during the past three months, have you had more than five drinks containing alcohol?[4] Score responses: No (0 points), Yes (1 point). *A score of 1 indicates a need for further screening, counseling, or referral.*	
Rest more	8. How many hours do you sleep on a typical night?[2] Score responses: 7–9 hours (0 points), <7 hours or >9 hours (1 point). *A score of 1 indicates a need for further screening, counseling, or referral.*	
Treat tobacco use	9. Do you currently vape or use any form of tobacco? Score responses: No (0 points), Yes (1 point). *A score of 1 indicates a need for further screening, counseling, or referral if ready to quit.*	
TOTAL Score	Sum scores in gray boxes. *Total scores of ≥10 points indicate an overall unhealthy lifestyle vital signs score, with one or more areas needing further screening, counseling, or referral.*	

Figure 1.2 (*continued*)

[1]Powell, H. S., & Greenberg, D. L. (2019, January). Screening for unhealthy diet and exercise habits: The electronic health record and a healthier population. *Preventive Medicine Reports, 14*, 100816. https://doi.org/10.1016/j.pmedr.2019.01.020

[2]Houlden, R. L., Yen, H. H., & Mirrahimi, A. (2018). The lifestyle history: A neglected but essential component of the medical history. *American Journal of Lifestyle Medicine, 12*(5), 404–411. https://doi.org/10.1177/1559827617703045

[3]Exercise is Medicine. (2021). *Physical activity vital sign*. American College of Sports Medicine. www.exerciseismedicine.org/support_page.php/health-care-providers

[4]Taj, N., Devera-Sales, A., & Vinson, D. C. (1998). Screening for problem drinking: Does a single question work? *Journal of Family Practice, 46*(4), 328–335.

[5]Chaput, J. P., Dutil, C., & Sampasa-Kanyinga, H. (2018). Sleeping hours: What is the ideal number and how does age impact this? *Nature and Science of Sleep, 10*, 421–430. https://doi.org/10.2147/NSS.S163071

importance on personal behavior choices and the role of lifestyle management in decreasing chronic diseases (Houlden et al., 2018). Ideally, procedures in the clinical setting should include documenting the lifestyle vital signs in the patient medical record at each encounter, similar to other vital signs. The APP should also review the lifestyle vital signs metrics at each encounter for changes to provide relevant lifestyle prevention and management strategies to mitigate risk factors for chronic diseases.

Data from patients with obesity indicate that patients want to discuss lifestyle behaviors with their healthcare provider and are more likely to be successful with behavior change if their healthcare provider offers counseling (Caterson et al., 2019). However, it is essential that the APP use effective strategies to start the conversation, such as seeking permission from the patient to discuss a particular lifestyle behavior. For example, if patients' score for *adopt healthy eating* is greater than three, poor eating habits are indicated. The APP may inform the patients that eating certain foods can lower their risk of heart disease, T2DM, and cancer and then ask the patients, "Would you mind if we discussed ways that you can lower your risk of heart disease?" If the patients do not give permission, the APP should not discuss it at that encounter but should let them know that he or she is available to discuss it at another time if they change their mind. It is essential that conversations about lifestyle occur in a nonjudgmental manner and that patients feel that they are partners with the APP in decisions about their care.

Prescribing Lifestyle Behaviors and Deprescribing Medications

Nearly every evidence-based clinical guideline incorporates lifestyle behaviors as the first-line intervention for chronic diseases such as CVD, hypertension, T2DM, and cancer (Rippe, 2018). However, clinicians are more likely to prescribe a medication with potential side effects than to offer a lifestyle behavior prescription. Medications prescribed for conditions without addressing the lifestyle root causes will have only a Band-Aid effect and may increase the risk of progression of a disease. APPs who collaborate with patients to develop person-centered lifestyle changes as first-line treatment options may avoid adverse medication effects, complications from polypharmacy, disease progression, and unnecessary procedures.

Martinez-Gomez et al. (2018) determined that prescribing healthy lifestyle behaviors and deprescribing medications decrease deaths from all causes and CVD. The study defined polypharmacy as medical management with more than five medications. Six healthy lifestyle behaviors were assessed: not smoking (never or quit >15 years), adopting a nutritious diet, being moderately or very active, being sedentary for seven hours or less per day, and sleep duration of seven to eight hours per day. Those who practiced five to six of the identified healthy lifestyle behaviors were determined to have a healthy lifestyle. Based on this study, it was discovered that even among those with polypharmacy, if they adhered to a healthy lifestyle, they had a 54% less chance of dying from all causes and a 60% less chance of dying from CVD than those who did not practice a healthy lifestyle. This study provides sufficient evidence to support the value of prescribing healthy lifestyle behaviors to decrease mortality.

Deprescribing is the process of decreasing or discontinuing medicines under the guidance of a healthcare provider. Martinez-Gomez et al. (2018) evaluated the effect of replacing medicines with lifestyle behaviors or deprescribing medications while prescribing lifestyle behavior, compared to only deprescribing. The results indicated that replacing medications with lifestyle behaviors was two- to threefold more effective in reducing all causes of mortality than only deprescribing. Further, the number of

medications an individual took directly affected death from all causes and CVD. Those who took five or more medicines were twice as likely to die from all causes of CVD than those who took one or no pills. Therefore, APPs should review medications for appropriateness to determine whether deprescribing is warranted. Indeed, a "healthy lifestyle is 'medicine' and may replace medications" (Martinez-Gomez et al., 2018, Discussion section, para. 4). However, the APP should use a person-centered approach to evaluate the risk versus benefits of deprescribing.

There is evidence that those who are on medications who also practice healthy lifestyle behaviors can have substantially decreased incidences of death. Individuals who practiced three or four of the six healthy lifestyle behaviors even while taking two to four medications significantly decreased mortality (Martinez-Gomez et al., 2018). In fact, individuals taking two to four medications and practicing a healthy lifestyle had a 55% lower risk of all-cause mortality and a 53% decreased risk of CVD mortality compared to those with an unhealthy lifestyle. Even those who took one or no medications and practiced unhealthy lifestyles had increased mortality compared to those taking two to four

medicines and practicing a healthy lifestyle. Hence, despite the number of medications a patient takes, practicing healthy lifestyle behaviors is paramount to increasing longevity and decreasing death from all causes, including heart disease, the leading cause of death. Whenever possible, APPs should consider replacing medications with healthy lifestyle prescriptions to reduce the ill effects of polypharmacy and optimize health benefits.

While lifestyle behavior counseling is underutilized, it has been shown that this "advice is more effective in changing behavior when complemented by a written prescription for a lifestyle change" (White et al., 2020, p. 271). The American College of Sports Medicine's (2021) core exercise prescription format, which includes the frequency, intensity, time, and type (FITT) of activity, can be adapted for all lifestyle behaviors. Using the FITT format or the SMART-EST (specific, measurable, attainable, relevant, time-bound, evidence-based, strategic, tailored) format will provide patients with clear, achievable, and quantifiable directions (White et al., 2020). Lifestyle prescriptions are provided in **Table 1.6** as exemplars of the FITT types of prescriptions relevant to the A-SMART behaviors to promote health and well-being.

Table 1.6 **Exemplars of A-SMART Lifestyle Behavior Prescriptions**

Lifestyle Behavior	Lifestyle Prescription Using FITT
Adopt healthy eating	Example of a FITT prescription to increase vegetable consumption: F: Every day I: Three servings (1/2 cup = 1 serving) T: During lunch and dinner T: Eat a variety of colored vegetables (e.g., spinach, broccoli, cauliflower, carrots, cucumber)
	Example of a FITT prescription for substituting a low-fiber breakfast with a high-fiber breakfast: F: Every day I: Increase fiber to at least 10 g T: During breakfast meal T: Eat a serving of high-fiber breakfast cereal (e.g., oatmeal) with one small apple or 1/2 cup berries and 1/4 cup almonds

Lifestyle Behavior	Lifestyle Prescription Using FITT
Stress less	Example of a FITT prescription for mindful breathing: F: Twice daily I: Focus on breathing deeply T: In the morning before getting out of bed and in the evening before going to sleep T: Inhale deeply through the nose for 4 seconds while expanding the abdomen, hold breath for 7 seconds, then exhale through the mouth for 8 seconds. Repeat 3 times.
Move often	Example of a FITT prescription for low-intensity physical activity: F: Four days a week I: Low intensity, during which you can talk comfortably in full sentences with little to no pause for a breath T: Twenty minutes (may divide into 5- to 10-minute sessions) T: Walk at a leisurely pace before and after work.
	Example of a FITT prescription for moderate-intensity physical activity: F: Five days a week I: Moderate intensity during which you can talk in short sentences with pauses for a breath T: Thirty minutes each day after dinner T: Walk at a brisk pace
Avoid alcohol	Example of a FITT prescription for a male drinker to limit alcohol: F: Seven days per week I: Limit alcoholic beverages to two or fewer drinks T: Daily T: None recommended. (One drink contains 14 g of pure alcohol. Examples include 12 oz. of regular beer, 5 oz. of wine, or 1.5 oz. of distilled spirits.)
Rest more	Example of a FITT prescription for a shift worker who sleeps during the day: F: Once every 24 hours I: Deep restorative sleep T: 7–8 hours between 8:00 a.m. and 4:00 p.m. T: Daytime sleep, using a light-blocking window covering or an eye mask to block light
Treat tobacco use	Example of a FITT prescription to gradually decrease tobacco use for cessation for a one-pack-per-day smoker: F: Weekly I: Gradual decrease T: Each morning, count out the daily allotment of cigarettes T: Decrease daily tobacco use by 2 cigarettes each week (e.g., 18 cigarettes per day for 1 week, then 16 cigarettes per day for 1 week, and so forth until smoke-free)

Data from Frates, B., Bonnet, J. P., Joseph, R., & Peterson, J. A. (2019). *Lifestyle medicine handbook: An introduction to the powers of healthy habits.* Healthy Living.

Equally important, each lifestyle prescription must fit the patient's unique needs to improve success. Even though the foundational evidence upon which lifestyle management prescriptions are developed is universal, the application of the evidence is exclusive to the patient. Lifestyle management is not a one-size-fits-all prescription. It considers the patient's behavioral, environmental, and social determinants of health and desires (White et al., 2020). Integral to an effective lifestyle prescription is the "sacred bond" between the patient and the provider as they collaborate to attain disease remission and improve health outcomes (Dysinger, 2021, p. 556).

Though examples of lifestyle prescriptions are provided for each A-SMART behavior in Table 1.6, it's important to note that just as medications are prescribed by starting low and going slow, the same principle applies to lifestyle prescriptions. As stated previously, lifestyle behaviors have an additive effect, and the more behaviors practiced, the better the overall health outcome will be. However, when several lifestyle behaviors need to be changed, the lifestyle prescriptions should be introduced gradually to promote adherence and a successful outcome. If patients are required to change several behaviors at once, they may become overwhelmed and discouraged and not adhere to long-term behavior change.

Lifestyle prescriptions can be written and handed to the patient at the conclusion of the encounter and "filled" at home as the patient implements the personalized lifestyle strategies discussed during the visit. Many electronic medical records have customizable prescription templates that can be printed or electronically sent to patients and easily referenced during future encounters (Dysinger, 2021). Lifestyle prescriptions serve as reminders of lifestyle counseling delivered during the visit and may enhance adherence to the behaviors described as first-line treatment in clinical practice guidelines for the prevention and management of metabolically related conditions. Ultimately, the use of lifestyle prescriptions can improve health outcomes, decrease the use of medication, and lower the cost of health care.

Strategies to Enhance Adherence to Lifestyle Management

The success of lifestyle management in preventing and managing chronic diseases will depend on developing an evidence-informed person-centered management plan. Lifestyle vital signs and prescriptions are fundamental components of a lifestyle management approach. There are many behavior change strategies that APPs may utilize when prescribing lifestyle management, such as addressing motivators, barriers, and self-monitoring (Hooker et al., 2018). Too often, healthcare providers give patients behavior change instructions, only to later find out the patient has not followed through. APPs can overcome this phenomenon by proactively assessing facilitators and barriers to lifestyle behaviors and collaboratively developing solutions when prescribing A-SMART lifestyle behaviors by asking patients, "What could get in the way of doing this behavior?" or "What challenges do you anticipate in carrying out this lifestyle prescription?"

Another person-centered approach to individualizing prescriptions and promoting adherence is the Frates MOSS Method™, which stands for motivation, obstacles, strategies, and strengths (Frates et al., 2019). An individual's motivation can be determined by asking open-ended questions, such as "What makes you want to start a particular behavior now?" "What is motivating you to start the behavior?" and "What benefits do you expect to achieve by doing a behavior?" Since obstacles change periodically and may be related to an individual's stage of life, an obstacle for one person could be a motivator for another, underscoring the importance of using a person-centered approach to assess obstacles. For example, caring

for children may be an obstacle to one mother's physical activity goals, whereas another mother may find that her children motivate her to be physically active so that she can "be in good shape" to take care of them. Others may not prioritize time for physical activity, focusing all their energy on their children. A key obstacle is not having a distinct motivator for undertaking a particular behavior (Frates et al., 2019).

Strategies are patient-specific tactics developed to overcome obstacles. Examples of strategies that the APP may suggest are the need for social support (e.g., walking groups) and self-monitoring (e.g., using a smartphone app or journal). Strengths are essential to discuss with patients who have previously tried a particular behavior change without success and who may lack confidence. The APP can help patients identify strengths in other areas of their life that may be applied to the desired behavior change. The MOSS Method™ is one of many techniques for determining facilitators and barriers to lifestyle change. In brief, APPs need to evaluate factors that may impact a person's practice of lifestyle behaviors to determine successful person-centered behavior change strategies (Lenz, 2014).

Application of the A-SMART Vital Signs and Prescriptions

The following scenario describes a conventional patient encounter and provides an analysis of opportunities to apply the A-SMART lifestyle vital signs and prescriptions.

Subjective data: M.C. is a 35-year-old cisgender female who comes into the primary care office for the first time with a complaint of fatigue over the past six months. She has no allergies and currently does not take any medications. Her medical history is unremarkable except that both her parents have T2DM. She is single, lives alone, and works the night shift as a store clerk. See the A-SMART lifestyle vital signs relevant to M.C. in **Table 1.7**.

Objective data: M.C.'s vital signs are within normal limits, except her blood pressure is 142/80 mmHg, and her BMI is 31 kg/m^2. The physical exam is unremarkable.

Assessment: R53.83 Fatigue, other; R03.0 Elevated blood-pressure reading, without diagnosis of hypertension; E66.9 Obesity, unspecified; Z68.31 Body mass index 30–39, adult.

Plan: The APP orders thyroid-stimulating hormone, complete blood count, complete metabolic panel, and hemoglobin A1C. A-SMART vital sign findings are reviewed, and risk factors of obesity, smoking, and sedentary behaviors are discussed. The APP explores which lifestyle behavior the patient is ready to change. The APP and the patient agree to work on increasing sleep hours. Sleep hygiene strategies are provided. Using the MOSS^{TM} approach, the APP identifies motivators, obstacles, strategies, and strengths to improve her sleep. The patient was given a lifestyle prescription to rest more (Table 1.6) and asked to self-monitor by keeping a sleep diary. M.C. was referred to a registered dietitian. A return visit is scheduled in two weeks to review labs, recheck blood pressure, and evaluate sleep progress.

In M.C.'s case, findings from the A-SMART lifestyle vital signs assessment reveal several behaviors that need to be optimized for improved health. This assessment can guide the astute APP to provide additional screening and offer lifestyle counseling. Further discussion

Table 1.7 M.C. Case Study A-SMART Lifestyle Vital Signs Assessment

Lifestyle Vital Sign	Screening Questions	Patient Responses	Score
Adopt healthy eating	1. How many days per week do you eat ≥5 fruits and vegetables? Score responses: 6–7 days (0 points), 4–5 days (1 point), 2–3 days (2 points), 0–1 days (3 points)	"I don't like vegetables, but I eat a banana every day."	3
	2. How many days per week do you consume sugary foods/drinks? Score responses: 0–1 days (0 points), 2–3 days (1 point), 4–5 days (2 points), 6–7 days (3 points)	"I usually have a soda once per day with dinner."	3
	Sum scores for questions 1 and 2.	*A score of ≥3 indicates a need for further screening, counseling, or referral.*	6
	A follow-up dietary screening question is asked: "What do you eat and drink for breakfast, lunch, and dinner, including snacks?"	"I do not eat breakfast except for two cups of coffee; for lunch, I have a burger and fries; for dinner, I have rice, steak, and soda. I don't snack."	
Stress less	3. In the past month, how often have you felt your stress level was not manageable? Score responses: Never (0 points), Almost never (1 point), Sometimes (2 points), Fairly often (3 points), Very often (4 points)	"Almost every day at work, I feel my stress is not manageable."	4
	4. Do you feel that you have personal support? Score responses: Yes (0 points), No (1 point)	"Yes, my faith community provides support."	0
	Sum scores for questions 3 and 4.	*A score of ≥3 indicates a need for further screening, counseling, or referral.*	4
Move often	5. On average, how many days a week do you engage in moderate to vigorous physical activity, such as walking?	"I don't have time to be physically active except at work."	0
	6. On average, how many minutes do you engage in physical activity at this level?		0

Lifestyle Vital Sign	Screening Questions	Patient Responses	Score
	Multiply responses for questions 5 and 6 for total minutes per week. Score responses: ≥150 minutes of moderate activity or 75 minutes of vigorous activity (0 points), <150 minutes of moderate activity or 75 minutes of vigorous activity (1 point).	*Total of 0 minutes per week, which is <150 minutes of moderate activity or 75 minutes of vigorous activity (1 point). A score of 1 indicates a need for further screening, counseling, or referral.*	1
Avoid alcohol	7. On any single occasion during the past three months, have you had more than five drinks containing alcohol? Score responses: No (0 points), Yes (1 point)	"No."	0
Rest more	8. How many hours do you sleep on a typical night? Score responses: 7–9 hours (0 points), <7 hours or >9 hours (1 point)	"I sleep four to five hours." *A score of 1 indicates a need for further screening, counseling, or referral.*	1
Treat tobacco use	9. "Do you currently vape or use any form of tobacco?" Score responses: No (0 points), Yes (1 point)	"Yes, I smoke a pack per day." *A score of 1 indicates a need for further screening, counseling, or referral if ready to quit.*	1
	A follow-up tobacco use screening question is asked: "How long have you been smoking?"	"Fifteen years." *(Note: Fifteen pack-year history of smoking)*	
TOTAL score	Sum scores in gray boxes.	*A score of 13 indicates an overall unhealthy vital signs score with one or more areas needing further screening, counseling, or referral.*	13

with the patient will determine areas in which referrals to other healthcare professionals, such as a dietitian, an exercise specialist, or a mental health professional, might be appropriate. The APP can help the patient prioritize and identify person-centered and evidence-informed lifestyle strategies to improve health outcomes, keeping in mind that behavior changes should be introduced gradually and when the patient is ready. Also, when counseling a patient to make lifestyle changes, it is essential to address personal health goals and identify barriers and facilitators to behavior change.

An APP using a lifestyle lens would also consider the reciprocal nature of the patient's health behaviors and risk factors. For example, poor sleep and other unhealthy lifestyle behaviors contribute to obesity and elevated blood pressure while obesity, in turn, influences sleep and hypertension. Furthermore, health and lifestyle are not linear processes but are interconnected and complex (Egger et al., 2017). An example of linear thinking is "if energy out (basal metabolic rate and calories burned in physical activity) is greater than energy in (calories consumed), it will result

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Health Promotion Case Study Addressing Lifestyle in an Older Adult Female

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Case Description: C.G. is a 67-year-old female diagnosed with heart failure who presented to the primary care clinic for follow-up post-hospitalization one week ago. She reports having shortness of breath after climbing three flights of stairs and swelling in her lower legs. She has a history of T2DM and hypertension. She has lived alone, a widow for 10 years, and can care for herself. She was discharged with insulin, a diuretic, and an antihypertensive.

Vital Signs: Blood pressure 144/90 mmHg left arm, heart rate 90 beats per minute, respiratory rate 20 breaths per minute, temperature 97.9º F.

Physical Exam: The physical exam reveals a well-developed, well-nourished female who appears depressed. She is well kept and appropriately dressed. The exam is unremarkable except for bibasilar crackles and pitting edema in bilateral lower extremities.

Critical Thinking Questions

- What additional subjective data related to lifestyle behaviors do you want to obtain and why?
- What additional lifestyle objective data do you want to assess and why?
- Are there any lifestyle vital signs you would like to obtain and why?
- What lifestyle management strategies would you consider to optimize C.G.'s health outcomes?
- List an intervention for each of the five levels of prevention.
- Write a lifestyle prescription.
- Find research evidence to support lifestyle management of heart failure.

Additional Reading: Razavi, A. C., Monlezun, D. J., Sapin, A., Sarris, L., Schlag, E., Dyer, A., & Harlan, T. (2019). Etiological role of diet in 30-day readmissions for heart failure: Implications for reducing heart failure-associated cost via culinary medicine. *American Journal of Lifestyle Medicine, 14*(4), 351–360. https://doi.org/10.1177/1559827619861933

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in weight loss." On the other hand, a systems approach considers the multiple factors that influence health and their interrelatedness (Egger et al., 2017). As in M.C.'s case, inadequate sleep impacts the release of cortisol and other hormones that affect satiety and hunger. Poor sleep can lead to fatigue, fatigue to inactivity, and inactivity to poor eating habits, all of which could subsequently lead to depression, obesity, heart disease, and T2DM. Additionally, poor eating habits, sedentary habits, and substance use can lead to accidents, insomnia, or illnesses that exacerbate the disease cycle. Medications that help control blood pressure, depression, or other health problems may have side effects that lead to weight

gain or other complications. All of these—risk factors, etiology, the condition, and the management—are included in lifestyle management (Egger et al., 2017).

M.C.'s case is a complex interplay of lifestyle, biological, and environmental factors. Without lifestyle management and person-centered behavior change strategies, the outcome will be less than ideal. The takeaway from this case is that biological processes are complex and each behavior contributes to a feedback loop. Even if medications are required, lifestyle management can enhance positive outcomes, reduce the use of drugs, and decrease potential side effects such as weight gain.

Lifestyle Management and Conventional Medicine

Lifestyle management focuses on mitigating the unhealthy lifestyle choices that contribute to disease, whereas conventional medicine treats symptoms and disease (Egger et al., 2017). Hence, in lifestyle management, the patient is actively involved in, rather than passively receiving, care. According to the ACLM (n.d.), lifestyle management should not be viewed as different from conventional medicine but rather as the foundation of conventional practice. Even so, Egger and colleagues' (2017) description of the fundamental differences between lifestyle and conventional management outlined in **Table 1.8** can enlighten the APP.

Lifestyle management does not indicate using only a nonmedical clinical approach. Patient outcomes are enhanced when lifestyle management strategies integrate interventions with conventional medical practices to manage illnesses when warranted. Healthy lifestyle behaviors are integral to optimal chronic disease management and health outcomes. For example, the treatment for uncontrolled

Table 1.8 Differences Between Lifestyle and Conventional Management of Disease

Lifestyle Management	Conventional Management
Treats lifestyle behavior/environmental causes.	Treats individual risk factors.
Patient is engaged as a partner in care and required to make significant lifestyle behavior changes.	Patient is less likely to be engaged in care and is not required to make significant lifestyle behavior changes.
Treatment is often long term.	Treatment is usually short term.
Accountability is also on individuals as partners in their care.	Accountability is on the clinician only.
Emphasis is on amending health behavior/environment, and medication is secondary.	Medication is usually the endpoint of care.
Emphasis is on motivation and agreement.	Emphasis is on diagnosis and prescription.
Focus is on primordial, primary, secondary, and tertiary prevention.	Objective is disease management.
Much consideration of the environment.	Less consideration of the environment.

Data from Egger, G., Binns, A., Rossner, S., & Sagner, M. (2017). *Lifestyle medicine: Lifestyle, the environment, and preventive medicine in health and disease* (3rd ed.). Elsevier.

Health Promotion Activity: Review the Nurses' Health Study in the Context of Lifestyle

Review the findings of the 40-year-long longitudinal Nurses' Health Study (NHS) at https://nurseshealthstudy.org. Describe the NHS results that pertain to the association of lifestyle behaviors and environmental factors and their relationship to various chronic diseases.

hypertension may include lifestyle behaviors such as increased physical activity, decreased sodium intake, and antihypertensive medications. The evidence-informed practice involves using lifestyle management to consider ecological determinants of disease and modify behavior while using conventional management to adjust medications.

Summary

Globally, lifestyle-related chronic diseases pose a significant burden on society. In the United States, CVD, cancers, and T2DM are the leading causes of morbidity and mortality. The primary risk factors for these common disorders are poor lifestyle behaviors, including unhealthy eating patterns, chronic stress, inactivity, alcohol consumption, lack of adequate sleep, tobacco use, and social determinants of health. These risk factors increase the cost of health care, with the United States spending more on health care than most industrialized countries but with lower longevity and worse healthcare outcomes. The good news is that most lifestyle-related chronic diseases can be prevented by integrating the six strategies of the A-SMART model into daily practice. In fact, 80% of lifestyle-related chronic conditions would not exist if individuals would eat a healthy dietary pattern of predominately plant sources, achieve a BMI within the normal range, be physically active, and not smoke. Also, lifestyle behavior interventions tend to be cost effective compared to conventional treatment strategies.

Further, even when individuals have a genetic predisposition or already have a chronic illness, if they practice healthy behaviors, their health outcomes and longevity may increase compared to those who do not practice healthy behaviors. Epigenetic changes are reversible with positive lifestyle behavior changes. It is well known that healthy lifestyle behaviors can decrease incidences of chronic diseases, reverse disease progression, and promote longevity.

Although most Americans do not practice recommended dietary and physical activity habits for optimum health outcomes, only a few receive advice on these and other lifestyle behaviors from a health professional. Still, there is evidence that those who receive lifestyle counseling are more likely to make lifestyle change. Providers face many barriers to implementing lifestyle behaviors in practice. However, with adequate training in the core competencies of lifestyle medicine and the relevant advanced practice registered nurse (APRN) and PA health promotion and disease prevention competencies, APPs will be better prepared to provide lifestyle management in practice. APPs owe it to their patients to provide the lifestyle counseling they need. APPs must seek to overcome barriers to integrating lifestyle management into their practice by participating in educational opportunities, seeking out effective ways of coding and billing, and relying on the interprofessional team by referring patients to other healthcare team members when warranted. **Table 1.9** list a sample of evidence-based resources to enhance and support lifestyle management assessment and application.

APPs who use effective lifestyle management strategies can promote healthy behaviors that decrease incidences of the leading causes of illness, disability, and death in the United States. These tactics require that APPs assess and evaluate lifestyle vital signs and develop person-centered prescriptions considering personal, environmental, and social barriers. APPs must collaborate with patients to create distinctive health behavior strategies and include written instructions using a lifestyle prescription model that provides clear, measurable, and attainable action steps. The overarching goal of lifestyle management is to promote health, decrease incidences of preventable chronic diseases, and decrease the economic burden of chronic diseases on society by integrating evidence-informed lifestyle as medicine in mainstream practice.

TABLE 1.9	Evidence-Based Resources for Health Promotion, Disease Prevention, and Lifestyle Concepts

Resource	URL
American College of Lifestyle Medicine	https://www.lifestylemedicine.org
American Institute for Cancer Research	https://www.aicr.org/cancer-prevention
Dietary Guidelines for Americans	https://www.dietaryguidelines.gov
Epigenetics	https://learn.genetics.utah.edu/content/epigenetics
Healthy People 2030	https://health.gov/healthypeople
Tracking Network for Lifestyle Risk Factor Data	https://www.cdc.gov/nceh/tracking/topics/LifestyleRiskFactors.htm
Physical Activity Guidelines	https://health.gov/our-work/physical-activity/current-guidelines
Physicians Committee for Responsible Medicine	https://www.pcrm.org
The Plantrician Project	https://plantricianproject.org
Institute of Lifestyle Medicine	https://www.instituteoflifestylemedicine.org
True Health Initiative	https://www.truehealthinitiative.org
Video: Lifestyle Medicine	https://vimeo.com/134629158 https://vimeo.com/281875215
Video: Heart Disease	https://vimeo.com/136965421
Video: Type 2 Diabetes	https://vimeo.com/137208481

Acronyms

ACC/AHA: American College of Cardiology and American Heart Association
ACLM: American College of Lifestyle Medicine
APP: advanced practice provider
APRN: advanced practice registered nurse
A-SMART: adopt healthy eating, stress less, move often, avoid alcohol, rest more, treat tobacco use
BMI: body mass index
CDC: Centers for Disease Control and Prevention

CVD: cardiovascular disease
FITT: frequency, intensity, time, type
HPFS: Health Professionals Follow-Up Study
MOSS: motivation, obstacles, strategies, strengths
NCCDPHP: National Center for Chronic Disease Prevention and Health Promotion
NHS: Nurses' Health Study
NONPF: National Organization of Nurse Practitioner Faculties
NP: nurse practitioner
PA: physician assistant

QALY: quality-adjusted life year
ROI: return on investment
SMART-EST: specific, measurable, attainable, relevant, time-bound, evidence-based, strategic, tailored

T2DM: type 2 diabetes
WHO: World Health Organization

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