

Institute of Medicine report. While not mentioned as a specific type of team care, modern information technology offers substantial promise in providing consistent, readily available information across settings and providers. All such team programs are targeted at prevention and management of chronic and complex problems. Evidence from clinical trials or quasi-experimental studies supports the benefit of each model, and for some models data are sufficient to support meta-analyses. The evidence for benefit is not always consistent between studies or types of care but includes some support for improved quality of care, quality of life, function, survival, and health care costs and use. Some models of care are disease-specific and focus on common chronic conditions such as diabetes mellitus, congestive heart failure, chronic obstructive pulmonary disease, and stroke. One challenge in the use of these models is that a majority of older adults will have multiple simultaneous conditions and thus will need services from multiple programs that may not communicate among themselves.

Most models of care are difficult to implement in today's health care system because nonphysician services are not reimbursed, nor is physician effort that is not incorporated into "face-to-face" time. Thus, several models have been developed largely by the Department of Veterans Affairs Health Care System, Medicare Managed Care providers, and other sponsoring agencies. Medicare has developed a series of demonstration projects that can expand the evidence base and serve policy makers. More recently, there has been an effort to promote coordinated care through Accountable Care Organizations and patient-centered "medical homes." However, the processes and outcomes of such care must evolve from disease-specific indicators to more general markers, such as optimizing functional status, focusing on outcomes that are important to patients, and minimizing inappropriate care.

SCREENING AND PREVENTION IN OLDER PERSONS

In older adults, prevention tests and interventions are less consistently recommended for all asymptomatic patients. The guidelines fail to address the influence of health status and life expectancy on recommendations, although the benefits of prevention are clearly affected by life expectancy. For example, in most types of cancer, screening provides no benefit in patients with a life expectancy of ≤ 5 years. More research is needed to build an appropriate evidence base for age- and life expectancy-adapted preventive services. Health behavior modification, especially increasing physical activity and improving nutrition, probably has the greatest potential to promote healthy aging.

Screening Tests

- Osteoporosis: Bone mineral density (BMD) should be measured at least once after the age of 65 years. There is little evidence that regular monitoring of BMD improves the prediction of fractures. Because of limitations in the precision of dual-energy x-ray absorptiometry, the minimal interval between evaluations should be 2–3 years.
- Hypertension: Blood pressure should be determined at least once a year or more often in patients with hypertension.
- Diabetes: Serum glucose and hemoglobin A1c should be checked every 3 years or more often in patients who are obese or hypertensive.
- Lipid disorders: A lipid panel should be done every 5 years or more often in patients with diabetes or any cardiovascular disease.
- Colorectal cancer: A fecal occult blood test and a sigmoidoscopy or colonoscopy should be done on a regular schedule up to the age of 75 years. No consensus guidelines exist for these tests >75 years of age.
- Breast cancer: Mammography should be done every 2 years between the ages of 50 and 74 years. No consensus guidelines exist for mammography after the age of 75 years.
- Cervical cancer: A Pap smear should be done every 3 years up to the age of 65 years.

Preventive Interventions

- Influenza: Immunize annually.
- Shingles: Administer herpes zoster vaccine once after the age of 50 years.
- Pneumonia: Administer pneumococcal vaccine once at the age of 65 years.

- Myocardial infarction: Prescribe daily aspirin for patients with prevalent cardiovascular disease or with a poor cardiovascular risk profile.
- Osteoporosis: Prescribe calcium at 1200 mg daily and vitamin D at ≥ 800 IU daily.

Exercise Rates of regular physical activity decrease with age and are lowest in older persons. This situation is unfortunate because increased physical activity has clear benefits in older adults, improving physical function, muscle strength, mood, sleep, and metabolic risk profile. Some studies suggest that exercise can improve cognition and prevent dementia, but this association is still controversial. Exercise programs, both aerobic and strength training, are feasible and beneficial even in very old and frail individuals. Regular, moderate-intensity exercise can reduce the rate of age-associated decline in physical function. The Centers for Disease Control and Prevention recommends that older persons should spend at least 150 min per week in moderate-intensity aerobic activity (e.g., brisk walking) and should engage in muscle-strengthening activities that work all major muscle groups (legs, hips, back, abdomen, chest, shoulders, and arms) at least 2 days a week. In the absence of contraindications, more intense and prolonged physical activity provides greater benefits. Frail and sedentary persons may need supervision, at least at the start of the exercise program, to avoid falls and exercise-related injuries.

Nutrition Older persons are particularly vulnerable to malnutrition, and many problems that affect older patients can be addressed by dietary modification. As mentioned above, nutrient sensing is the major factor associated with differential longevity in several animal models, including mammals. Treatment with rapamycin, the only pharmacologic intervention that has been associated with longevity, affects nutrient sensing. Nevertheless, there are almost no evidence-based guidelines for individualizing dietary modifications based on differing health outcomes in the elderly. Even when guidelines exist, older people tend to be poorly compliant with dietary recommendations. Basic principles of a healthy diet that are also valid for older persons are as follows:

- Encourage the consumption of fruits and vegetables; they are rich in micronutrients, mineral, and fibers. Whole grains are also a good source of fiber. Keep in mind that some of these foods are costly and thus less accessible to low-income persons.
- Emphasize that good hydration is essential. Fluid intake should be at least 1000 mL daily.
- Encourage the use of fat-free and low-fat dairy products, legumes, poultry, and lean meats. Encourage consumption of fish at least once a week, since there is strong epidemiologic evidence that fish consumption is associated with a lowered risk of Alzheimer's disease.
- Match intake of energy (calories) to overall energy needs in order to maintain a healthy weight and BMI (20–27). Recommend moderate (5–10%) caloric restriction only when the BMI is >27 .
- Limit consumption of foods with high caloric density, high sugar content, and high salt content.
- Limit the intake of foods with a high content of saturated fatty acids and cholesterol.
- Limit alcohol consumption (one drink per day or less).
- Introduce vitamin D–fortified foods and/or vitamin D supplements into the diet. Older persons who have little exposure to UVB radiation are at risk of vitamin D insufficiency.
- Make sure that the diet includes adequate food-related intake of magnesium, vitamin A, and vitamin B₁₂.
- Monitor daily protein intake, which, in healthy older persons, should be in the range of 1.0–1.2 g/kg of body weight. Higher daily protein intake (i.e., ≥ 1.2 –1.5 g/kg) is advised for those who are exercising or are affected by chronic diseases, especially if these conditions are associated with chronic inflammation. Older people with severe kidney disease (i.e., an estimated glomerular filtration rate of <30 mL/min per 1.73 m²) who are not on dialysis should limit protein intake.