
COMING OF AGE: CONSIDERATIONS IN THE PRESCRIPTION OF EXERCISE FOR OLDER ADULTS

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Abstract

Older adults represent the fastest-growing age demographic of the population. Physiological changes associated with primary aging and concurrent chronic disease adversely impact functional capacity, health outcomes, and quality of life. For these reasons, there is a national emphasis for healthcare providers to improve the health, function, and quality of life of older adults to preserve independent living and psychological well-being. The benefits of regular physical activity or exercise with regard to aging and disease are indisputable, yet many clinicians do not prescribe exercise to older adults. This reluctance may be attributable to a lack of knowledge regarding appropriate exercise prescription for older adults in light of the potential risks and benefits of various doses and types of exercise. In addition, clinicians and patients may have concerns about potential health considerations relevant to older adults such as comprehensive pre-exercise screening and exercise-drug interactions. In light of this, the following review presents (1) guidelines for exercise prescription in older adults and modification of these guidelines for patients with the most common age-associated comorbidities; (2) recommendations for pre-exercise screening prior to initiating an exercise program in older adults; (3) considerations for older adults on one or more medications; and (4) common barriers to adopting and maintaining exercise in an older population. Our goal is to provide a framework that clinicians can follow when prescribing exercise in older adults while considering the unique characteristics and concerns present in this population.

Introduction

Older adults are among the fastest growing age groups in the United States, with more than 47 million adults ≥ 65 years old.¹ It is projected that by the year 2030, the number of individuals aged 65 years and over will reach 74 million, making those aged 85 years and older the fastest-growing segment of our population.¹ Presently, two out of every three older adults manage multiple chronic conditions, and treatment for these conditions accounts for 66% of the country's health care budget.² Accordingly, the U.S. government's Healthy People 2020 initiative has set measurable objectives to be achieved by the year 2020, with the overarching goal to "improve the health, function, and quality of life of older adults."³ While participation in a regular exercise training program is a cost-effective intervention with known health benefits to improve health, delay physical dysfunction, and prevent/treat chronic disease among older adults,⁴ only 22% of adults ≥ 65 years meet the recommendations for physical activity.⁵ On the provider side, older adults have the ability to adapt and respond to both aerobic and strength training,⁴ yet only 32% of clinicians deliver exercise counseling or education to older adults during an office visit.⁶

Because the majority of risk factors associated with chronic disease increase with age, the adoption of regular physical activity is essential to buffer the functional declines associated with aging and to improve health outcomes and disability among older adults.⁴ Therefore, it is vital that clinicians understand the unique aspects surrounding exercise prescription in older adults so that effective recommendations and clinical interventions can be

designed to maximize benefit among the fastest-growing segment of our population.

The following review presents guidelines for exercise prescription in older adults, the rationale for pre-exercise screening prior to initiating an exercise program in older adults, modification of an exercise prescription for patients with the most common age-associated comorbidities, considerations for older adults on one or more medications, and common barriers to adopting and maintaining exercise in an older population. The overall purpose is to provide a framework for clinicians to follow for the prescription of exercise in older adults while keeping in mind the unique characteristics and concerns present in this population.

Exercise Prescription for Older Adults

An exercise prescription (ExRx) is a recommended physical activity program designed in a systematic and individualized manner in terms of the Frequency, Intensity, Time, Type, Volume, and Progression, known as the FITT-VP principle. The American College of Sports Medicine's (ACSM) general ExRx recommendations for adults ≥ 65 years are detailed in Table 1.⁷ Of note, these guidelines also apply to individuals aged 50 to 64 years with clinically significant conditions or physical limitations that affect movement. Deconditioning, low muscle tone, and/or low functional capacity contribute to poor health outcomes and low quality of life⁴; therefore, the ACSM recommends that older adults engage in a combination of aerobic, resistance, flexibility, and balance training to promote and maintain health.⁷

The FITT-V Principle of the ExR _x	Professional Committee/Organization					
	ACSM/AHA ^{7,31}	CDC ⁹	NIH ⁴⁵	CSEP ⁴⁶	BSG ⁴⁷	WHO ⁴⁸
Frequency (How often?)	If moderate intensity: ≥ 5 d/wk If vigorous intensity: ≥ 3 d/wk If combination of moderate and vigorous intensity: 3-5 d/wk	≥ 3 d/wk, throughout the week	Most or all days of the wk	NA	5 d/wk	NA
Intensity (How hard?)	Moderate to vigorous ^c	Moderate to vigorous ^c	Moderate to vigorous	Moderate to vigorous ^c	Moderate ^c	Moderate to vigorous ^c
Time (How long?)	If moderate intensity: ≥ 30 min/d If vigorous intensity: ≥ 20 min/d ^{d,e}	NA	≥ 30 min/d	NA	30 min/d, one bout or cumulative	NA
Type (What kind?) Primary	Aerobic	Aerobic	Endurance	Aerobic	Aerobic	Aerobic
Adjuvant 1	Muscle strengthening ≥ 2 d/wk (non-consecutive) Moderate to vigorous intensity ^c 8-10 exercise; ≥ 1 set of 10-15 repetitions ^{g,h}	Muscle strengthening ≥ 2 d/wk Moderate to high intensity 2-3 sets of 8-12 repetitions ^{g,h}	Muscle strengthening ≥ 2 d/wk (non-consecutive) 30 min/d ^{g,h}	Muscle and bone strengthening ≥ 2 d/wk ^g	Muscle strengthening ≥ 2 d/wk (non-consecutive)	Muscle strengthening ≥ 2 d/wk ^g
Adjuvant 2	Flexibility ≥ 2 d/wk at least 10 min/d	Balance if at risk of falling ≥ 3 d/wk In addition, standardized balance exercise program	NA	Balance if mobility is poor	Flexibility before and after other types of activity Or ≥ 2 d/wk; ≥ 10 min/d	Balance if mobility is poor ≥ 3 d/wk
Adjuvant 3	Balance if at substantial risk of falling	NA	NA	NA	Balance if at substantial risk of falling ≥ 3 d/wk	NA
Volume^d	If moderate intensity: ≥ 150 min/wk If vigorous intensity: ≥ 75 min/wk ^{e,f}	If moderate intensity: ≥ 150 min/wk If vigorous intensity: ≥ 75 min/wk ^{e,f}	NA	≥ 150 min/wk ^e	NA	If moderate intensity: ≥ 150 min/wk If vigorous intensity: ≥ 75 min/wk ^{e,f}

^a Older adults refers to men and women age ≥ 65 yrs and adults age 50 to 64 yrs with clinically significant chronic conditions and/or functional limitations by ACSM/AHA^{7,31}; Older adults are referring to men and women age ≥ 65 yrs by CDC,⁹ NIH,³² CSEP,³³ and BGS³⁴; Older adults are referring to men and women age ≥ 60 yrs by WHO.³⁵

^bACSM: American College of Sports Medicine; AHA: American Heart Association; CDC: Centers for Disease Control and Prevention; NIH: National Institutes of Health; CSEP: Canadian Society of Exercise Physiology; BGS: British Geriatric Society; WHO: World Health Organization.

^c Moderate intensity is defined as 5 to 6 on a scale of 0 (sitting) to 10 (all-out effort) of level of physical exertion^{9,31,35} or an intensity that causes noticeable increases in heart rate and breathing for aerobic activity³¹⁻³⁴ or 60% to 70% of one repetition maximum for muscle strengthening activity⁷; vigorous or high intensity is defined as 7 to 8 on a scale of 0 (sitting) to 10 (all-out effort) of level of physical exertion^{9,31,35} or an intensity that causes substantial increases in heart rate and breathing (out of breath) for aerobic/muscle strengthening activity.^{9,31,33}

^d For greater and more extensive benefits, ACSM/AHA^{7,31} recommends to progress exercise volume and reach: total 60 min/d, 300 min/wk if moderate intensity; total 30 min/d, 100 min/wk if vigorous intensity. CDC⁹ and WHO³⁵ recommend to progress exercise volume and reach total 300 min/wk if moderate intensity, total 150 min/wk if vigorous intensity.

^e Exercise can be performed in one continuous bout or multiple bouts of at least 10 minutes each.

^f Exercise can be performed as an equivalent combination of moderate and vigorous intensity activity.

^g Muscle strengthening activity should involve all the major muscle groups.

^h Appropriate progression is emphasized.

Table 1. Exercise prescription guidelines, scientific statements, and recommendations for older adults^a by the various professional committees and organizations.^b FITT-V: Frequency, Intensity, Time, Type, and Volume of the exercise prescription; ExR_x: exercise prescription; NA: not available.

Specifically, the ACSM recommends the following FITT-VP ExR_x⁷ for older adults:

Frequency: ≥ 5 days per week (d/wk) for moderate-intensity aerobic exercise (or ≥ 3 d/wk for vigorous-intensity aerobic exercise, or 3 to 5 d/wk for a combination of moderate- and vigorous-intensity exercise) supplemented by resistance exercise ≥ 2 d/wk and flexibility exercise ≥ 2 d/wk.

Intensity: On a scale of 0-10 for level of physical exertion, 5-6 for moderate-intensity aerobic exercise, 7-8 for vigorous-intensity aerobic exercise, and 5-6 for moderate-intensity resistance exercise.

Time: A minimum of 30 minutes or up to 60 minutes per day (m/d) for moderate intensity aerobic exercise or at least 20 to 30 m/d for vigorous intensity aerobic exercise.

Type: Emphasis should be placed on aerobic activities that do not impose excessive orthopedic stress, such as walking. Resistance training may supplement as an adjuvant to aerobic training and should consist of 8 to 10 different exercises targeting the major muscle groups. Flexibility exercise training is recommended ≥ 2 d/wk holding each muscle 30 to 60 seconds. Balance (neuromotor) training is also recommended 2 to 3 d/wk in individuals at high risk for fall.

Volume: Should total 150 m/wk of moderate intensity exercise or 75 m/wk of combined moderate- and vigorous-intensity exercise.

Progression: The FITT components may be increased, as tolerated, to achieve the recommended volume, up to 300 m/wk of moderate-intensity aerobic exercise or 100 m/wk of vigorous-intensity aerobic exercise. Progression may be individualized based on tolerance and preference in a conservative manner.

The ACSM is considered the gold standard for exercise recommendations. Other organizations with formal recommendations for the optimal ExR_x for older adults present with slight but notable departures from the ACSM (Table 1). Despite the small differences in the FITT of the recommended prescriptions in Table 1, the overall consensus is for older adults to participate in 30 m/d or more of moderate-intensity aerobic exercise for at least 3 to 5 d/wk to total 150 m/wk and to supplement with resistance, flexibility, and balance exercise training.

Exercise Preparticipation Health Screening Recommendations

Before any older adult adopts a new or increases an existing structured exercise program, appropriate preparticipation health screening should be implemented to identify at-risk individuals who may require medical clearance before they begin an exercise program. Although exercise is safe for most individuals, there is a small but measureable acute risk of cardiovascular complications in certain susceptible individuals. The risk for acute exercise-related cardiovascular events are highest among sedentary adults with known or underlying cardiovascular disease (CVD) who perform unaccustomed vigorous-intensity exercise.⁸ Therefore, the goal of preparticipation health screening is to assess and mitigate this risk but not to present unnecessary obstacles or excessive burden on the individual or clinician (i.e., unwarranted referrals, false-positive exercise stress tests, invasive diagnostic testing).⁸

The ACSM has recently updated their preparticipation health screening recommendations using an evidence-informed model with the goal of eliminating possible barriers to exercise⁸ and emphasizing the U.S. Surgeon General's message that regular physical activity is important for all individuals.⁹ It is notable that age is no longer a consideration for aerobic exercise participation.

In addition, the new guidelines focus on (1) the current level of exercise, (2) presence or absence of asymptomatic/symptomatic known disease, and (3) desired intensity of exercise.⁸ Following the ACSM preparticipation health screening logic model, individuals are initially triaged based on the current level of exercise, in which "physically active" is defined as one who engages in planned, structured physical activity at least 30 minutes at moderate intensity on at least 3 d/wk for at least the last 3 months.

Physically active: Physically active asymptomatic individuals with known cardiovascular, metabolic, or renal disease whose health care provider has cleared them to exercise within the last 12 months do not need to revisit their health care provider to continue a moderate-intensity exercise program unless they develop resting or exertional symptoms of cardiovascular, metabolic, or renal disease or experience a change in health status. However, physically active individuals who develop signs or symptoms of cardiovascular, metabolic, or renal disease should discontinue exercise and seek medical clearance before resuming exercise of any intensity.⁸

Physically inactive: Physically inactive but otherwise healthy asymptomatic persons may begin light- to moderate-intensity exercise without medical clearance and, in the absence of symptoms, progress gradually in intensity as recommended by current ACSM exercise prescription guidelines.⁷ Physically inactive individuals with known cardiovascular, metabolic, or renal disease and/or those with signs or symptoms suggestive of these diseases should seek medical clearance before starting an exercise program, regardless of the intensity.⁸

Older adults may benefit from counseling on how to quantify subjective intensity and recognize limiting signs or symptoms. Light-intensity exercise is defined as an intensity that causes slight increases in heart rate (HR) and breathing; moderate intensity causes noticeable increases in HR and breathing; and vigorous intensity causes substantial increases in HR and breathing.⁸ Signs and symptoms that are suggestive of cardiovascular, metabolic, or renal disease and may necessitate the need for medical clearance are shortness of breath at rest or with mild exertion, chest discomfort of any type, dizziness or syncope, orthopnea or paroxysmal nocturnal dyspnea, ankle edema, palpitations or tachycardia, intermittent claudication, known heart murmur, or unusual fatigue or shortness of breath with usual activities.⁸

Due to a lack of evidence that exercise testing is effective in mitigating the risk of exercise-related cardiovascular events,¹⁰⁰ general exercise testing guidelines are no longer universally endorsed. Rather, clinicians are encouraged to evaluate the need for medical examination, exercise stress test, or diagnostic imaging using their own clinical judgment and on an individualized basis.

Special Considerations in Exercise Prescription

Chronic diseases and comorbidities such as CVD, cancer, diabetes, and chronic lower respiratory infections are the leading causes of death among older adults.¹¹ Two of three older adults have multiple chronic conditions, and medical treatment for this population accounts for 66% of the U.S. health care budget.² Exercise has been shown to be an effective lifestyle therapy for most chronic conditions such as hypertension,^{12,13} type 2 diabetes,¹⁴ and chronic obstructive pulmonary disease.¹⁵ Special considerations or modifications to the FITT-VP principle of ExR_x should be considered in the treatment paradigm for a given chronic disease or condition, but it should not replace good clinical judgment. The ACSM currently has 18 published ExR_x for special

populations that may be relevant for older adults. These include those with arthritis, cancer, cardiovascular and cerebrovascular disease, cerebral palsy, diabetes mellitus, dyslipidemia, human immunodeficiency virus, hypertension, intellectual disability and Down syndrome, kidney disease, metabolic syndrome, multiple sclerosis, osteoporosis, overweight and obesity, Parkinson's disease, peripheral artery disease, pulmonary diseases, and spinal cord injury.⁷

Table 2 presents an example of FITT-VP modifications for the top four leading medical conditions (hypertension, type 2 diabetes, dyslipidemia, and arthritis) based on prevalence, Medicare utilization, and spending for the years 2008-2012.¹⁶ As an example, consider a case study of a 67-year-old man with hypertension (146/92 mm Hg) seeking to initiate an exercise program in an effort to better control his blood pressure (BP). Modifications to the FITT ExRx for an older adult with hypertension can be made to maximize health benefits for this particular individual. Referring to Table 2, we can see that the recommendations surrounding flexibility, resistance, and balance training remain the same as the older adult ExRx previously outlined. However, in the setting of hypertension, substantial emphasis should now be placed on the FIT for aerobic exercise training due to the established BP-lowering effects of aerobic exercise. Aerobic exercise training has been shown to reduce resting BP by 5 to 7 mm Hg in individuals with hypertension.¹⁷ Specifically, the ACSM recommends the following FIT, aerobic ExRx modifications for individuals with hypertension⁷:

Frequency: Aerobic exercise on most and preferably all days of the week (as opposed to 3-5 d/wk). This recommendation is made due to the immediate and sustained BP-lowering effects of acute aerobic exercise (i.e., postexercise hypotension; PEH).^{18,19} In other words, BP is lower on days when individuals with hypertension exercise than when they do not exercise.

Intensity: Moderate-intensity remains the suggested intensity of aerobic exercise. However, due to emerging evidence that greater BP reductions can be achieved with greater levels of physical exertion,¹⁸ vigorous-intensity aerobic exercise may be more beneficial for the patient assuming they are able to tolerate higher levels of physical exertion;

Time: Recommended time is 30 to 60 min/d of continuous or intermittent aerobic exercise. If intermittent, bouts should be at least 10 min in duration. This recommendation is consistent with the emerging evidence that PEH is a low-threshold phenomenon regarding the time of the acute exercise bout, and several short bouts of intermittent exercise may be a viable therapeutic lifestyle option for BP control among individuals with hypertension.¹⁸

Pharmacological Interactions with Exercise

An additional consideration for ExRx in older adults is the use of concomitant medications that may influence physical activity and alter exercise tolerance. An obvious example is the risk of hypotension following a bout of aerobic exercise in older adults who are prescribed multiple BP-lowering drugs to treat chronic hypertension. Since aerobic exercise evokes an acute drop in BP (i.e., PEH), older adults on several antihypertensive medications may experience a more significant drop in BP with exercise, evoking a transient orthostatic intolerance that translates into balance disturbance and increased fall risk. By contrast, however, recent evidence finds that certain medications, in conjunction with exercise, facilitate greater improvements in health outcomes and risk factors than with exercise alone—such as combining aerobic exercise training with antihypertensive drug use.¹³ Therefore, clinicians and patients need to carefully weigh the benefits and

adverse side effects of medication use within each individual's ExRx.

The use of statin therapy in older adults illustrates the need for this nuanced assessment when weighing the benefits and risks of drug therapy against exercise efficacy and safety. Data suggest that the combination of exercise training and cholesterol-lowering drugs may be most beneficial for patients with elevated low-density lipoprotein cholesterol (LDL-C). For example, after 12 weeks of resistance training in older adults, LDL-C was reduced on average by 18 mg/dL and further lowered by another 12 mg/dL with the concurrent use of cholesterol-lowering drugs.²⁰ Similarly, an analysis of more than 10,000 veterans²¹ found that while both high fitness and statin drug use decreased mortality risk, individuals who were both highly fit and taking a statin had the lowest mortality risk of any study participants. This was above and beyond the benefits achieved with fitness or statin therapy alone.

However, statins may potentially have adverse effects on routine physical activity. The most frequently experienced statin side effect is muscle complaints (i.e., cramping, myalgia, soreness, and weakness), occurring in approximately 5% to 10% of patients,²² and these statin-related side effects can negatively impact medication compliance and physical activity. These muscle complaints may also be exacerbated by exercise. Several reports indicate that athletes and/or physically active individuals are less likely to tolerate statin therapy.²³ In addition, the muscle damage associated with downhill and marathon running is augmented by concurrent statin therapy,^{24,25} which may have implications for master's athletes being treated with statins. Therefore, certain susceptible older adults may experience reduced benefit from the interactions between exercise and statin therapy and may need to tailor their doses accordingly. Weighing the benefits and side effects of statin use illustrates the need for clinician and patient discretion when considering pharmacological interventions alone, in conjunction with, and as a barrier to physical activity in older adults.

Barriers and Motivation for Exercise Adherence

Approximately 87% of older adults have at least one barrier to exercise participation,²⁶ including low self-efficacy, fear of injury, lack of social support, and social isolation.⁷ However, pain (i.e., fear of pain or exacerbation of existing pain) is often reported as the most common barrier among older adults.²⁷ Because of the increased rates of social isolation and depression, group-based exercise has been shown to be more effective for long-term adherence than home-based individual exercise programs in older adults.²⁸ Exercise Rx approaches that encompass education, positive social support, and behavior theories to promote exercise and build self-efficacy—for example, health belief model, theory of planned behavior—are necessary to improve exercise adherence among older adults and optimize health through physical fitness.

Conclusion

Physical activity is a complex behavior with myriad physiological and environmental determinants that are unique to older adults. Despite known barriers, older adults have the ability to adapt and respond to both aerobic and strength training, but only 32% of clinicians deliver exercise counseling or education to older adults.⁶ Initiatives such as the ACSM's *Exercise is Medicine* campaign encourages healthcare providers to (1) record physical activity as a vital sign, and (2) prescribe exercise as they might

ACSM ^a FITT Principle of the ExR _x	Chronic Medical Condition				
	Healthy Older Adult ^b	Hypertension	Type II Diabetes Mellitus	Dyslipidemia	Arthritis
Frequency (How often?)	If moderate intensity: ≥ 5 d/wk If vigorous intensity: ≥ 3 d/wk If combination of moderate and vigorous intensity: 3-5 d/wk	Most, preferably all, days of the week	3-7 d/wk	≥ 5 d/wk to maximize caloric expenditure	3-5 d/wk
Intensity^c (How hard?)	Moderate to vigorous	Moderate	Moderate to vigorous	Moderate	Light to moderate; very light if deconditioned
Time^{d,e}	If moderate intensity: ≥ 30 min/d to total 150 min/wk If vigorous intensity: ≥ 20 min/d to total 75 min/wk	30-60 min/d	10-30 min/day to total 150 min/wk with greater benefits increasing to ≥ 300 min/wk	30-60 min/d with greater benefits with weight loss (i.e., 50-60 min/d)	Short bouts of 10 min/d increasing as tolerated to 30 min/d to total 150 min/wk
Type (What kind?) Primary	Aerobic	Aerobic	Aerobic	Aerobic	Aerobic
Adjuvant 1^{c,f,g}	Muscle Strengthening ≥ 2 d/wk (non-consecutive) Moderate to vigorous intensity 8-10 exercise; ≥ 1 set of 10-15 repetitions	Muscle strengthening ≥ 2 d/wk (non-consecutive) Moderate to vigorous intensity 8-10 exercise; ≥ 1 set of 8-12 repetitions	Muscle strengthening ≥ 2 d/wk (non-consecutive) Moderate to vigorous intensity 8-10 exercise; ≥ 1 set of 10-15 repetitions	Muscle strengthening ≥ 2 d/wk (non-consecutive) Moderate to vigorous intensity 8-10 exercise; ≥ 1 set of 10-15 repetitions	Muscle strengthening 2-3 d/wk; light to moderate intensity 8-10 exercise; ≥ 1 set of 10-15 repetitions
Adjuvant 2	Flexibility ≥ 2 d/wk At least 10 min/d	Flexibility ≥ 2 d/wk at least 10 min/d	Flexibility ≥ 2 d/wk At least 10 min/d	Flexibility ≥ 2 d/wk at least 10 min/d	Flexibility ≥ 2 d/wk at least 10 min/d
Adjuvant 3	Balance if at substantial risk of falling	Balance if at substantial risk of falling	Balance if at substantial risk of falling	Balance if at substantial risk of falling	Functional exercise can improve balance
Special Considerations	Intensity and duration should be light at first and progressed to tolerance and preference. Resistance exercise should precede aerobic training among frail individuals.	Encourage patients to exercise in the morning to benefit from the immediate blood pressure lowering effects throughout the day. Emphasis should be on aerobic exercise activities.	A combination of aerobic and resistance training improves blood glucose better than either alone. Avoid two consecutive days of inactivity per week. Vigorous intensity and high caloric expenditure should be goals of progression.	A special focus should be on exercise that uses large muscle groups and maximizes caloric expenditure.	Avoid strenuous exercise during flare ups. A small amount of discomfort up to 2 hrs after exercise is common. Warm water exercises may aid in pain management.

^a ACSM: American College of Sports Medicine⁷

^b Older adults refers to men and women age ≥ 65 yrs and adults age or 50 to 64 yrs with clinically significant chronic conditions and/or functional limitations by ACSM.

^c Moderate intensity is defined as 5 to 6 on a scale of 0 (sitting) to 10 (all-out effort) of level of physical exertion^{9,31,35} or an intensity that causes noticeable increases in heart rate and breathing for aerobic activity³¹⁻³⁴ or 60% to 70% of one repetition maximum for muscle strengthening activity⁷; vigorous or high intensity is defined as 7 to 8 on a scale of 0 (sitting) to 10 (all-out effort) of level of physical exertion^{31,35} or an intensity that causes substantial increases in heart rate and breathing (out of breath) for aerobic/muscle strengthening activity.^{9,31,33}

^d Exercise can be performed in one continuous bout or multiple bouts of at least 10 minutes each.

^e Exercise can be performed as an equivalent combination of moderate and vigorous intensity activity.

^f Muscle strengthening activity should involve all the major muscle groups.

^g Appropriate progression is emphasized.

Table 2. Exercise prescription modifications and special considerations for common medical conditions in older adults. FITT: Frequency, Intensity, Time, and Type of the exercise prescription; ExR_x: exercise prescription

a medication for patients.²⁹ Initiatives such as these have been shown to increase exercise participation 6-fold when compared to adults not receiving exercise counseling.³⁰ In general, older adults can be encouraged to participate in 30 min/d or more of moderate-intensity aerobic exercise 3 to 5 d/wk to total 150 min/wk and supplement with resistance, flexibility, and balance training ≥ 2 d/wk. Given the known efficacy of exercise to improve health and treat chronic disease, it is imperative for clinicians to understand the multifaceted nature of exercise in older adults so that effective ExRx can be designed that maximize benefit among the fastest-growing segment of our population.

Key Points

- An ExRx should be designed in a systematic and individualized manner in terms of the Frequency (how often?), Intensity (how hard?), Time (how long?), Type (what kind?), Volume, and Progression—or the FITT-VP principle.
- Components of the FITT-VP within an ExRx may be modified in the setting of certain chronic conditions to maximize therapeutic benefit of exercise.
- Older adults can be encouraged to participate in 30 min/d or more of moderate-intensity aerobic exercise 3 to 5 d/wk to total 150 min/wk and supplement with resistance, flexibility, and balance training ≥ 2 d/wk. For greater and more intensive benefits, vigorous intensity aerobic exercise is encouraged, if tolerated.
- Preparticipation health screening should be implemented to identify at-risk individuals, taking into consideration the patient's current level of exercise, desired intensity of exercise, diagnosed disease, and signs and symptoms suggestive of disease.
- Potential additive or deleterious interactions between exercise and concomitant medications commonly used by older adults highlight the need for clinicians to appraise the effects of each medication alone and in combination with exercise.

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Keywords: elderly, exercise training, health promotion, physical activity, exercise prescription

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