



5

Recommendations for Prescribing Exercise to Healthy Adults and Elderly

5



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Healthy Adults

Recommendations for Exercise Prescription

To promote and maintain health, the following FITT framework is recommended for all healthy adults aged 18 to 64 years (1-3). A combination of aerobic physical activities, resistance exercises and stretching exercises is recommended for substantial health improvement.

	Recommendations for Aerobic Activities*	Recommendations for Resistance Exercises*
Frequency	<ul style="list-style-type: none">Perform moderate-intensity aerobic physical activity on at least 5 days per week or vigorous-intensity activity on at least 3 days per week, or a weekly combination of 3 to 5 days per week of moderate- and vigorous- intensity exercise.	<ul style="list-style-type: none">Perform resistance exercise of each muscle group on 2 to 3 days per week with at least 48 hours separating the exercise training sessions for the same muscle group.
Intensity	<ul style="list-style-type: none">A combination of moderate- and vigorous-intensity aerobic exercise is recommended.	<ul style="list-style-type: none">A load of 60 to 80% of 1 repetition maximum (1-RM) is recommended for resistance exercises.



Time	<ul style="list-style-type: none"> • Perform moderate-intensity aerobic exercise for at least 30 mins per day to a total of at least 150 mins per week, or vigorous-intensity exercise for at least 20 mins per day to a total of at least 75 mins per week. Performance of intermittent exercise of at least 10 mins in duration to accumulate the minimum duration recommendations above is an effective alternative to continuous exercise. • For additional and more extensive health benefits, adults should increase their aerobic physical activity to 300 mins (5 hours) a week of moderate-intensity, or 150 mins a week of vigorous-intensity aerobic physical activity, or an equivalent combination of moderate- and vigorous-intensity activity. Additional health benefits are gained by engaging in physical activity beyond this amount. 	<ul style="list-style-type: none"> • 8 to 10 resistance exercises are recommended. Each muscle group should be trained for a total of 2 to 4 sets with 8 to 12 repetitions per set and a rest interval of 2 to 3 mins in between.
Type	<ul style="list-style-type: none"> • Aerobic exercise should be rhythmic in nature that involves large muscle groups and best requires little skill to perform. Exercise and sports requiring skill to perform or higher level of fitness are recommended only for individuals possessing respective skill and fitness. Please see Box 5.1 for certain types of aerobic exercise that could be recommended to healthy adults. 	<ul style="list-style-type: none"> • Concerning resistance exercises, multi-joint exercises involving more than one muscle group and targeting agonist and antagonist muscle groups are recommended, while single-joint exercises targeting major muscle groups may also be included[#]. Please see Box. 5.2 for certain types of resistance exercise that could be recommended to healthy adults.

* As many patients may present with comorbidities, it may be necessary to tailor the exercise prescription accordingly.

All individuals should receive professional instruction in proper resistance exercise techniques. In addition to proper body positioning and breathing (i.e. exhalation during exertion/muscle contraction; inhalation during relaxation), instruction should emphasise that all exercises use a full range of motion conducted in a deliberate, controlled manner with each repetition including concentric and eccentric muscle actions.

Recommendations for Stretching Exercise

- A stretching exercise of at least 10 mins involving the major muscle tendon groups of body (i.e., neck, shoulder, upper and lower back, pelvis, hips and legs) with 4 or more repetition (with 10 to 30 seconds for a static stretch) per muscle group performed on a minimum of 2 days per week is recommended. Preferably, stretching activities are performed on all days that aerobic or muscle-strengthening activity is performed.

Box 5.1 Examples of Aerobic Exercises that could be Recommended to Healthy Adults

Exercise Requiring Little Skill to Perform

- | | |
|--|--|
| <ul style="list-style-type: none">• Walking• Hiking uphill• Window washing• Stairs climbing• Jogging*• Running*• Rowing* | <ul style="list-style-type: none">• Brisk walking• Dancing• Sweeping, vacuuming, mopping• Rope-jumping• Stepping exercise*• Aerobic dance*• Elliptical exercise* |
|--|--|

Exercise Requiring Skill to Perform

- | | |
|---|---|
| <ul style="list-style-type: none">• Swimming• Cycling• Table tennis• Roller skating• Golf• Gateball• Netball• Football*• Rugby*• Handball* | <ul style="list-style-type: none">• Basketball• Tennis• Badminton• Volleyball• Martial arts• Baseball• Tai chi• Roller hockey*• Squash* |
|---|---|

* These exercise are typically performed at a vigorous intensity and, therefore, are recommended for persons who exercise regularly or who are at least of average physical fitness.

Box 5.2 Examples of Resistance Exercises that could be Recommended to Healthy Adults*

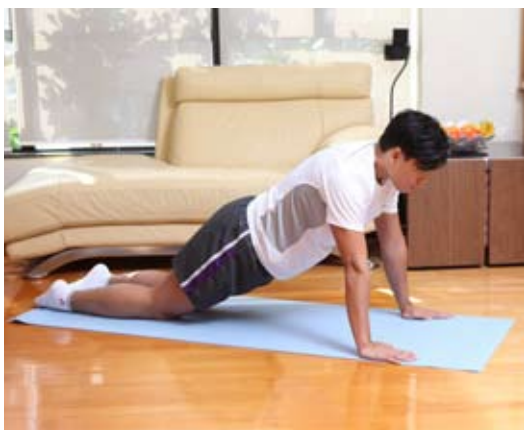
Find the exercises that best suit your patient and advise him/her to work each muscle group in turn.

Chest

▲ **Multi-joint Exercises Mainly for Training Chest Muscles**



Push Up – also trains shoulders and triceps



Bent-knee Push Up – also trains shoulders and triceps
(For lower intensity training, may also change to wall push up)



Lying Bench Dumbbell Chest Press – also trains shoulders and triceps

* You may refer to the patient leaflet “鍛鍊肌肉保健康” for the Chinese names of some of these exercises

Chest



Seated Machine Chest Press – also trains shoulders and triceps

▲ Single-joint Exercises Mainly for Training Chest Muscles



Lying Bench Dumbbell Chest Fly

Shoulders

▲ Multi-joint Exercises Mainly for Training Shoulder Muscles



Seated Elastic Band Shoulder Press – also trains triceps



Seated Machine Shoulder Press – also trains triceps

Shoulders

Single-joint Exercises Mainly for Training Shoulder Muscles



Elastic Band Shoulder Front Raise



Elastic Band Shoulder Lateral Raise



Arms

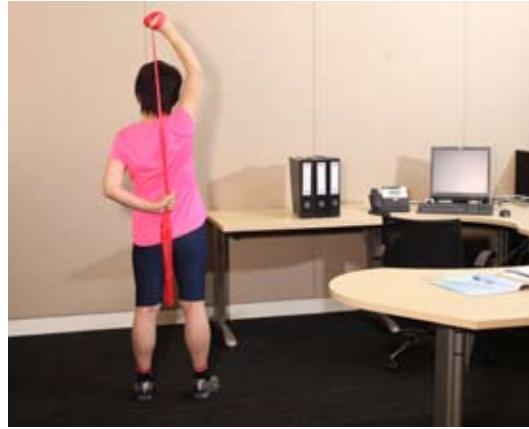
Multi-joint Exercises Mainly for Training Arm Muscles



Bench Triceps Dip – also trains chest and shoulders

Arms

▲ Single-joint Exercises Mainly for Training Arm Muscles



Elastic Band Triceps Overhead Extension – mainly triceps



Bent-over Dumbbell Triceps Kickback – mainly triceps



Lying Bench Dumbbell Triceps Extension – mainly triceps

Arms



Cable Triceps Push-down – mainly triceps



Elastic Band Biceps Curl – mainly biceps

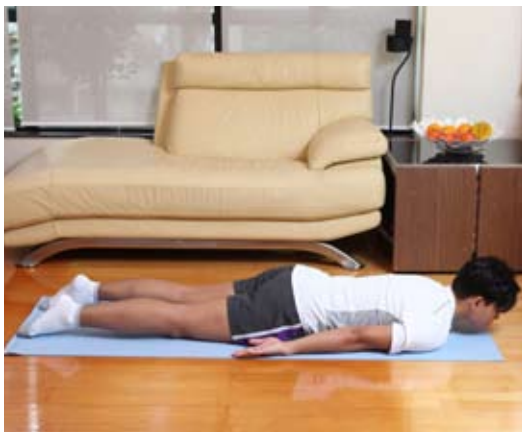


Elastic Band Hammer Curl – mainly biceps and forearms

Back



Contralateral Limb Raise – also trains gluteus, hamstrings and shoulders



Lying Cobra – mainly middle back

(Perform this exercise in a slow and controlled manner and hold momentarily at the end position for 1-2 sec)



Elastic Band Reverse Fly – mainly middle back, also trains deltoids

Back



Dumbbell Upright Row – mainly trapezius, also trains biceps and shoulders



Bent-over Dumbbell Row – mainly latissimus dorsi, also trains biceps and shoulders

Back



Lying Bench Dumbbell Pullover – mainly latissimus dorsi, also trains chest



Roman Chair Back Extension – mainly middle back and lower back



Seated Cable Row (narrow grip) – mainly latissimus dorsi, also trains biceps and shoulders

Back



Seated Cable Pull-down – mainly latissimus dorsi, also trains middle back, shoulders and biceps

Abdomen



Crunch – mainly abdominals

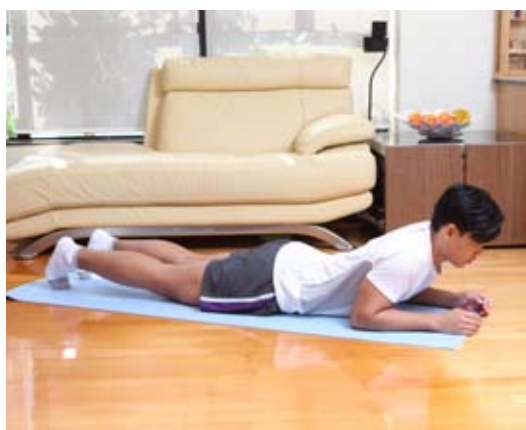


Leg Pull-in – also trains hip flexors

Abdomen



Bird-dog – also trains back, gluteus and shoulders



Front Plank – also trains back

(Perform in an isometric manner: hold torso up and stabilise for 15 sec to 1 min and repeat for 2-3 times depending on personal fitness)



Dumbbell Trunk Side Bend – mainly abdominals

Abdomen



Seated Machine Crunch – mainly abdominals

Hips and Thighs

Multi-joint Exercises for Training Hip/thigh Muscles



Wall Squat – mainly quadriceps, also trains gluteus and hamstrings



Butt Lift (Bridge) – mainly gluteus, also trains abdominals and hamstrings

Hips and Thighs



Freehand Jump Squat – mainly quadriceps, also trains calves, gluteus and hamstrings



Lunge – mainly quadriceps, also gluteus and hamstrings

Hips and Thighs



Elastic Band Squat – mainly quadriceps, also trains gluteus and hamstrings



Seated Elastic Band Single Leg Press – mainly quadriceps, also trains gluteus and hamstrings



Seated Machine Leg Press – mainly quadriceps, also trains gluteus and hamstrings

Hips and Thighs

Single-joint Exercises for Training Hip or Thigh Muscles



Quadruped Bent-knee Hip Extension – mainly gluteus and hamstrings



Side Lying Hip Abduction – mainly gluteus

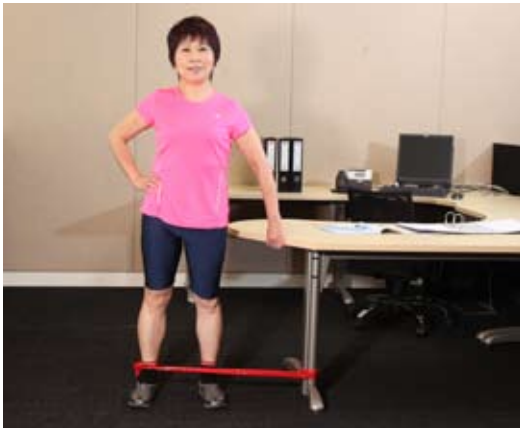


Elastic Band Hip Flexion – mainly hip flexors, also trains quadriceps

Hips and Thighs



Elastic Band Hip Extension – mainly gluteus and hamstrings

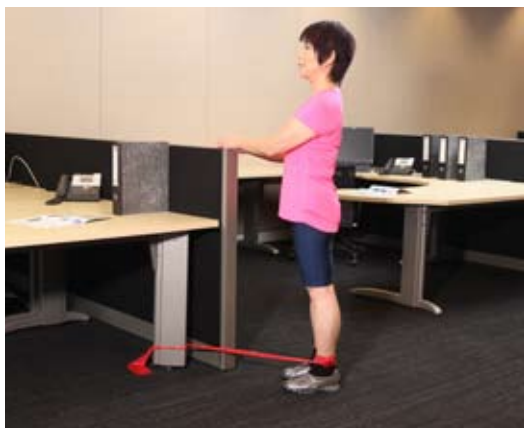


Elastic Band Hip Abduction – mainly gluteus



Elastic Band Hip Adduction – mainly inner thighs, also trains quadriceps

Hips and Thighs



Elastic Band Leg Curl – mainly hamstrings



Seated Machine Hip Abduction – mainly gluteus



Seated Machine Hip Adduction – mainly inner thighs, also trains quadriceps

Hips and Thighs



Seated Machine Leg Extension – mainly quadriceps



Seated Machine Leg Curl – mainly hamstrings

Calves

▲ Single-joint Exercise Mainly for Training Calf Muscles



Elastic Band Calf Raise – mainly calves

▲ Special Considerations

- Increase physical activity gradually over time whenever more activity is necessary to meet guidelines or health goals. Inactive people should “start low and go slow” by gradually increasing the frequency and duration of exercising.
- Terminate exercise immediately and seek prompt medical care if warning signs or symptoms develop during or after exercise. These may include dizziness, palpitation, unusual shortness of breath, angina or chest discomfort.

Healthy Older Adults

▲ Recommendations for Exercise Prescription

The term “Older Adult” is defined here as people ≥ 65 years and people 50 to 64 years with clinically significant conditions or physical limitations that affect movement, physical fitness, or physical activity.

Despite the fact that most older adults recognise the benefits of doing regular exercise, they are usually one of the least physically active amongst all age groups (3). However, age should not be a barrier to physical activity promotion because positive improvements are attainable at any age. Even when older adults cannot perform the recommended amount of physical activity because of chronic conditions, they should be as physically active as their abilities and conditions allow so as to avoid being sedentary. Most healthy older adults in fact do not require an exercise test prior to initiating moderate-intensity physical activity, unless additional cardiovascular risk factor(s) is/are present.

To promote and maintain health, the following FITT framework is recommended to all healthy older adults (2-5).

	Recommendations for Aerobic Activities*	Recommendations for Resistance Exercises*
Frequency	<ul style="list-style-type: none"> Perform moderate-intensity aerobic physical activity on at least 5 days per week or vigorous-intensity activity on at least 3 days per week, or a combination of 3 to 5 days per week of moderate- and vigorous- intensity exercise 	<ul style="list-style-type: none"> Perform resistance exercise at least 2 nonconsecutive days per week.
Intensity	<ul style="list-style-type: none"> Intensity of aerobic or resistance exercise is best defined relative to an individual's fitness within the context of perceived physical exertion using a 10-point scale. 	
	<ul style="list-style-type: none"> A combination of moderate- and vigorous-intensity aerobic exercise is recommended. On a scale of 0 to 10 for level of physical exertion, 5 to 6 is for moderate intensity whilst 7 to 8 is for vigorous intensity. 	<ul style="list-style-type: none"> For resistance exercise, an intensity between moderate (5 to 6) and vigorous (7 to 8) on a 10-point scale is recommended.
Time	<ul style="list-style-type: none"> Perform moderate-intensity aerobic exercise for 30 to 60 mins per day to a total of 150 to 300 mins per week, or vigorous-intensity exercise for 20 to 30 mins per day to a total of 75 to 100 mins per week. Performance of intermittent exercise of at least 10 mins in duration to accumulate the minimum duration recommendations above is an effective alternative to continuous exercise. 	<ul style="list-style-type: none"> 8 to 10 resistance exercises are recommended and each muscle group should be trained for a total of 1 or more sets with 10 to 15 repetitions per set. Subsequent to a period of adaptation to resistance training and improved musculo-tendinous conditioning, older adults may choose to follow guidelines for younger adults.

Type	<ul style="list-style-type: none"> Any modality of aerobic exercise that does not impose excessive orthopaedic stress is recommended. Walking is the most common type of activity. Aquatic exercise and stationary cycle exercise may be advantageous for those with limited tolerance for weight bearing activity. 	<ul style="list-style-type: none"> Recommended resistance exercises include progressive weight training programme, weight bearing calisthenics, stair climbing and other muscle strengthening activities that use major muscle groups.
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Recommendations for Stretching Exercise

- Stretching exercise of at least 10 mins involving the major muscle tendon groups of body with 4 or more repetition (with 10 to 30 seconds for a static stretch) per muscle group performed on a minimum of 2 days per week is recommended.
- Preferably, stretching activities are performed on all days that aerobic or muscle-strengthening activity is performed.
- Neuromuscular exercise (to improve balance, agility and proprioceptive training) is recommended particularly for those who are frequent fallers or with mobility impairments although there are currently no specific recommendations regarding frequency, intensity or type of neuromuscular exercises for older adults.
- A reasonable recommendation would appear to be at least 2 to 3 days per week. General recommendations include using (a) progressively difficult postures that gradually reduce the base of support; (b) dynamic movements that perturb the centre of gravity; (c) stressing posture muscle groups; and (d) reducing sensory input.
- Examples include tai chi and yoga. The emphasis should be placed on progressing to higher degrees of difficulty than high volumes of training. Tai chi and similar forms of exercise have been successfully prescribed for 45 mins to 1 hour, 2 to 3 days per week.

* As many patients may present with comorbidities, it may be necessary to tailor the exercise prescription accordingly.

▲ Special Precautions

- Intensity and duration of physical activity should be low at the beginning in particular for older adults who are highly deconditioned, functionally limited, or have chronic conditions that affect their ability to perform physical tasks.
- Progression of activities should be individualised and tailored to tolerance and preference.
- For resistance training involving use of weight-lifting machines, initial training sessions should be supervised and monitored by personnel who are sensitive to special needs of older adults.
- In the early stages of exercise programme, muscle strengthening activities may need to precede aerobic exercise among very frail individuals.

References

1. Haskell WL, Lee IM, Pate RR, Powell KE, Blair SN, Franklin BA, Macera CA, Heath GW, Thompson PD, Bauman A; American College of Sports Medicine; American Heart Association. Physical activity and public health: updated recommendation for adults from the American College of Sports Medicine and the American Heart Association. *Circulation* 2007;Aug;116(9):1081-93.
2. Physical Activity Guidelines Advisory Committee. *Physical Activity Guidelines Advisory Committee Report*, 2008. Washington (DC); US Department of Health and Human Services; 2008.
3. World Health Organization. *Global recommendations on physical activity for health*. Geneva: World Health Organization 2010.
4. Nelson ME, Rejeski WJ, Blair SN, Duncan PW, Judge JO, King AC, Macera CA, Castaneda-Sceppa C; American College of Sports Medicine; American Heart Association. Physical activity and public health in older adults: recommendation from the American College of Sports Medicine and the American Heart Association. *Circulation*. 2007 Aug 28;116(9):1094-105.
5. American College of Sports Medicine. *ACSM's Resource Manual for Guidelines for Exercise Testing and Prescription*. 6th edition. American College of Sports Medicine. 2010.

Reading Note

[illegible]