

Physical activity and lifestyle modification



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The Biggest Public Health Problem of the 21st Century

- ❖ **Disasters**
- ❖ **Cancer**
- ❖ **Traffic accidents**
- ❖ **Daesh (ISIS)**
- ❖ **Physical inactivity**



Current situation

- ❖ **Unfortunately, there is paucity of well organized national surveys addressing the level of physical activity among Iranian adults.**
- ❖ **However, there is some exceptions.**

Third National Surveillance of Risk Factors of Non-Communicable Diseases (SuRFNCD-2007)

- **40% of Iranian adults (31.6% of men and 48.6% of women) belonged to the low physical activity category.**
- **Physical activity at work, commuting and recreation contributed to 71%, 20% and 9% of TPA, respectively.**
- **Approximately 15% of Iranian adults (4.7 million people) do not have any physical activity in any of the 3 studied domains.**
- **Physical inactivity is common in Iran, particularly in females and in the older age groups.**
- **Preventing a rapid growth of conditions such as diabetes and cardiovascular diseases requires health programs with more focus on physical activity.**

Gender-specific changes in physical activity pattern in Iran: National surveillance of risk factors of non-communicable diseases (2007–2011)

- **Based on 2011 survey, 56.4 %, 39.2 %, and 74.4 % of participants were physically inactive at work, commuting and recreation, respectively.**
- **In all domains of PA, males showed a higher degree of activity (min/day) than females (P value\0.001).**
- **The overall prevalence of physical inactivity was increased from 15 % (2007) to 21.5 % (2011) (P value\0.001). Over the 4 years, a significant decline in total physical activity and the duration of commuting activity were noted in both genders.**
- **Work-related activity was dramatically decreased in females. However, the time spent in recreational activity remained relatively constant.**

PHYSICAL ACTIVITY AND FITNESS TERMINOLOGY

✦ Physical activity and exercise are often used interchangeably, but these terms are not synonymous.

✦ *Physical activity is defined as any bodily movement produced by the contraction of skeletal muscles that results in a substantial increase in caloric requirements over resting energy expenditure*

✦ *Exercise is a type of physical activity consisting of planned, structured, and repetitive bodily movements done to improve and/or maintain one or more components of physical fitness.*

✦ *Physical fitness is defined as a set of attributes or characteristics individuals have or achieve that relates to their ability to perform physical activity.*

Health-Related and Skill-Related Components of Physical Fitness

HEALTH-RELATED PHYSICAL FITNESS COMPONENTS

- **Cardiorespiratory endurance:** The ability of the circulatory and respiratory system to supply oxygen during sustained physical activity.
- **Body composition:** The relative amounts of muscle, fat, bone, and other vital parts of the body.
- **Muscular strength:** The ability of muscle to exert force.
- **Muscular endurance:** The ability of muscle to continue to perform without fatigue.
- **Flexibility:** The range of motion available at a joint.

SKILL-RELATED PHYSICAL FITNESS COMPONENTS

Agility: The ability to change the position of the body in space with speed and accuracy.

Coordination: The ability to use the senses, such as sight and hearing, together with body parts in performing tasks smoothly and accurately.

Balance: The maintenance of equilibrium while stationary or moving.

Power: The ability or rate at which one can perform work.

Reaction time: The time elapsed between stimulation and the beginning of the reaction to it.

Speed: The ability to perform a movement within a short period of time.

Sports:



Activities require specific skilled movements performed during organized game situations.

Public Health Approach



Proper Type

✓ **Sport??**



✓ **Exercise??**



✓ **Physical Activity??**



How Much Physical Activity Do Adults Need?

Aerobic Activities:

- ✓ **150** minutes (2 hours and 30 minutes) each week of moderate-intensity aerobic physical activity (such as brisk walking or tennis)
- ✓ **75** minutes (1 hour and 15 minutes) each week of vigorous-intensity aerobic physical activity (such as jogging or swimming laps)
- ✓ An equivalent combination of moderate- and vigorous-intensity aerobic physical activity
- ✓ Do aerobic physical activity in episodes of at least 10 minutes and, if possible, spread it out through the week.

Muscle-strengthening Activities:


- ✓ Do muscle-strengthening activities (such as lifting weights or using resistance bands) that are moderate or high intensity and involve all major muscle groups on 2 or more days a week.


Steps per Day

Steps per Day	Classification
<5000	Sedentary lifestyle
5000–7499	Daily activity excluding volitional sports/exercise: low active
7500–9999	Some volitional activities (and/or elevated occupational activity demands): somewhat active
≥10 000	Active
>12 500	Highly active

There is no evidence at this time to suggest an index indicative of excessive activity associated with health decrements.

MET (1)	Steps equivalent per minute (2)	Sports Activities	Home Activities
12	300	squash, boxing, canoeing (competitive), in-line skating, ice-skating (competitive)	running (upstairs)
11	270	rock climbing, swimming (butterfly)	
10	250	running (on a track, team practice), judo/karate/kick boxing, rugby, rope jumping, soccer (competitive)	
9	230	running (cross-country), football (competitive)	moving furniture upstairs
8	220	running (training), bicycling, football (general), basketball (competitive), lacrosse, polo, volley ball (competitive), ice hockey, cross-country skiing, snow shoeing	
7	180	jogging, tennis, badminton (competitive), soccer (general), roller skating, swimming (backstroke), ice skating (general), tobogganing	carrying groceries upstairs
6	150	hiking, weight lifting, fencing, basketball (general), swimming (leisure), water skiing, downhill skiing,	race walking (if you went any faster you'd be running), moving furniture, home repair (outside house), gardening with power tools, shovelling snow by hand
5.5	140	health club exercise	mowing lawn
5	135	ball room dancing, baseball, children's games, skateboarding, kayaking, snorkeling	walking to work or class, walking briskly (like you're late for a bus), walking upstairs, cleaning gutters, painting (outside house), yard work
4.5	130	badminton (general), golf	operating snow blower
4	125	horseback riding, table tennis, volley ball (general), juggling, Tai Chi, paddle boat, curling	walking for pleasure, scrubbing floors and bathtub, moving household items, raking lawn, gardening (general)
3.5	120	marching band, archery, sky diving, canoeing (general), snowmobiling	walking the dog, walking with purpose, mopping, vacuuming
3	100	light workout, miniature golf, bowling, frisbee playing, fishing, sailing	walking inside the house, walking downstairs, taking out the trash, picking up things around the house, sweeping floors, heavy cleaning (e.g. washing car), home repair (inside house), painting (inside house), loading/unloading a car, riding snow blower
2.5	70	camping, billiards, croquet, darts, bird watching	walking shopping (incl. grocery shopping), light cleaning (e.g. dusting), cooking or food preparation (walking), riding lawn mower or motorcycle
2	45	mild stretching	cooking or food preparation (standing), making bed, standing (e.g. talking on phone, reading), showering (standing), touring/vacation
1.5	20		retreat/family reunion activities (sitting, relaxing, talking, eating), using a computer, standing in line, sitting (e.g. light office work, card playing, talking on phone, reading), bathing (sitting)
1	0	whirlpool (sitting)	watching television, riding in a car or bus, reclining (e.g. talking on phone, reading)

- 
- ✦ It is important to clearly define the wide range of intensities associated with physical activity.
 - ✦ Methods for quantifying the relative intensity of physical activity include specifying a percentage of oxygen uptake reserve ($\dot{V}O_{2R}$), heart rate reserve (HRR), oxygen consumption (V_{O_2}), heart rate (HR), or metabolic equivalents (METs).



✦ METs are a useful, convenient, and standardized way to describe the absolute intensity of a variety of physical activities. Light physical activity is defined as requiring < 3 METs, moderate as $3- <6$ METs, and vigorous as >6 METs.

TABLE 1.1. Metabolic Equivalents (METs) Values of Common Physical Activities Classified as Light, Moderate, or Vigorous Intensity

Light (<3 METs)	Moderate (3–<6 METs)	Vigorous (≥6 METs)
Walking	Walking	Walking, jogging, and running
Walking slowly around home, store, or office = 2.0 ^a	Walking 3.0 mi · h ⁻¹ = 3.0 ^a	Walking at very, very brisk pace (4.5 mi · h ⁻¹) = 6.3 ^a
Household and occupation	Walking at very brisk pace (4 mi · h ⁻¹) = 5.0 ^a	Walking/hiking at moderate pace and grade with no or light pack (<10 lb) = 7.0
Sitting—using computer, work at desk, using light hand tools = 1.5	Household and occupation	Hiking at steep grades and pack 10–42 lb = 7.5–9.0
Standing performing light work, such as making bed, washing dishes, ironing, preparing food, or store clerk = 2.0–2.5	Cleaning, heavy — washing windows, car, clean garage = 3.0	Jogging at 5 mi · h ⁻¹ = 8.0 ^a

Leisure time and sports	Sweeping floors or carpet, vacuuming, mopping = 3.0–3.5	Jogging at $6 \text{ mi} \cdot \text{h}^{-1} = 10.0^a$
Arts and crafts, playing cards = 1.5	Carpentry — general = 3.6	Running at $7 \text{ mi} \cdot \text{h}^{-1} = 11.5^a$
Billiards = 2.5	Carrying and stacking wood = 5.5	Household and occupation
Boating — power = 2.5	Mowing lawn — walk power mower = 5.5	Shoveling sand, coal, etc. = 7.0
Croquet = 2.5	Leisure time and sports	Carrying heavy loads, such as bricks = 7.5
Darts = 2.5	Badminton — recreational = 4.5	Heavy farming, such as bailing hay = 8.0
Fishing — sitting = 2.5	Basketball — shooting a round = 4.5	Shoveling, digging ditches = 8.5
Playing most musical instruments = 2.0–2.5		Leisure time and sports Bicycling on flat — light effort ($10\text{--}12 \text{ mi} \cdot \text{h}^{-1}$) = 6.0

TABLE 1.2. Classification of Physical Activity Intensity

Intensity	Relative Intensity		Absolute Intensity Ranges (METs) Across Fitness Levels			
	$\dot{V}O_2R$ (%) HRR (%)	Maximal HR (%)	12 METs $\dot{V}O_{2max}$	10 METs $\dot{V}O_{2max}$	8 METs $\dot{V}O_{2max}$	6 METs $\dot{V}O_{2max}$
Very light	<20	<50	<3.2	<2.8	<2.4	<2.0
Light	20-<40	50-<64	3.2-<5.4	2.8-<4.6	2.4-<3.8	2.0-<3.1
Moderate	40-<60	64-<77	5.4-<7.6	4.6-<6.4	3.8-<5.2	3.1-<4.1
Vigorous (hard)	60-<85	77-<94	7.6-<10.3	6.4-<8.7	5.2-<7.0	4.1-<5.3
Vigorous (very hard)	85-<100	94-<100	10.3-<12	8.7-<10	7.0-<8	5.3-<6
Maximal	100	100	12	10	8	6


HR, heart rate; HRR, heart rate reserve; METs, metabolic equivalents (1 MET = $3.5 \text{ mL} \cdot \text{kg}^{-1} \cdot \text{min}^{-1}$); $\dot{V}O_{2max}$, maximal volume of oxygen consumed per minute; $\dot{V}O_2R$, oxygen uptake reserve.

Adapted from (18,24,55).

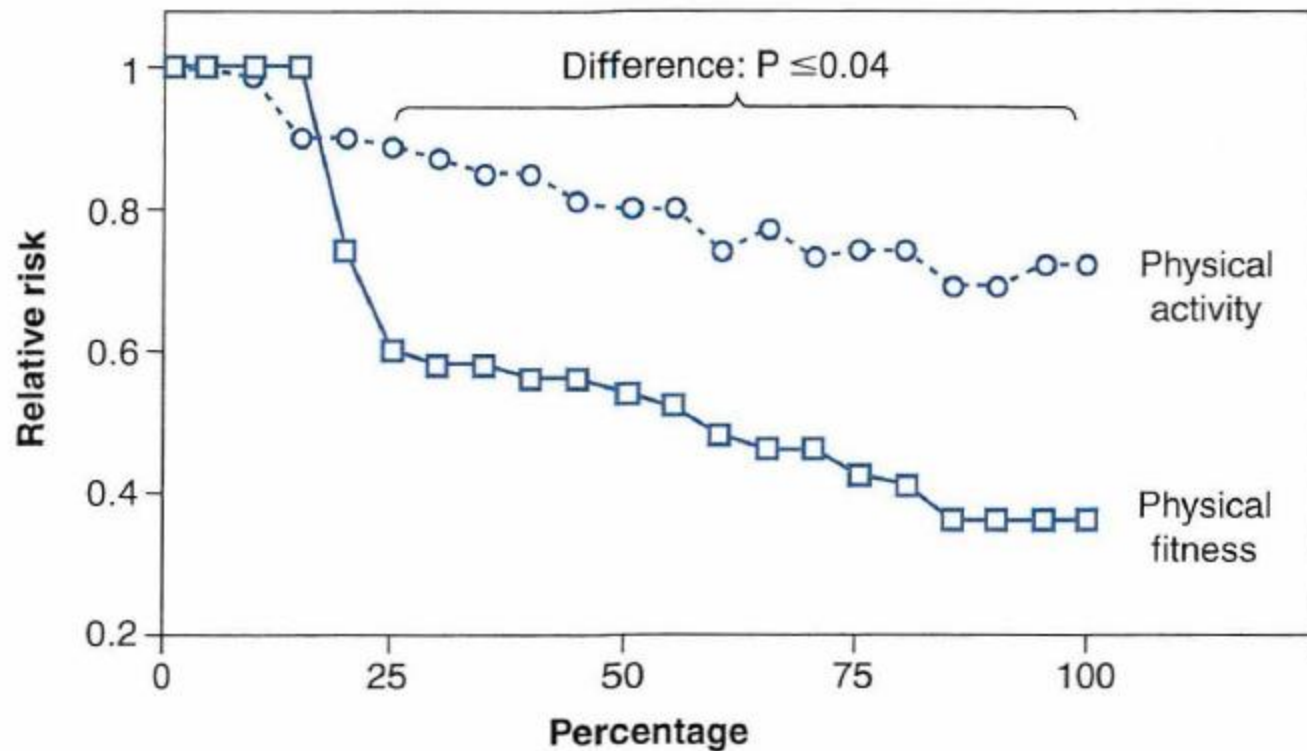
PUBLIC HEALTH PERSPECTIVE FOR CURRENT RECOMMENDATIONS

✦ Over 25 yr ago, the American College of Sports Medicine (ACSM) in conjunction with the U.S. Centers for Disease Control and Prevention (CDC) ,the U .S. Surgeon General, and the National Institutes of Health issued landmark publications on physical activity and health .

- An important goal of these reports was to clarify for public health, health! fitness, clinical exercise, and health care professionals the amount and intensity of physical activity needed **to improve health, lower susceptibility to disease (morbidity), and decrease premature mortality.**




✦ In addition, these reports documented the **dose-response relationship** between physical activity and health (i.e., some activity is better than none, and more activity, up to a point, is better than less).




■ **FIGURE 1.1.** Estimated dose-response curve for the relative risk of atherosclerotic cardiovascular disease (CVD) by sample percentages of fitness and physical activity. Studies weighted by individual-years of experience. Used with permission from (64).

TABLE 1.3. Evidence for Dose-Response Relationship between Physical Activity and Health Outcome

Variable	Evidence for Inverse Dose-Response Relationship	Strength of Evidence^a
All-cause mortality	Yes	Strong
Cardiorespiratory health	Yes	Strong
Metabolic health	Yes	Moderate
Energy balance:		
Weight maintenance	Insufficient data	Weak
Weight loss	Yes	Strong
Weight maintenance following weight loss	Yes	Moderate
Abdominal obesity	Yes	Moderate
Musculoskeletal health:		
Bone	Yes	Moderate
Joint	Yes	Strong
Muscular	Yes	Strong
Functional health	Yes	Moderate
Colon and breast cancers	Yes	Moderate
Mental health:		
Depression and distress	Yes	Moderate
Well-being		
Anxiety, cognitive health, and sleep	Insufficient data	Weak


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- ✦ Important health benefits can be obtained by performing a moderate amount of physical activity on most , if not all, days of the week.
 - ✦ Additional health benefits result from greater amounts of physical activity.
 - ✦ Individuals who maintain a regular program of physical activity that is longer in duration and/or of more vigorous intensity are likely to derive greater benefit than those who engage in lesser amounts .




✦ In 1995, the CDC and ACSM issued the recommendation , "every U.S. adult should accumulate 30 minutes or more of moderate physical activity on most , preferably all, days of the week“.

✦ Unfortunately, although there is some evidence that leisure time physical inactivity has decreased, sedentary behavior remains a major public health concern .

✦ Specifically, only 46% of adults in the United States in a recent survey indicated that they met the minimum CDC-ACSM physical activity recommendation of participating in moderate intensity, physical activity for 30 min' d- 1 on ~5 d. wk " ! or vigorous intensity for 20 min' d- 1 on ~3 d . wk" !

- 
- ✦ As indicated earlier, the inverse relationship between physical activity and chronic disease and premature mortality is well established.
 - ✦ Since the release of the U.S. Surgeon General's Report in 1996 (55) , several reports have advocated physical activity levels above the minimum CDC-ACSM physical activity recommendations



✦ These guidelines and recommendations primarily refer to the volume of physical activity required to prevent weight gain and/or obesity and should not be viewed as contradictory.

BOX 1.2

The ACSM-AHA Primary Physical Activity Recommendations (23)

- All healthy adults aged 18–65 yr should participate in moderate intensity, aerobic physical activity for a minimum of 30 min on 5 d · wk⁻¹ or vigorous intensity, aerobic activity for a minimum of 20 min on 3 d · wk⁻¹.
- Combinations of moderate and vigorous intensity exercise can be performed to meet this recommendation.
- Moderate intensity, aerobic activity can be accumulated to total the 30 min minimum by performing bouts each lasting ≥10 min.
- Every adult should perform activities that maintain or increase muscular strength and endurance for a minimum of 2 d · wk⁻¹.
- Because of the dose-response relationship between physical activity and health, individuals who wish to further improve their fitness, reduce their risk for chronic diseases and disabilities, and/or prevent unhealthy weight gain may benefit by exceeding the minimum recommended amounts of physical activity.

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ACSM, American College of Sports Medicine; AHA, American Heart Association.

BOX 1.3**The Primary Physical Activity Recommendations from the 2008 Physical Activity Guidelines Committee Report (56)**

- All Americans should participate in an amount of energy expenditure equivalent to 150 min · wk⁻¹ of moderate intensity, aerobic activity; 75 min · wk⁻¹ of vigorous intensity, aerobic activity; or a combination of both that generates energy equivalency to either regimen for substantial health benefits.
- These guidelines further specify a dose-response relationship, indicating additional health benefits are obtained with 300 min · wk⁻¹ or more of moderate intensity, aerobic activity; 150 min · wk⁻¹ or more of vigorous intensity, aerobic activity; or an equivalent combination of moderate and vigorous intensity, aerobic activity.

The 2008 federal physical activity guidelines also recommend breaking the total amount of physical activity into regular sessions during the week (e.g., 30 min on 5 d · wk⁻¹ of moderate intensity, aerobic activity) in order to reduce the risk of musculoskeletal injuries.

Benefits of Regular Physical Activity and/or Exercise

IMPROVEMENT IN CARDIOVASCULAR AND RESPIRATORY FUNCTION

- Increased maximal oxygen uptake resulting from both central and peripheral adaptations
- Decreased minute ventilation at a given absolute submaximal intensity
- Decreased myocardial oxygen cost for a given absolute submaximal intensity
- Decreased heart rate and blood pressure at a given submaximal intensity
- Increased capillary density in skeletal muscle
- Increased exercise threshold for the accumulation of lactate in the blood
- Increased exercise threshold for the onset of disease signs or symptoms (*e.g.*, angina pectoris, ischemic ST-segment depression, claudication)

REDUCTION IN CARDIOVASCULAR DISEASE RISK FACTORS

- Reduced resting systolic/diastolic pressure
- Increased serum high-density lipoprotein cholesterol and decreased serum triglycerides
- Reduced total body fat, reduced intra-abdominal fat
- Reduced insulin needs, improved glucose tolerance
- Reduced blood platelet adhesiveness and aggregation
- Reduced inflammation

DECREASED MORBIDITY AND MORTALITY


- Primary prevention (*i.e.*, interventions to prevent the initial occurrence)
- Higher activity and/or fitness levels are associated with lower death rates from coronary artery disease
- Higher activity and/or fitness levels are associated with lower incidence rates for CVD, CAD, stroke, Type 2 diabetes mellitus, metabolic syndrome, osteoporotic fractures, cancer of the colon and breast, and gallbladder disease
- Secondary prevention (*i.e.*, interventions after a cardiac event to prevent another)
- Based on meta-analyses (*i.e.*, pooled data across studies), cardiovascular and all-cause mortality are reduced in patients with post-myocardial infarction (MI) who participate in cardiac rehabilitation exercise training, especially as a component of multifactorial risk factor reduction
- Randomized controlled trials of cardiac rehabilitation exercise training involving patients with post-MI do not support a reduction in the rate of nonfatal reinfarction

OTHER BENEFITS

- Decreased anxiety and depression
 - Improved cognitive function
 - Enhanced physical function and independent living in older individuals
 - Enhanced feelings of well-being
 - Enhanced performance of work, recreational, and sport activities
 - Reduced risk of falls and injuries from falls in older individuals
 - Prevention or mitigation of functional limitations in older adults
 - Effective therapy for many chronic diseases in older adults
-


RISKS ASSOCIATED WITH EXERCISE

- ✦ In general, exercise does not provoke cardiovascular events in healthy individuals with normal cardiovascular systems.
- ✦ The risk of sudden cardiac arrest or myocardial infarction (MI) is very low in apparently healthy individuals performing moderate intensity, physical activity.



✦ However, there is an acute and transient increase in the risk of sudden cardiac death and/or MI in individuals performing vigorous intensity exercise with either diagnosed or occult CVD.

✦ The absolute annual risk of exercise-related death among high school and college athletes is one per 133,000 men and 769,000 women.



✦ It should be noted that these rates, although low, include all sports –related nontraumatic deaths.

✦ Of the 136 total identifiable causes of death, 100 were caused by CVD.

TABLE 1.4. Cardiovascular Causes of Exercise-Related Sudden Death in Young Athletes^a

	Van Camp (<i>n</i> = 100)^b (57)	Maron (<i>n</i> = 134) (33)	Corrado (<i>n</i> = 55)^c (12)
Hypertrophic CM	51	36	1
Probable hypertrophic CM	5	10	0
Coronary anomalies	18	23	9
Valvular and subvalvular aortic stenosis	8	4	0
Possible myocarditis	7	3	5
Dilated and nonspecific CM	7	3	1
Atherosclerotic CVD	3	2	10
Aortic dissection/rupture	2	5	1
Arrhythmogenic right ventricular CM	1	3	11
Myocardial scarring	0	3	0
Mitral valve prolapse	1	2	6
Other congenital abnormalities	0	1.5	0
Long QT syndrome	0	0.5	0
Wolff-Parkinson-White syndrome	1	0	1
Cardiac conduction disease	0	0	3
Cardiac sarcoidosis	0	0.5	0
Coronary artery aneurysm	1	0	0
Normal heart at necropsy	7	2	1
Pulmonary thromboembolism	0	0	1

Evidence statements and summary of recommendations for the individualized exercise prescription.

	Evidence-Based Recommendation	Evidence Category
Cardiorespiratory ("aerobic") exercise		
Frequency	≥ 5 d·wk ⁻¹ of moderate exercise, or ≥ 3 d·wk ⁻¹ of vigorous exercise, or a combination of moderate and vigorous exercise on ≥ 3 –5 d·wk ⁻¹ is recommended.	A
Intensity	Moderate and/or vigorous intensity is recommended for most adults. Light- to moderate-intensity exercise may be beneficial in deconditioned persons.	A B
Time	30–60 min·d ⁻¹ (150 min·wk ⁻¹) of purposeful moderate exercise, or 20–60 min·d ⁻¹ (75 min·wk ⁻¹) of vigorous exercise, or a combination of moderate and vigorous exercise per day is recommended for most adults. <20 min·d ⁻¹ (<150 min·wk ⁻¹) of exercise can be beneficial, especially in previously sedentary persons.	A B
Type	Regular, purposeful exercise that involves major muscle groups and is continuous and rhythmic in nature is recommended.	A
Volume	A target volume of ≥ 500 –1000 MET·min·wk ⁻¹ is recommended. Increasing pedometer step counts by ≥ 2000 steps per day to reach a daily step count ≥ 7000 steps per day is beneficial. Exercising below these volumes may still be beneficial for persons unable or unwilling to reach this amount of exercise.	C B C
Pattern	Exercise may be performed in one (continuous) session per day or in multiple sessions of ≥ 10 min to accumulate the desired duration and volume of exercise per day. Exercise bouts of <10 min may yield favorable adaptations in very deconditioned individuals. Interval training can be effective in adults.	A B B

AEROBIC EXERCISE VOLUME RECOMMENDATION



A target volume of ≥ 500 – $1,000$ MET-min \cdot wk⁻¹ is recommended for most adults. This volume is approximately equal to $1,000$ kcal \cdot wk⁻¹ of moderate intensity, physical activity, ~ 150 min \cdot wk⁻¹ of moderate intensity exercise, or pedometer counts of $\geq 5,400$ – $7,900$ steps \cdot d⁻¹. Because of the substantial errors in prediction when using pedometer step counts, use steps \cdot d⁻¹ *combined with* currently recommended time/durations of exercise. Lower exercise volumes can have health/fitness benefits for deconditioned individuals, and greater volumes may be needed for weight management.

Resistance exercise

Frequency

Each major muscle group should be trained on 2–3 d·wk⁻¹.

A

Intensity

60%–70% of the 1RM (moderate to hard intensity) for novice to intermediate exercisers to improve strength.

A

≥80% of the 1RM (hard to very hard intensity) for experienced strength trainers to improve strength.

A

40%–50% of the 1RM (very light to light intensity) for older persons beginning exercise to improve strength.

A

40%–50% of the 1RM (very light to light intensity) may be beneficial for improving strength in sedentary persons beginning a resistance training program.

D

<50% of the 1RM (light to moderate intensity) to improve muscular endurance.

A

20%–50% of the 1RM in older adults to improve power.

B

Time

No specific duration of training has been identified for effectiveness.

Type

Resistance exercises involving each major muscle group are recommended.

A

A variety of exercise equipment and/or body weight can be used to perform these exercises.

A

Repetitions

8–12 repetitions is recommended to improve strength and power in most adults.

A

10–15 repetitions is effective in improving strength in middle aged and older persons starting exercise

A

15–20 repetitions are recommended to improve muscular endurance

A

Sets

Two to four sets are the recommended for most adults to improve strength and power.

A

A single set of resistance exercise can be effective especially among older and novice exercisers.

A

≤2 sets are effective in improving muscular endurance.

A

Pattern

Rest intervals of 2–3 min between each set of repetitions are effective.

B

A rest of ≥48 h between sessions for any single muscle group is recommended.

A

Progression

A gradual progression of greater resistance, and/or more repetitions per set, and/or increasing frequency is recommended.


A



Flexibility exercise


Frequency	$\geq 2-3 \text{ d}\cdot\text{wk}^{-1}$ is effective in improving joint range of motion, with the greatest gains occurring with daily exercise.	B
Intensity	Stretch to the point of feeling tightness or slight discomfort.	C
Time	Holding a static stretch for 10–30 s is recommended for most adults. In older persons, holding a stretch for 30–60 s may confer greater benefit. For PNF stretching, a 3- to 6-s contraction at 20%–75% maximum voluntary contraction followed by a 10- to 30-s assisted stretch is desirable.	C C B
Type	A series of flexibility exercises for each of the major muscle–tendon units is recommended. Static flexibility (active or passive), dynamic flexibility, ballistic flexibility, and PNF are each effective.	B B
Volume	A reasonable target is to perform 60 s of total stretching time for each flexibility exercise.	B
Pattern	Repetition of each flexibility exercise two to four times is recommended. Flexibility exercise is most effective when the muscle is warmed through light to moderate aerobic activity or passively through external methods such as moist heat packs or hot baths.	B A
Progression	Methods for optimal progression are unknown.	





Neuromotor exercise training

Frequency	$\geq 2-3 \text{ d}\cdot\text{wk}^{-1}$ is recommended.	B
Intensity	An effective intensity of neuromotor exercise has not been determined.	
Time	$\geq 20-30 \text{ min}\cdot\text{d}^{-1}$ may be needed.	B
Type	Exercises involving motor skills (e.g., balance, agility, coordination, and gait), proprioceptive exercise training, and multifaceted activities (e.g., tai ji and yoga) are recommended for older persons to improve and maintain physical function and reduce falls in those at risk for falling. The effectiveness of neuromuscular exercise training in younger and middle-aged persons has not been established, but there is probable benefit.	B D
Volume	The optimal volume (e.g., number of repetitions, intensity) is not known.	
Pattern	The optimal pattern of performing neuromotor exercise is not known.	
Progression	Methods for optimal progression are not known.	



Classification of Interventions

✓ **Family based**

✓ **School or Workplace based**

✓ **Community based**

Seven best investment areas for national action

- ❖ There is no one single solution to increasing physical activity, an effective comprehensive approach will require multiple concurrent strategies to be implemented.
- ❖ To support countries ready to respond, there are seven “best investments” for physical activity, which are supported by good evidence of effectiveness and that will have worldwide applicability.
- ❖ Multiple sectors of society need to be involved in the solutions.

Urban Strategies



Urban Strategies

Get your feet on the street

1 MILL RD
via Hataea Dr to CBD
2,500 steps (2.0km) 15mins

2 WHAREORA RD
via Mill Rd & Bank St to CBD
3,400 steps (2.5km) 25mins

3 KENDINGTON PARK
via Western Hills Dr to CBD
2,700 steps (2.0km) 20mins

4 WHG HOSPITAL
via Maunu Rd to CBD
2,500 steps (2.0km) 15mins

5 VISITORS CENTRE
via Taveria Rd to CBD
2,500 steps (2.0km) 15mins

6 WHG AQUATIC CENTRE
via Riverside Dr to CBD
875 steps (0.7km) 10mins

10000 STEPS Northland
maui ora

**Please note: All Steps are approximates only*



5- Public education, including mass media to raise awareness

- ❖ In most countries, physical activity promotion is absent from mass media. Both paid and non-paid forms of media can be used to raise awareness, increase knowledge, shift community norms and values and motivate the population to be more active.
- ❖ Public education can involve print, audio and electronic media, outdoor billboards and posters, public relations, point of decision prompts, mass participation events, mass distribution of information as well as new media such as text messaging, social networking and other uses of the internet.

Educational Packages



Every Day for Life!

Be Active, Your Way,



Age is no barrier

Get active your way ...

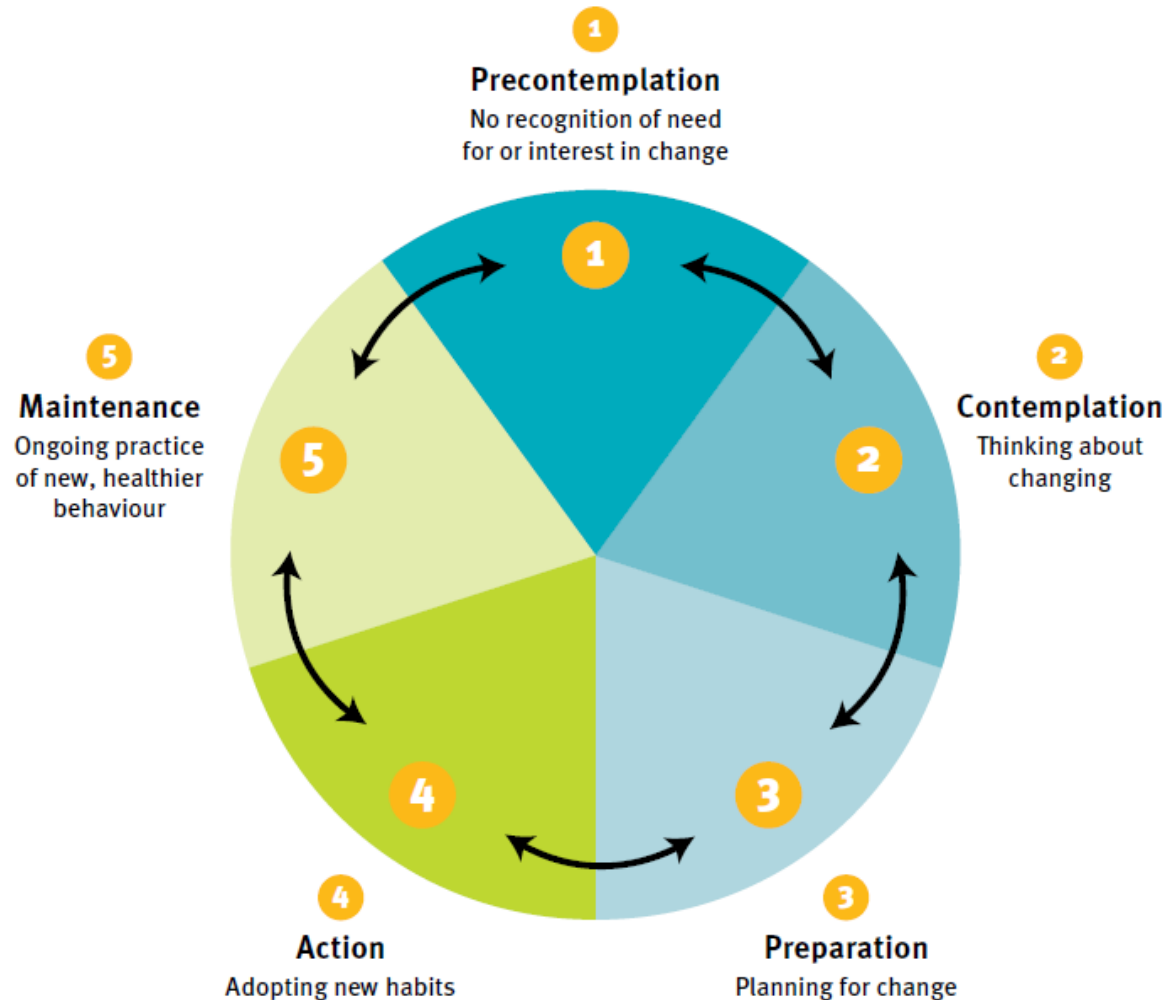
build physical activity
into your daily life...

- at home
- at school
- at work
- at play
- on the way



.... that's active living !

The trans-theoretical model



دو نمونه از پروژه‌های موفق شهری



پروژه ۱۰۰۰۰ گام در روز شهر Northland در کشور نیوزلند (۲۰۰۴-۲۰۰۷)



عوامل کلیدی در موفقیت پروژه



مشارکت بخش‌های مختلف شهری، دولتی و غیر دولتی

استفاده از پیام کلیدی ساده ۱۰۰۰۰ گام در روز

اتخاذ هدف عملیاتی واقع‌گرایانه

استفاده از ابزار objective پدومتر

لذتبخش و تفریحی بودن عمل شمردن گام‌ها

راحت بودن و قابل اجرا بودن فعالیت جسمانی پیش‌بینی شده

استفاده از رسانه‌های آموزشی مؤثر، بروشورهای ساده و اتخاذ تدابیر شهری

در نظر گرفتن جایزه برای نخستین گروه‌هایی که به اهداف تعیین شده برسند.

پوشش رسانه‌ای گسترده

پژوهش بازگشت سرمایه برنامه رسمی ۱۰۰۰۰ گام

■ آنالیز بازگشت سرمایه برنامه رسمی ۱۰۰۰۰ گام نشان داد که هزینه برنامه به ازای هر کارگر ۱۵۱.۵ دلار و بازگشت سرمایه معادل ۴۸۲.۹ دلار به ازای هر کارگر بود که این امر به معنای بازگشت سرمایه ۳ به ۱ است.

Thanks

