



EUROPEAN FEDERATION OF SPORTS MEDICINE ASSOCIATIONS

Edited by Scientific and Education Commission of EFSMA

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Exercise Prescription for Health

– Training recommendations –
EFSMA recommends:

For yourself and for all your patients:

>>>> *How to get started*

>>>> *Choose to move*

>>>> *Something is more than Nothing*

With regular activity:

Feel better, Be fitter, Live better and longer

General recommendations for physical activity for health (FITT)

(Exercise Prescription for health (EPH))

>>>> **150 Min/week at 3 or 4 days**

>>>> **75 min/week at 2 or 3 days**

Definitions of FITT:

(modified from Exercise prescription in health and disease, eds. P. O'Halloran and G. Bhogal, www.fsem.ac.uk)

Frequency: Number of times per week the activity is performed

Intensity: Level of exercise intensity (vigor) the activity requires.
Calculation of intensity see table below

Time: Duration of physical activity in minutes the activity is performed
150 min/week may be broken into 10 min periods or 30 min at least
on 5 days a week

Type of exercise: On the one hand endurance, strength, flexibility, balance
or: walking, jogging, cycling, swimming or other sports activities

Special recommendation for prevention and in diseases

Training recommendation for prevention and therapy in diseases (© EFSMA)

General recommendations: Warming up about 3 to 5 min, cooling down 3-5 min, flexibility training daily
(For Borg Scale or RPE Scale, Abbreviations, Kind of sports, and HITT: High intensity interval training see below)

	Frequency/Week	Intensity	Time (duration)	Type of training	Type of sports	Strength training
Prevention in general © EFSMA	Low intensity: 5/week Vigorous intensity: 3/week	Low intensity: 40-65 % HR _{max} RPE 10-13 Vigorous intensity: 65-85 % HR _{max} RPE > 13-16	Low intensity: > 30min/session or 150min/week Vigorous intensity: > 25min/session or 75min/week	Endurance, strength.	Running, walking, cycling, swimming, skating, cross-country ski.	70 % of 1RM > 2-3/week, 10-15 reps, 1- 3 sets.
Coronary heart disease © EFSMA	3-5/week Vigorous intensity: 3/week	50-80 % VO ₂ max or 40-70 % HR _{max} RPE 12-15 maybe: HITT*	40-60 min/session Low intensity: < 30 min Vigorous intensity: > 20 min/session HITT* : see below	Endurance, strength.	Running, walking, cycling, swimming.	60-75 % of 1RM, > 2/week, 8-12 reps, 2-3 sets.
Heart Failure © EFSMA	3-5/week	Low – moderate intensity: 40-60 %VO ₂ max RPE 11- 15 HITT* : with 90% 4 min and 3 min pause in between	15-60 min/session HITT* : for details see below	Endurance, strength, combination, respiratory muscle training (30% of max insp. pressure).	Jogging, (Nordic) walking, cycling, aerobics, cross-country ski.	60-75 % of 1RM, 2-5/week, 8-12 reps, 2-3 sets, RPE local 13-15.
Rhythm Disturbances © EFSMA	3-5 /week 2-3 /week	Moderate intensity: 40-60 %VO ₂ max, RPE: 11-13 Vigorous intensity: 60-80 %VO ₂ max RPE: 9-15	30-60 min/session 20-30 min/session	Endurance, flexibility, sensomotoric, muscle, endurance.	Running, nordic ski, aerobics, cycling.	40-60 % of 1 RM, 12-15 reps, 3 sets, 8-10 exercises, RPE 11-13 (- 19).
Arterial Hypertension (Frequent control of blood pressure) e.g. ambulant © EFSMA	3-5 (7) /week 2-3 (4)/week	Moderate intensity: 40-60 %VO ₂ max, RPE: 11-13 Vigorous intensity: 60-80 %VO ₂ max RPE: 9-15	30-45 min/session 20-30 min/session	Endurance, flexibility, sensomotoric, muscle endurance.	Jogging, (Nordic) walking, swimming, scating, aerobics, dance, cycling.	60-75 % of 1RM, 2-5/week, 8-12 reps, 2-3 sets, RPE local 13-15.
Crohn's Disease Ulcerative Colitis © EFSMA	3/week to start later 5-7/week	Low intensity: 40-60 %VO ₂ max 60 % HRmax RPE: 6-10 No moderate /intense activity during acute exacerbations.	20-30 min/session continuously or 5x4 min bouts	Endurance, strength.	Walking.	50 % of 1RM, 2-3/week, 10-12 exercises, 5-8 reps, 2 sets.
Obstipation (Constipation) © EFSMA	3-4/week (every other day)	HR: at least 110/min	30 min/session	Endurance.	Running.	/
Multiple Sclerosis © EFSMA	3-5/week	65-75 %HR _{max} 40-70 %VO ₂ max RPE: 11-14	10min first The increase to 20-60 min	Endurance, strength.		60-80 % of 1RM 2/week, 8-15 reps, 1-2 sets.

	Frequency/Week	Intensity	Time (duration)	Type of training	Type of sports	Strength training
Bronchial Asthma (Possibly bronchodilator before activity) © EFSMA	Low intensity: ≥ 5/week Vigorous intensity: ≥ 3/week	Low intensity: > 55 %HR _{max} 30-50 %VO ₂ max RPE: 10-12 Vigorous intensity: > 70 %HR _{max} > 60 %VO ₂ max RPE: 10-14	Low intensity: ≥ 30 min Vigorous intensity: ≥ 20 min	Endurance, strength, flexibility, respiratory muscle training.	Running, walking, cycling, aerobics.	70 % of 1RM, ≥ 2-3/week, 10-15 reps, 1-3 sets.
Kidney Disease (Training for pts. with dialysis below) © EFSMA	3/week	Moderate intensity: 40-60 %VO ₂ max RPE: 11-13 Vigorous intensity: 60-80 %VO ₂ max, RPE: 12-18	30-60 min/day or 150 min/week 30 min/day or 75 min/week	Endurance, interval, muscular endurance, flexibility, balance training, strength training.	Jogging, (Nordic) walking, swimming, scating, aerobics, dance, cycling.	80% of 1RM, 1-2 sets, 8-10 reps, functional training.
Diabetes mellitus type 2 © EFSMA	Moderate intensity: 5/week Vigorous intensity: 3/week	Moderate intensity: 40-70 % VO ₂ max RPE 11-13 Vigorous intensity: 60-90 % VO ₂ max RPE: 13-16	20-60 min/session at least every two days optimal: 27 MET hs / Week	Endurance training, frequently strength training.	Jogging, (Nordic) walking, swimming, scating, aerobics, dance, rowing (if possible), cycling.	70 % of 1RM, ≥ 2-3/week, 8-12 reps, 1-3 sets.
Metabolic Syndrome © EFSMA	5-7/week	60-70 % VO ₂ max RPE 10-13	> 30min/session or 150-300 min/week (can do in Nx10min), 60-90 min for weight loss	Endurance, strength.	(Nordic) walking, jogging, cycling, swimming.	70 % of 1RM, 2-3/week, 10-15 reps, 1-3 sets.
Obesity © EFSMA	≥ 5/week	Moderate intensity: 40-60 %VO ₂ max RPE: 10-14	30-60 min (can start with 3x10 min)	Endurance, strength.	Water gymnastics, cycling, swimming.	40-50% of 1RM 2-3/week, 10-15 reps, 1 set.
Dyslipidemia © EFSMA	≥ 5/week	40-75 %VO ₂ max	≥ 50-60 min (can be in 10 min intervals)	Endurance.	Jogging, running, skiing, fitness classes, brisk walks, cycling, swimming, racquet and ball sports.	
Osteoporosis © EFSMA	> 5 /week	40-70 %VO ₂ max RPE: 10-13	Bouts of > 10/min or accumulate 30min/day	Aerobic weight-bearing activities, balance training, sensomotoric training.	Walking, jogging, aerobics.	> 2/week, 8-12 reps max, 1-3 sets.
Osteoarthritis © EFSMA	3-5/week	Low-moderate intensity: 40-60 %VO ₂ max RPE: 11-13	Aerobic: 30 min (or 3x10 min) Strength: 20-60 min	Endurance, strength, weight control.	(Nordic) walking, cycling, swimming.	40-60 % of 1RM, 2-3/week, 8-10 exercises, 10-15 reps, 1-3 sets.
Low Back Pain © EFSMA	Moderate intensity: ≥ 5/week Vigorous intensity: ≥ 3/week	Moderate intensity: 40-65 %HR _{max} RPE: 10-13 Vigor intensity: 65-85 %HR _{max} RPE: >13-16	Moderate intensity: 30-60 min/day or ≥ 150min/week Vigor intensity: 20-60 min/day or ≥ 75min/week	Endurance, strength.	Walking, cycling, swimming, dance, cross-country ski.	70 % of 1RM, 2-3/week, 8-12 reps, 2-4 sets.

	Frequency/Week	Intensity	Time (duration)	Type of training	Type of sports	Strength training
Rheumatoid Arthritis © EFSMA	Low intensity: 4-7/week Moderate intensity: 3/week	Low intensity: 50-70% SFmax RPE: 10-14 Moderate intensity: 60-80% SFmax RPE: 11-15	Low intensity: 30 min Moderate intensity: 30-60 min	Endurance, strength, muscular endurance.	Cycling, cross-country skiing, (Nordic) walking, light fitness training, dancing.	2-3/week Strength: 60-80 % of 1RM, 8-12 reps, ≥ 1 set. Muscular endurance: 30-40 % of 1RM, 15-25 reps, 1-2 sets.
Fatigue Syndrome Fibromyalgia © EFSMA	3-5 days/week	Low-moderate intensity: 40-60 %VO ₂ max, RPE: 11-13 Vigorous intensity: 60-80 VO ₂ max, RPE: 13-16	15-45 min/session 15-30 min/session		All activities with large muscle groups depending on the cause of fatigue	Strength training on an individual basis, at least 2/ week with intensity as shown above (prevention)
Cancer (*depending on localisation) © EFSMA	4-5/week, preferred daily	Low-moderate intensity: 40-60 %VO ₂ max, RPE: 11-13, individually high.	15-60 min/session	Endurance, strength.	All activities with large muscle groups: (Nordic) walking, cycling, skiing, evtl. swimming.	On an individual basis depending on the cancer location, If arms and legs not concerned, 2/week strength training.
Pregnancy (for details see appendix) © EFSMA	2/week up to week 28 of pregnancy	Moderate intensity: 40-60 %VO ₂ max HR 135-125/min (acc. to age)	20-30 min	Endurance.	Swimming, (Nordic) walking, jogging, stretching.	
Children (age 6-18ys) © EFSMA	daily	Moderate, vigorous. No restrictions.	60 min	Endurance, flexibility, balance, muscular endurance.	Running, ball games, gymnastics, swimming, cycling.	Ad libitum.
Older Adults (> 65 ys.) © EFSMA	Moderate intensity: ≥ 5/week Vigorous intensity: ≥ 3/week	Moderate intensity: RPE: 10-12 Vigorous intensity: RPE: 14-16	Moderate intensity: 30-60 min (can start with 3x10 min) Vigorous intensity: 20-30 min	Endurance, muscle strength and endurance.	Walking, aquatic exercises, stationary cycling, stair climbing.	Moderate intensity: 60-70 % of 1 RM Low intensity: 40-50 % of 1 RM ≥ 2/week, 8-10 exercises, 10-15 reps, ≥ 1 set.

Comment: Exercise and pregnancy

(From **Korsten Reck**, Ulrike: Pregnancy and sport : *International SportMed Journal*, 14, 2013: 256-259

General information on endurance training during pregnancy⁷

- Endurance training should always be accompanied by weight training exercises and coordination exercises
- Individually adjusted heart rates (HR) should be chosen in consultation with the supervising physician according to the recommendations (talk test):
Women 20-29 years 135-150 HR
Women 30-39 years 130-145 HR
Women > 40 years 125-140 HR
- Potentially high individual differences should be taken into account.
Sports with particularly positive effects for mother and child.
- Cycling on low ground-here the bicycle carries the weight and relieves the spine.

- Swimming is especially suited for pregnant women with edema. Contrary to common opinion, the risk of infections is not increased. Furthermore, swimming is a joint friendly activity. Water temperature should not be below 20° Celsius and not above 33° Celsius to prevent additional circulatory reactions.
- Hiking, walking, jogging, Nordic walking, cross country skiing, stretching.

General recommendations for physical activity for health (FITT)
(Exercise Prescription for health (EPH))

	Frequency	Intensity*	Time (duration)	Type of activity	Volume
Adults	>= 5	moderate	> 30 min	Aerobic	> 1000Kcal/week
	150 Min/week at 3 or 4 days				
	>= 3	vigorous	> 30 min	(An) aerobic	> 1500 Kcal/week
	75 min/week at 2 or 3 days				
	> 2 non-consecutive	40-60 1RM	>= 20-30 min	Resistance	1-3 sets, 8-12 reps 8-10 exercises

*(VanHees et al., EJPC,2012)

Alternative: Endurance 150 min or more /week moderate intensity at least at 3-5 days with at least > 10 min episodes

or	75 min or more/week vigorous intensity	at least at 3 days
Resistance	8-10 exercise, 8-12 RM	2 days/week or more
Flexibility	2 days /week or more	stretches, static movements etc.
Balance	sensomotoric movements	to tolerance, progressive difficult postures, different muscle groups

(modified from Vopat BG et al: *J Am Acad Orthopaedic Surgeons*, 2014, 22:576, Pescatello, 2015)

Appendix

HITT: High intensitiy interval training:2 /week with functional capacity > 5 MET: 10 min warm up, thereafter with 4 min exercise and 3 min pause, for a total load time of 38-40 min and cool down for 5 minutes (Conraads et al.2015) with 60 % of VO₂max, progression to 90 %,

Patients with reduced functional capacity (< 5 METs): Start with continuous endurance training for at least 2 weeks, then start with HITT 2 /week with 60% of VO₂ max and progression within 4-8 weeks to 90%.

Consider: Endurance training (continuous training) is the basis for training in heart disease, add on HITT should be performed as add on intermittent exercise program two times a week if preferred by the subjects. Supervision by an experienced sports physician in patients is mandatory. (For more details see Conraads et. al. 2015 and Liou K et. al., 2015)

Table: Classification of Physical Activity Intensity (modified from Pescatello, 2014) © EFSMA

Intensity (RPE)	VO ₂ R (%) HRR	Maximal HR (%)	12 METs* VO ₂ max	10 Mets VO ₂ max	8 METs VO ₂ max	6 METs VO ₂ max
Very light	< 20	< 50	< 3,2	< 2.8	< 2.4	< 2.0
Light	20 - < 40	50 - < 64	3.2 - < 5.4	2.87 - < 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	5.2 - < 7.0
Vigorous (hard)	60 - < 85	77 - < 94	7.6 - < 10.3	6.4 - < 8.7	4.2 - < 7.0	4.1 - < 5.3
Vigorous (very hard)	85 - <100 100	94 - < 100 100	10.3 - < 12 12	8.7 - < 10 10	7.0 - < 8 8	5.3 - < 6 6

Abbreviations: HR: Heart rate, HRR: Heart reserve; MET: Metabolic equivalent;

VO₂max : maximal oxygen uptake; VO₂R: oxygen uptake reserve. 12 METs corresponds to 215 watts, 10 METs to 175 watts, 8 METs to 140 watts, and 6 METs to 100 watts during bicycling exercise.

HRmax – Maximal Heart Rate.

VO₂max – Maximal Oxygen Uptake.

Reps – Repetitions.

RPE – Rating of Perceived Exertion.

RM – Repetition Maximum. 1 RM corresponds to the maximum weight that can be lifted through the entire exercise movement one time.

Maximal Heart Rate:

208 – 0.7 Age (ys) for men

– 0.8 Age (ys.) for women (Tanaka, 2001)

Metabolic Equivalent

MET and classification: 1 MET: 1 Kcal/kg/*h or 4.184 * kJ/kg/*h

Light physical activities: MET < 3 (corresponds to 25 watts/time, or 50-63% of max HR, or RPE 6-10)

Moderate activities: MET 3-6 (corresponds to 75-125 watts/time, or 64-76% of max HR, or RPE 11-13)

Vigorous intensity activities: > 6 MET (corresponds to > 150 watts/time, or 77-93% of max HR, or RPE 14-20)

MET: Table for METs and daily activities: See Ainsworth, BE, Haskell WL, Leon AS et. al.:

Compendium of physical activities: classification of energy costs of human physical activities.

MSSE 1993;25:71-80 also: www.gloablrrph.com

MET calculator from ergometer and treadmill tests: MET – calculat or: (www.fedel.com)

Ratings of Perceived Exertion

Intensity according to Ratings of Perceived exertion (for details see below):

RPE Scale 0-10:

light intensity: 0-5

moderate: 5-6

vigorous: 7-8

RPE Scale 6-20:

6-11

11-13

14 and more

Ratings of Perceived Exertion Scales

RPE – Scale 6-20		RPE – Scale 0-10 (CR-Scale*) (*Category -Ratio-Scale, anchored at 10)	
6	no exertion at all	0	nothing at all
7		0.5	very, very light
	extremely light	1	very light
8		2	fairly light
9	very light	3	moderate
10		4	somewhat hard
11	light	5	hard
12		6	
13	somewhat hard	7	very hard
14		8	
15	hard (heavy)	9	
16		10	very, very hard, maximal
17	very hard		
18			
19	extremely hard		
20	maximal exertion		

(For details see Borg's perceived exertion and pain scales. Gunnar Borg, Human Kinetics, Champaign, IL., 1998)

