



EXERCISE PRESCRIPTION FOR HEALTH (EPH) IN PRACTICE

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The link between physical activity and good health has long been established, as hinted at by Hippocrates more than 2000 years ago and supported by reams of more recent research.

Exercise can however seem difficult to quantify, unlike an individual's blood pressure or pulse rate, which can be represented in simple terms. It may be for this reason that doctors and healthcare workers are notoriously poor at recording an individual's physical activity (PA) load, or it may simply be that they consider it less "vital".

The Physical Activity Prescription

MEDICATION PRESCRIPTION

Example

Drug	Paracetamol
Dose	1 gram
Route	Oral
Frequency	4 Times a Day
Quantity	100 Tablets

PHYSICAL ACTIVITY PRESCRIPTION

Example

Frequency	5 Days a Week
Intensity	Moderate
Time	30 Minutes
Type	Walking



EXERCISE PRESCRIPTION

The FITT (Frequency, Intensity, Time, Type) principle offers the clinician a useful tool for establishing a detailed account of an individual's "exertional load" and often forms the basis for an "exercise prescription".

HEALTH



- **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 breaked 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

EXERCISE PRESCRIPTION

Metabolic Equivalent

MET and classification:

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

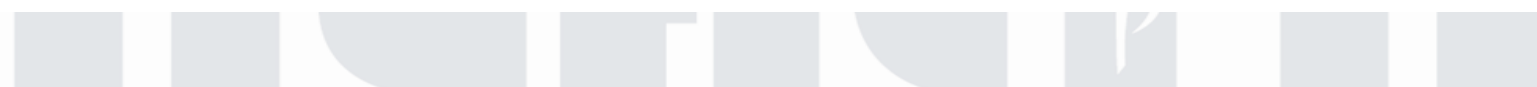
- Light physical activities:** MET < 3 (corresponds to 25 watts /time, or 50-63% of max HR, RPE 6-10)
Moderate activities: MET 3 – 6 (corresponds to 75 – 125 watts/ time or 64-76% of max HR; or RPE 11-13)
Vigorous intensity activities: > 6 MET (corresponds to > 150 Watts/time, or 77-93% of max HR, or 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.gloablrph.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

Borg's scale of Ratings of Perceived Exertion (RPE)

	No exertion at all
	Extremely light
	Very light
	Light
	Somewhat hard
	Hard
	Very hard
	Extremely hard
	Maximal exertion

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	extremely light	0.5	very, very light
8	very light	1	very light
9	light	2	fairly light
10	somewhat hard	3	moderate
11	hard	4	somewhat hard
12	hard (heavy)	5	hard
13	very hard	6	very hard
14	extremely hard	7	very, very hard, maximal
15	maximal exertion	8	
16		9	
17		10	
18			
19			
20			

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



QUANTIFY AN INDIVIDUAL'S PA VOLUME

- 1) "On average, how many days per week do you engage in moderate (able to talk but not sing) or greater intensity physical activity (like a brisk walk)?"
- 2) "On those days, for how many minutes do you engage in activity at this level?"



It is important to consider all exercise elements, including both recreational and occupational physical activity levels. Asking about employment often gives the clinician further insight into the patient's overall activity levels. For example exercise at work may comprise the majority of the overall energy expenditure for a postman or builder. In addition it is important to determine whether the patient is undertaking any resistance exercise, e.g. heavy lifting, in addition to aerobic activity, which involves activities such as walking, cycling and swimming.

HEALTH



WHO CAN AND CANNOT SAFELY START EXERCISING

Löllgen H¹, Börjesson M², Cummiskey J³, Bachl N⁴, Debruyne A⁵

The Pre-Participation Examination in Sports: EFSMA Statement on ECG for Pre-Participation Examination

Die sportärztliche Vorsorgeuntersuchung: Stellungnahme der EFSMA zur Bedeutung des EKG in der Vorsorgeuntersuchung

STATEMENT

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Löllgen H, Börjesson M, Cummiskey J, Bachl N, Debruyne A. The Pre-Participation Examination in Sports: EFSMA Statement on ECG for Pre-Participation Examination. Dtsch Z Sportmed. 2015; 66: 151-155.

EFSMA PPE QUESTIONNAIRE

ATHLETES NAME: _____ BIRTH

DATE: _____ AGE: _____ GENDER: M / F

ADDRESS: _____

TELEPHONE: _____

SPORTS: _____

GENERAL QUESTIONS (incl. vaccination, allergic diseases,...)

Has a doctor ever denied or restricted your participation in sports for any reason?

YES | NO | ?



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
	<u>150 Min/week at 3 or 4 days</u>				
	>/= 3	vigorous	> 30 min	(An)aerobic	> 1500 Kcal/week
<u>75 min/week at 2 or 3 days</u>					
	> 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 /wek 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)



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
<p>Prevention in general</p> <p>© EFSMA</p>	<p>Low intensity: 5/week</p> <p>Vigorous intensity: 3/week</p>	<p>Low intensity: 40–65 % HRmax RPE 10-13</p> <p>Vigorous intensity: 65-85 % HRmax RPE > 13-16</p>	<p>Low intensity: > 30min/session or 150min/week</p> <p>Vigorous intensity: > 25/min/session or 75min/week</p>	Endurance, strength.	Running, walking, cycling, swimming, skating, cross-country ski.	70 % of 1RM > 2-3/week, 10-15 reps, 1- 3 sets.
<p>Coronary heart disease</p> <p>© EFSMA</p>	<p>3–5/week</p> <p>Vigorous intensity: 3/week</p>	<p>50–80 % V_O₂max or 40-70 % HRmax RPE 12–15</p> <p>maybe:HITT*</p>	<p>40-60 min/session</p> <p>Low intensity: < 30 min</p> <p>Vigorous intensity: > 20 min/session</p> <p>HITT* : see below</p>	Endurance, strength.	Running, walking, cycling, swimming.	60-75 % of 1RM, > 2/week, 8–12 reps, 2-3 sets.



CASE 1

- 40 year old man
- Works as a manager for a medium size company
- He has been experiencing a lot of stress at work; he is sometimes having difficulty sleeping because of concerns about project deadline
- He has no other significant past medical history
- He is married and has one child

CASE 1

- Check for symptoms of depression
- Ask about his physical activity level: he admits that he was not a „sporty“ type during his university years but has always been interested in what could be done to lose a bit of weight, „get into shape“, and improve his physical fitness
- You conclude that he is currently physically not active
- His health will benefit from an increase in physical activity so you need to discuss benefits of physical activity with him and talk about appropriate exercises.
- You do PPE according to EFSMA recommendations: no CI for exercise

CASE 1

	Frequency/Week	Intensity	Time (duration)	Type of training	Type of sports	Strength training
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CASE 1

A more precise way of finding the desired intensity of exercise would be to first assess the patient's maximal aerobic capacity (VO_2 max) and training status, since the same physical activity can be perceived as light for a well-trained individual and as vigorous for a sedentary person, though this may not always be practical. Benefits of aerobic exercise can be achieved at 55-65% of VO_2 max for sedentary, 65-75% of VO_2 max for moderately active, and at 75-90% of VO_2 max for highly active individuals. There are number of tests, tables and charts to estimate VO_2 max and work out the pace of aerobic exercise. They can be found in the references



LOGO National Association

Prescription for exercise

ENDURANCE TRAINING

-x/wk, each Min
- Training Heartrate:/min
- Borg-Value:
- Warming up: 5 min, cooling down: 5 min
- Recommended training:

Slow Walk	Fast Walk	Nordic Walk	Running
Swimming	Cycling	Others	
- Ergometer Training:Watt/ ...min for warming up
.....Watt/min..... minutes

STRENGTH TRAINING

.....% 1RM.....REPsSETS
.....muscle groups

Gymnastics/ Balance/Coordinationwk
Ball Gameswk each.....min
Others (Golf, Dancing, ...)wk
 each.....min
 Sport Physician :..... Date :

In case of dyspnoe, irregular heart beats, chest pain or dizziness, stop activity and counsel your doctor.



CASE 2

Mrs S, is a 56 year old female with a 2 years history of T2DM. She is overweight with a BMI of 28. She comes in for her routine diabetes check-up. From previous practice notes you see that she is a non-smoker, normotensive, and has a good lipid profile. Mrs S has been managing her diabetes with diet control only. You notice that her recent HbA1C is 7.5%. She has not developed any micro or macro vascular diabetic complications or symptoms. She says that she is using a pedometer and tries to take at least 6500 steps per day to keep active. Mrs S's husband is going to run a local 5 km charity race in 4 weeks' time. She wants to participate in this event as well and wonders whether it is safe for her to do it.



CASE 2

Considerations in this patient

While considering starting a blood glucose lowering medication (e.g. metformin), you also need to address the safety of exercise participation. A pre-participation health screening should take place. You should establish whether this patient is at higher risk of developing an acute cardiovascular event during physical activity. You should also assess her current physical activity level.

HIGH RISK PATIENTS : PPE + GRADED EXERCISE TEST



CASE 2

	Frequency/Week	Intensity	Time (duration)	Type of training	Type of sports	Strength training
<p>Diabetes mellitus type 2</p> <p>© EFSMA</p>	<p>Moderate intensity: 5/week</p> <p>Vigorous intensity: 3/week</p>	<p>Moderate intensity: 40-70 % VO_2max RPE 11-13</p> <p>Vigorous intensity: 60-90 % VO_2max RPE: 13-16</p>	<p>20-60 min/session</p> <p>at least every two days</p> <p>optimal: 27 MET hs / Week</p>	<p>Endurance training, frequently strength training.</p>	<p>Jogging, (Nordic) walking, swimming, scating, aerobics, dance, rowing (if possible), cycling.</p>	<p>70 % of 1RM, ≥ 2-3/week, 8-12 reps, 1-3 sets.</p>



CASE 2

You compliment Mrs S. on her regular physical activity and use of pedometer. However you explain that the number of steps has to be gradually increased from 6500 to 10000 steps/day. You advise that running and jogging represent vigorous activity. In order to determine whether it is safe for her to engage in this type of exercise you will organise an exercise tolerance test at your local hospital. You warn her about rather short preparation time for charity run especially taking into account current activity levels.



CASE 2

Also, a sudden increase in physical activity may put musculoskeletal system under extra strain and lead to injuries. Provided she tolerates exercise test well i.e. is asymptomatic and has normal haemodynamic response and electrocardiogram - she can plan a training programme for the next run. Preparing for the competition/race is a great motivator to do regular physical activity.

You recommend missing the race this time and consider signing up for next year. It will allow sufficient time to gradually build up her level of physical activity. She may continue using a pedometer to monitor activity levels. In addition, she could encourage her husband to train with her to help maintain her motivation and enjoyment.



SOME PRACTICAL TIPS

Progressing the Physical Activity Prescription

The initial frequency will be determined through negotiation with an individual to set a practical, achievable starting level of activity and maximise compliance. You may wish to try suggesting three times a week, which places emphasis on the regular element of the overall benefit of physical activity and requires commitment on alternate days of the week. Subsequent increases can then be considered dependent on progress and focus on gradually (every 1-2 weeks) increasing the frequency, intensity or time of the activity or a combination of these factors.



SOME PRACTICAL TIPS

Considering several activities or lifestyle changes may maintain motivation and enthusiasm by providing variation. Positive reinforcement for sustained changes is vital, which strengthens the argument for considering physical activity as the fifth vital sign within a clinical consultation.

HEALTH

SOME PRACTICAL TIPS

Lifestyle changes are the simplest way of increasing physical activity into an individual's day without having to find 'additional' specific time. Practical points to suggest could include:

- Walking up the stairs rather than using escalators or lifts
- Parking the car further away from the shops and walking
- Getting off the bus a stop early and walking to your destination
- Meeting friends for a walk (and then a coffee) rather than just a coffee
- If working from home, walk around the block at the start and end of your working day
- Going for a walk at lunchtime
- Holding walking meetings at work rather than just sitting at a desk
- Consider doing static exercises when on the phone or watching TV
- Go for a walk rather than watch TV after work to unwind

WE HAVE RECOMMENDATIONS BUT DON'T FORGET



- Advice must be tailored to the individual
- Modifications must be made to adjust for specific conditions as clinically indicated
- Increases in physical activity participation should always be gradual
- If individuals develop new symptoms and/or clinical signs they should seek medical review before continuing their chosen physical activity
- And don't forget that it is good medical practice to document the content of any such discussions with individuals within your clinical notes.

WE HAVE RECOMMENDATIONS BUT DON'T FORGET ALSO THAT

The important points to remember yourself, as the prescriber, and emphasise to individuals and your colleagues are:

- Regular is the key word in 'regular physical activity'
- The physical activity needs to be something enjoyable (or non-intrusive to a busy lifestyle)
- Gradually increase the frequency towards achieving the national physical activity recommendations of at least 150mins of moderate intensity activity a week – “some activity is better than none”

WWW.EFSMA-SCIENTIFIC.EU



E.F.S.M.A.

SCIENCE & EDUCATION
IN SPORTS MEDICINE

CONCLUSION

“WALKING IS A MAN’S BEST MEDICINE”
HIPPOCRATES 460 - 377BC

HEALTH

EXERCISE PREP

EXERCISE





THANK YOU FOR YOUR ATTENTION!

EXAMPLES OF QUESTIONS

1. Is an ECG necessary before everyone takes up exercise for the first time or after returning to exercise after 10 years?
2. How much exercise is necessary in order to improve a participant's objective fitness criteria?

EXAMPLES OF QUESTIONS

3. When prescribing exercise, what does the acronym FITT stands for

- Fitness
- Frequency
- Intensity
- Duration
- Time
- Type

4. What kind of dose – response is observed during training and risk reduction?

- Horizontal relationship
- Non-linear, exponential decreasing curve
- Linear decreasing relationship

EXAMPLES OF QUESTIONS

5. The EFSMA general training recommendations for prevention and therapy suggest the activity of:

- a. 300 Min/week at 3 or 4 days of moderate intensity or 150 min/week at 2 or 3 days of vigorous intensity
- b. 150 Min/week at 3 or 4 days of moderate intensity or 75 min/week at 2 or 3 days of vigorous intensity
- c. 100 Min/week at 3 or 4 days of moderate intensity or 60 min/week at 2 or 3 days of vigorous intensity
- d. 60 Min/week at 3 or 4 days of moderate intensity or 30 min/week at 2 or 3 days of vigorous intensity

6. According to EFSMA training recommendations for prevention and therapy of obesity, physical activity should:

- a. not be performed more than 3 times per week
- b. start with 3x10 min sessions per day
- c. non-weight bearing activities are not recommended
- d. strength exercises are the best choice of activity

EXAMPLES OF QUESTIONS

- 7. EFSMA has recently recommended pre-participation cardiac examination of athletes. What is the content?**
- a. Personal history, family history and physical examination
 - b. Personal and family history, physical examination and resting-ECG
 - c. Personal and family history, physical examination and echocardiography
 - d. Personal and family history, physical examination, resting-ECG and exercise testing
- 8. What is NOT true regarding resting ECG?**
- a. The ECG has a high sensitivity for underlying relevant cardiac disease in young athletes
 - b. ECG has a low sensitivity for coronary artery disease in older athletes
 - c. Screening with ECG is more costly, than screening without ECG
 - d. The ECG is most useful in older athletes with a higher risk profile