

EUROPREV Guide on Promoting Health through Physical Activity

Dr Mateja BULC

Introduction

This booklet was developed by EUROPREV - the European Network for Prevention and Health Promotion in Family Medicine / General Practice. EUROPREV is the official network for preventive activities within WONCA-Europe, the European regional branch of WONCA - the World Organization of Family Doctors. This guide is aimed at practicing general practitioners/family physicians, who need a simple, short and practical guide for counselling physical activity to their patients.

EUROPREV's objective was to cover most of the questions and dilemmas patients have while considering a health behaviour change. We hope that this booklet will help general practitioners/family physicians to be more efficient in helping their patients change health related behaviour.

1. What are the benefits of regular physical activity?

Regular physical activity has a lot of beneficial effects. Besides making us feel better it gives satisfaction, better self-esteem and helps us stay fit and vital. It is also used as a preventive and curative tool, since it

- lowers blood pressure
- increases insulin sensitivity and lowers blood glucose level
- lowers serum LDL cholesterol level
- increases serum HDL cholesterol level
- helps to prevent some types of cancer (e.g. breast, colon and prostate cancer)
- reduces percentage of body fat
- reduces stress
- improves cardiovascular functional status and performance
- prevents osteoporosis
- prevents and treats diseases of the locomotor system
- increases life expectancy compared to sedentary people

2. What are the dangers of regular physical activity?

Sudden death is a very rare complication, happening usually in cases of pre-existing coronary vessel disease. Physical activity over 6 METs (Metabolic Equivalent Units - see Section 4 for more details) could be a trigger for acute coronary syndrome, mostly when sedentary patients become physically active without undergoing a medical check-up.

3. Screening and assessment of patient's fitness before advising regular physical activity

The safest way is to assess health status in all patients, healthy and not healthy, before prescribing regular physical activity. Patients with:

- a history of cardiovascular disease
- high coronary risk
- obesity
- diabetes mellitus
- other serious medical problems
- a history of complete inactivity

should be checked before starting an intensive exercise program!

Clinical status, coronary risk and medication have to be taken into account, as well as the patient's habits and desires.

In such assessment several tools can be used:

3.1 Physical activity readiness questionnaire (PAR-Q)

This questionnaire (Table 1) serves to recognise patients who would need additional cardiovascular investigation if their answer to any of the questions is "YES" or "DON'T KNOW" (80% specific, 100% sensitive).

Table 1: Physical activity readiness questionnaire

Physical activity readiness questionnaire			
	YES	DON'T KNOW	NO
Have you ever had cardiac disease or diabetes?			
Have you ever had high blood pressure?			
Have you ever had chest pain during exercise or at rest?			
Are you currently taking any medication for blood pressure, heart disease, etc.?			
Have you ever had vertigo, dizziness or lost consciousness?			
Have you been seriously ill or admitted to hospital in the last year?			
Are you over 65 and not accustomed to physical activity?			
Have you ever had joint or bone problems, made worse by exercise?			
Do you have a viral infection (e.g. influenza) right now?			
Do you get asthma or shortness of breath while walking?			
Is there any other reason you should not be physically active?			

Adapted from Coaching NI Professional Instructors Award Training Manual (2006, p61)

3.2 Tests for assessment of physical fitness

• **2 km walking test (UKK 2 km)**

This is very useful in population preventive programs, testing both subjective and objective health status and cardiovascular fitness during brisk walking for 2 km. By measuring blood pressure and heart rate before and after the exercise, using a computer system, the patient's individual fitness is calculated.

• **Cycloergometrical assessment**

This is a clinical test, usually performed by cardiologists, which gives the most objective estimation of a patient's cardiovascular fitness. Since it is not fully available in GP/FM, it is recommended for:

- cardiac patients
- sedentary adults (men over 40, women over 50 years), who would like to start intensive physical activity for the first time in their life.

4. Prescribing physical activity

The prescribing of physical activity should always be INDIVIDUAL, depending on several factors:

- what is the goal? (to become fit, to lose weight, to improve health, etc)
- what intensity of physical activity are we are capable of?
- how physically active have we been so far?
- are any health problems present?
- how fit are we?
- age
- interests
- lifestyle

The plan for physical activity should be based on the caloric threshold. According to American College of Sport Medicine, the minimal caloric threshold is 1000 kcal/week:

- 200 kcal/day 4 times a week
- or
- 300 kcal/day 4 times a week.

The optimal caloric threshold for a healthy adult is 2000 kcal/week.

Calories spent in physical activity can be calculated from:

$$\frac{\text{MET} \times 3.5 \times \text{BW}}{200} = \text{kcal/min}$$

BW = body weight (kg)

1 MET = metabolic equivalent unit = 3.5 ml O²/kg/min

Examples of different physical activities and their intensity in METs are shown in Table 2.

Table 2: Intensity of different physical activities

Intensity of different physical activities, expressed in METs	
Resting	1 METs
Eating, dressing	2 METs
Walking (4.8 km/h), fishing, billiards	3 METs
Brisk walking (5.6 km/h)	4 METs
Tennis (doubles), climbing stairs, cricket	5 METs
Tennis (singles)	6 METs
Basketball	7 METs
Running (8 km/h), aerobics, mountaineering	8 METs

In prescribing physical activity we use the FIT (TP) formula:

- F: frequency (how many days per week)
- I: intensity (mild, moderate, intense)
- T: time (quantity of physical activity/day)
- T: type of activity (aerobic, anaerobic, for strength, stretching...)
- P: progression

4.1 F - Frequency

It is advisable that the patients are active every day, no matter what type of activity they choose. Physical activity gives beneficial effects when done regularly, the minimum being 30 minutes for 3-5 days per week (European recommendation).

4.2 I - Intensity

According to physiological parameters, 3 levels of intensity exist:

- a) **Mild:** This refers to any activity that burns less than 3.5 calories per minute (kcal/min). These levels are equal to the effort a healthy individual might burn while strolling, walking slowly, doing moderate housekeeping, etc. The heart rate (pulse) in mild exercise is less than 50% of the maximal pulse (see sub-section A below for more details).
- b) **Moderate:** Moderate-intensity physical activity refers to any activity that burns 3.5 to 7 calories per minute (kcal/min). These levels are equal to the effort a healthy individual might burn while walking briskly, mowing the lawn, dancing, swimming for recreation, bicycling, walking for pleasure, gardening and working in the yard, housekeeping, dancing and performing recreational activities such as tennis, racquetball, soccer, basketball and touch football. In moderate physical activity our heart rate (pulse) is 50-70% of the maximal pulse. Moderate-intensity activities, if performed daily, have many long-term health benefits. They help lower the risk of cardiovascular diseases.
- c) **Intensive:** Such physical activity refers to any activity that burns more than 7 calories per minute (kcal/min). These levels are equal to the effort a healthy individual might burn while jogging, engaging in heavy yard work, participating in high-impact aerobic dancing, swimming continuous laps, or bicycling uphill. In very intensive exercise one's heart rate (pulse) is more than 70% of the maximal pulse.

Intensity Assessment

There are several ways for assessing the intensity of physical activity. One can count his/her heart beats or observe his reaction to exercise.

A. Pulse (heart rate) measurement

Measuring the heart rate (beats per minute) can tell how hard the heart is working. One can check his/her heart rate by counting the pulse for 15 seconds and multiplying the beats by 4.

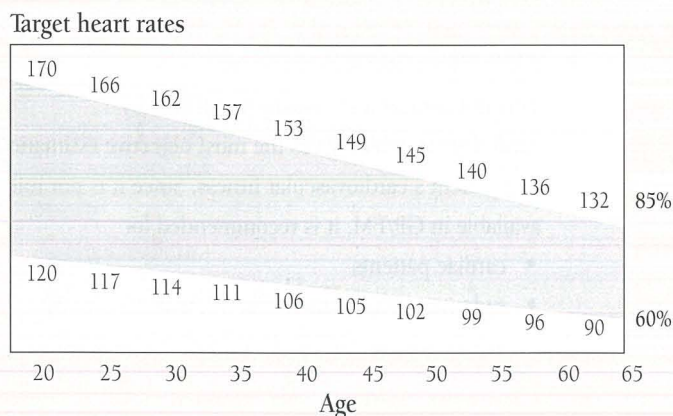
Maximal, recommended and target pulses can be calculated using the following equations (where Fr represents Frequency):

- Maximal pulse = Fr max = 220 – age
- Recommended pulse = Fr recom. = Fr max – Fr rest
- Target pulse for 50 – 85 % intensity = ((Fr max – Fr rest) x 0.50 and 0.85 + Fr rest

When just beginning an exercise program, one should aim for the lower target heart rate (60%). As the fitness improves, one can exercise harder to get the heart rate closer to the top number (85%).

Figure 1 shows the target heart rates for people of different ages:

Figure 1: Target heart rates



(Ref.: www.familydoctor.org)

B. Subjective reaction to physical activity:

1. Scale of RPE (rate of perceived exertion)

One way of assessing subjectively the reaction to physical activity is by using the RPE (Rate of Physical Exertion) Scale shown in Table 3.

Table 3: Scale of RPE (rate of perceived exertion)

“How do you feel during physical activity?” (Please tick one box)	
1. I have no problems	<input type="checkbox"/>
2. It was easily done	<input type="checkbox"/>
3. I can do more	<input type="checkbox"/>
4. I start feeling breathless	<input type="checkbox"/>
5. I am rather breathless	<input type="checkbox"/>
6. I am very breathless	<input type="checkbox"/>
7. I feel tired	<input type="checkbox"/>
8. I feel very tired	<input type="checkbox"/>
9. I can't breathe	<input type="checkbox"/>
10. I feel exhausted	<input type="checkbox"/>

1-3: not intensive enough

4-6: intensive enough

>6: too intensive

2. Observing techniques

The exercise is safe, as long as:

- we are still able to talk while being active,
- muscular pain (“muscle fever”) after the exercise lasts less than a day,
- at the end of the exercise we feel we could repeat the activity.

The exercise is too intensive- not safe, if signs of alarm are present:

- we are not able to finish the activity
- we can't talk while exercising
- we are exhausted after training
- we experience chronic tiredness
- sleeping disorders are present
- we feel pain in the joints
- chest pain (angina pectoris) appears during the exercise
- we feel breathless (dyspnoea) while exercising or resting
- we get nausea, dizziness during/after exercise
- we can't breathe when lying down (orthopnoea) or we have paroxysmal night dyspnoeas
- we feel palpitations or fast heart beats (tachycardia)
- ankle swelling (oedema) appears
- because of strong pain in the legs during exercise (intermittent claudication) we have to stop

4.3 T - TYPE

Some activities improve flexibility, some build muscular strength and some increase endurance. Anaerobic exercise comprises brief, strength-based activities, such as sprinting

or bodybuilding, whereas **aerobic exercise** is centred on endurance activities, such as marathon running or long-distance cycling. However, the early stage of all **exercise** is anaerobic.

A. Aerobic exercise

This is generally an activity performed over a long period of time, typically 20 minutes or more. It is used to tone the body, make it leaner, and improve endurance by keeping the cardiovascular system healthy. Technically, aerobic exercise is exercise that mainly uses energy from the cells in the muscles of the body doing aerobic respiration. Aerobic respiration of a cell is when the cell uses oxygen to burn energy (aerobic means “requiring air/oxygen”), unlike anaerobic respiration where the cell does not use oxygen when it burns energy.

Cellular aerobic respiration can potentially be 18 times more efficient than anaerobic respiration, and aerobic respiration produces fewer toxins in the cell. Because of this, the cell will try to do aerobic respiration whenever it can, but it will do anaerobic respiration to get energy when it lacks oxygen.

Exercises that are less intense but last longer allow the body to give the muscles oxygen as they are using it up, and keep them doing aerobic respiration. More intense exercises use up the oxygen in the cells faster than it can be replaced, so the cells divert to anaerobic respiration to get the energy they need. Continuous activities, which involve using the large muscles in arms or legs, are called **endurance or aerobic exercises**. They help the heart by making it work more efficiently during exercise and at rest.

Types of aerobic exercises are: swimming, dancing, walking, running, climbing stairs (sustained for 20 minutes or more), rowing, chopping wood (sustained for 20 minutes or more), cross country skiing, hiking, jogging, cycling, etc.

B. Anaerobic exercise

Anaerobic means “without air”, and refers to the energy exchange in living tissue that is independent of oxygen. **Anaerobic exercise** is brief, high intensity activity where **anaerobic metabolism** is taking place in muscles. Any exercise that consists of short exertion, high-intensity movement, is an anaerobic exercise. Anaerobic exercise is typically used by athletes in non-endurance sports to build power and by body-builders to build muscle mass. Muscles that are trained under anaerobic conditions develop biologically differently giving them greater performance in short duration-high intensity activities.

Examples of anaerobic exercise include: weight lifting, sprinting, jumping, etc.

In primary prevention the rule of balanced physical activity should be followed:

- 50% = 4-7 days a week: endurance exercise - aerobic activity
- 25% = 2-4 days a week: anaerobic activity for muscular strength
- 25% = 4-7 days a week: exercise for flexibility (stretching plus relaxation)

Preferably one should start the exercise session with a gradual warm-up period. During this time (about 5 to 10 minutes), one should slowly stretch muscles first, and then gradually increase the level of activity. For example, one should begin walking slowly and then pick up the pace. When the exercise is finished, one should cool down for about 5 to 10 minutes, stretch the muscles and let the heart rate slow down gradually. The same stretches as in the warm-up period can be used.

4.4 T - TIME

There are several different recommendations on the duration of physical activity. Two of them are shown below:

ACSM (American College of Sports Medicine) recommendation:

- 20 – 60 minutes per day

European recommendation, where Fr max = maximal frequency (maximal pulse):

- 3- 4 days /week for 30 minutes of 50 -80% Fr max, or
- all days in a week for 30 minutes of < 50% Fr max

4.5 P - PROGRESSION

Healthy adults can achieve 3 stages: start, improvement and maintenance (see Table 4).

5. Exercise advices and tips

Finally, here are some tips that will help you start and stick with an exercise programme:

- Start by talking with your doctor. This is especially important if you haven't been active, if you have any health problems, or if you're pregnant or elderly. Start out slowly. If you've been inactive for years, begin with a 10-minute period of light exercise or a brisk walk every day and gradually increase how hard you exercise and for how long.
- Enjoy it! Choose the activity you like to do. Make sure it suits you physically, too. For instance, swimming is easier on arthritic joints.
- Get a partner. Exercising with someone else can make it more fun.
- Vary your routine. You may be less likely to get bored or injured if you change your routine. Walk one day. Bicycle the next. Consider activities like dancing and racquet sports, and even chores like chopping wood.
- Choose a comfortable time of day. Don't work out too soon after eating or when it's too hot or cold outside. Wait until later in the day if you're too stiff in the morning.
- Don't get discouraged. It can take weeks or months before you notice some of the changes from exercise.
- Forget "no pain, no gain." While a little soreness is normal after you first start exercising, pain isn't. Stop if you hurt.
- Make exercise fun. Read, listen to music or watch TV while riding a stationary bicycle, for example. Find fun things to do, like taking a walk through the zoo. Go dancing. Learn how to play tennis.
- Use appropriate clothes and footwear.
- Take fluids to drink.
- Warm up before starting, start slowly and increase frequency and time gradually! Do not forget to cool down and stretch at the end of your exercise!

Table 4: The three stages of exercise progression in healthy adults

Stage	Week	Frequency- F (times/week)	Intensity- I (%)	Time- T (minutes)
Starting	1	3	40-50	12
	2	3	50	14
	3	3	60	16
	4	3	60-70	18
	5	3	60-70	20
Improvement	6-9	3-4	70-80	21
	10-16	3-4	70-80	24
	17-19	4-5	70-80	28
	20-27	4-5	70-80	30
Maintenance	28 and more	5-6	70-85	30-45

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Dr Mateja BULC MD, PhD
on behalf of the EUROPREV Network

Dr Mario R SAMMUT
MD, DipHSc, MSch, Dip MSc PC/GP (Ulster), MMCFCF
EUROPREV Representative for Malta

Email: mrsammut@rocketmail.com