

# Monitoring a diagnostika **PA**

# **kvantitativní**

množství

objem

počet

# **kvalitativní**

intenzita

struktura

fyziologické faktory

# **metody monitoringu PA**

# metody monitoringu PA

- subjektivní
- objektivní

pozorování

dotazování (interview, dotazníky)

přístrojové

- kalorimetrie
- krokoměry
- akcelerometry
- GPS
- TF
- kombinace
- ...

# POZOROVÁNÍ

- malý počet respondentů
- časově náročné
- ovlivněno pozorovatelem
- nepřesné



# DOTAZOVÁNÍ, INTERVIEV

- lze předem připravit
- náročné pro respondenta s ohledem na paměť





# DOTAZOVÁNÍ, DOTAZNÍK

## množství PA IPAQ 15 - 69 (International Physical Activity Questionnaire) – krátká a dlouhá verze

5. How much time did you usually spend on one of those days doing **moderate** physical activities as part of your work?
- \_\_\_\_ hours per day  
\_\_\_\_ minutes per day
6. During the **last 7 days**, on how many days did you **walk** for at least 10 minutes at a time **as part of your work**? Please do not count any walking you did to travel to or from work.
- \_\_\_\_ days per week
- No job-related walking → **Skip to PART 2: TRANSPORTATION**
7. How much time did you usually spend on one of those days **walking** as part of your work?
- \_\_\_\_ hours per day  
\_\_\_\_ minutes per day

### PART 2: TRANSPORTATION PHYSICAL ACTIVITY

These questions are about how you traveled from place to place, including to places like work, stores, movies, and so on.

8. During the **last 7 days**, on how many days did you **travel in a motor vehicle** like a train, bus, car, or tram?
- \_\_\_\_ days per week
- No traveling in a motor vehicle → **Skip to question 10**
9. How much time did you usually spend on one of those days **traveling** in a train, bus, car, tram, or other kind of motor vehicle?
- \_\_\_\_ hours per day  
\_\_\_\_ minutes per day

Now think only about the **bicycling** and **walking** you might have done to travel to and from work, to do errands, or to go from place to place.

10. During the **last 7 days**, on how many days did you **bicycle** for at least 10 minutes at a time to go **from place to place**?
- \_\_\_\_ days per week
- No bicycling from place to place → **Skip to question 12**

11. How much time did you usually spend on one of those days to **bicycle** from place to place?
- \_\_\_\_ hours per day  
\_\_\_\_ minutes per day
12. During the **last 7 days**, on how many days did you **walk** for at least 10 minutes at a time to go **from place to place**?
- \_\_\_\_ days per week
- No walking from place to place → **Skip to PART 3: HOUSEWORK, HOUSE MAINTENANCE, AND CARING FOR FAMILY**
13. How much time did you usually spend on one of those days **walking** from place to place?
- \_\_\_\_ hours per day  
\_\_\_\_ minutes per day

### PART 3: HOUSEWORK, HOUSE MAINTENANCE, AND CARING FOR FAMILY

This section is about some of the physical activities you might have done in the **last 7 days** in and around your home, like housework, gardening, yard work, general maintenance work, and caring for your family.

14. Think about only those physical activities that you did for at least 10 minutes at a time. During the **last 7 days**, on how many days did you do **vigorous** physical activities like heavy lifting, chopping wood, shoveling snow, or digging **in the garden or yard**?
- \_\_\_\_ days per week
- No vigorous activity in garden or yard → **Skip to question 16**
15. How much time did you usually spend on one of those days doing **vigorous** physical activities in the garden or yard?
- \_\_\_\_ hours per day  
\_\_\_\_ minutes per day
16. Again, think about only those physical activities that you did for at least 10 minutes at a time. During the **last 7 days**, on how many days did you do **moderate** activities like carrying light loads, sweeping, washing windows, and raking **in the garden or yard**?
- \_\_\_\_ days per week
- No moderate activity in garden or yard → **Skip to question 18**

17. How much time did you usually spend on one of those days doing **moderate** physical activities in the garden or yard?
- \_\_\_\_ hours per day  
\_\_\_\_ minutes per day
18. Once again, think about only those physical activities that you did for at least 10 minutes at a time. During the **last 7 days**, on how many days did you do **moderate** activities like carrying light loads, washing windows, scrubbing floors and sweeping **inside your home**?
- \_\_\_\_ days per week
- No moderate activity inside home → **Skip to PART 4: RECREATION, SPORT AND LEISURE-TIME PHYSICAL ACTIVITY**
19. How much time did you usually spend on one of those days doing **moderate** physical activities inside your home?
- \_\_\_\_ hours per day  
\_\_\_\_ minutes per day

### PART 4: RECREATION, SPORT, AND LEISURE-TIME PHYSICAL ACTIVITY

This section is about all the physical activities that you did in the **last 7 days** solely for recreation, sport, exercise or leisure. Please do not include any activities you have already mentioned.

20. Not counting any walking you have already mentioned, during the **last 7 days**, on how many days did you **walk** for at least 10 minutes at a time **in your leisure time**?
- \_\_\_\_ days per week
- No walking in leisure time → **Skip to question 22**
21. How much time did you usually spend on one of those days **walking** in your leisure time?
- \_\_\_\_ hours per day  
\_\_\_\_ minutes per day
22. Think about only those physical activities that you did for at least 10 minutes at a time. During the **last 7 days**, on how many days did you do **vigorous** physical activities like aerobics, running, fast bicycling, or fast swimming **in your leisure time**?
- \_\_\_\_ days per week
- No vigorous activity in leisure time → **Skip to question 24**

23. How much time did you usually spend on one of those days doing **vigorous** physical activities in your leisure time?
- \_\_\_\_ hours per day  
\_\_\_\_ minutes per day
24. Again, think about only those physical activities that you did for at least 10 minutes at a time. During the **last 7 days**, on how many days did you do **moderate** physical activities like bicycling at a regular pace, swimming at a regular pace, and doubles tennis **in your leisure time**?
- \_\_\_\_ days per week
- No moderate activity in leisure time → **Skip to PART 5: TIME SPENT SITTING**
25. How much time did you usually spend on one of those days doing **moderate** physical activities in your leisure time?
- \_\_\_\_ hours per day  
\_\_\_\_ minutes per day

### PART 5: TIME SPENT SITTING

The last questions are about the time you spend sitting while at work, at home, while on course work and during leisure time. This may include time spent sitting at a desk, visiting friends, reading or sitting or lying down to watch television. Do not include any time spent in a motor vehicle that you have already told me about.

26. During the **last 7 days**, how much time did you usually spend **sitting** on a work day?
- \_\_\_\_ hours per day  
\_\_\_\_ minutes per day
27. During the **last 7 days**, how much time did you usually spend **sitting** on a work day?
- \_\_\_\_ hours per day  
\_\_\_\_ minutes per day

This is the end of the questionnaire, thank you for participating!



# DOTAZOVÁNÍ, DOTAZNÍK

množství i intenzita PA

## Druh a intenzita všech prováděných pohybových aktivit včetně organizovaných.

Zaznamenejte dobu (zaokrouhleně na pět minut) všech pohybových aktivit, které jste v průběhu dne prováděl/a **déle než 10 minut** (stejně aktivity sčítejte). Fyzicky náročnou pohybovou aktivitu s vyšší intenzitou (značná únava, zadýchání, zpocení, vysoká srdeční frekvence) označte u záznamu minut znakem I (intenzivní).

Pohybová aktivita	1. den	2. den	3. den	4. den	5. den	6. den	7. den	8. den
Chůze (i turistika)								
Běh (jogging)								
Cvičení s hůdkou (aerobic ap.)								
Tanec								
Základní a sportovní gymnastika								
Kondiční cvičení, posilování								
"Zdravotní" cvičení (i ranní)								
Plavání								
Lyžování sjezdové								
Lyžování běh								
Bruslení (i kolečkové)								
Jízda na kole (i turistika)								
Fotbal, nohejbal								
Basketbal								
Volejbal								
Tenis, softenis								
Stolní tenis								
Florbal, hokej								
Úpoly (bojová umění, sebeobrana)								
Zahrádkaření								
Pracovní (manuální práce)								
Domácí práce (uklizení, úpravy bytu)								
Jiné.....								

## Druh a intenzita všech inaktivit.

Zaznamenejte dobu (zaokrouhleně na pět minut) všech inaktivit, které jste v průběhu dne prováděl/a **déle než 10 minut** (stejně inaktivity sčítejte).

Pohybová inaktivita	1. den	2. den	3. den	4. den	5. den	6. den	7. den	8. den
Sezení (ležení) u televize								
Sezení (ležení) u počítače								
Sezení ve škole								
Sezení (ležení) při učení, hře, ...								
Sezení v parku, restauraci ap.								
Sezení (stání) při sport. a kulturních akcích								
Sezení (stání) v dopravních prostředcích								

**PŘÍSTROJOVÉ**

# KALORIMETRIE

- přímá
- nepřímá



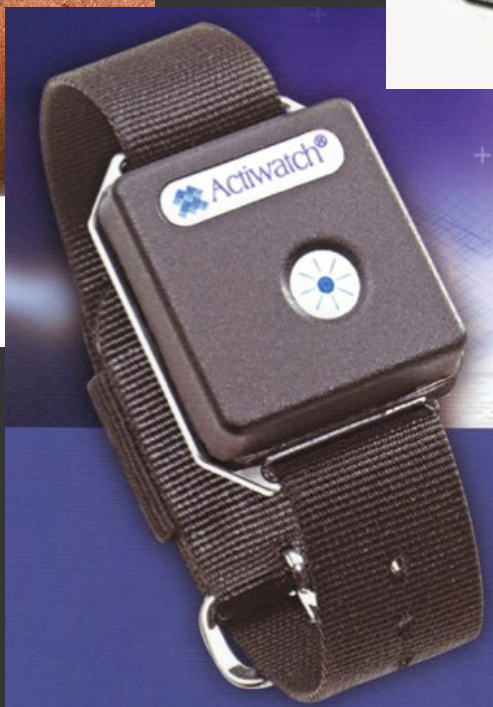
# TEPOVÁ FREKVENCE



# KROKOMĚRY



# AKCELEROMETRY



# AKCELEROMETRY - fitnessbelt

FITBIT



GARMIN VIVOFIT



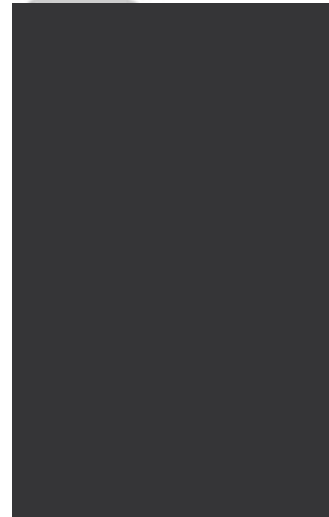
JAWBONE



NIKE FUEL BAND



POLAR LOOP



# AKCELEROMETRY – smartphone, smartwatch

LG

MOTO-G

SAMSUNG

TESCO

APPLE

MICROSOFT

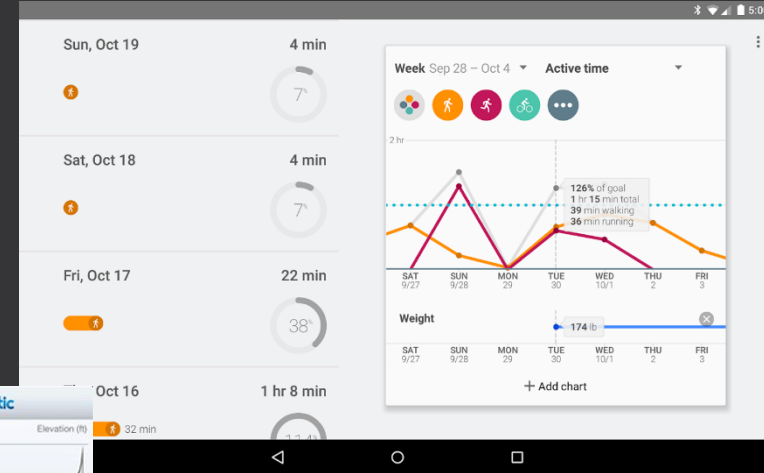




# AKCELEROMETRY – smartphone, smartwatch



SPORTS TRACKER  
GOOGLE FIT  
RUNKEEPER  
ENDOMONDO  
RUNSTATIC



# WEBové portály

The screenshot shows the Garmin Connect web interface. It features a dark blue header with the 'connect' logo and 'powered by Garmin'. A left sidebar contains navigation icons. The main content area is divided into several sections: 'CONNECTIONS' with a list of user activity entries; 'STEPS' showing a large gauge for today's steps (6,922) and a bar chart for the week; 'REPORTS' with a bar chart of weekly step counts; 'SLEEP' with a sleep schedule indicator; 'DEVICES' listing a 'vivofit' device; and 'CALORIES IN/OUT' with a 'Track Your Calories' section.

The screenshot displays the Nike+ web interface for user RIYAD EMERAN. At the top, it shows a profile picture placeholder and key statistics: NIKE+ FUELBAND (2,336,704), 98% goal hit %, 449 active days, and 5,204 average NikeFuel/Day. Below this, it shows NIKE+ RUNNING statistics: 207,994 total runs, 977km total distance, 153 total runs, and 6.3km average distance/run. The interface includes a '5 FRIENDS' section, a 'TROPHIES' section with five achievement icons, and a 'NIKE+ SESSIONS' section showing 27,651 running sessions, 9,535 cycling sessions, and 570 sleeping sessions. A large donut chart on the right indicates a total of 37,756 sessions.

The screenshot shows the eVivo web interface for user Tomas. The header includes navigation tabs for 'Zdraví', 'Výživa', 'Pohyb', and 'Motivace', along with the user's name 'Tomas'. The main content area features a central green silhouette of a person surrounded by various health and activity metrics in circular gauges, such as heart rate (82.0 bpm), blood pressure, and energy levels. On the right, there is a list of recent activities: '30 min Horská cyklistika', '45 min Běh 4.5 min/km', and '0,63 km Cyklistika'. A 'Please confirm your sleep' dialog box is visible in the foreground, showing a sleep schedule from 0:00 to 7:00.

# GPS



# **Normy a doporučení**

# Normy a doporučení

Počet kroků za den	Stupeň aktivity
<5000	sedavý způsob života - velmi málo aktivní
5000 - 7499	málo aktivní - denní aktivita bez cvičení či sportu
7500 - 9999	středně aktivní - zahrnuje nějakou pohybovou aktivitu nebo zvýšenou pracovní aktivitu
10000 - 12499	aktivní
>12500	vysoce aktivní

Tudor-Locke a Bassett (2004)

30 minut chůze denně alespoň pětkrát týdně

Healthy People 2010 (USDHHS, 2000)

10 000 kroků za den

(Hatano, 1993)

## CHŮZE - Počet kroků

<i>FITT charakteristiky</i>	<i>Denní počet kroků</i>
<ul style="list-style-type: none"> <li>▶ <b>Pohybová aktivita alespoň střední intenzity po dobu nejméně 90 minut denně.</b></li> <li>▶ <b>Rozložení PA do kratších, alespoň 10minutových úseků s cílem souhrnné realizace nejméně 90 minut PA alespoň střední intenzity za den.</b></li> </ul>	<ul style="list-style-type: none"> <li>▶ V převažujícím počtu dnů v týdnu by měl dosahovat <b>12 000 kroků u děvčat</b> a <b>14 000 kroků u chlapců</b></li> </ul>
<i>Další doporučení</i>	
<ul style="list-style-type: none"> <li>▶ <b>Podporovat pohybově aktivní (pěší a cyklistický) dopravu</b> dětí do školy a ze školy, zájmových organizací, klubů a dalších volnočasových aktivit.</li> <li>▶ <b>Upřednostňovat všestranný pohybový rozvoj</b> před jednostranným pohybovým (nebo sportovním) zaměřením.</li> <li>▶ <b>Upřednostňovat rychlostně-obratnostní PA</b> před aktivitami silového charakteru.</li> <li>▶ Zvýšit podíl dětí, které jsou <b>3–4× týdně</b> zapojeny do <b>organizované pohybové aktivity</b> (zahrnující vyučovací jednotky tělesné výchovy).</li> <li>▶ Děti by si měly osvojit základy mnoha druhů pohybových aktivit (bruslení, jízda na kole, lyžování, plavání, šplhání) a základní gymnastické prvky nejpozději do nástupu puberty.</li> <li>▶ <b>Nepřetržité sledování</b> televize či monitoru počítače by nemělo překročit <b>90 minut denně.</b></li> </ul>	

školní děti ve věku 6–11 let

(Sigmundová, Erik & Šnoblová, 2012)

# Normy a doporučení

Provádět středně zatěžující pohybovou aktivitu (3–6 MET) alespoň **150** minut týdně nebo intenzivní pohybovou aktivitu alespoň **75** minut týdně

„2008 Physical activity guidelines for Americans“ (USDHHS, 2008), ACSM

Provádět středně zatěžující pohybovou aktivitu nejméně **30** minut **pětkrát** týdně nebo intenzivní pohybovou aktivitu nejméně **20** minut **tříkrát** týdně.

„EU physical activity guidelines“ (EU Sport Ministers, 2008)

Intenzitu zatížení lze rozdělit do tří pásem: (Pate et al., 1995)

- Nízké zatížení (**méně než 3,0 METs**)
- Střední zatížení (**3,0-6,0 METs**)
- Vysoké zatížení (**více než 6,0 METs**)

Frekvence: 3 – 4x týdně

Intenzita: 60 – 80% maximálního výkonu

Trvání: 30 - 45 min

oddělení tělovýchovného lékařství, LF UK

# Physical activity benefits for adults and older adults

- BENEFITS HEALTH**
- IMPROVES SLEEP**
- MAINTAINS HEALTHY WEIGHT**
- MANAGES STRESS**
- IMPROVES QUALITY OF LIFE**

REDUCES YOUR CHANCE OF

Type II Diabetes	-40%
Cardiovascular Disease	-35%
Falls, Depression and Dementia	-30%
Joint and Back Pain	-25%
Cancers (Colon and Breast)	-20%

## What should you do?

For a healthy heart and mind

To keep your muscles, bones and joints strong

To reduce your chance of falls



<b>VIGOROUS</b> RUN	<b>MODERATE</b> WALK	TV	GYM	DANCE
SPORT	CYCLE	SOFA	YOGA	TAI CHI
STAIRS	SWIM	COMPUTER	CARRY BAGS	BOWLS

**MINUTES PER WEEK**

**75 OR 150**

**VIGOROUS INTENSITY**  
(BREATHING FAST  
DIFFICULTY TALKING)

**MODERATE INTENSITY**  
(INCREASED BREATHING  
ABLE TO TALK)

**OR A COMBINATION OF BOTH**

**BREAK UP SITTING TIME**

**2 DAYS PER WEEK**

Something is better than nothing.  
Start small and build up gradually:  
just 10 minutes at a time provides benefit.  
**MAKE A START TODAY: it's never too late!**

UK Chief Medical Officers' Guidelines 2011 Start Active, Stay Active: <http://bit.ly/startactive>



# The American Heart Association Recommendations for Physical Activity in Adults

At least **30** minutes of moderate-intensity aerobic activity

At least **5** days per week for a total of **150** minutes

OR

At least **25** minutes of vigorous aerobic activity

At least **3** days per week for a total of **75** minutes

or a combination of the two

AND

Moderate to **HIGH INTENSITY** muscle-strengthening activity

At least **2** days per week for additional health benefits

**MINISTRY OF Health** **PHYSICAL ACTIVITY**  
Guidelines for Healthy Children Age: 5 - 17

**Strength and Flexibility**  
Include muscle strengthening and flexibility activities on 3 or more days each week

**Aerobic Exercise or Recreational Play**  
Do at least 60 minutes of activity that will get your heart racing and breathing heavy on 5 or more days each week

**Sit LESS**  
SIT LESS! Cut down on sitting/screen time to less than 2 hours each day

**Move More... Play for 60 everyday**  
Increase PLAY time to 60 minutes or more EVERY day

# Canadian Physical Activity Guidelines

## FOR ADULTS WITH MULTIPLE SCLEROSIS

### Guidelines

To achieve important fitness benefits, adults aged 18-65 years with multiple sclerosis who have mild to moderate disability need at least:



- 30 minutes of moderate intensity aerobic activity, 2 times per week, AND



- Strength training exercises for major muscle groups, 2 times per week.



Meeting these guidelines may also reduce fatigue, improve mobility and enhance elements of health related to quality of life.

### Let's talk intensity!

- Moderate-intensity physical activity is usually a 5 or 6 on a scale of 10 and causes your heart rate to go up
- Pick a resistance (free weights, cable pulleys, bands, etc.) heavy enough that you can barely, but safely, finish 10-15 repetitions of the last set
- Repetitions are the number of times you lift and lower a weight

### Important things to know

- Aerobic and strength training activities can be done on the same day
- Rest your muscles for at least one day between strength training sessions

### Aerobic Activity

#### How often?

- Two times per week
- Aerobic and strength training activities can be done on the same day

#### How much?

- Gradually increase your activity so that you are doing at least 30 minutes of aerobic activity during each workout session.

#### How hard?

- These activities should be performed at a moderate intensity.
- Moderate-intensity physical activity is usually a 5 or 6 on a scale of 10, and causes your heart rate to go up.
- As a general rule if you're doing moderate-intensity activity you can talk, but not sing a song, during the activity.

#### How to?

Some options for activity include:

- Upper Body Exercises: arm cycling
- Lower Body Exercises: walking, leg cycling
- Combined Upper and Lower body exercises: elliptical trainer

Other types of exercise that may bring benefits:

- Elastic resistance bands
- Aquatic exercise
- Calisthenics

For more information please go to ...



## Exercise and Physical Activity Guide for Health Promotion 2006

### 1. For people who want to increase physical activity for health promotion

#### Health promotion by physical activity

Let's walk to achieve the following goals in everyday life.

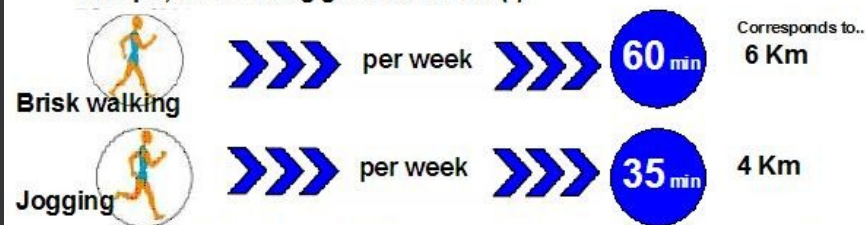


> When one uses a pedometer...

The goal should be set as 10,000 steps per day (70,000 per week), including 2,000~4,000 steps unconsciously taken in everyday life.

#### Health promotion by exercises

Let's practice more exercises, in addition to physical activity in everyday life, according to your lifestyle and physical fitness. For example, the following goals can be set (\*).



\*In this case, the goal of walking should be 50 minutes per day (350 minutes per week)

### 2. For people who are conscious about visceral fat

Let's try to achieve the following goals, so as to reduce visceral fat and improve the metabolic syndrome. People with no exercise habit could start with one fifth of these goals, and then increase the amount of exercise gradually.

