Exercise prescription in primary care setting

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Summary

- Introduction
- Screening
- Goal setting
- Designing program

Benefits of physical activity

- Heart diseases
- High cholesteol
- Hypertension
- Diabetes
- Cancer
- Stroke
- Type 2 diabetes mellitus
- Hypertension
- Colon cancer

Kesaniemi et al. 2001

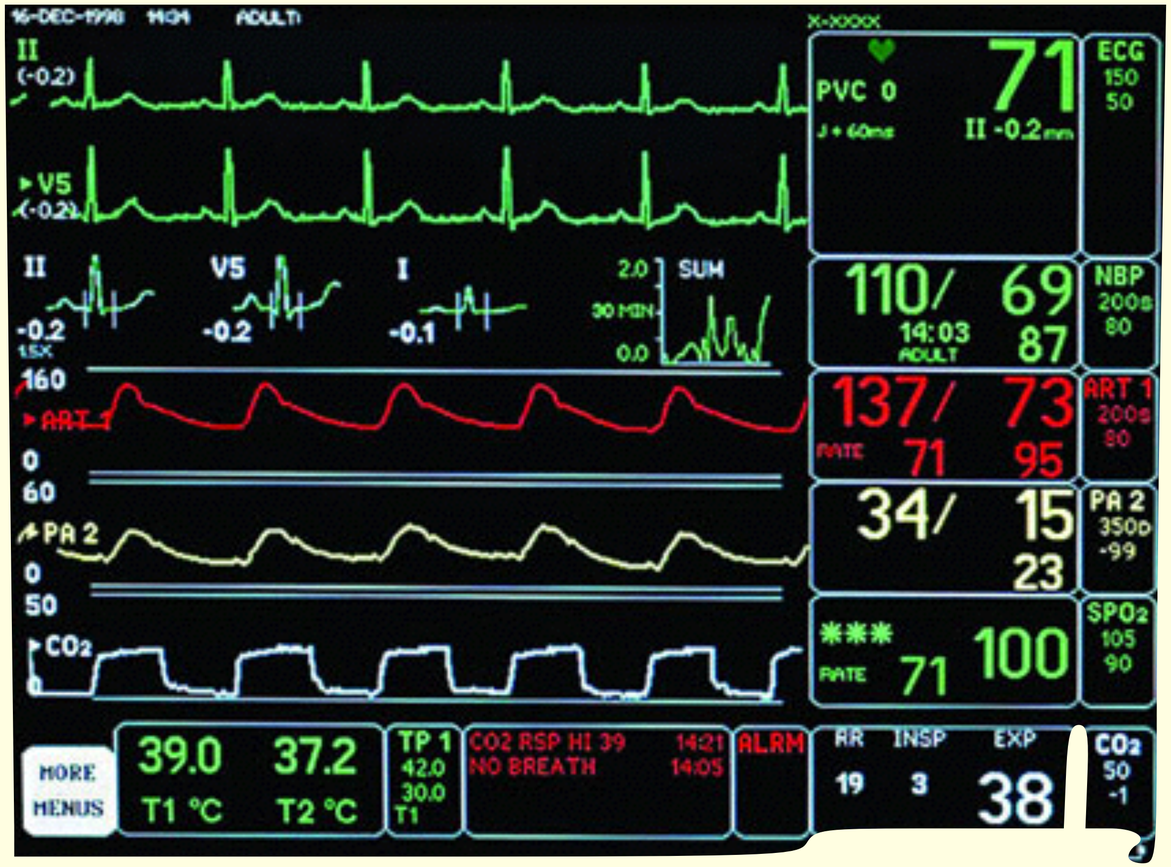
Risk of sedentary behaviour

- Reduced functional capacity
- Osteoporosis
- Obesity
- Anxiety and depression
- Cardiovascular disease
- Stroke
- Type 2 diabetes mellitus
- Hypertension

Kesaniemi et al. 2001

New vital sign

- Pulse
- Blood pressure
- Temperature
- Respiratory rate
- Physical activity



American College Sports Medicine, 2009

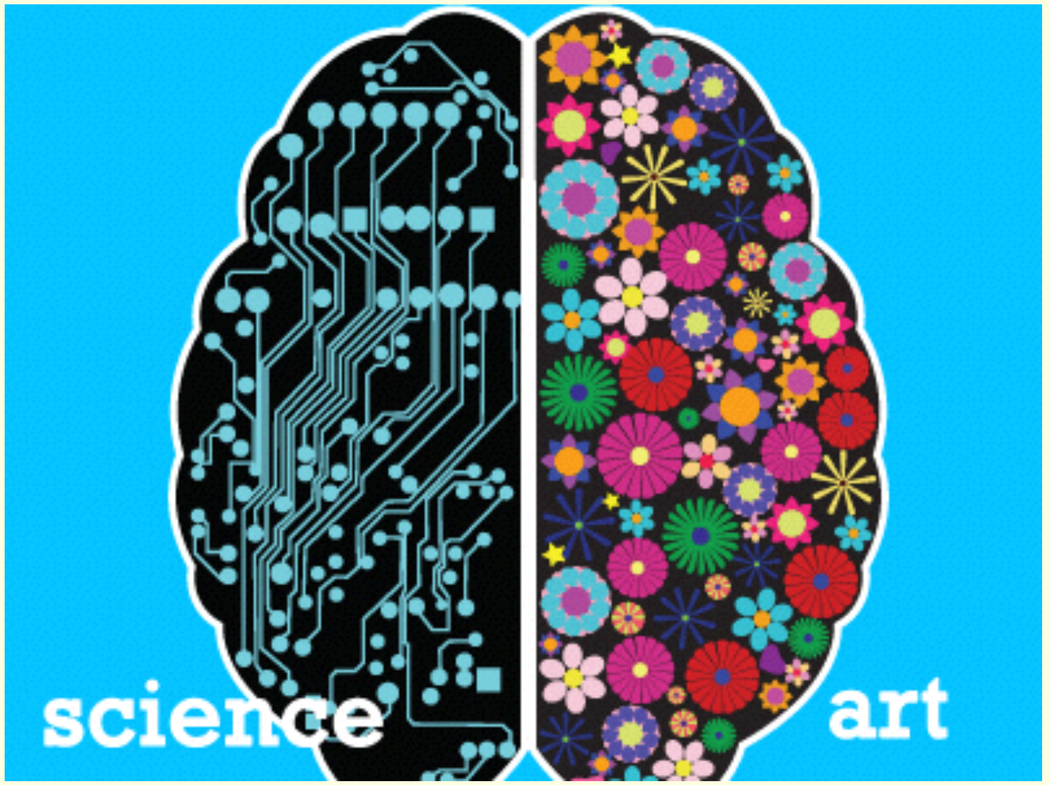
Healthcare personnel

- Educate and advise
- How to adopt lifestyle changes
  - Dietary advised
  - Safe physical activity/exercise
  - Role model

NSPNCD, 2010

Exercise prescription

- EASY
- Science & Art
- Basic principles - same
- Specific to setup



Exercise prescription: Steps

- Readiness to change
- Objectives / goals
- Ensure safety
- Regular follow-up

Readiness to change?

For each statement, please mark yes or no.

1. I am currently physically active (at least 30 minutes per week). ☐ Yes ☐ No
2. I intend to become more physically active in the next 6 months. ☐ Yes ☐ No
3. I currently engage in **regular** physical activity. ☐ Yes ☐ No
4. I have been **regularly** physically active for the past 6 months. ☐ Yes ☐ No

Stage of Change	Action Step	
Precontemplation (Patient has no intention to be physically active)	• Promote being more physically active by discussing its health benefits, emphasizing the pros of changing their behavior, and helping work through the cons of being more physically active. • The individual is likely not ready to receive a physical activity prescription at this point.	
	Independent	***Supervision Necessary***
Contemplation (Patient is thinking about becoming physically active)	Write prescription; refer to exercise professional.	Refer to clinical exercise professional.
	• Continue to emphasize the pros and reducing the cons of being more physically active. • The individual may be becoming receptive to receiving basic guidance on becoming more physically active.	
Preparation (Patient is active and making small changes, but not meeting PA guidelines*)	Write prescription; refer to non-clinical exercise professionals.	Refer to clinical exercise professionals.
Action (Patient is meeting the physical activity guidelines but for less than 6 months)	Encourage continued exercise.	Encourage continued supervised exercise training.
	Strengthen their commitment to change and ability to fight urges to slip back into unhealthy behaviors.	
Maintenance (Patient is meeting the physical activity guidelines for the last 6 months or more)	Encourage continued exercise.	Encourage continued supervised exercise.
	Encourage them to spend time with people with similar healthy behaviors; continue to engage in healthy activities to cope with stress instead of relying on unhealthy behavior.	

Physical activity: Stage of change

	Item				Action
Stage	1	2	3	4	
Precontemplation	No	No	-	-	Education
Contemplation	No	Yes	-	-	Education
Preparation	Yes	-	No	-	Prescription
Action	Yes	-	Yes	No	Prescription
Maintenance	Yes	-	Yes	Yes	Prescription

ACSM, 2009

Exercise: Risk

- Heart disease patients
  - 1 : 220,000 (heart attack)
  - 1 : 750,000 (death)
- Healthy men
  - 1 : 15,000 - 18,000 (death)
    - Least active —> vigorous exercise
    - Start low and go slow

Thompson et al., 2003

Screening

- Ensure safety of participation
- Easy
  - Regular patient - refer to medical records
  - New patients
    - Self assessment questionnaire - PAR-Q

Physical activity readiness - questionnaire (PAR-Q)

YES	NO	
☐	☐	1. **Has your doctor ever said that you have a heart condition and that you should only do physical activity recommended by a doctor?**
☐	☐	2. **Do you feel pain in your chest when you do physical activity?**
☐	☐	3. **In the past month, have you had chest pain when you were not doing physical activity?**
☐	☐	4. **Do you lose your balance because of dizziness or do you ever lose consciousness?**
☐	☐	5. **Do you have a bone or joint problem (for example, back, knee or hip) that could be made worse by a change in your physical activity?**
☐	☐	6. **Is your doctor currently prescribing drugs (for example, water pills) for your blood pressure or heart condition?**
☐	☐	7. **Do you know of any other reason why you should not do physical activity?**

Answer all NO = Low risk

safe to participate in exercise program without supervision at any intensity level

SECTION 2 - CHRONIC MEDICAL CONDITIONS

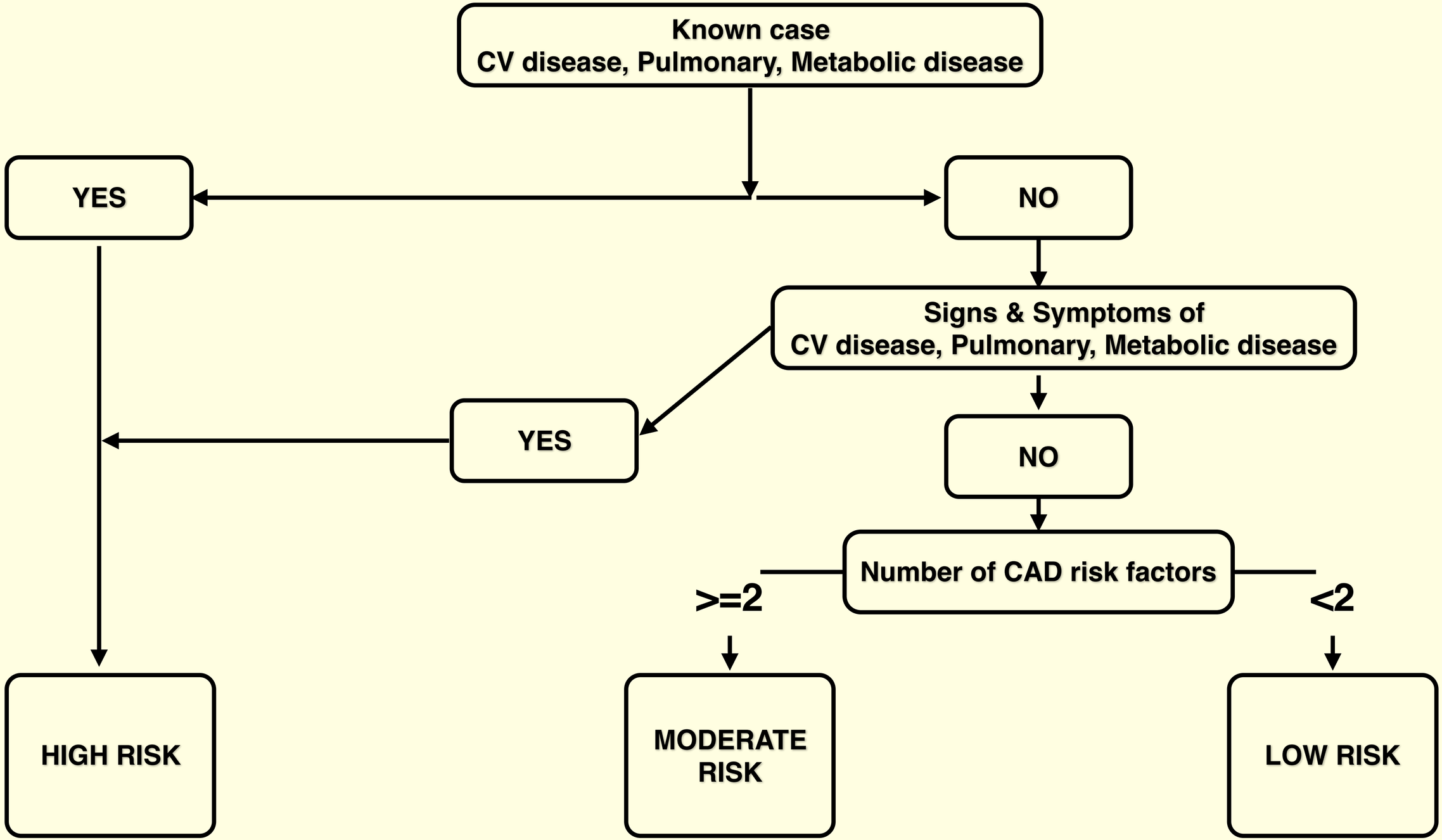
Please read the questions below carefully and answer each one honestly: check YES or NO.			YES	NO
1.	Do you have Arthritis, Osteoporosis, or Back Problems?		☐ If yes, answer questions 1a-1c	☐ If no, go to question 2
	1a.	Do you have difficulty controlling your condition with medications or other physician-prescribed therapies? (Answer NO if you are not currently taking medications or other treatments)	☐	☐
	1b.	Do you have joint problems causing pain, a recent fracture or fracture caused by osteoporosis or cancer, displaced vertebra (e.g., spondylolisthesis), and/or spondylolysis/pars defect (a crack in the bony ring on the back of the spinal column)?	☐	☐
	1c.	Have you had steroid injections or taken steroid tablets regularly for more than 3 months?	☐	☐
2.	Do you have Cancer of any kind?		☐ If yes, answer questions 2a-2b	☐ If no, go to question 3
	2a.	Does your cancer diagnosis include any of the following types: lung/bronchogenic, multiple myeloma (cancer of plasma cells), head, and neck?	☐	☐

CSEP | SCPE
THE GOLD STANDARD IN EXERCISE SCIENCE AND PERSONAL TRAINING

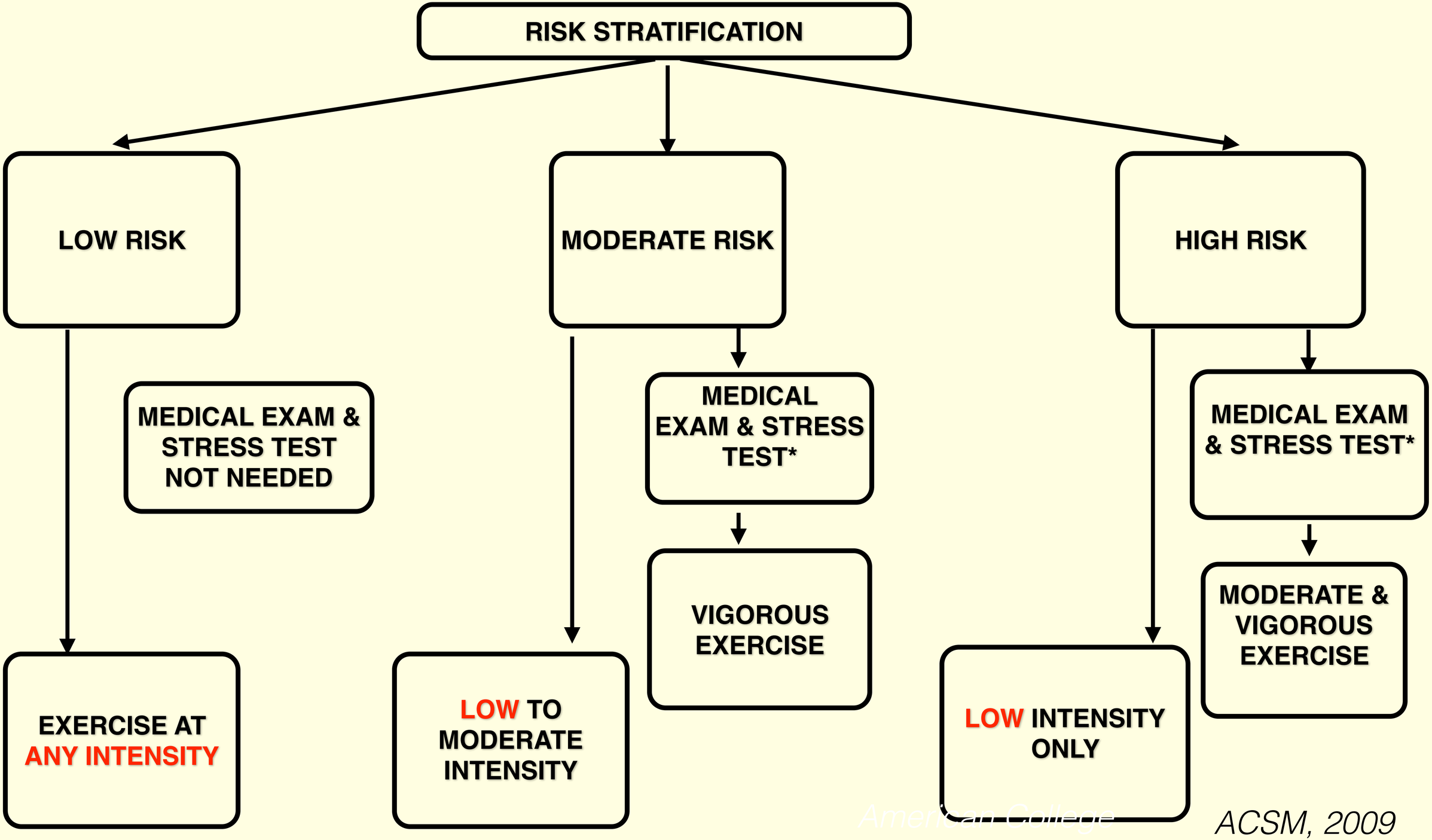
CSEP, 2011

Heart disease: Risk factors

- Age
  - Men > 45 ; Women > 55
- Family history
  - Men < 55 ; Women < 65
- Smoking
- Sedentary
- Obesity
- Hypercholesterolemia
- Pre-diabetes


Known case
CV disease, Pulmonary, Metabolic disease
YES
NO
Signs & Symptoms of
CV disease, Pulmonary, Metabolic disease
YES
NO
Number of CAD risk factors
>=2
<2
HIGH RISK
MODERATE RISK
LOW RISK

ACSM, 2009


RISK STRATIFICATION
LOW RISK
MODERATE RISK
HIGH RISK
MEDICAL EXAM & STRESS TEST NOT NEEDED
MEDICAL EXAM & STRESS TEST*
MEDICAL EXAM & STRESS TEST*
EXERCISE AT ANY INTENSITY
LOW TO MODERATE INTENSITY
VIGOROUS EXERCISE
LOW INTENSITY ONLY
MODERATE & VIGOROUS EXERCISE

ACSM, 2009

FITT Principles

Frequency (F) : 3 - 5 times /week (150 min / week)

Intensity (I) : Moderate - intensity

Time (T) : 10 - 30 minutes

Type (T) : Brisk walking, jogging, cycling, swimming

Measuring intensity

	Subjective measures		**Physiological measures**
Intensity	“Talk test”	Perceived exertion (10 point scale)	Maximal HR (%)
Light	Can talk AND sing	< 3	< 64
Moderate	Can talk NOT sing	3 to 4	64 to 76
Vigorous	Difficulty talking	> 5	> 76

Intensity - RPE

- Reliable level for assessing level of PE during continuous aerobic exercise
  - RPE 12 = 40% HRR
  - RPE 16 = 84% HRR

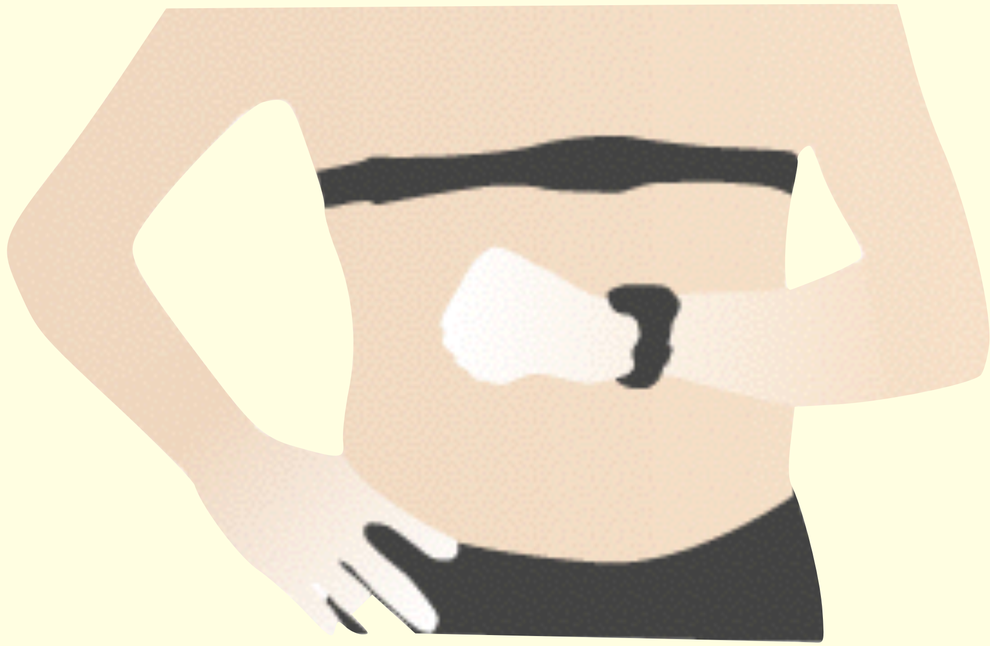
Borg Scale of Perceived Exertion

6	Very, very light	How you feel when lying in bed or sitting in a chair relaxed.
7		
8	Very light	Little or no effort.
9		
10		
11	Fairly light	Target range: How you should feel with exercise or activity.
12		
13	Somewhat hard	
14	Hard	
15		
16	Very hard	How you felt with the hardest work you have ever done.
17		
18	Very, very hard	
19		
20	Maximum effort	Don't work this hard!

Intensity (heart/pulse rate)

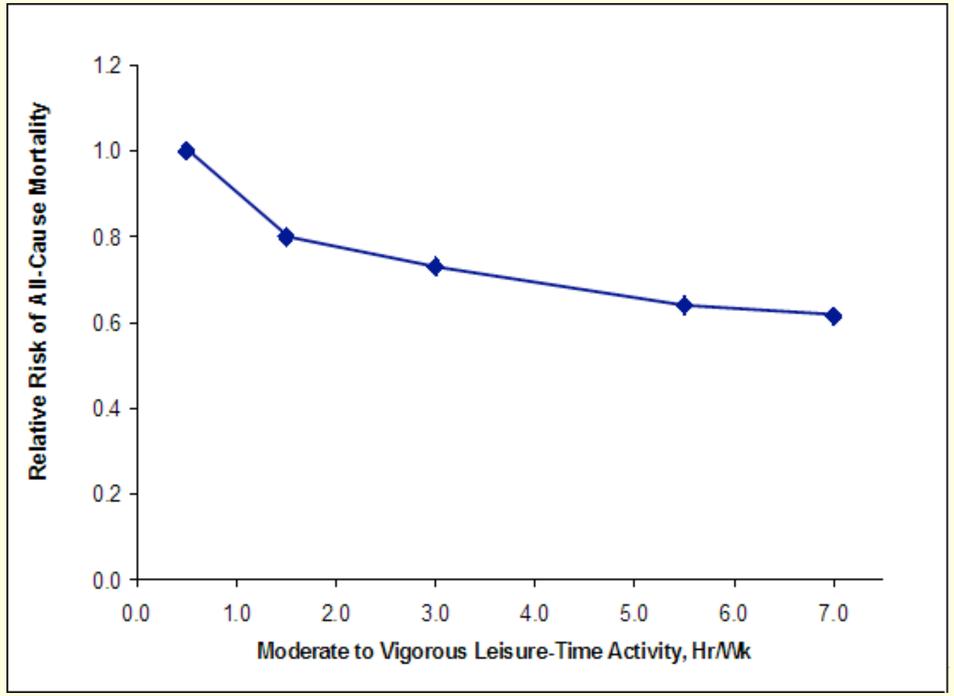
- % HR max (estimation)
  - 220 - age
- % HR Reserve (HRR)
  - HRR = HR max - HR rest (resting)
    - 39 y.o man
    - Resting HR = 68
    - Exercise intensity - 60%
      - What is the target HR?

- Maximal HR = 220 -39 = 181
- Resting HR = 68
- HRR = 181 - 68 = 113
  - 60% HRR = 68
- Target HR = 60% HRR + RHR
  - = 68 + 68 = 136



Initial goal

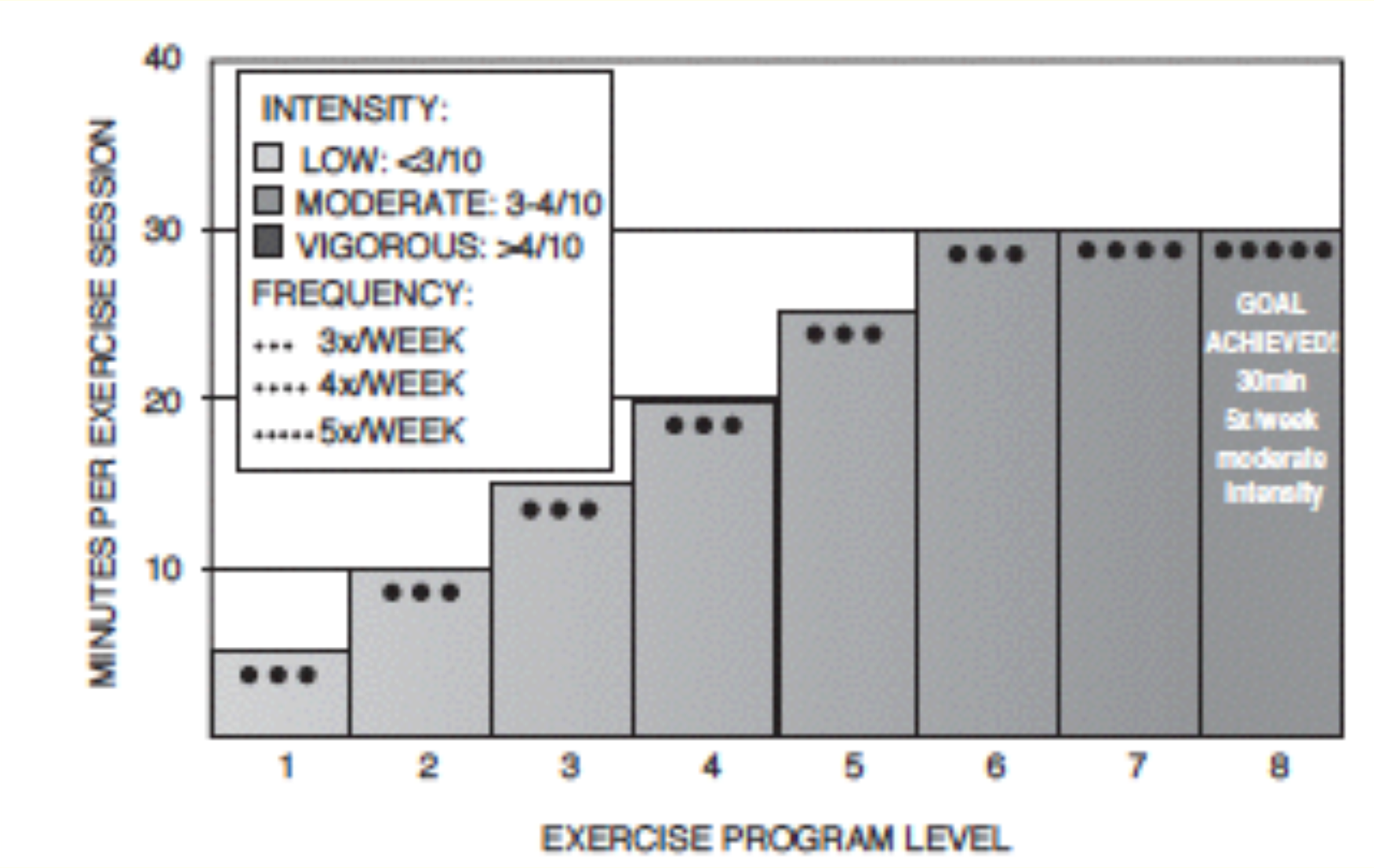
- Regularity - forget about intensity!!!
- Low intensity
  - 30 minutes / day
  - 2x / week
- Little is better than nothing



Source: http://www.health.gov/paguidelines/Report/G1_allcause.aspx#q3

Low intensity < 3 METs
Walking - slow pace (around home or office)
Household & occupation - computer, work at desk
Leisure activity - Art & crafts, fishing playing musical instruments

Intermediate goal



Moderate 3 - 6 METs
Walking - brisk 5 km/h
Household & occupation - washing car, clean garage, sweeping, vacuuming, mowing lawn
Leisure activity - Badminton, bicycling, dancing, tennis, swimming, golf

Long term goal

Type	Intensity	Duration	Frequency	Total
Cardio exercise	Moderate	30 minutes / day	5 X / week	150 mins / week
OR				
Cardio exercise	Vigorous	20 minutes / day	3 X / week	75 mins / week
AND				
Weight exercise	8 - 12 repetitions/exercise		2 X / week	

ACSM, 2009

Maintenance

- Careful consideration
- Barriers
  - Lapse (up to 50%)
  - Termination

ACSM, 2005

Barriers

- **Personal**
  - MALAS
  - Time
  - Lack of motivation
  - Do not how to start
- **External**
  - Environment
    - Safety
    - Weather
    - Facilities

Ibrahim et al. BMC Public Health 2013, 13:275
http://www.biomedcentral.com/1471-2458/13/275

BMC Public Health

RESEARCH ARTICLE Open Access

Perceived physical activity barriers related to body weight status and sociodemographic factors among Malaysian men in Klang Valley

Suraya Ibrahim[1], Norimah A Karim[1,4*], Ng Lai Oon[2] and Wan Zurinah Wan Ngah[3]

Barriers

1. Other activities more fun - 38.6%
2. Weather hot or rainy - 34.7%
3. Lack of self discipline (malas) - 29.8%
4. Time factor - 27.7%
5. No extra money - 27.7%

Ibrahim et al, 2014

Overcoming barriers

- Time:
  - Break into few sessions (10 mins - morning, lunch, evening)
- Still no time:
  - Increases physical activities
  - **AVOID SEDENTARY LIFESTYLE**

Your health. Your choice.

30 seconds
to the top

30 steps
to better health

10,000 Steps	
Berat (kg)	**Energy (kcal)**
40	200
60	300
80	400
100	500

RM 5 JER!!!

Overcoming barriers

- Lack of motivation
  - Exercise buddy
  - Spouse, friends, family, grand children, etc

Overcoming barriers

- Do not know how to start
  - Ask professional advice
  - Public talks / forum

Overcoming barriers

- Environmental
  - Weather

Overcoming barriers

- MALAS
  - TAK DAPAT NAK TOLONG!!!!

Experience in clinic

Case Scenario

- 35 y.o Malay lady
- Height: 157.5 cm
- Weight: 59.55 kg
  - % Body fat: 26
  - % Fat free mass: 74
  - Average calorie intake: 2000 kcal
  - Occupation: Secretary

Questions

BMI = 24

- Which weight category is she in?
- What is the significance of diagnosing obesity?
- Goals for weight management?
- How would you plan exercise prescription for her?

Table 2.1: Classification Of Overweight And Obesity By BMI, Waist Circumference And Associated Disease Risk*

Classification	BMI (kg/m²)	Risk of co-morbidities	
		Waist circumference	
		<90 cm (men)	≥90 cm (men)
		<80 cm (women)	≥80 cm (women)
Underweight	< 18.5	Low (but increased risk of other clinical problems)	Increased
Normal range †	18.5 - 22.9	Increased but acceptable risk	Increased
Overweight : BMI ≥ 23.0			
Pre-Obese	23.0 - 27.4	Increased	High
Obese I	27.5 - 34.9	High	Very High
Obese II	35.0 - 39.9	Very High	Very High
Obese III	≥ 40	Extremely High	Extremely High

* Disease risk for type 2 diabetes, hypertension, and CVD.

† Increased waist circumference can also be a marker for increased risk even in persons of normal weight.

- Lose weight - how much???
- Based on % body fat
  - Present FFM = 59.55 x 0.74 = 44.1 kg
  - Target body weight = 44.1 / 0.80 = 55.1 kg
- Weight loss
  - 59.55 - 55.1 = 4.45 kg
- Total deficit needed to produce 4.45 kg weight loss
  - 3500 kcal = 0.45 kh
  - 3500 / 0.45 x 4.45 = **34,611.11 kcal**

Lose weight plan

- Increase energy use
  - Exercise by 200 - 300 kcal/day
    - Gradually
    - Regularity —> Intensity
- Reduce energy intake
  - 500 kcal /day

Which activities?

Exercise Planner

Plan your weekly exercises from the followings and estimate your weight loss from those activities.

Energy expenditure of each activity(base weight: 67. 8 kg / Duration: 30min./ unit: kcal)

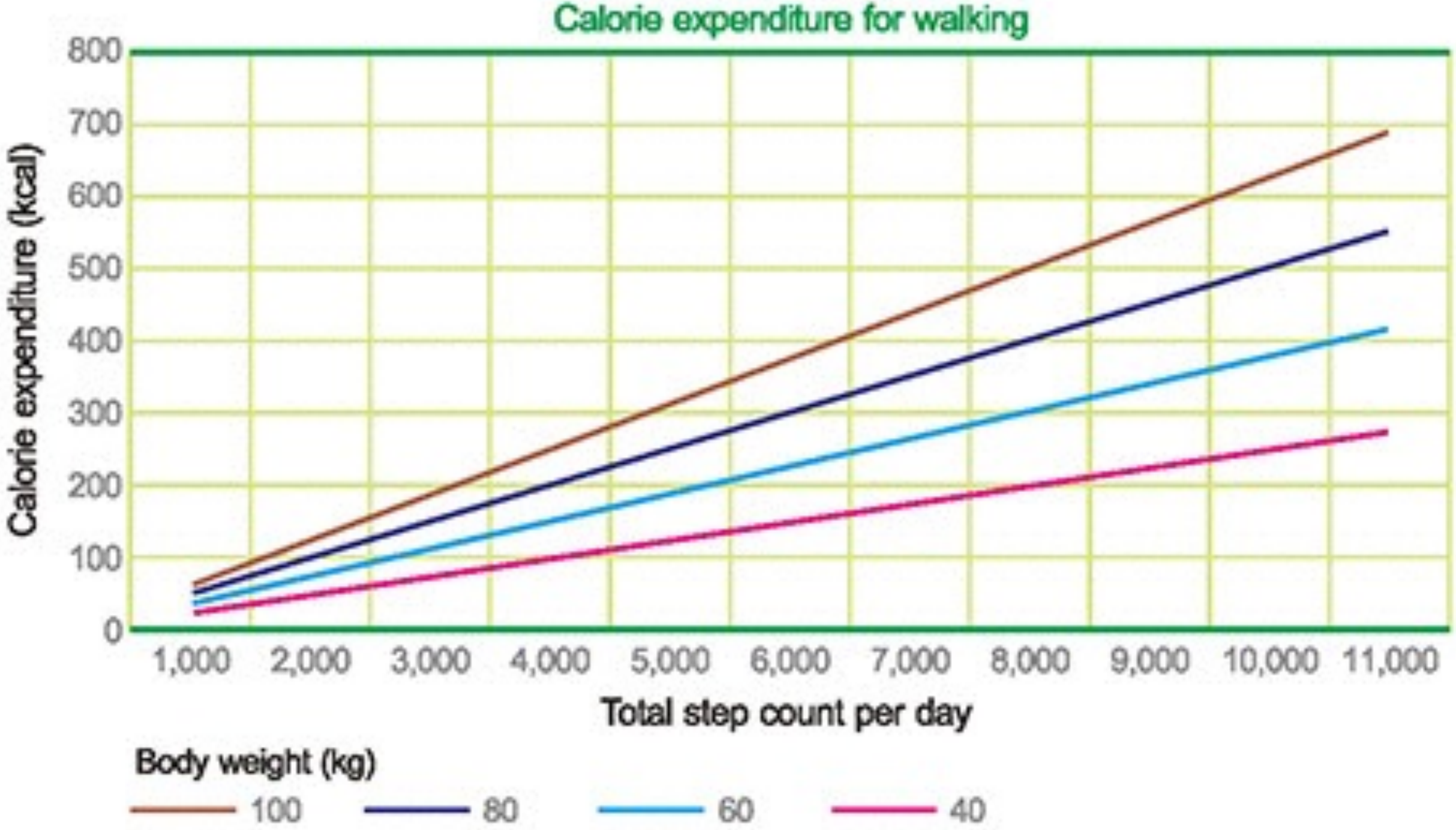
Walking 136	Jogging 237	Bicycle 203	Swim 237	Mountain Climbing 221	Aerobic 237
Table tennis 153	Tennis 203	Football 237	Oriental Fencing 339	Gate ball 129	Badminton 153
Racket ball 339	Tae-kwon-do 339	Squash 339	Basketball 203	Rope jumping 237	Golf 119
Push-ups development of upper body	Sit-ups abdominal muscle training	Weight training backache prevention	Dumbbell exercise muscle strength	Elastic band muscle strength	Squats maintenance of lower body muscle

- **How to do**
  1. Choose practicable and preferable activities from the left.
  2. Choose exercises that you are going to do for 7 days.
  3. Calculate the total energy expenditure for a week.
  4. Estimate expected total weight loss for a month using the formula shown below
- **Recommended calorie intake per day**

1500 *kcal*

If doing tai chi

- MET tai chi = 4.0
- 60 kg adult doing tight - 45 mins (0.75 hrs)
- Energy used
    - 4.0 x 60 x 0.75 = 180 kcal


Calorie expenditure for walking
Calorie expenditure (kcal)
800
700
600
500
400
300
200
100
0
1,000
2,000
3,000
4,000
5,000
6,000
7,000
8,000
9,000
10,000
11,000
Total step count per day
Body weight (kg)
100
80
60
40

PANDUAN NILAI KALORI 200 JENIS MAKANAN

BAHAGIAN PEMAKANAN
KEMENTERIAN KESIHATAN MALAYSIA

PANDUAN NILAI KALORI 200 JENIS MAKANAN

BAHAGIAN PEMAKANAN
KEMENTERIAN KESIHATAN MALAYSIA

Bil.	MAKANAN	KUANTITI/SAIZ	KALORI
1.	Bingka Ubi Kayu	1 Potong (100 g)	221
2.	Bingka Ubi Kayu Gula Merah	1 Potong (100 g)	223
3.	Cokodok Pisang	1 Biji (71 g)	180
		100 g	254
4.	Cucur Badak	1 Biji (29 g)	73
		100 g	253
5.	Emping	1 Keping (20 g)	72
		100 g	360
6.	Kerepek Ubi Kayu	1 Keping (11 g)	48
		100 g	434
7.	Kuih Bangkit	1 Biji (3 g)	13
		100 g	434
8.	Kuih Bangkit Sagu	1 Biji 4 g)	17
		100 g	432
9.	Kuih Kacang	1 Biji (19 g)	86
		100 g	452
10.	Kuih Kastad Jagung	1 Potong (93 g)	108
		100 g	116
11.	Kuih Kasturi	1 Biji (72 g)	177
		100 g	246

Bil.	MAKANAN	KUANTITI/SAIZ	KALORI
23.	Nasi Dagang	1 Pinggan (250 g)	508
		100g	203
24.	Nasi Goreng	1 Pinggan (330 g)	637
		100 g	193
25.	Nasi Minyak	1 Pinggan (245 g)	436
		100 g	178
26.	Roti Canai	1 Keping (95 g)	301
		100 g	317
27.	Roti Telur	1 Keping (135 g)	356
		100 g	264
28.	Kuah Kacang Dal Kuning dihidang dengan roti canai/roti telur	1/2 Cawan (80 g)	58
		100 g	73
29.	Bubur Nasi (kosong)	2 Cawan (332 g)	130
		100 g	39
30.	Mee Kungfu	1 Pinggan (480 g)	419
31.	Nasi Goreng Kampung	1 Pinggan (325 g)	631
32.	Nasi Goreng Ikan Masin	1 Pinggan (340 g)	640
33.	Nasi Goreng Pattaya	1 Pinggan (320 g)	605
34.	Nasi Goreng USA	1 Pinggan (414 g)	668
35.	Soto Ayam	1 Mangkuk (493 g)	512

Basmati Rice

51g CARBS	233 CALS	5g PROTEIN	1g FAT

0g FIBRE	Weight: 163g	0g SAT FAT

Week 1

- Walking additional 3000 steps/day
  - 100 kcal/day x 7 days = 700 kcal
- Diet (replace 2 bowl of rice)
  - 500 kcal/day x 7 days = 3500 kcal
    - **Total = 4200 kcal**

Week 2

- Walking additional 4000 steps/day
  - 150 kcal/day x 7 days = 1050 kcal
- Diet (replace 2 bowl of rice)
  - 500 kcal/day x 7 days = 3500 kcal
    - **Total = 4550 kcal**

Week 3-4

- Walking additional 5500 steps/day
  - 200 kcal/day x 14 days = 2800 kcal
- Diet (replace 2 bowl of rice)
  - 500 kcal/day x 14 days = 7000 kcal
    - **Total = 9800 kcal**

Week 5-6

- Walking additional 7000 steps/day
  - 250 kcal/day x 14 days = 3500 kcal
- Diet (replace 2 bowl of rice)
  - 500 kcal/day x 14 days = 7000 kcal

- **Total = 10500 kcal**

Week 7

- Walking additional 8000 steps/day
  - 300 kcal/day x 7 days = 2100 kcal
- Diet (replace 2 bowl of rice)
  - 500 kcal/day x 14 days = 7000 kcal

- **Total = 5600 kcal**

Total energy burned

- Week 1 = 4200
- Week 2 = 4550
- Week 3-4 = 9800
- Week 5-6 = 10500
- Week 7 = 5600
- **Total = 34,650 kcal**

FAMILY
2015
RETREAT
Sports Med
FAMILY
2015
RETREAT

Take home message

- Exercise prescription - EASY
- Three-step
    1. Determine current physical activity level
    2. Stages of change model
    3. Screening (ensure safety for participation)
- Exercise prescription
    1. Focus on regular
    2. Gradually increase

Exercise prescription

Medication prescription

Medicine: Ibuprofen

Strength: 600mg

Frequency: 3x / day

Refills: 3 x

Exercise prescription

Exercise: Walk 30 mins / day

Strength: Moderate intensity

Frequency: 5 days / week

Refills: Forever

Thank You