

Exercise Prescription For Fitness & Weight

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Definitions



Definitions.

A **sedentary lifestyle**: Type of **lifestyle** involving little or no physical activity.

A person living a **sedentary lifestyle** is often sitting or lying down while engaged in an activity like reading, socializing, watching television, playing video games, or using a mobile phone/computer for much of the day.



Physical activity

Body movement that is produced by the contraction of skeletal muscles and that increases energy expenditure.

C J Caspersen et al. Physical activity, exercise, and physical fitness: definitions and distinctions for health-related research.
Public Health Rep. 1985 Mar-Apr; 100(2): 126–131.



Housework Versus Workout

 30 mins of Digging	315 CALORIES BURNED	 45 mins of Cycling	 30 mins of Washing the Car	143 CALORIES BURNED	 32 mins of Yoga
 30 mins of Climbing the Stairs	285 CALORIES BURNED	 19.5 mins of Skipping	 30 mins of Making Beds	130 CALORIES BURNED	 12 mins of Jogging
 30 mins of Raking Leaves	225 CALORIES BURNED	 37 mins of Ice Skating	 30 mins of Cleaning Windows	125 CALORIES BURNED	 21mins of Power Yoga
 30 mins of Scrubbing the Bath	220 CALORIES BURNED	 45 mins of Ballroom Dancing	 30 mins of Weeding	115 CALORIES BURNED	 13 mins of Weight Training
 30 mins of Carrying Shopping Bags	190 CALORIES BURNED	 40 mins of golf	 30 mins of Shelving the Groceries	110 CALORIES BURNED	 18 mins of badminton
 30 mins of Painting & Decorating	160 CALORIES BURNED	 25 mins of walking	 30 mins of Loading the Dishwasher	105 CALORIES BURNED	 30 mins of Light Stretching

Exercise

Planned, structured, and repetitive movement to improve or maintain one or more components of physical fitness

C J Caspersen et al. Physical activity, exercise, and physical fitness: definitions and distinctions for health-related research.

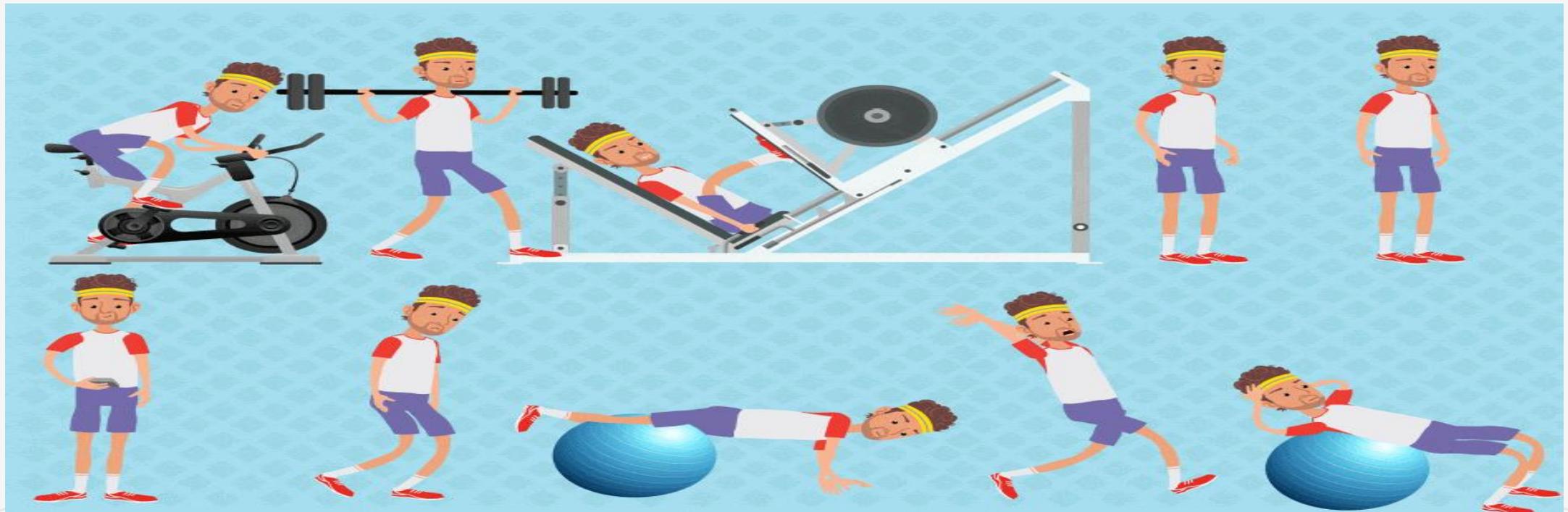
Public Health Rep. 1985 Mar-Apr; 100(2): 126–131.



Physical Fitness

Ability to carry out with vigor and alertness, without undue fatigue, and with ample energy to enjoy leisure time pursuits and meet unforeseen emergencies.

Physical Activity Guidelines Advisory Committee, 2008



Participation in exercise and the accumulation of physical activity have been shown to result in improvements in Physical fitness, which is operationally defined as a state of well-being with a low risk of premature health problems and energy to participate in a variety of physical activities.

American College of Sports Medicine,2009



Aerobic Exercise Training

exercises in which the body's large muscles move in a rhythmic manner for sustained periods

Resistance exercise training

Exercise that causes muscles to work or hold against an applied force or weight

Flexibility

Activities designed to preserve or extend range of motion (ROM) around a joint

Balance training

Combination of activities designed to increase lower body strength and reduce the likelihood of falling

Cut Down On



video games



TV

2-3 Times a Week



leisure activities



flexibility & strength training

3-5 Times a Week



aerobic exercise



recreational activities



Every Day



walk the dog



take the stairs



gardening



household chores & errands



Physical Inactivity



Physical Inactivity

Physical inactivity should become an actively monitored risk factor in clinical medical practice

A sedentary lifestyle is one of the major risk factors for cardiovascular disease.

Physical Activity



Risk for CVD



Key Facts

Insufficient physical activity is one of the leading risk factors for death worldwide.

Insufficient physical activity is a key risk factor for noncommunicable diseases (NCDs) such as cardiovascular diseases, cancer and diabetes.

Physical activity has significant health benefits and contributes to prevent NCDs.

Globally, 1 in 4 adults is not active enough.

More than 80% of the world's adolescent population is insufficiently physically active.

Policies to address insufficient physical activity are operational in 56% of WHO Member States.

WHO Member States have agreed to reduce insufficient physical activity by 10% by 2025.

Physical Inactivity

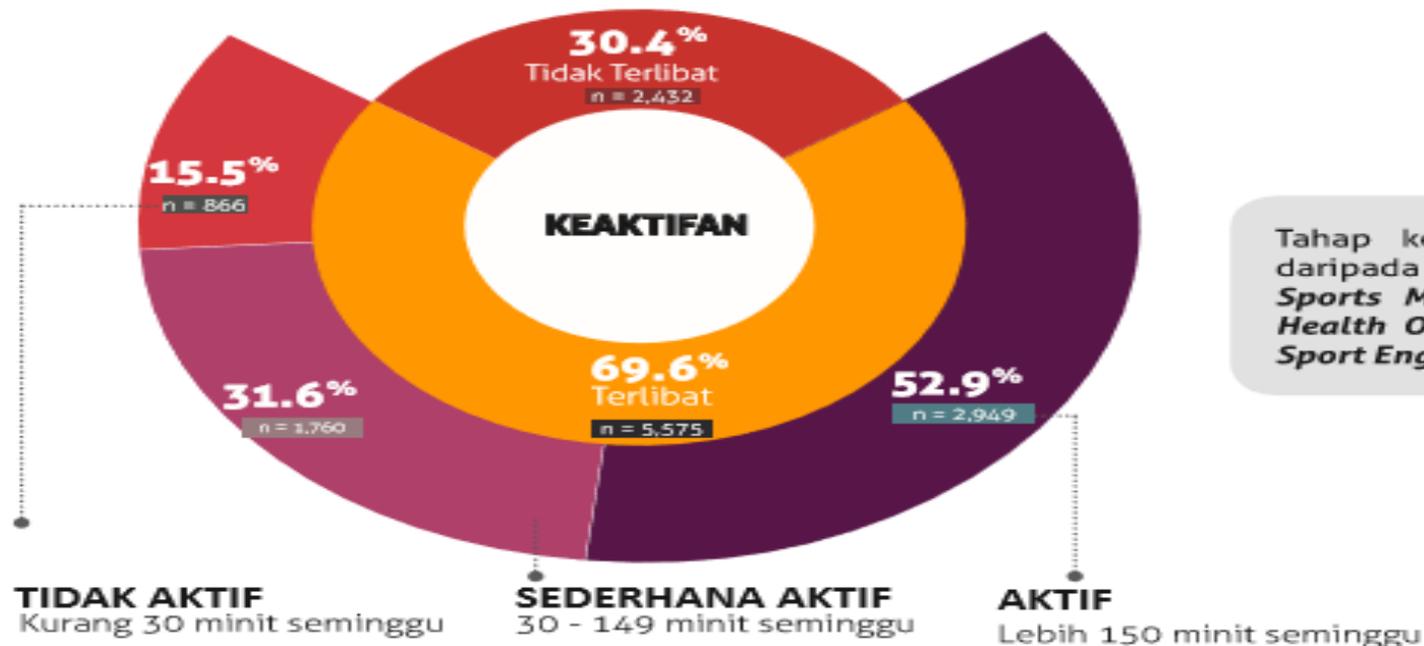
Insufficient physical activity is one of the 10 leading risk factors for global mortality.

People who are insufficiently physically active have a 20% to 30% increased risk of all-cause mortality compared to those who engage in at least 150 minutes of moderate intensity physical activity per week, or equivalent, as recommended by WHO.

Globally in 2016, 23% of men and 32% of women aged 18+ years were insufficiently physically active.

Over the past 15 years, levels of insufficient activity did not improve (28.5% in 2001; 27.5% in 2016).

Keaktifan Rakyat Melakukan Aktiviti Sukan, Senaman dan Rekreasi Aktif Berdasarkan Takrifan Antarabangsa



Tahap keaktifan ini diadaptasi daripada *American College of Sports Medicine (ACSM)*, *World Health Organization (WHO)* dan *Sport England, 2017*

Takrifan Keaktifan ini telah diadaptasi daripada *American College of Sports Medicine (ACSM)*; *World Health Organization (WHO)* dan *Sport England (2017)* yang mana 'Aktif' merujuk kepada melakukan aktiviti melebihi 150 minit seminggu. Berdasarkan panduan tersebut, keaktifan dibahagikan kepada 3 kategori iaitu Tidak Aktif (melakukan aktiviti kurang 30 minit seminggu); Sederhana Aktif (melakukan aktiviti 30 hingga 149 minit seminggu); dan Aktif (melakukan aktiviti lebih 150 minit seminggu).

Physical Activity and Sedentary Time

Physical activity is no longer sufficient just to meet minimum levels recommended by health guidelines in order to reduce cardiovascular risk.

Both physical inactivity and sedentary behavior have their own health hazards and need to be addressed separately, in order to explore their different deleterious mechanisms.



Physical Activity and Sedentary Time

Prolonged periods of sitting or sedentary behaviour are associated with deleterious health consequences independent of Physical Activity level.

Sedentary time was also associated with a 30% lower relative risk for all cause mortality among those with high level of PA with those with low level of PA.

Sedentary Time and Its Association With Risk for Disease Incidence, Mortality, and Hospitalization in Adults

A Systematic Review and Meta-analysis

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Background: The magnitude, consistency, and manner of association between sedentary time and outcomes independent of physical activity remain unclear.

Purpose: To quantify the association between sedentary time and hospitalizations, all-cause mortality, cardiovascular disease, diabetes, and cancer in adults independent of physical activity.

Data Sources: English-language studies in MEDLINE, PubMed, EMBASE, CINAHL, Cochrane Library, Web of Knowledge, and Google Scholar databases were searched through August 2014 with hand-searching of in-text citations and no publication date limitations.

Study Selection: Studies assessing sedentary behavior in adults, adjusted for physical activity and correlated to at least 1 outcome.

Data Extraction: Two independent reviewers performed data abstraction and quality assessment, and a third reviewer resolved inconsistencies.

Data Synthesis: Forty-seven articles met our eligibility criteria. Meta-analyses were performed on outcomes for cardiovascular disease and diabetes (14 studies), cancer (14 studies), and all-

cause mortality (13 studies). Prospective cohort designs were used in all but 3 studies; sedentary times were quantified using self-report in all but 1 study. Significant hazard ratio (HR) associations were found with all-cause mortality (HR, 1.240 [95% CI, 1.090 to 1.410]), cardiovascular disease mortality (HR, 1.179 [CI, 1.106 to 1.257]), cardiovascular disease incidence (HR, 1.143 [CI, 1.002 to 1.729]), cancer mortality (HR, 1.173 [CI, 1.108 to 1.242]), cancer incidence (HR, 1.130 [CI, 1.053 to 1.213]), and type 2 diabetes incidence (HR, 1.910 [CI, 1.642 to 2.222]). Hazard ratios associated with sedentary time and outcomes were generally more pronounced at lower levels of physical activity than at higher levels.

Limitation: The limited number of studies in research designs and the assessment of sedentary time and physical activity.

Conclusion: Prolonged sedentary time was independently associated with deleterious health outcomes regardless of physical activity.

Funding Source: None.

Ann Intern Med. 2015;162:123-132. doi:10.7326/M14-1651 www.annals.org
For author affiliations, see end of text.

Adults are advised to accumulate at least 150 minutes of weekly physical activity in bouts of 10 minutes or more (1). The intensity of such habitual physical

and outcomes after adjustment for physical activity, the magnitude and consistency of such associations and the manner by which they change according to the

Breaks in Sedentary Time

Beneficial associations with metabolic risk

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OBJECTIVE — Total sedentary (absence of whole-body movement) time is associated with obesity, abnormal glucose metabolism, and the metabolic syndrome. In addition to the effects of total sedentary time, the manner in which it is accumulated may also be important. We examined the association of breaks in objectively measured sedentary time with biological markers of metabolic risk.

RESEARCH DESIGN AND METHODS — Participants ($n = 168$, mean age 53.4 years) for this cross-sectional study were recruited from the 2004–2005 Australian Diabetes, Obesity and Lifestyle study. Sedentary time was measured by an accelerometer (counts/minute⁻¹ < 100) worn during waking hours for seven consecutive days. Each interruption in sedentary time (counts/min ≥ 100) was considered a break. Fasting plasma glucose, 2-h plasma glucose, serum triglycerides, HDL cholesterol, weight, height, waist circumference, and resting blood pressure were measured. MatLab was used to derive the breaks variable; SPSS was used for the statistical analysis.

RESULTS — Independent of total sedentary time and moderate-to-vigorous intensity activity time, increased breaks in sedentary time were beneficially associated with waist circumference (standardized $\beta = -0.16$, 95% CI -0.31 to -0.02 , $P = 0.026$), BMI ($\beta = -0.19$, -0.35 to -0.02 , $P = 0.026$), triglycerides ($\beta = -0.18$, -0.34 to -0.02 , $P = 0.029$), and 2-h plasma glucose ($\beta = -0.18$, -0.34 to -0.02 , $P = 0.029$).

CONCLUSIONS — This study provides evidence of the importance of avoiding prolonged uninterrupted periods of sedentary (primarily sitting) time. These findings suggest new public health recommendations regarding breaking up sedentary time that are complementary to those for physical activity.

Diabetes Care 31:1066–1072, 2008

The world is in the grip of a diabetes and obesity epidemic (1). The re-emerging evidence that another set of behaviors involving prolonged periods of

nificant associations with metabolic markers (11–13).

In addition to the effects of total sedentary time, the manner in which it is accumulated may also be important. Single bouts of prolonged inactivity, such as days and weeks of bed rest, decrease insulin sensitivity in healthy humans (14,15), and animal studies have shown rapid alterations in biological pathways affecting lipid metabolism following a single bout of prolonged, uninterrupted sedentary time (16–18). Such extreme prolonged sedentary behavior is rare in free-living healthy adults, but technological and social factors have made prolonged sitting ubiquitous during working, domestic, and recreational time. Occupational and leisure-time factors, as well as inherent individual differences, contribute to variations in how sedentary time is accumulated. Given the strong epidemiological evidence on the deleterious effects of total sedentary time and the experimental evidence on the acute metabolic effects of prolonged sedentary time, there is a need to better understand how the patterns by which free-living sedentary time is accumulated may be associated with metabolic risk.

In Australian adults without diagnosed diabetes, we examined the associations of breaks in objectively assessed sedentary time with adiposity, lipid

Association of Sedentary Time with Mortality Independent of Moderate to Vigorous Physical Activity

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Abstract

Background: Sedentary behavior has emerged as a novel health risk factor independent of moderate to vigorous physical activity (MVPA). Previous studies have shown self-reported sedentary time to be associated with mortality; however, no studies have investigated the effect of objectively measured sedentary time on mortality independent of MVPA. The objective of our study was to examine the association between objectively measured sedentary time and all-cause mortality.

Methods: 7-day accelerometry data of 1906 participants aged 50 and over from the U.S. nationally representative National Health and Nutrition Examination Survey (NHANES) 2003–2004 were analyzed. All-cause mortality was assessed from the date of examination through December 31, 2006.

Results: Over an average follow-up of 2.8 years, there were 145 deaths reported. In a model adjusted for sociodemographic factors, lifestyle factors, multiple morbidities, mobility limitation, and MVPA, participants in third quartile (hazard ratio (HR):4.05; 95%CI:1.55–10.60) and fourth quartile (HR:5.94; 95%CI: 2.49–14.15) of having higher percent sedentary time had a significantly increased risk of death compared to those in the lowest quartile.

Conclusions: Our study suggests that sedentary behavior is a risk factor for mortality independent of MVPA. Further investigation, including studies with longer follow-up, is needed to address the health consequences of sedentary behavior.

Citation: Koster A, Caserotti P, Patel KV, Matthews CE, Berrigan D, et al. (2012) Association of Sedentary Time with Mortality Independent of Moderate to Vigorous Physical Activity. PLoS ONE 7(6): e37696. doi:10.1371/journal.pone.0037696

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Introduction

Low physical activity levels are a well-known risk factor of mortality. Previous studies have shown that people who do not meet the physical activity recommendations or those who report less moderate to vigorous activity (MVPA) are at increased risk of death [1,2,3,4]. Sedentary behavior has emerged as a potential risk

known to be prone to reporting errors of physical activity duration and intensity [13]. To our knowledge no studies have investigated the effect of objectively measured sedentary behavior on mortality and whether this association is independent of MVPA. To address this question, we used data from the U.S. nationally representative National Health and Nutrition Examination Survey (NHANES) of adults 50 years of age and older to examine the association

General Recommendation

1. The intensity should be at least moderate, which means that one is able to talk, but not to sing, i.e. heart rate and breathing will be increased. This type of exercise is denoted as aerobic type of exercise.
2. The duration of each exercise session should not be less than 10 minutes. It is not enough to just walk a few minutes back and forth to the parking lot.
3. Exercise of moderate intensity can be replaced by exercise of higher intensity (vigorous intensity). For instance, walking 30 minutes per day can be replaced by running 20–30 minutes, 3–4 times per week. The same amount of energy is expended in these two examples, but in a shorter period of time in the alternative with higher intensity.

Consequently, the expected health benefits are considered to be the same

4. The goals are set per week instead of per day – 150 minutes of brisk walking per week (moderate intensity) or 75 minutes of running (vigorous intensity). It is also possible to mix these two intensity levels over the week. The activity should be spread throughout the week.

5. Everyone is recommended to do strength training and flexibility exercises at least two times per week.

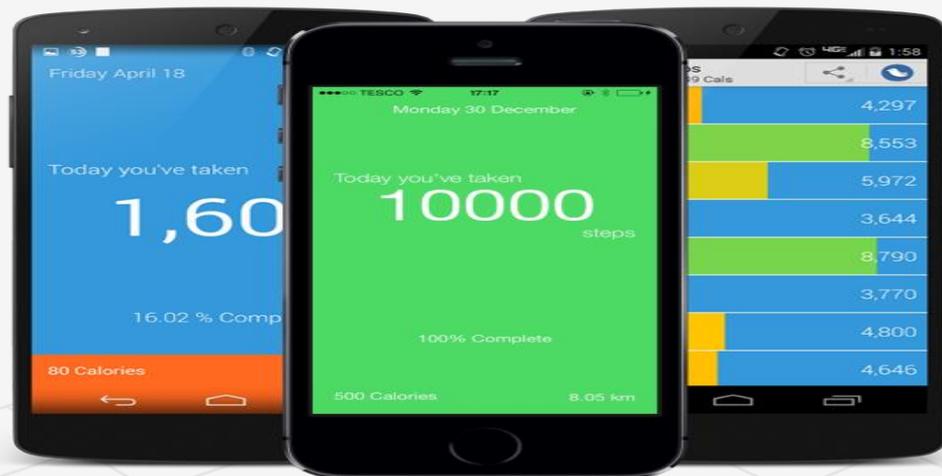
6. Balance training is important for the elderly.

7. Children need at least 60 minutes per day of moderate to vigorous activity.

8. More health benefits are achieved if the amount of physical activity is increased from 150 to 300 minutes if the intensity is moderate and from 75 to 150 minutes if the intensity is vigorous.

<5000 steps/ day	5000-7499 steps/day	7500-9999 Steps/day	≥10000 steps/day	>12500 steps/ day
Inactive	Somewhat active	Low active	Active	Highly active

Technology, Wearable and others



Exercise Metabolism

Exercise Metabolism

Skeletal muscle comprises ~40% of total body mass in mammals and accounts for ~30% of the resting metabolic rate in adult humans

(Zurlo et al., 1990).

Skeletal muscle has a critical role in glycemic control and metabolic homeostasis and is the predominant (~80%) site of glucose disposal under insulin-stimulated conditions

(DeFronzo et al., 1981).

Exercise metabolism

Skeletal muscle is the largest glycogen storage organ, with/having ~4-fold the capacity of the liver.

A single bout of acute exercise improves whole-body insulin sensitivity for up to 48 hr after exercise cessation

(Mikines et al., 1988; Koopman et al., 2005)



Exercise Metabolism

Skeletal muscle is the principal contributor to exercise-induced changes in metabolism.

Maximal exercise can induce a 20-fold increase in whole-body metabolic rate over resting values, whereas the ATP turnover rate within the working skeletal muscle can be more than 100-fold greater than at rest.

(Gaitanos et al., 1993)



Exercise Metabolism

Skeletal muscle is richly endowed with mitochondria and heavily reliant on oxidative phosphorylation for energy production.

During strenuous exercise, dramatic (>30-fold) increases in intramuscular oxygen consumption and local blood flow occur

Skeletal muscle is the primary site for CHO and lipid metabolism for energy production.

(Andersen and Saltin, 1985; Gibala et al., 1998)



Exercise metabolism

Exercise intensity increases, muscle utilization of circulating FFAs declines modestly, whereas utilization of circulating glucose increases progressively up to near-maximal intensities

This coincides with increasing absolute rates of CHO oxidation and relative contribution to energy provision, with a majority of energy at high intensities of exercise being provided by muscle glycogen

(van Loon et al., 2001)

Exercise metabolism

Muscle glycogen is the predominant CHO source during moderate to intense exercise, and the rate of degradation (glycogenolysis) is proportional to the relative exercise intensity

(Romijn et al., 1993).

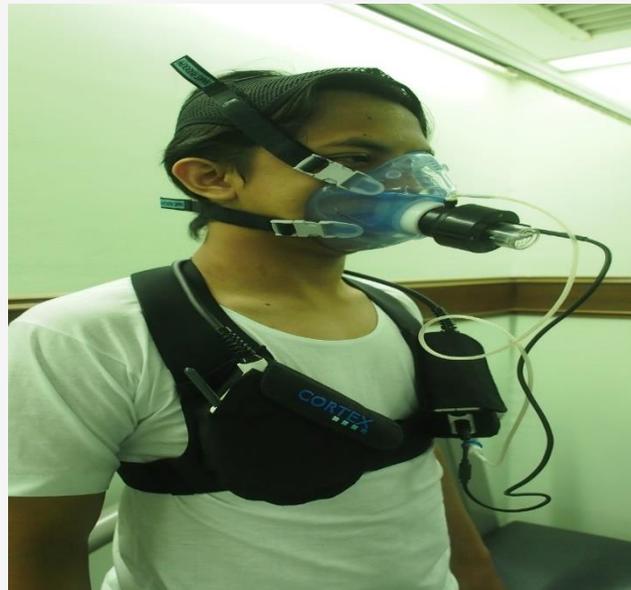
Exercise Metabolism

After the cessation of exercise, the metabolic rate declines but remains slightly elevated (<10%) for up to 24 hr.

Børsheim and Bahr, 2003

Cardio Pulmonary Exercise Test

VO₂ Peak/VO₂max



E) $\dot{V}O_2$ Max and Performance Markers For Training Purposes

- Lactate Threshold

The higher the tolerance the fitter the individual. Occurs in untrained individuals at 50%-60% $\dot{V}O_2$ max and at higher work rates in trained subjects which is about 65%-80% of $\dot{V}O_2$ max. this is due to low levels of O_2 supply in individual muscle cells.

- RER

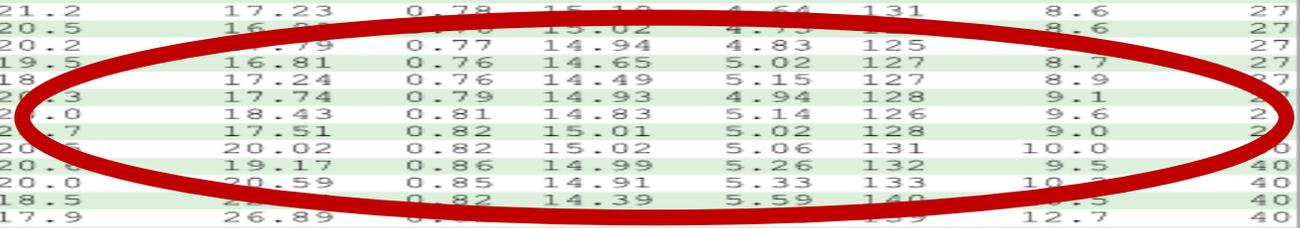
R- 0.70 (100% Fat)

R- 0.85 (50 % Fat, 50% Carbohydrate)

R-1.00 (100% Carbohydrate)

By identifying the HR at the point of LT and RER values we can set the training goal/zone more specifically.

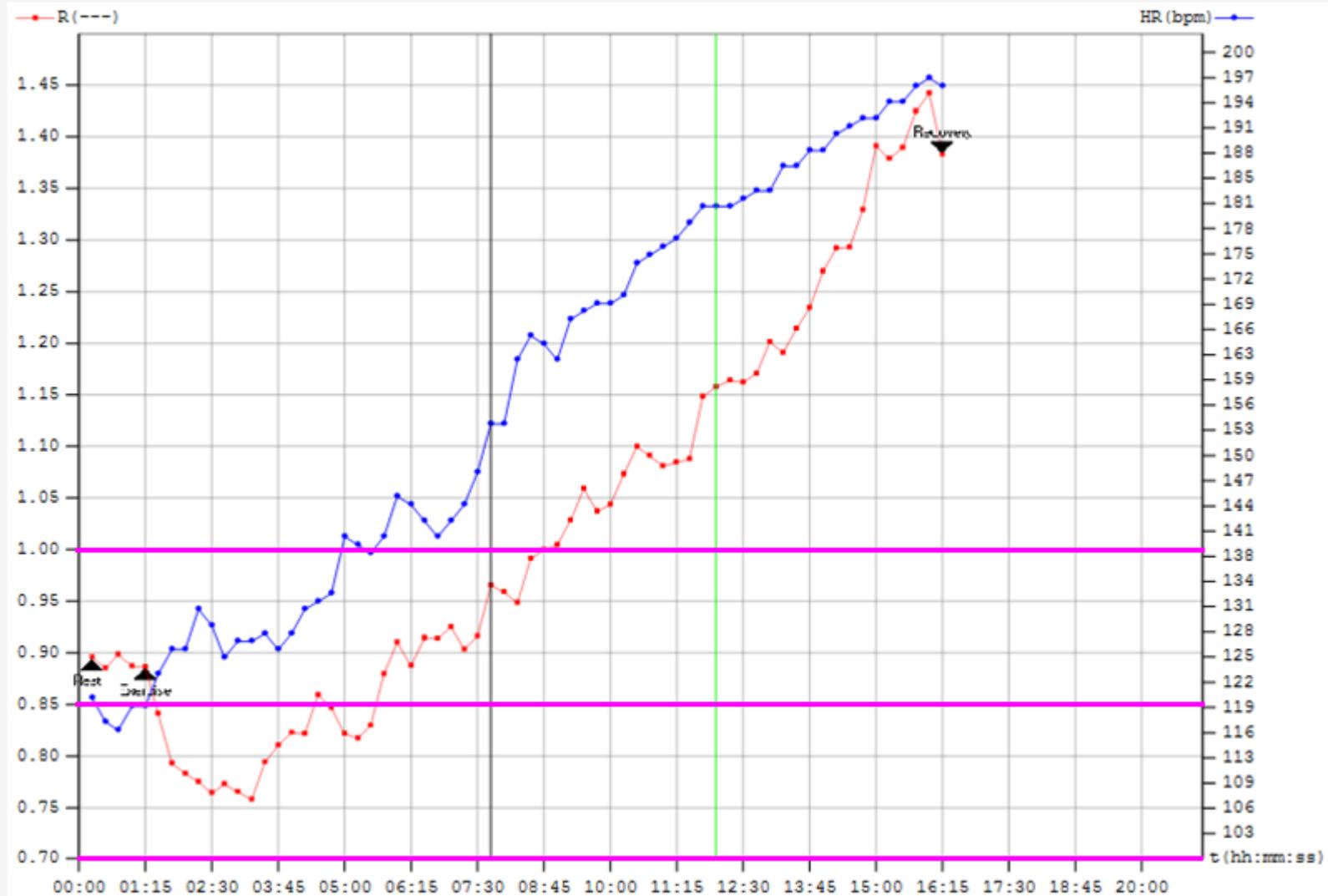
t	Rf	VE	VO2	VCO2	VE/VO2	VO2/Kg	R	FeO2	FeCO2	HR	VO2/HR	Speed
hh:mm:ss	b/min	l/min	ml/min	ml/min	---	ml/min/Kg	---	%	%	bpm	ml/bpm	Kmh*10
00:00:15	22.8	11.9	390	349	30.5	5.95	0.90	16.65	3.82	120	3.3	0
00:00:30	22.2	11.3	385	341	29.4	5.87	0.88	16.66	3.85	117	3.3	0
00:00:45	19.7	10.5	364	327	28.8	5.55	0.90	16.50	3.98	116	3.1	0
00:01:00	24.0	13.0	449	398	28.9	6.85	0.89	16.57	3.91	119	3.8	0
00:01:15	24.2	18.3	678	600	26.9	10.33	0.89	16.27	4.19	119	5.7	27
00:01:30	27.1	19.3	762	640	25.3	11.61	0.84	16.01	4.23	123	6.2	27
00:01:45	29.6	20.0	884	700	23.3	13.47	0.79	15.63	4.37	126	7.0	27
00:02:00	29.4	20.0	952	745	22.0	14.52	0.78	15.40	4.51	126	7.6	27
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00:11:30	30.0	44.5	2031	2012	22.2	34.44	0.99	15.33	5.43	162	14.0	54
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00:12:15	30.0	44.5	2031	2012	22.2	34.44	0.99	15.33	5.43	162	14.0	54
00:12:30	30.0	44.5	2031	2012	22.2	34.44	0.99	15.33	5.43	162	14.0	54
00:12:45	30.0	44.5	2031	2012	22.2	34.44	0.99	15.33	5.43	162	14.0	54
00:13:00	30.0	44.5	2031	2012	22.2	34.44	0.99	15.33	5.43	162	14.0	54
00:13:15	30.0	44.5	2031	2012	22.2	34.44	0.99	15.33	5.43	162	14.0	54
00:13:30	30.0	44.5	2031	2012	22.2	34.44	0.99	15.33	5.43	162	14.0	54
00:13:45	30.0	44.5	2031	2012	22.2	34.44	0.99	15.33	5.43	162	14.0	54
00:14:00	30.0	44.5	2031	2012	22.2	34.44	0.99	15.33	5.43	162	14.0	54
00:14:15	30.0	44.5	2031	2012	22.2	34.44	0.99	15.33	5.43	162	14.0	54
00:14:30	30.0	44.5	2031	2012	22.2	34.44	0.99	15.33	5.43	162	14.0	54
00:14:45	30.0	44.5	2031	2012	22.2	34.44	0.99	15.33	5.43	162	14.0	54
00:15:00	30.0	44.5	2031	2012	22.2	34.44	0.99	15.33	5.43	162	14.0	54
00:15:15	30.0	44.5	2031	2012	22.2	34.44	0.99	15.33	5.43	162	14.0	54
00:15:30	30.0	44.5	2031	2012	22.2	34.44	0.99	15.33	5.43	162	14.0	54
00:15:45	30.0	44.5	2031	2012	22.2	34.44	0.99	15.33	5.43	162	14.0	54
00:16:00	30.0	44.5	2031	2012	22.2	34.44	0.99	15.33	5.43	162	14.0	54
00:16:15	30.0	44.5	2031	2012	22.2	34.44	0.99	15.33	5.43	162	14.0	54
00:16:30	30.0	44.5	2031	2012	22.2	34.44	0.99	15.33	5.43	162	14.0	54
00:16:45	30.0	44.5	2031	2012	22.2	34.44	0.99	15.33	5.43	162	14.0	54
00:17:00	30.0	44.5	2031	2012	22.2	34.44	0.99	15.33	5.43	162	14.0	54
00:17:15	30.0	44.5	2031	2012	22.2	34.44	0.99	15.33	5.43	162	14.0	54
00:17:30	30.0	44.5	2031	2012	22.2	34.44	0.99	15.33	5.43	162	14.0	54
00:17:45	30.0	44.5	2031	2012	22.2	34.44	0.99	15.33	5.43	162	14.0	54
00:18:00	30.0	44.5	2031	2012	22.2	34.44	0.99	15.33	5.43	162	14.0	54
00:18:15	30.0	44.5	2031	2012	22.2	34.44	0.99	15.33	5.43	162	14.0	54
00:18:30	30.0	44.5	2031	2012	22.2	34.44	0.99	15.33	5.43	162	14.0	54
00:18:45	30.0	44.5	2031	2012	22.2	34.44	0.99	15.33	5.43	162	14.0	54
00:19:00	30.0	44.5	2031	2012	22.2	34.44	0.99	15.33	5.43	162	14.0	54
00:19:15	30.0	44.5	2031	2012	22.2	34.44	0.99	15.33	5.43	162	14.0	54



Graph RER & HR / t

Last name: SANTOS PARAFITA First name: ENDRICK DOS

ID code: 515	Test number: 792	Barometric press. (mmHg): 754
Sex: M	Test date: 9/1/2018	Temperature (degrees C): 22
Age: 22	Test time: 11:45	STPD: 0.819
Height (cm): 177.5	N. of steps: 77	BTPS insp: 1.099
Weight (Kg): 65.6	Duration (hh:mm:ss): 00:19:15	BTPS exp: 1.020
HR max (bpm): 198	BSA (m ²): 1.8	BMI (Kg/m ²): 20.8



Prescription for Fitness and Weight



Pre-participation assessment needed,

Current level of fitness,

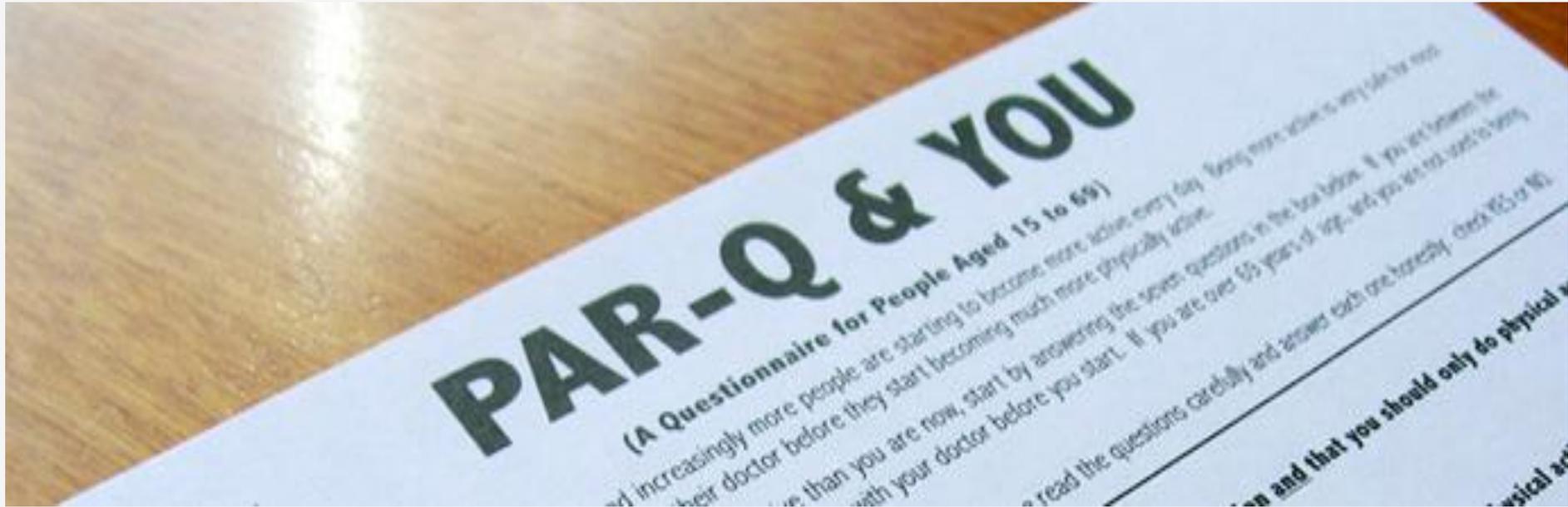
Blood pressure and other observations,

ECG was requested as a baseline.

Exercise stress test.



Par-Q



Physical Activity Readiness Questionnaire (PAR-Q)

Name of participant _____

Signature _____ Date _____

PAR-Q & You

PAR-Q is designed to help you help yourself. Many health benefits are associated with regular exercise,

1. Has your doctor ever said you have heart trouble?
2. Do you frequently have pains in your heart and chest?
3. Do you often feel faint or have spells of severe dizziness?
4. Has a doctor ever said your blood pressure was too high?
5. Has your doctor ever told you that you have a bone or joint problem?
6. Is there a good physical reason not mentioned here why you should not follow an activity program even if you wanted to?
7. Are you over age 65 and not accustomed to vigorous exercise?



Participates in Regular Exercise

YES

No CV, Metabolic, or Renal Disease
/AND No Signs or Symptoms
Suggestive of CV, Metabolic, or
Renal Disease

Medical Clearance Not Necessary

Continue Moderate or Vigorous
Intensity Exercise
May Gradually Progress Following
ACSM Guidelines

Known CV, Metabolic, or Renal
Disease AND Asymptomatic

Medical Clearance for Moderate
Intensity Exercise Not Necessary
Medical Clearance (within the last
12 months if no change in
signs/symptoms) Recommended
Before Engaging in Vigorous Intensity
Exercise

Continue with Moderate Intensity
Exercise
Following Medical Clearance,
May Gradually Progress as
Tolerated Following ACSM
Guidelines

Any Signs or Symptoms Suggestive
of CV, Metabolic, or Renal Disease
(Regardless of disease status)

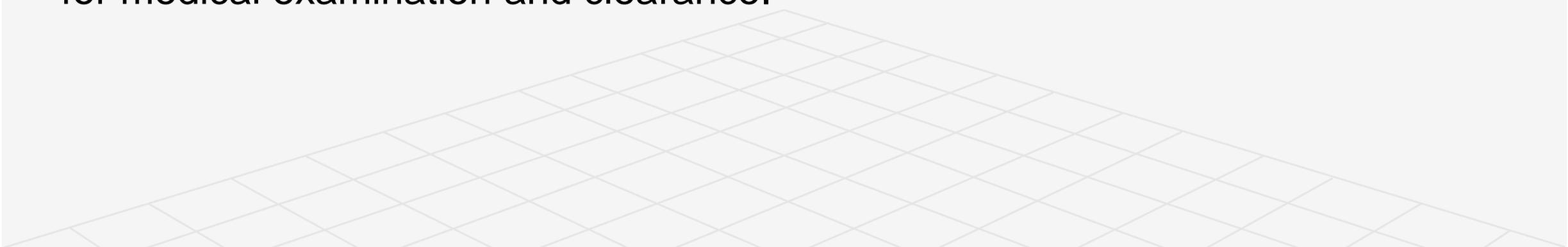
Discontinue Exercise and Seek
Medical Clearance

May Return to Exercise Following
Medical Clearance
Gradually Progress as Tolerated
Following ACSM Guidelines

Low risk:

Individuals classified as low risk are those who do not have signs/symptoms of or have diagnosed cardiovascular, pulmonary, and/or metabolic disease and have no more than one (i.e., ≤ 1) CVD risk factor.

The risk of an acute cardiovascular event in this population is low, and a physical activity/exercise program may be pursued safely without the necessity for medical examination and clearance.



Moderate risk: Individuals classified as moderate risk do not have signs/symptoms of or diagnosed cardiovascular, pulmonary, and/or metabolic disease, but have two or more (i.e., ≥ 2) CVD risk factors.

The risk of an acute cardiovascular event in this population is increased, although in most cases, individuals at moderate risk may safely engage in low- to moderate-intensity physical activities without the necessity for medical examination and clearance.

However, it is advisable to have a medical examination and an exercise test before participation in vigorous intensity exercise (i.e., $>80\%$).

High risk

Individuals classified as high risk are those who have one or more signs/symptoms of or diagnosed cardiovascular, pulmonary, and/or metabolic disease.

The risk of an acute cardiovascular event in this population is increased to the degree that a thorough medical examination should take place and clearance given before initiating physical activity or exercise at any intensity.



Option for those never exercise/No time to exercise!

Can't forced them what to do.!

Choose reasonable activity to do and to comply.

Motivation and closed monitoring, may be supervision or regular follow up, or call

Increase their activity level gradually.

Reduced sedentary time

Gadget /wearable.

Understand the level of Physical Activity/Exercise

No matter how small, is better than sitting

The good news is that accumulated daily physical activities count towards our overall energy expenditure.

Modified according to an individual's habitual physical activity, physical function, health status, exercise responses, and stated goals.



American College of Sports Medicine, 2011

The general Principal of F.I.T.T.E.P

- F – Frequency
- I – Intensity
- T – Type
- T – time

- E - Enjoyment
- P - Progression



FREQUENCY

Number of training sessions or activity sessions for a given time frame.

The time frame usually consists of a week.

For general health requirements the recommended frequency of activity is preferably every day of the week, for small quantities of time.

For improved fitness levels, the frequency is three to five days a week.

Frequency

Every day

3x/week

5x/week



INTENSITY

Level of demand the activity places on the body.

This is usually measured by heart rate or maximal oxygen consumption.

For general health requirements moderate intensity is preferred. This would be perceived as enough demand to increase heart and respiratory rates, but not cause exhaustion or breathlessness.

For improved fitness levels, the intensity recommended is moderate intensity, 60 to 80% of maximal heart rate (HR max).

Pulse

Pulse

Resting heart rate 60 -100 pulse/minute

Maximum heart rate

$$220 - \text{age} = \text{MHR}$$

$$\text{E g. } 220 - 40 = 180/\text{minutes}$$

Exercise

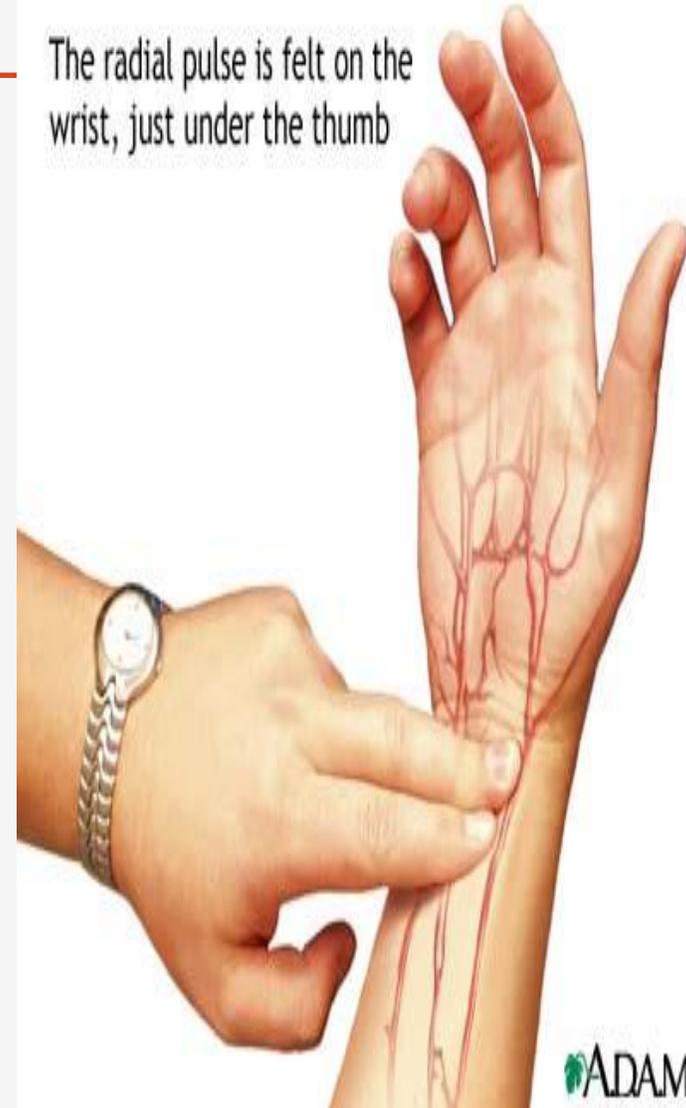
Target heart rate 60% – 80%

40 years old

108 – 144 beat per-minutes



The radial pulse is felt on the wrist, just under the thumb



COLOR	BORG	Explanation/ Perceived Exertion
Green	6	No exertion at all
	7	Extremely light
	8	La, la, la :-)
Yellow	9	Very light - (easy walking slowly at a comfortable pace)
	10	This is the effort level where you can't hear your breathing,
	11	<u>you're</u> able to easily talk and you can run here for a very long time
	12	Light. Here you are building aerobic endurance .
Orange	13	Somewhat hard (It is quite an effort; you feel tired but can continue)
	14	You start to hear your breathing, not gasping for air.
	15	You can talk, but more challenging, use one- or two-word answers.
	16	Hard This is considered your steady state .
Red	17	Very hard (very strenuous, and you are very fatigued) <u>ANAEROBIC THRESHOLD</u>
	18	Breathing is vigorous. You can't <u>talk</u> , you're reaching for air.
	19	Extremely hard (You're counting the minutes until it ends)
	20	Maximal exertion

RPE (Rate of Perceived Exertion)

RPE	Borg RPE Scale	Description	Description #2
1	6	no exertion at all	I'm watching TV and eating bon bons
	7	extremely light	
	8		
2	9	very light	I'm comfortable and could maintain this pace all day long
	10		
3	11	light	I'm still comfortable, but am breathing a bit harder
4	12		I'm sweating a little, but feel good and can carry on a conversation effortlessly
5	13	somewhat hard	I'm just above comfortable, am sweating more and can still talk easily
6	14		I can still talk, but am slightly breathless
7	15	hard (heavy)	I can still talk, but I don't really want to. I'm sweating like a pig
8	16		I can grunt in response to your questions and can only keep this pace for a short time period
8.5	17	very hard	
9	18		I am probably going to die
9.5	19	extremely hard	
10	20	maximal exertion	I am dead

Talk test

Moderate intensity

- Noticeable increasing in breathing rate at which a conversation can be maintained but does not have enough breath to sing

High/vigorous intensity

- Large increasing in breath rate – one is not able carry on a conversation but is not out of breath



- Health Promotion Board 2011

Diary | Training history | Activity | Recovery status | Sleep | Balance



Aerobics
Friday, Mar 30, 2018 07:32 | Polar M430

 0  0  Share  Followers

 **00:34:45**
Duration

A B
 Distance

 Mild
Training Load
Load from this
session 3 hours

 **114 bpm**
Average heart rate
Max 133 | Min 81

 **281 kcal**
Calories

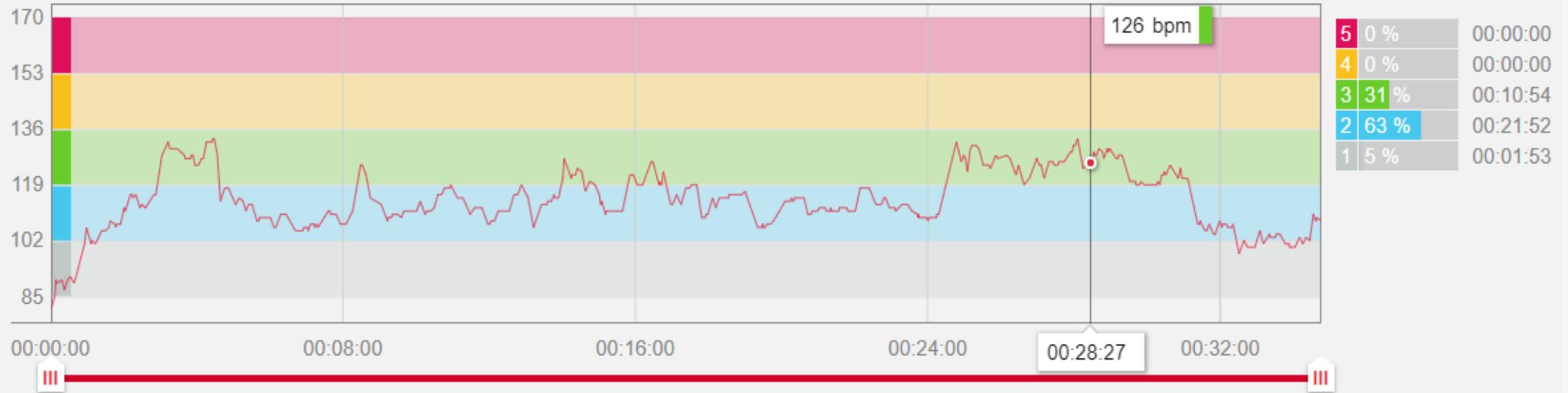
Basic and Steady
state training [less](#)

Sport

Aerobics

 **36 %**
Fat percentage of calories

How do you feel?





00:22:13
Duration

A B

Distance

Mild
Training Load
Load from this
session 1 hour



109 bpm
Average heart rate
Max 133 | Min 61



167 kcal
Calories

Basic and Steady
state training

Sport

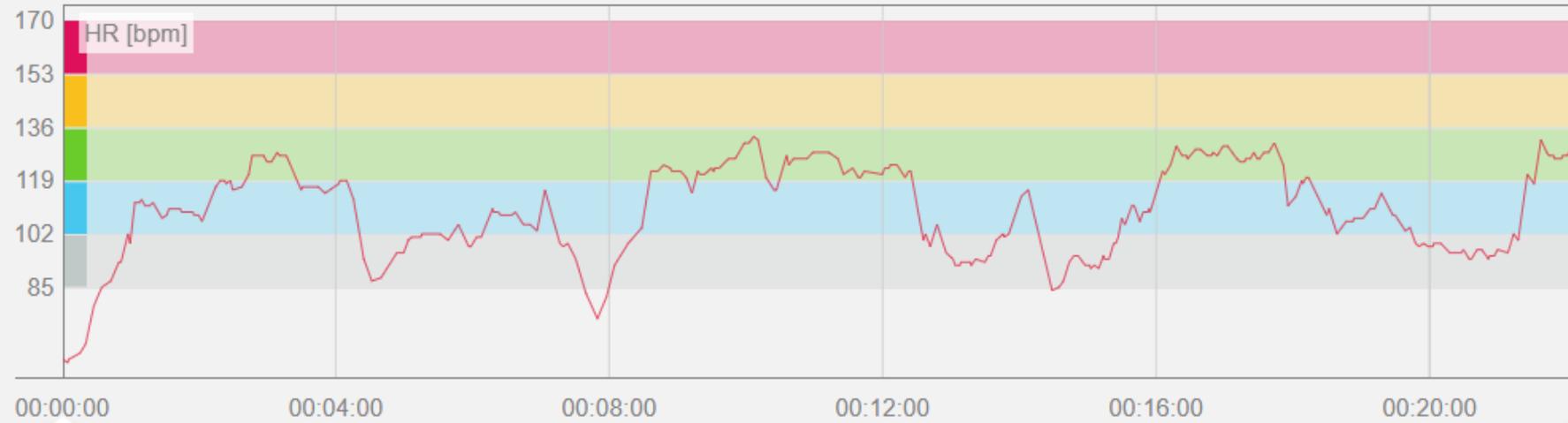
Aerobics



39 %
Fat percentage of calories

How do you feel?

Add feeling



5	0 %	00:00:00
4	0 %	00:00:00
3	35 %	00:07:22
2	36 %	00:07:37
1	29 %	00:06:15



Running
Monday, Jan 1, 2018 07:16 | Polar M200

 0  0  Relive  Share  Followers

 **00:48:56**
Duration

A B **9.86**
 Distance

 **165 bpm**
Average heart rate
Max 175 | Min 110

 **765 kcal**
Calories

Maximum training+ [less](#)

Sport

Running

How do you feel?

Add feeling

Training notes

Write a note about this training

 **04:57 min/km**
Average pace
Max 02:10

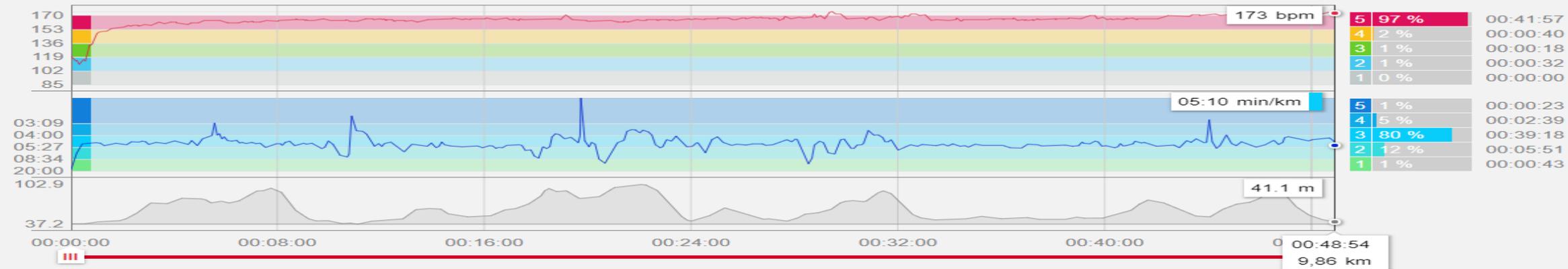
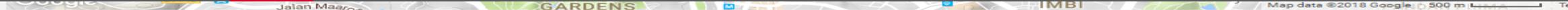
 **46**
Running Index

 **Extreme**
Training Load
Load from this session 3 days
17 hours

 **295 m**
Ascent

 **290 m**
Descent

 **4 %**
Fat percentage of calories



Walking
Monday, Apr 16, 2018 18:02 | Polar M430

 0  0  Relive  Share  Followers

 00:47:12
Duration

A B 3.14
Distance

 **83 bpm**
Average heart rate
Max 116 | Min 70

 **236 kcal**
Calories

Recovery training

[less](#)

Sport

Walking

How do you feel?

Add feeling

Training notes

Write a note about this training

 **15:00 min/km**
Average pace
Max 10:10

 **56 Steps/min**
Average cadence
Max 69

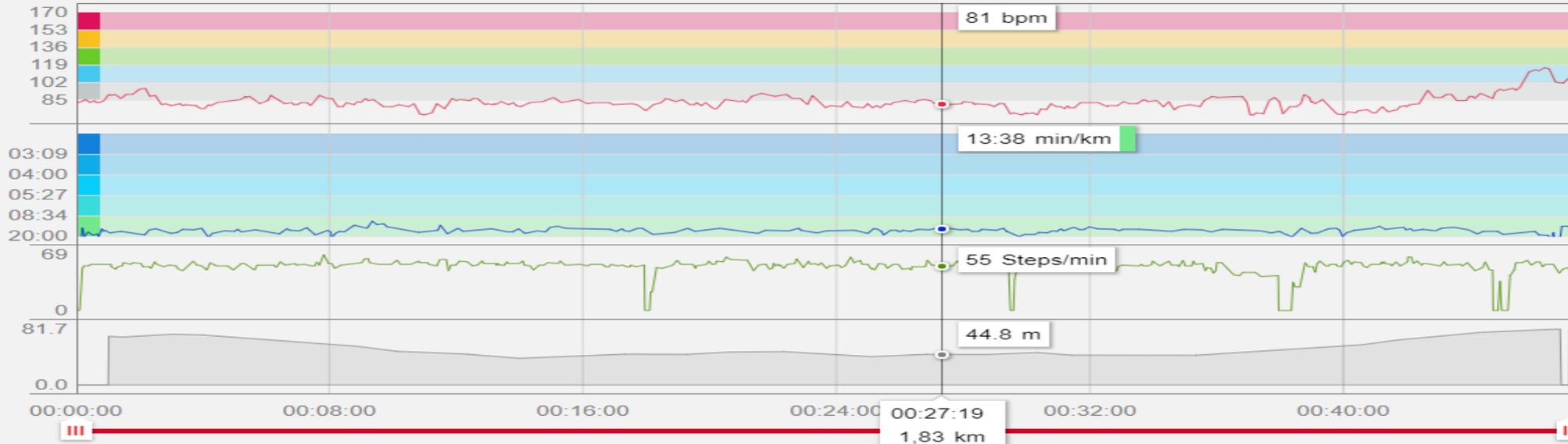
 Mild
Training Load
Load from this session 2 hours

 **45 m**
Ascent

 **35 m**
Descent

 **60 %**
Fat percentage of calories

 **236 kcal**
Calories



5	0 %	00:00:00
4	0 %	00:00:00
3	0 %	00:00:00
2	11 %	00:01:26
1	89 %	00:11:59

5	0 %	00:00:00
4	0 %	00:00:00
3	0 %	00:00:00
2	0 %	00:00:00
1	100 %	00:46:17

T - Type of Activity

Aerobic Exercise



Nelson ME, Rejeski WJ, Blair SN, et al. Physical activity and public health in older adults: recommendation from the American College of Sports Medicine and the American Heart Association. *Med Sci Sports Exerc.* 2007;39(8):1435-45

Resistance Type



Nelson ME, Rejeski WJ, Blair SN, et al. Physical activity and public health in older adults: recommendation from the American College of Sports Medicine and the American Heart Association. Med Sci Sports Exerc. 2007;39(8):1435-45

T- Type of Activity



Flexibility



Balance

ENJOYMENT

- **T**he amount of pleasure derived from the activity by the person.
- Often overlooked component of program
- The program and its activities must coincide with the personality, likes, and dislikes of the person.
- This ultimately translates into compliance.



Mrs AM

ID 28743962 | Height 155.3 cm | Date 21.12.2018
 Age 59 | Gender Female | Time 08:30:55

Body Composition Analysis

	Values	Soft Lean Mass	Fat Free Mass	Weight	Normal Range
T B W (kg) <small>Total Body Water</small>	27.5	35.3	37.7	69.9	25.8~31.6
Protein (kg)	7.3				6.9~8.5
Mineral (kg)	2.86	osseous: 2.41			2.38~2.92
Body Fat Mass (kg)	12.2				10.1~16.2

► Mineral is estimated.

Nutritional Evaluation

Protein Normal Deficient

Mineral Normal Deficient

Fat Normal Deficient Excessive

Weight Management

Weight Normal Under Over

SMM Normal Strong Under

Fat Normal Under Over

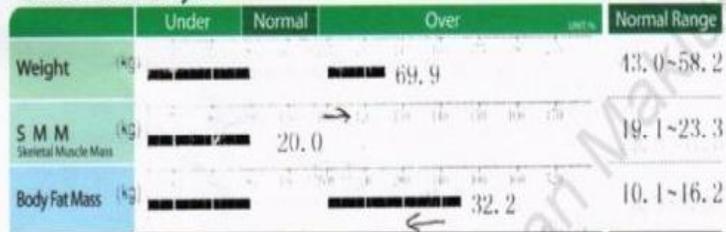
Obesity Diagnosis

BMI Normal Under Over Extremely Over

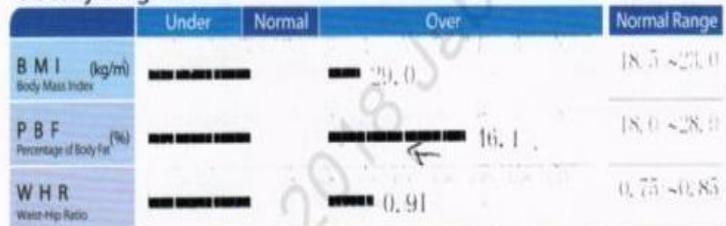
PBF Normal Over Extremely Over

WHR Normal Over Extremely Over

Muscle-Fat Analysis



Obesity Diagnosis



Weight Control

Weight Control	17.1 kg
Fat Control	21.6 kg
Muscle Control	1.7 kg

ID 28743962 | Height 155.3 cm | Date 22.10.2018
 Age 59 | Gender Female | Time 08:30:55

28743962 P 21/12/1959

Body Composition Analysis

	Values	Soft Lean Mass	Fat Free Mass	Weight	Normal Range
T B W (kg) <small>Total Body Water</small>	28.5	36.5	39.0	67.8	25.8~31.6
Protein (kg)	7.5				6.9~8.5
Mineral (kg)	2.97	osseous: 2.52			2.38~2.92
Body Fat Mass (kg)	28.8				10.1~16.2

► Mineral is estimated.

Nutritional Evaluation

Protein Normal Deficient

Mineral Normal Deficient

Fat Normal Deficient Excessive

Weight Management

Weight Normal Under Over

SMM Normal Strong Under

Fat Normal Under Over

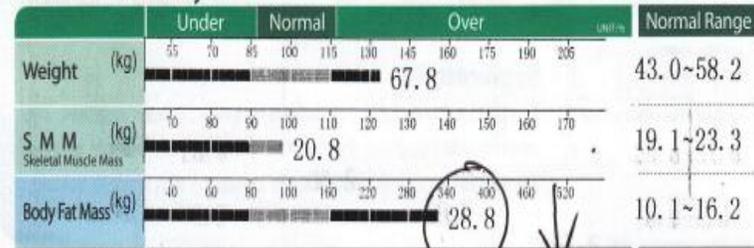
Obesity Diagnosis

BMI Normal Under Over Extremely Over

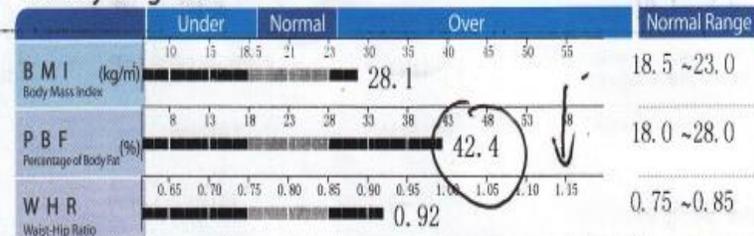
PBF Normal Over Extremely Over

WHR Normal Over Extremely Over

Muscle-Fat Analysis



Obesity Diagnosis



Weight Control

Weight Control	17.1 kg
Fat Control	17.1 kg
Muscle Control	0.0 kg

Mr. S

33930296

ID 33930296 | Height 156cm | Date 16. 7. 2018
 Age 66 | Gender Male | Time 08:39:19

Imagang: 82 cm
Pinggol: 93 cm

Body Composition Analysis

	Values	Soft Lean Mass	Fat Free Mass	Weight	Normal Range
T.B.W. (kg) <small>Total Body Water</small>	27.6	35.2	37.4	59.2	30.1~36.7
Protein (kg)	7.2				8.1~9.9
Mineral (kg)	2.55	OSSEOUS: 2.17			2.78~3.40
Body Fat Mass (kg)	21.8				6.4~12.9

► Mineral is estimated.

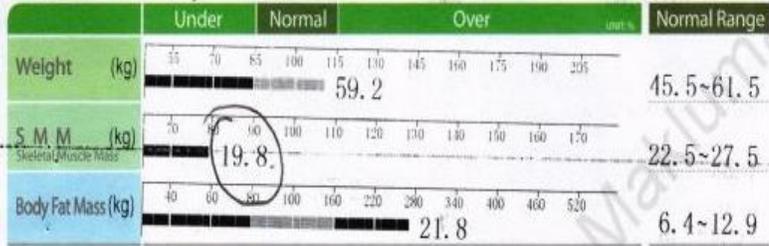
Nutritional Evaluation

- Protein Normal Deficient
- Mineral Normal Deficient
- Fat Normal Deficient Excessive

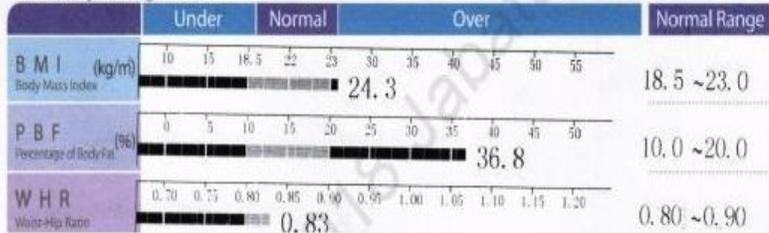
Weight Management

- Weight Normal Under Over
- SMM Normal Strong Under
- Fat Normal Under Over

Muscle-Fat Analysis



Obesity Diagnosis



Weight Control

- Weight Control - 5.6 kg
- Fat Control - 13.7 kg
- Muscle Control + 8.1 kg

ID 33930296 | Height 165cm | Date 22. 10. 2018
 Age 66 | Gender Male | Time 08:45:30

-Illyan

Body Composition Analysis

	Values	Soft Lean Mass	Fat Free Mass	Weight	Normal Range
T.B.W. (kg) <small>Total Body Water</small>	31.6	40.4	42.9	58.7	33.7~41.1
Protein (kg)	8.3				9.0~11.0
Mineral (kg)	3.02	OSSEOUS: 2.51			3.11~3.81
Body Fat Mass (kg)	15.8				7.2~14.4

► Mineral is estimated.

Nutritional Evaluation

- Protein Normal Deficient
- Mineral Normal Deficient
- Fat Normal Deficient Excessive

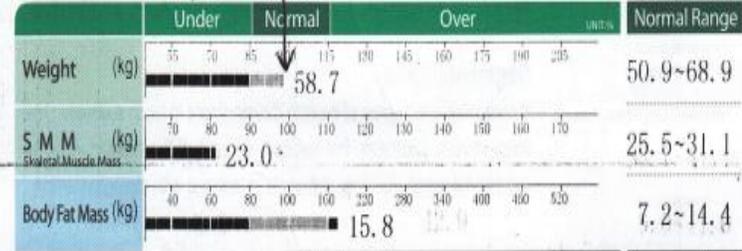
Weight Management

- Weight Normal Under Over
- SMM Normal Strong Under
- Fat Normal Under Over

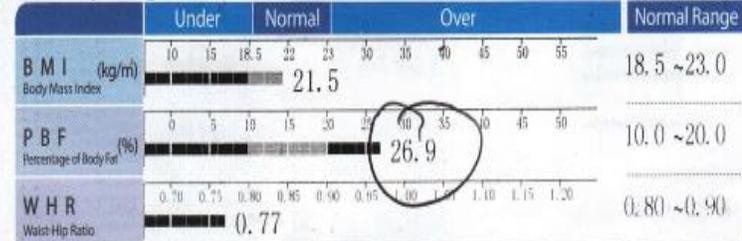
Obesity Diagnosis

- BMI Normal Under Over Extremely Over
- PBF Normal Over Extremely Over
- WHR Normal Over Extremely Over

Muscle-Fat Analysis



Obesity Diagnosis



Weight Control

- Weight Control + 1.2 kg
- Fat Control - 6.8 kg
- Muscle Control + 8.0 kg

Mrs. N

ID 08155801 Height 148cm Date 2.7.2018
 Age 62 Gender Female Time 11:16:16

Body Composition Analysis

	Values	Soft Lean Mass	Fat Free Mass	Weight	Normal Range
T B W (kg)	28.6	36.6	38.8	77.9	23.4~28.6
Protein (kg)	7.5				6.3~7.7
Mineral (kg)	2.67	2.17~2.65			
Body Fat Mass (kg)	39.1	9.2~14.7			

► Mineral is estimated.

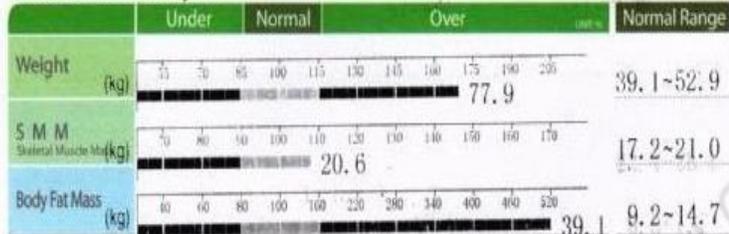
Nutritional Evaluation

Protein Normal Deficient
 Mineral Normal Deficient
 Fat Normal Deficient Excessive
Weight Management
 Weight Normal Under Over
 SMM Normal Strong Under
 Fat Normal Under Over

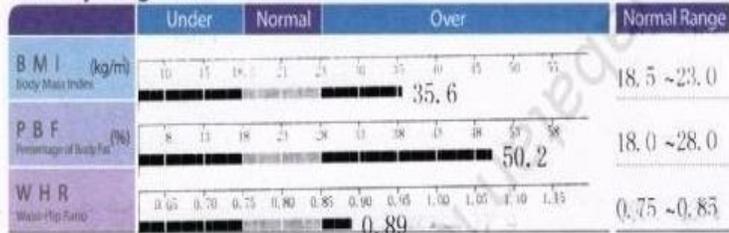
Obesity Diagnosis

BMI Normal Under Over Extremely Over
 PBF Normal Over Extremely Over
 WHR Normal Over Extremely Over

Muscle-Fat Analysis



Obesity Diagnosis



Weight Control

Weight Control 27.5 kg
 Fat Control 27.5 kg
 Muscle Control 0.0 kg

ID 08155801 Height 148cm Date 22.10.2018 08155801 P 17/04/1956
 Age 62 Gender Female Time 09:50:18

Body Composition Analysis

	Values	Soft Lean Mass	Fat Free Mass	Weight	Normal Range
T B W (kg)	28.3	36.2	38.4	74.1	23.4~28.6
Protein (kg)	7.3				6.3~7.7
Mineral (kg)	2.76	2.17~2.65			
Body Fat Mass (kg)	35.7	9.2~14.7			

► Mineral is estimated.

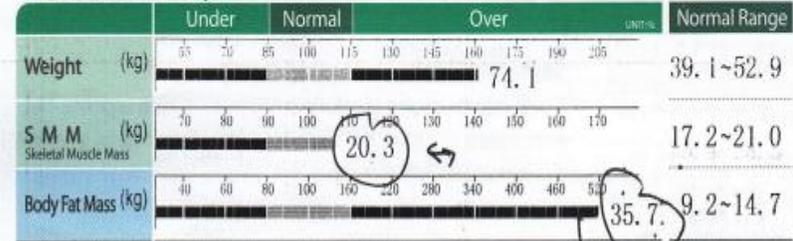
Nutritional Evaluation

Protein Normal Deficient
 Mineral Normal Deficient
 Fat Normal Deficient Excessive
Weight Management
 Weight Normal Under Over
 SMM Normal Strong Under
 Fat Normal Under Over

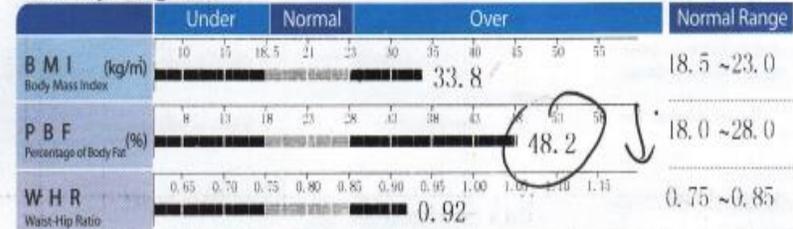
Obesity Diagnosis

BMI Normal Under Over Extremely Over
 PBF Normal Over Extremely Over
 WHR Normal Over Extremely Over

Muscle-Fat Analysis



Obesity Diagnosis



Weight Control

Weight Control 24.2 kg
 Fat Control 21.2 kg
 Muscle Control 0.0 kg

Weight Loss Maintenance Special Considerations

- Adults with overweight and obesity may benefit from progression to approximately $>250 \text{ min} \cdot \text{wk}^{-1}$ because this magnitude of physical activity may enhance long-term weight loss maintenance.
- Adequate amounts of physical activity should be performed on 5–7 d $\cdot \text{wk}^{-1}$.
- The duration of moderate-to-vigorous intensity, physical activity should initially progress to at least $30 \text{ min} \cdot \text{d}^{-1}$ and when appropriate progress to $>250 \text{ min} \cdot \text{wk}^{-1}$ to enhance long-term weight management.

Weight Loss Maintenance Special Considerations (cont.)

- Individuals with overweight and obesity may accumulate this amount of physical activity in multiple daily bouts of at least 10 min in duration or through increases in other forms of moderate intensity lifestyle physical activities.
- Accumulation of intermittent exercise may increase the volume of physical activity achieved by previously sedentary individuals and may enhance the likelihood of adoption and maintenance of physical activity.

Weight Loss Maintenance Special Considerations

- The addition of resistance exercise to energy restriction does not appear to prevent the loss of fat-free mass or the observed reduction in resting EE.
- However, resistance exercise may enhance muscular strength and physical function in individuals with overweight and obesity. Moreover, there may be additional health benefits of participating in resistance exercise such as improvements in CVD and DM risk factors and other chronic disease risk factors.

Weight Loss Program Recommendations

- Target a minimal reduction in body weight of at least 5%–10% of initial body weight over 3–6 mo.
- Incorporate opportunities to enhance communication between health care professionals, dietitians, and health/fitness and clinical exercise professionals and individuals with overweight and obesity following the initial weight loss period.
- Target changing eating and exercise behaviors because sustained changes in both behaviors result in significant long-term weight loss.

Weight Loss Program Recommendations

- Target reducing current energy intake by 500–1,000 kcal · d⁻¹ to achieve weight loss. This reduced energy intake should be combined with a reduction in dietary fat to <30% of total energy intake.
- Progressively increase to a minimum of 150 min · wk⁻¹ of moderate intensity, physical activity to optimize health/fitness benefits for adults with overweight and obesity.

Weight Loss Program Recommendations

- Progress to greater amounts of physical activity (*i.e.*, >250 min · wk⁻¹) to promote long-term weight control.
- Include resistance exercise as a supplement to the combination of aerobic exercise and modest reductions in energy intake to lose weight.
- Incorporate behavioral modification strategies to facilitate the adoption and maintenance of the desired changes in behavior

Considerations

- when helping patients take up physical activity are the frequency, intensity, type and duration of the training. Patients with joint pathologies may experience pain due to their weight and the sudden change in activity levels; this may feedback negatively on their ambitions.
- Therefore it is sensible to commence with non-weight bearing activity initially and minimise the impact on joints.

options of exercise modifications

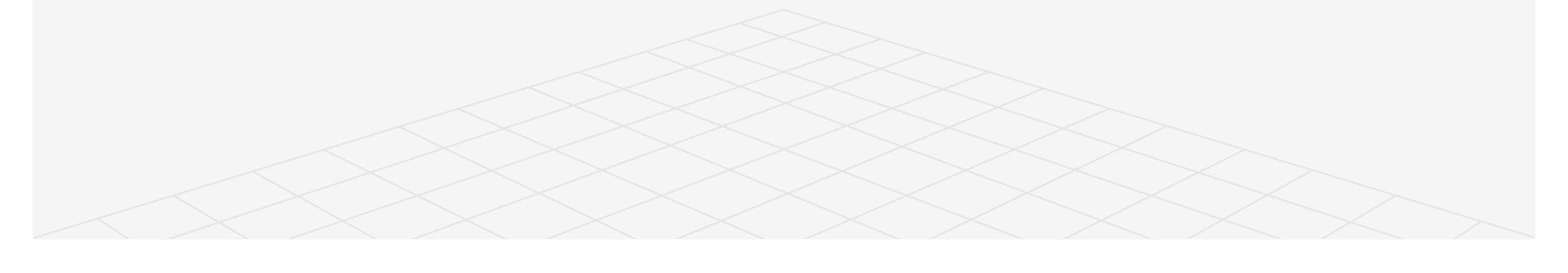




Exercise Prescription in Primary Care



-
- Understand the level of Physical Activity/Exercise
 - What their preference if they want to start exercising.
 - Understand individual Comorbidities
 - Never Exercise Group of People
 - Reduced sedentary time
 - Increase their activity level gradually, start with step count monitor with wearable/mobile apps

- Encourage their Exercise activity within their daily routine
 - Exercise is tailored for each individual
 - Do it within individual limits
 - Gradually progress the level of intensity.
 - A combination of cardiovascular, resistance and proprioceptive exercises are suitable when addressing confidence in physical activity
- 

- Regular contact supports the patient and enables monitoring of progress
-

- Assessment: Waist Circumference, Waist/Hip Ratio, Waist Height Ratio
- 6 minutes walk test
- Sit Stand Test
- Step Test



- Community based interventions are useful for adherence and there are additional benefits to be gained from social interaction with peers

My Journey



My Way to an ideal BMI, Waist line and Fat%



≤ 2007 = 80kg

Waist = 90 cm



2008 – August 2009

72-74 kg, W = 86





Waist = 75

You don't have to be
great to start, but
you have to start
to be great.

-Zig Ziglar





Thank you