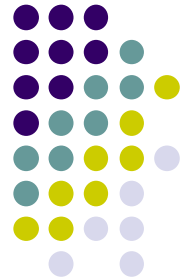
Aerobic fitness in EUROFIT fitness test battery

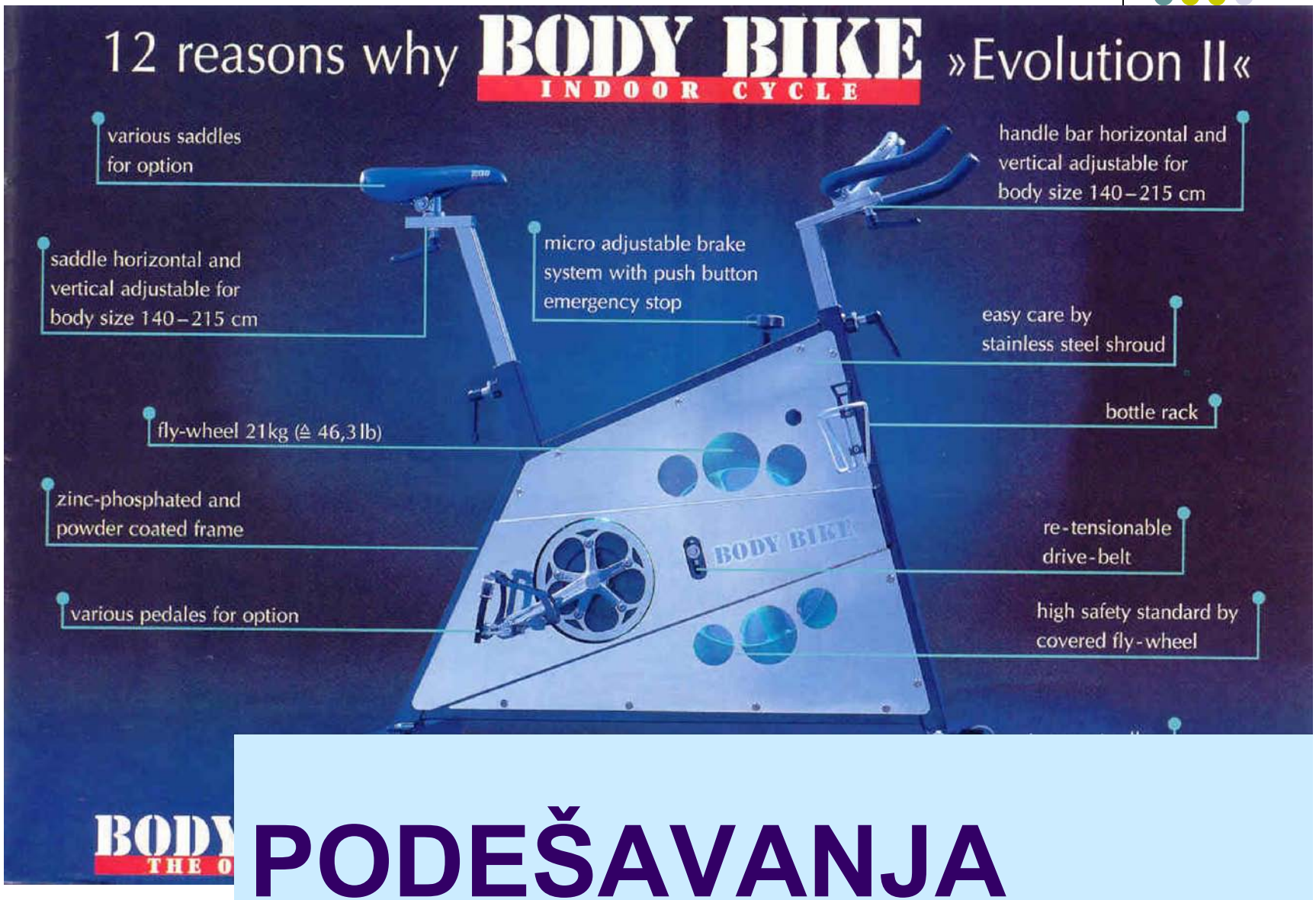


- PWC 170 aerobic endurance cycle ergometer test
- Endurance Shuttle run 20m test - multilevel progressive return loads running at 20 m
- UKK 2km walking test

- PWC 170 test aerobne izdržljivosti na bicikl ergometru
- "Shuttle run 20m" višestepeno progresivno opterećenje na 20m
- Test hodanja na 2km

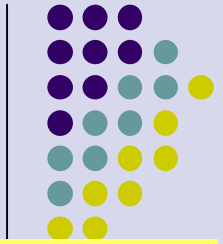
PWC 170 test

adjustment



PODEŠAVANJA

Test protocol 1.



Test protocol for assessing maximal oxygen uptake VO2max (Lange Anderson et al 1971). Respondent has the burden of three progressive levels, each lasting 4 minutes, preceded by a warming of 2 to 4 minutes. Maximum load is planned for patients ranging 70-85% of the maximum allowed for that usrast pulse. Assessment of maximal oxygen consumption is based on the linear relationship of work performed and heart rate during the load.

Protokol testa, za procenu maksimalne potrošnje kiseonika VO2max , (Lange Anderson i saradnici 1971). Ispitanik ima progresivno opterećenje na tri nivoa, svaki u trajanju od 4 minuta, kome prethodi zagrevanje od 2 do 4 minuta. Maksimalno opterećenje planira se za ispitanika u rasponu 70-85% maksimalno dozvoljenog pulsa za taj usrast. Procena maksimalne potrošnje kiseonika vrši se na osnovu linearnog odnosa izvršenog rada i srčane frekvencije u toku opterećenja.

Test protocol 2.

- respondent should be rested, relaxed and familiar with the nature of the test and pedaling technique.
- for bicycle mechanic recommended 60 turns per minute.
- room should be well ventilated, with direct ventilation and room temperature of 15 to 25 □ C.
- treadmill must be calibrated
- The seat should be at the correct height, knee slightly bent at the bottom position, and with handles in a comfortable position.

- ispitanik treba da je odmoran, opušten i upoznat sa prirodom testa i tehnikom pedaliranja.
- za mehaničke bicikle se preporučuje 60 okreta u minutu.
- soba treba da je provetrena, sa direktnom ventilacijom, a sobna temperatura od 15 do 25oC.
- ergometar mora da bude kalibriran
- sedište treba da bude na odgovarajućoj visini, koleno lagano savijeno u donjoj poziciji, i sa ručkama u udobnoj poziciji.

Test protocol 3.

- recommended that heart rate is monitored through odgovarujućeg monitoring system during the entire test.
- Heart rate is monitored at the end of every minute, except in the last one, at every level should be measured when the Segunda 15-20 before the end of that time to give instructions for the next level loads.
- Upon completion of the test subject does not break immediately, but the work continues even 30 -60 "pedaling to gradually settle down to the level of warming

- preporučuje se da srčani rad bude praćen preko odgovarujućeg monitoring sistema u toku čitavog testa.
- Srčani rad se prati na kraju svakog minuta, osim u toku poslednjeg, na svakom nivou kada treba meriti 15-20 sedundi pre kraja da bi se na vreme dalo uputsvo za sledeći nivo opterećenja.
- Po završenom testu ispitanik ne prekida odmah rad već nastavlja jo 30 -60" pedaliranje da se postepeno smiri do nivoa zagrevanja

Guidelines for workload (Watts) selection in the 3-stage (WHO) ergometer test
young and midle age adults 20-50/55 years. Older adults 50/55-60/65

Uputstvo za opterećenja u Watt-ima u toku testa na 3 nivoa opterećenja prema WHO
Mlado i zrelo doba 20-50/55 god. starije osobe 50/55-60/65

Physical activity	worm-up	1	2	3	worm-up	1	2	3
Physically very active	Women 100	125	150	175	50	75	100	125
	Men 100	150	200	250	50	100	150	175
sedentary or physically moderately active	Women 50	75	100	125	25	50	75	100
	Men 50	100	150	175	50	75	100	125

The formula for calculating maximum oxygen uptake

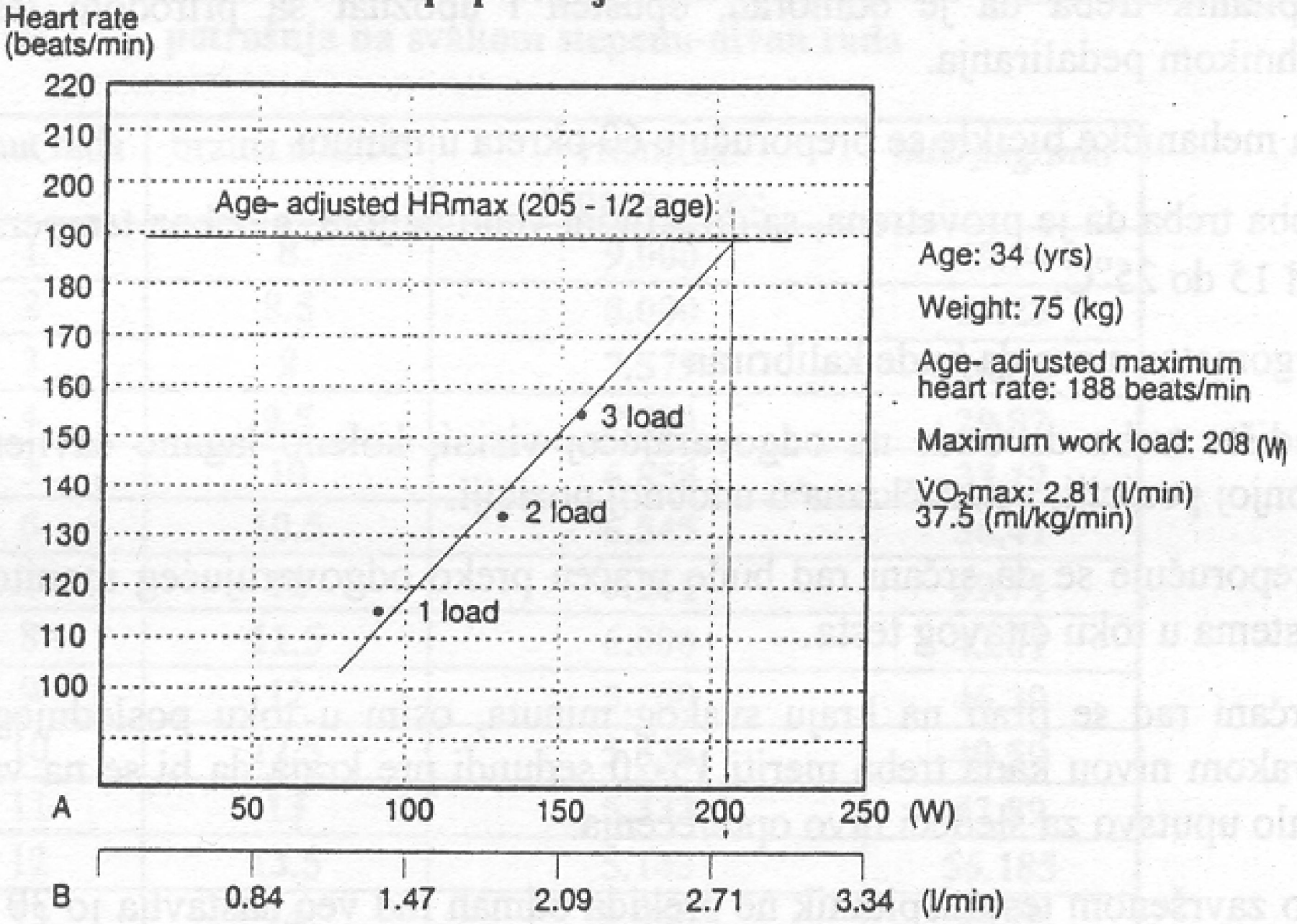
The formula for calculating maximum oxygen uptake

$$W_{max}\,(W) = 3.load(W) + \left[(Hrmax - HR3) \times \frac{3.load\,(W) - (1.load(W) + 2.load(W))/2}{HR3 - (HR1+HR2)/2}\right]$$

Wmax= Maximal work in Watts have

HR= heart rate at the end of each load level

Grafik 4 12 minutni test na bicikl ergometru, uzrast i rad srca izdvoj kod švedske populacije



Ensample

1 level 90 Watt HR1=115 beats/min

2 level 130 Watt HR2=133 beats/min

3 level 160 Watt HR3=155 beats/min

Age 34 years

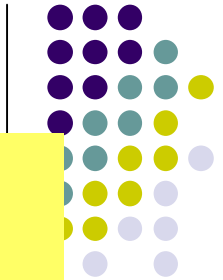
Body weight 75 kg

Maximum allowed pulse 205-1/2 years= 188

$$\mathbf{160} + \left[(188-155) \times \frac{160 - (90+130)/2}{155 - (115+133)/2}\right] = 208\text{Watt-a}$$

V02max (mil/kg/min) = (Wmax(W) x 12,48 +217) / body weight in kg

(208 x 12,48 + 217) / 75 = 37.5 ml/kg/min



Common problems in endurance tests

- Motivation
- Experience of subject to recognize his ability
- much time for one subject

Uobičajeni problemi kod testova izdržljivosti

- Motivacija ispitanika
- Iskustvo ispitanika da prepozna sopstvene sposobnosti
- Mnogo vremena se utroši za jednog ispitanika

The Maximal Multistage 20-Meter Shuttle Run Test authors Leger i Lambert (1982).

- At the same time can be a number of subjects
- Dictate the tempo beep eliminating erroneous assessment of the individual's own ability in choosing the pace and running speed.
- Reduces the possibility of overloading

TEST višestepenog progresivnog opterećenja povratnim trčanjem na 20 m

- Istovremeno može veći broj ispitanika
- Tempo diktira zvučni signal čime se eliminišu pogrešne procene pojedinca o sopstvenim sposobnostima u izboru tempa i brzine trčanja.
- Smanjena je mogućnost preopterećenja

20m
The initial speed of 8 miles per hour and accelerates the 0.5 km in one minute or
1 km every 2 minutes

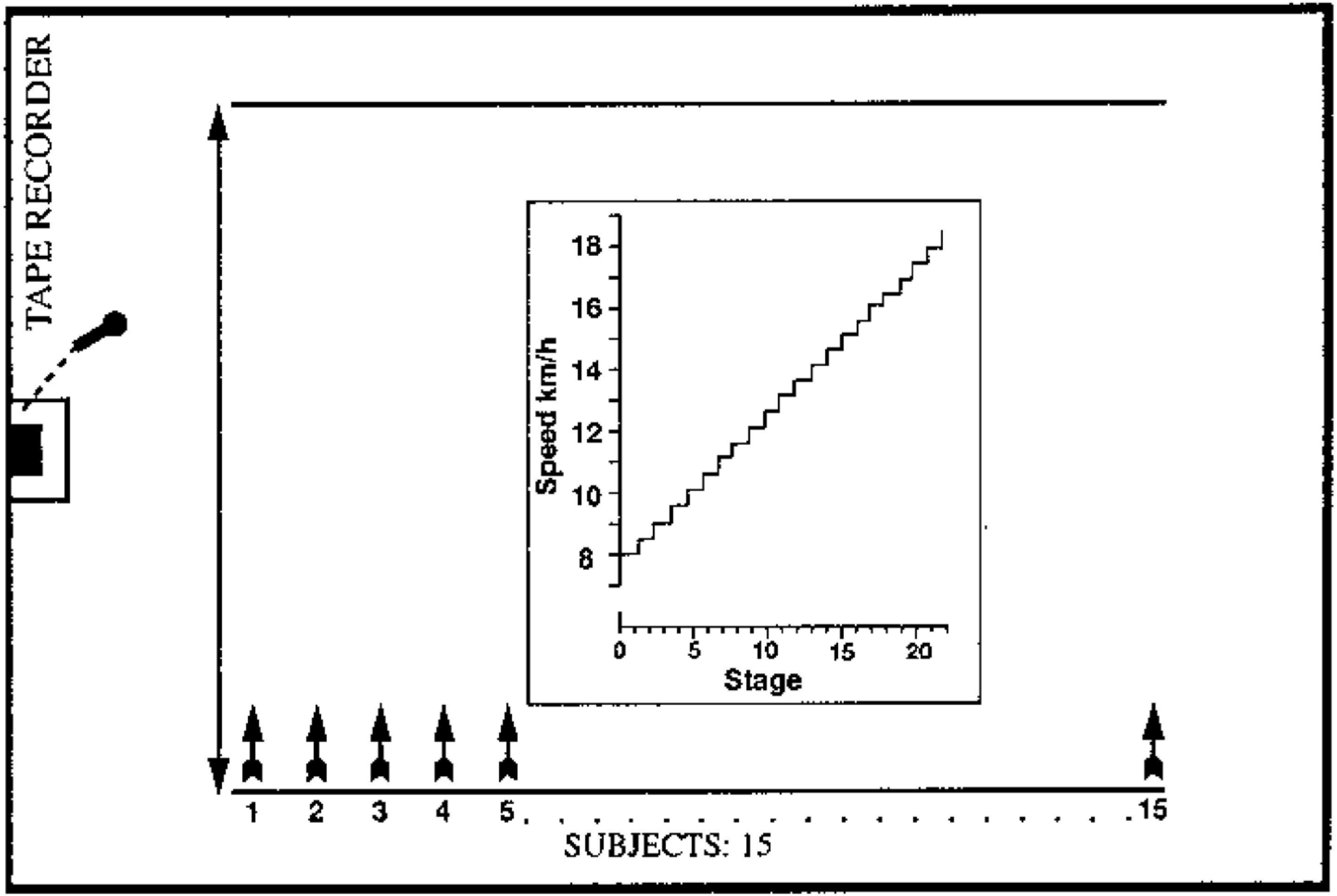
A variant of the 400m when the markers at 50m and also in accelerating two modalities

20m

Početna brzina 8 km na čas i ubrzava se

- 0,5 km na svaki minut ili
- 1 km na svaka 2 minuta

Varijanta na 400m kada su markeri na 50m i takođe u dva modaliteta ubrzavanja


TAPE RECORDER
Speed km/h
18
16
14
12
10
8
0
5
10
15
20
Stage
1
2
3
4
5
15
SUBJECTS: 15

minut rada	brzina u km/h	vreme za deonicu u sec	$mlO_2.kg/min$
1	**8**	**9.000**	**19.94**
2	**8.5**	**8.000**	**23.23**
3	**9**	**7.579**	**26.53**
4	**9.5**	**7.200**	**29.82**
5	**10**	**6.858**	**33.12**
6	**10.5**	**6.545**	**36.41**
7	**11**	**6.261**	**39.71**
8	**11.5**	**6.000**	**43.01**
9	**12**	**5.760**	**46.30**
10	**12.5**	**5.538**	**49.59**
11	**13**	**5.333**	**52.89**
12	**13.5**	**5.143**	**56.185**
13	**14**	**4.966**	**59.48**
14	**14.5**	**4.800**	**62.77**
15	**15**	**4.645**	**66.07**
16	**15.5**	**4.500**	**69.36**
17	**16**	**4.364**	**72.66**
18	**16.5**	**4.235**	**75.95**
19	**17**	**4.114**	**79.25**
20	**17.5**	**4.000**	**82.54**
21	**18**	**3.892**	**85.84**

Conconi test

- When athletes and advanced amateurs
- 400-meter running track
- Rhythm sets tone
- Ranges from 10 km per hour
- in each pass is measured and the pulse

goal is to determine the lactate threshold

based on the intersection of the load and heart rate

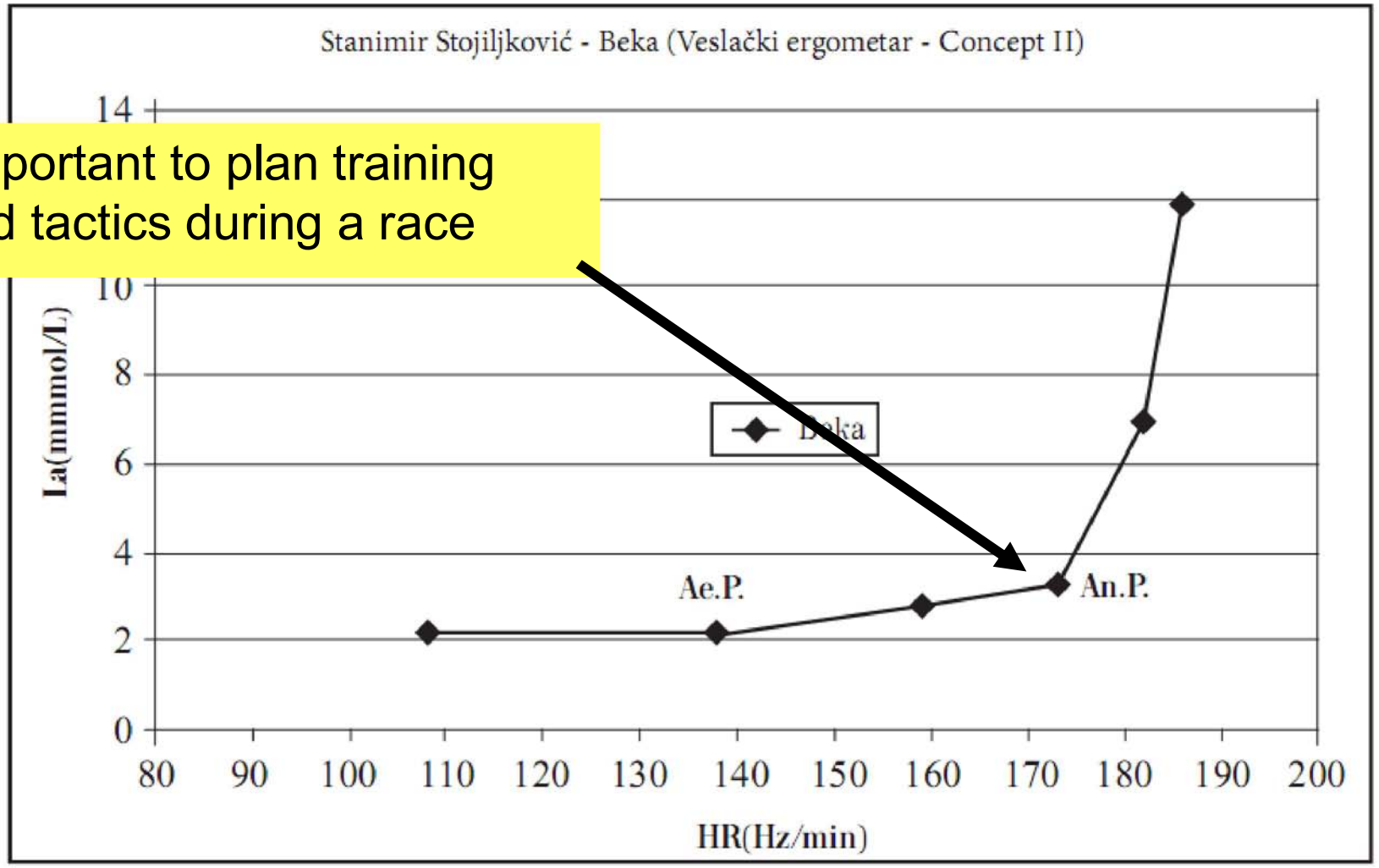
- Kod sportista i naprednih rekreativaca
- 400 metara atletska staza
- Ritam određuje zvučni signal
- Kreće se od 10 km na čas
- u svakom prolazu se meri i puls

cilj je da se utvrdi **LAKTATNI PRAG**

na osnovu ukrštanja opterećenja i srčane frekvencije

Curve depending on the level of lactate in the blood of the intensity of work

It's important to plan training and tactics during a race



UKK2km Walking test

Tur de testare

FITNESS INDEX

estimate VO_2-max

FITNES INDEX

Procena VO_2-max

Walking

- usual activities
- cyclical trends
- EASY TO ADDING

HODANJE

UOBIČAJENA AKTIVNOST

CIKLIČNO KRETANJE

JEDNOSTAVNO ZA DOZIRANJE

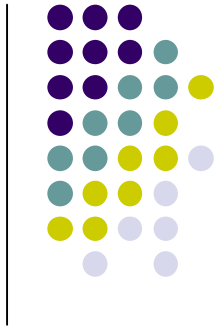
TEST PROTOCOL
temperature 5 - 30 degrees
Appropriate equipment and footwear
complete the questionnaire
Worming up 5-10 min
Walking to 200m
In the event of health problem termination of the test

PROTOKOL TESTA

- temperatura 5 - 30 stepeni
- Odgovarajuća oprema i obuća
- popuniti upitnik
- Zagrevanje 5-10 min
- prepešačiti do 200m
- U slučaju zdravstvenog problema prekid testa

Elements that enter into the formula for fitness INDEX

- Gander
- Age
- Body height
- Body weight
- Time for 2km
- Heart rate on the end of the test

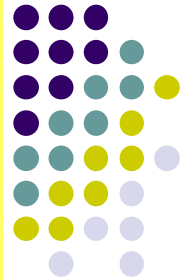


ELEMENTI KOJI ULAZE U FORMULU ZA FITNES INDEX

- POL
- GODINE
- TELESNA VISINA
- TELESNA MASA
- VREME ZA 2km
- SRČANA FREKVENCIJA NA KRAJU TESTA

Category BMI Body weight in kg /
/(height in meters to the power of 2)

<18 under the weight
20-25 normal
25-30 overweight
30-40 obesity
>40 pathology



Category **BMI** Body weight in kg /
/(height in meters to the power of 2)

<18 ispod težine
20-25 prihvatljivo
25-30 bucmast
30-40 debeo
>40 patologija

Male

420 - 11,6 x *time in min.*

0,2 x *time in sec*

0,56 x **HR**

2,6 x **BMI**

+ 0,2 *Age*

Female

304 -

8,5 x *time in min*.

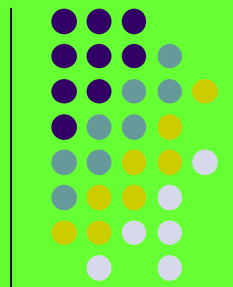
0,14 x *time in sec*

0,32 x **HR**

1,1 x **BMI**

+0,4 *Age*

FITNESS INDEX



< 70	well below average
70 - 89	under the average
90 - 110	average
110 - 130	above average
> 130	well above average

< 70	znatno ispod proseka
70 - 89	nešto ispod proseka
90 - 110	prosek
110 - 130	nešto iznad proseka
> 130	znatno iznad proseka

$VO_{2\ max}$

Male

184.9

- 4,65 time

- 0.22 HR

- 0.26 Age

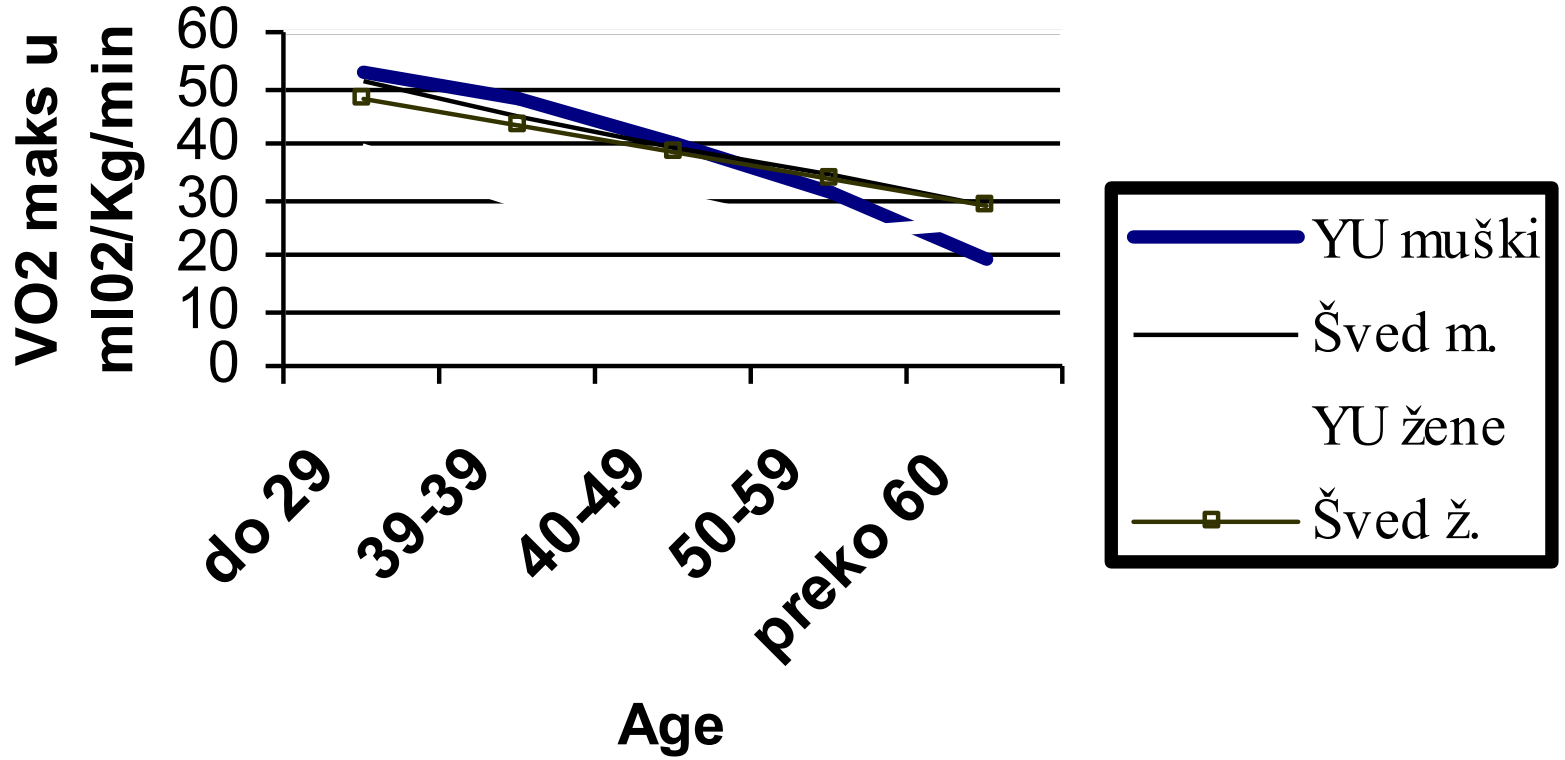
- 1.05 BMI

Female

116.2

- 2.98 time
- 0.11 HR
- 0.14 Age
- 0.39 BMI

VO2max Sweden norms and YU results



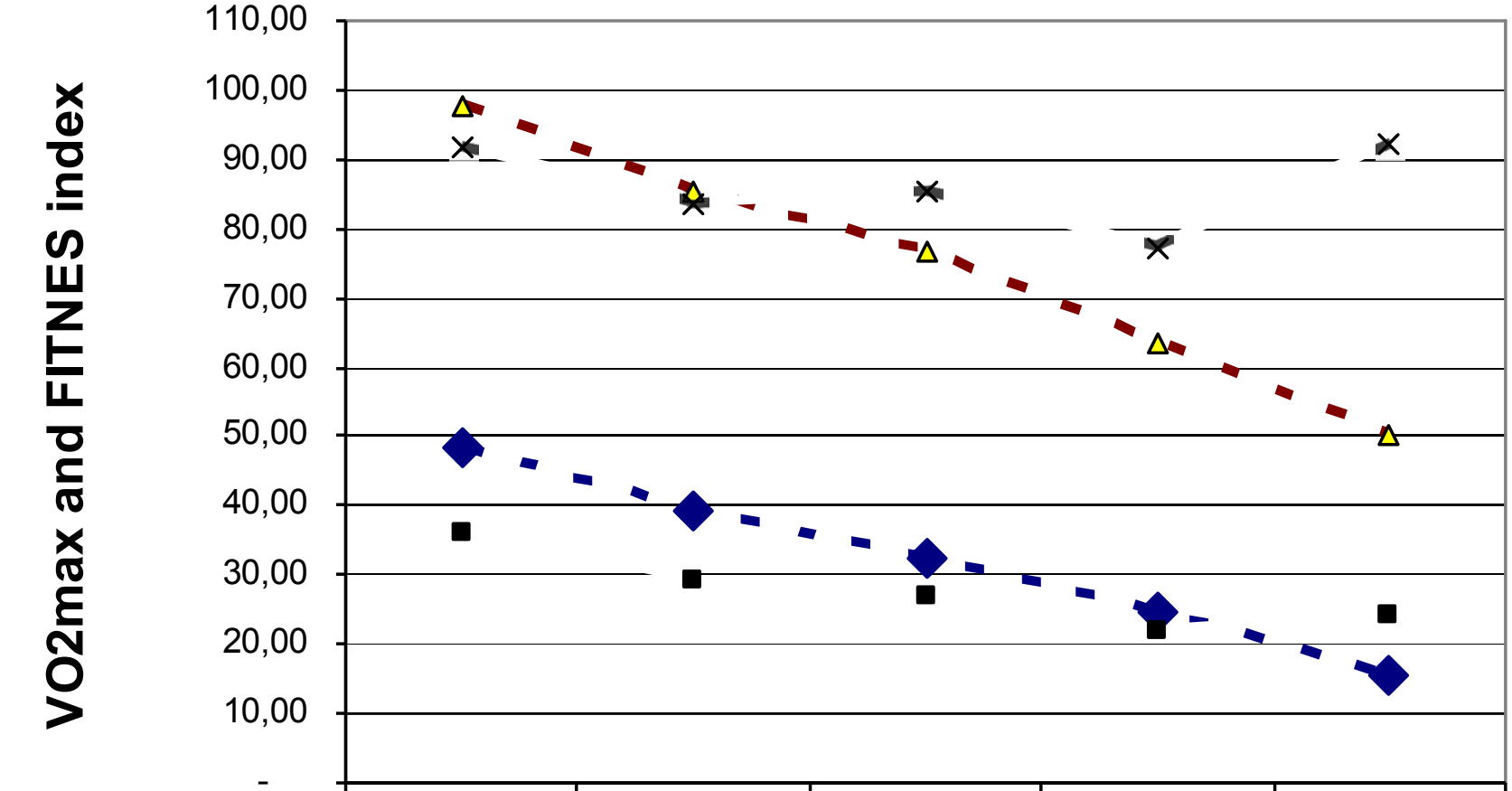
UKK-2km walking test

gander	male	female
do 29	375	186
30 do 39	42	35
40 do 49	85	71
50 do 59	50	24
preko 60	13	7
	565	323

From 1997 to 2004. we make a test with Students in the field of sport, the participants four summer Festivals and recreation program participants additional holiday workers

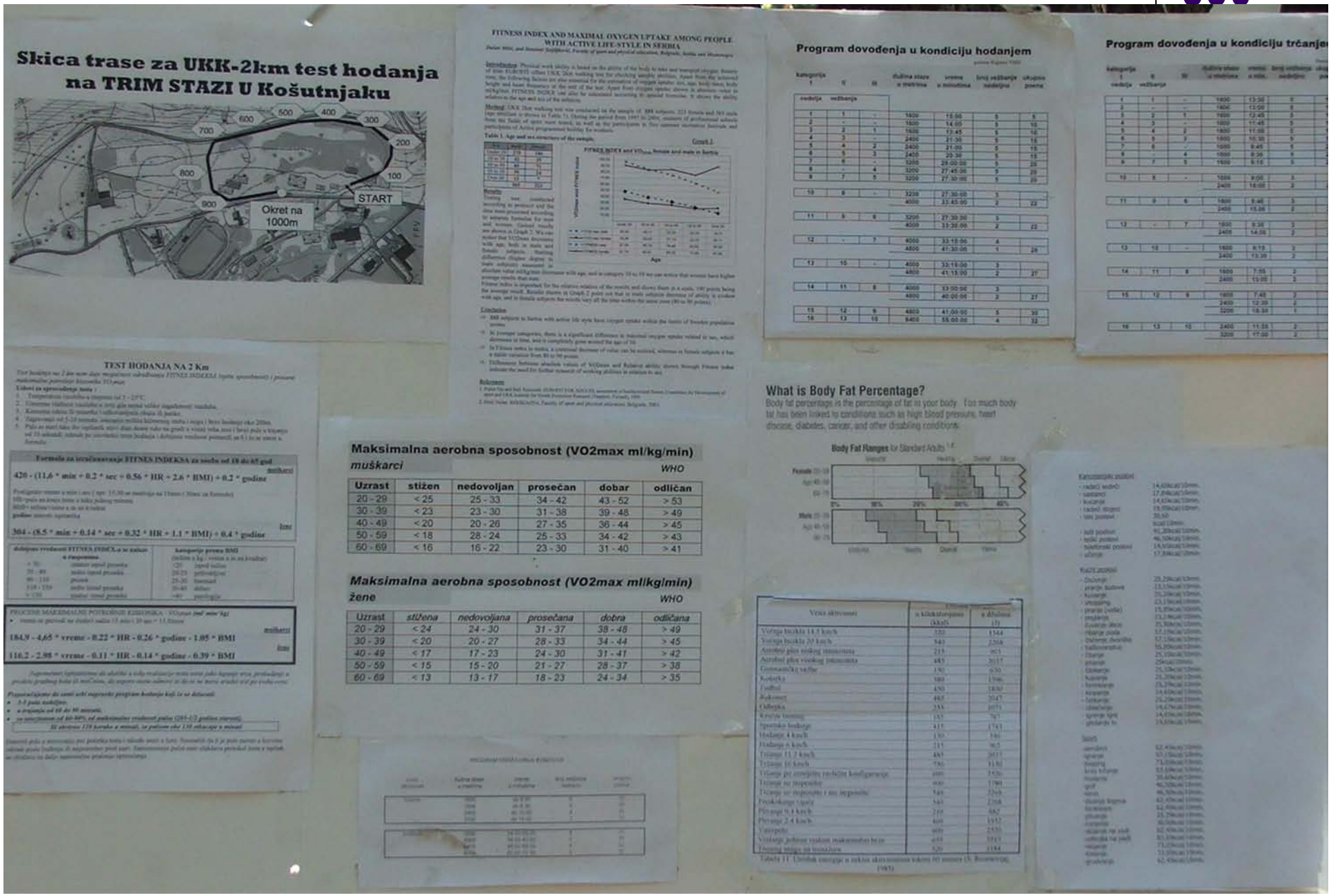
Od 1997 do 2004. testirali smo studente iz oblasti fizičkog vaspitanja i sporta, učesnike letnjih Festivala rekreacije i učesnike programa dopunski odmor radnika

FITNES INDEX and VO2max female and male in Serbia



	do 29	30 do 39	40 do 49	50 do 59	preko 60
VO2 max M	48,54	39,17	32,55	24,53	15,73
VO2 max Ž	35,86	29,23	27,13	22,12	24,11
FIT M	97,58	85,16	76,49	63,65	50,36
FIT Ž	91,74	83,61	85,26	77,00	91,99

Gander



Skica trase za UKK-2km test hodanja na TRIM STAZI U Košutnjaku

100
200
300
400
500
600
700
800
900
START
Okret na 1000m

FITNESS INDEX AND MAXIMAL OXYGEN UPTAKE AMONG PEOPLE WITH ACTIVE LIFE-STYLE IN SERBIA

Program dovođenja u kondiciju hodanjem

Program dovođenja u kondiciju trčanje

TEST HODANJA NA 2 Km

Maksimalna aerobna sposobnost (VO2max ml/kg/min)
muškarci
WHO

Uzrast	stižen	nedovoljan	prosečan	dobar	odličan
20 - 29	< 25	25 - 33	34 - 42	43 - 52	> 53
30 - 39	< 23	23 - 30	31 - 38	39 - 48	> 49
40 - 49	< 20	20 - 26	27 - 35	36 - 44	> 45
50 - 59	< 18	28 - 24	25 - 33	34 - 42	> 43
60 - 69	< 16	16 - 22	23 - 30	31 - 40	> 41

Maksimalna aerobna sposobnost (VO2max ml/kg/min)
žene
WHO

Uzrast	stižena	nedovoljana	prosečana	dobra	odlična
20 - 29	< 24	24 - 30	31 - 37	38 - 48	> 49
30 - 39	< 20	20 - 27	28 - 33	34 - 44	> 45
40 - 49	< 17	17 - 23	24 - 30	31 - 41	> 42
50 - 59	< 15	15 - 20	21 - 27	28 - 37	> 38
60 - 69	< 13	13 - 17	18 - 23	24 - 34	> 35

What is Body Fat Percentage?

Body fat percentage is the percentage of fat in your body. Too much body fat has been linked to conditions such as high blood pressure, heart disease, diabetes, cancer, and other disabling conditions.

Body Fat Ranges for Standard Adults