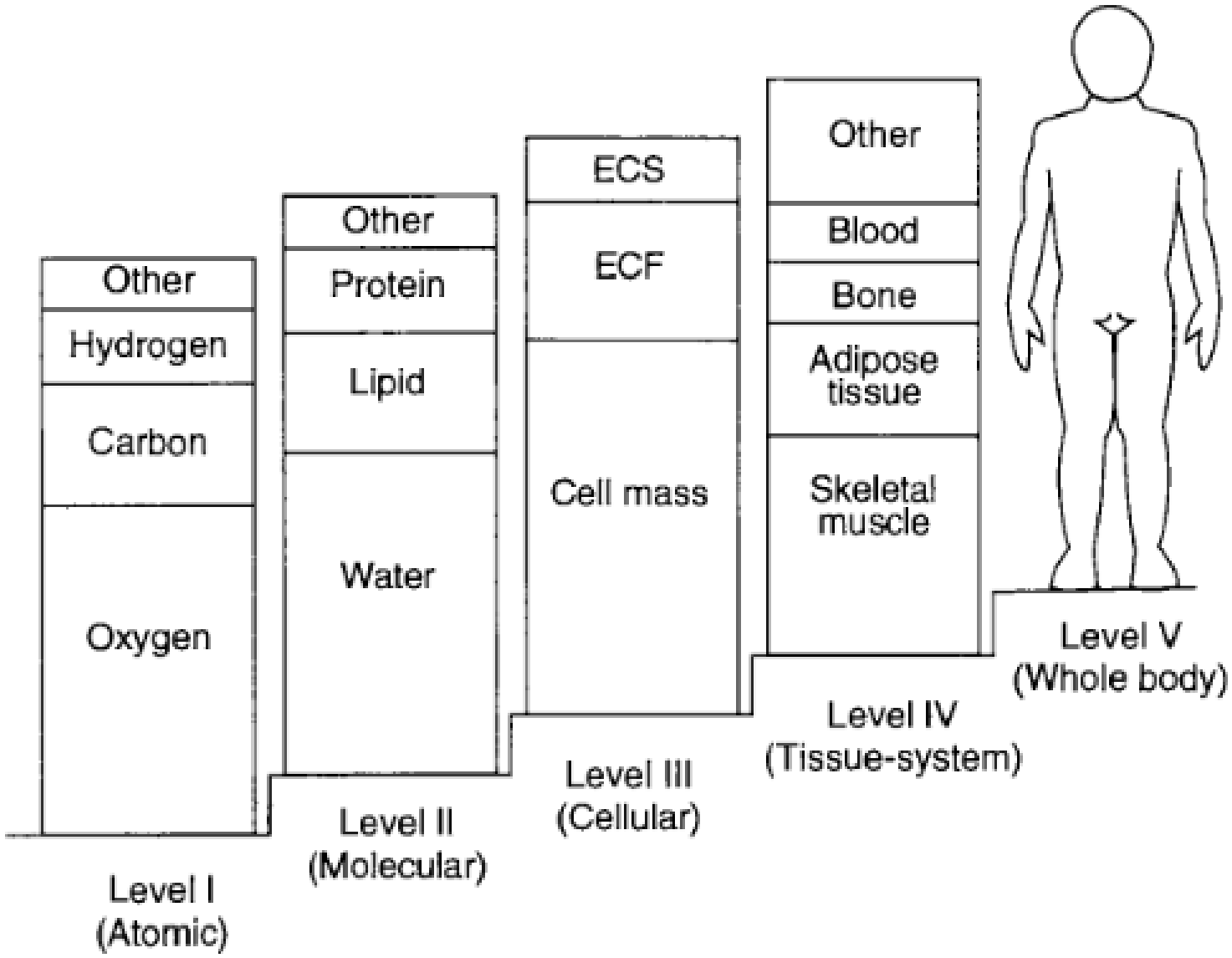
Prvek	Zastoupení	Prvek	Zastoupení
Kyslík	65 %	Draslík	0,4 %
Uhlík	18 %	Síra	0,2 %
Vodík	9,5 %	Sodík	0,2 %
Dusík	3,2 %	Chlór	0,2 %
Vápník	1,5 %	Hořčík	0,1 %
Fosfor	1,2 %	Ostatní prvky	< 1 %

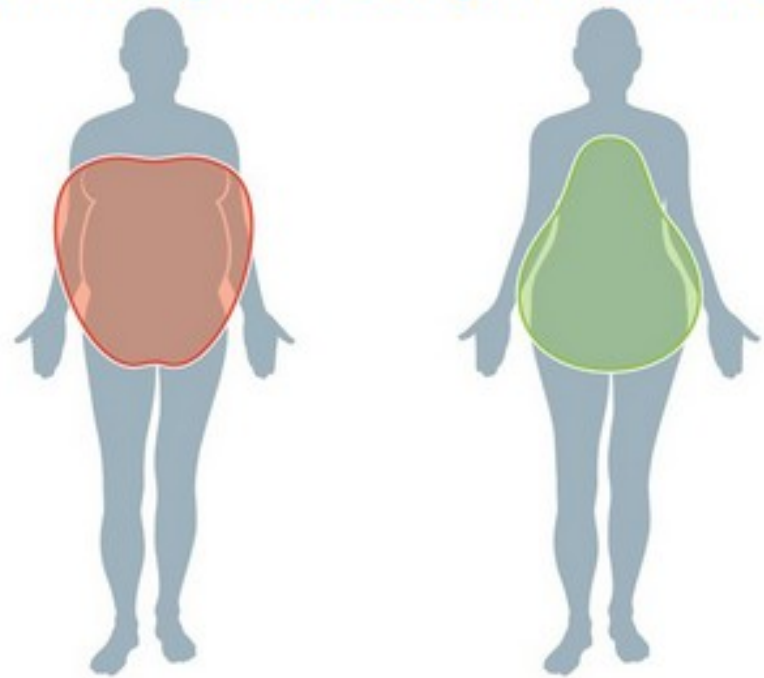

Other
Hydrogen
Carbon
Oxygen
Level I
(Atomic)
Other
Protein
Lipid
Water
Level II
(Molecular)
ECS
ECF
Cell mass
Level III
(Cellular)
Other
Blood
Bone
Adipose tissue
Skeletal muscle
Level IV
(Tissue-system)
Level V
(Whole body)

Název modelu	Složky
Dvoukompartmentový model	FM, FFM
Čtyřkompartmentový model	FM, TBW, proteiny (hmota tkání), minerální látky

Složka	Procentuální zastoupení
Tuk	83–87 %
Voda	10–15 %
Proteiny	2–3 %

	Sacharidy	Bílkoviny	Tuky
Substráty (g)	Jaterní glykogen (cca 100 g)	Veškeré bílkoviny organismu (17 % TH)	**Tuková tkáň** (85 % tuku)
Substráty (g)	Svalový glykogen (cca 9–13 g/kg svalu)	Plazmatické bílkoviny (cca 70 g)	Intramuskulární tuk
Celkové zásoby (kJ)	**Cca 500 g 8500 kJ**	**Cca 13–14 kg Cca 221 000 kJ**	**Cca 10,2 kg čistého tuku 387 000 kJ**
Zisk energie při oxidaci 1 l O_2	21,1 kJ	18,8 kJ	19,6 kJ

Android and Gynoid Body Fat Distribution



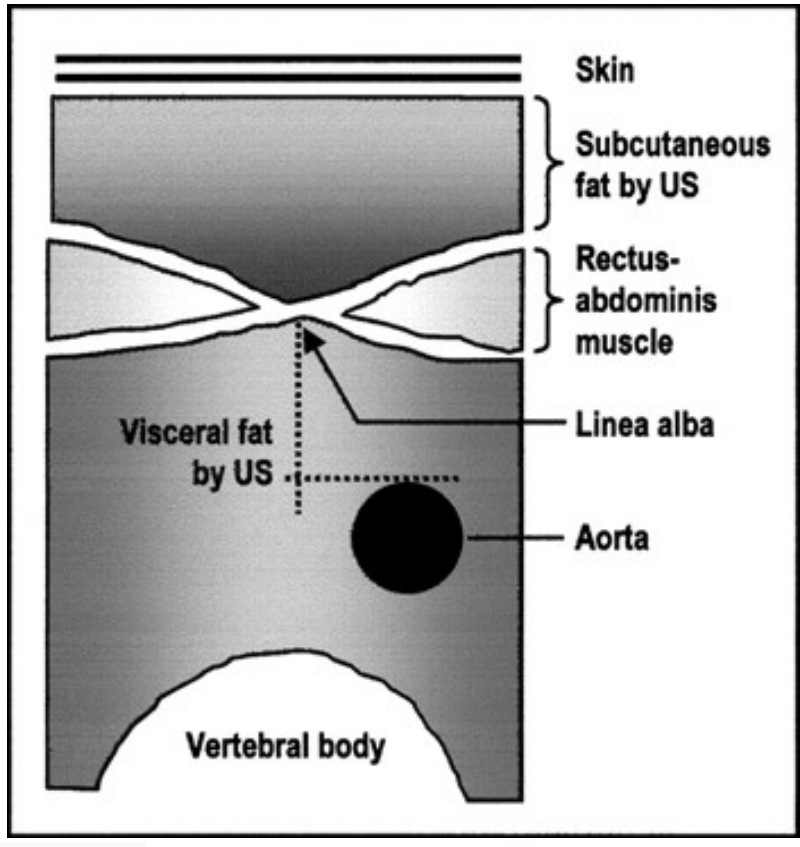
(a) Android ("apple-shaped") fat patterning

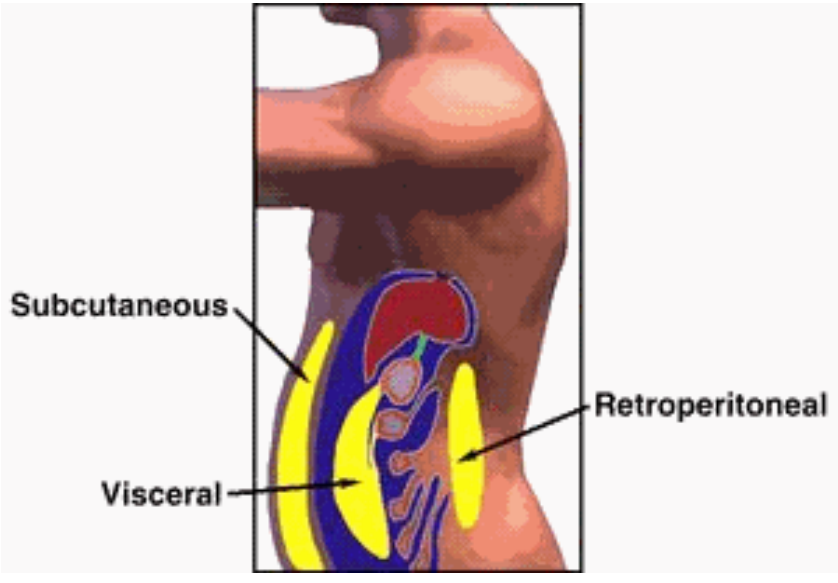
(b) Gynoid ("pear-shaped") fat patterning

Poměr pasu a boků (WHR)	≥0,90 (M), ≥0,85 (Ž)	vysoké

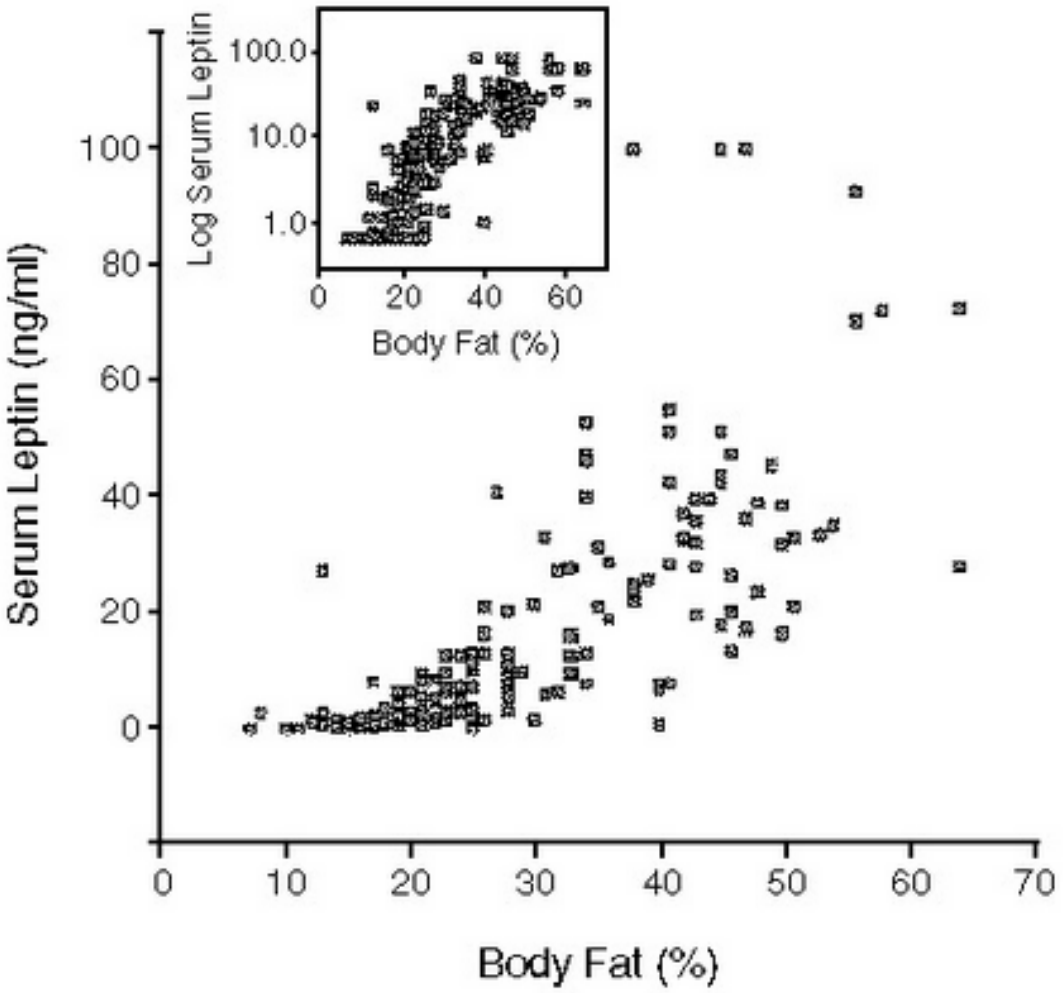
RIZIKO METABOLICKÉHO SYNDROMU DLE OBVODU PASU

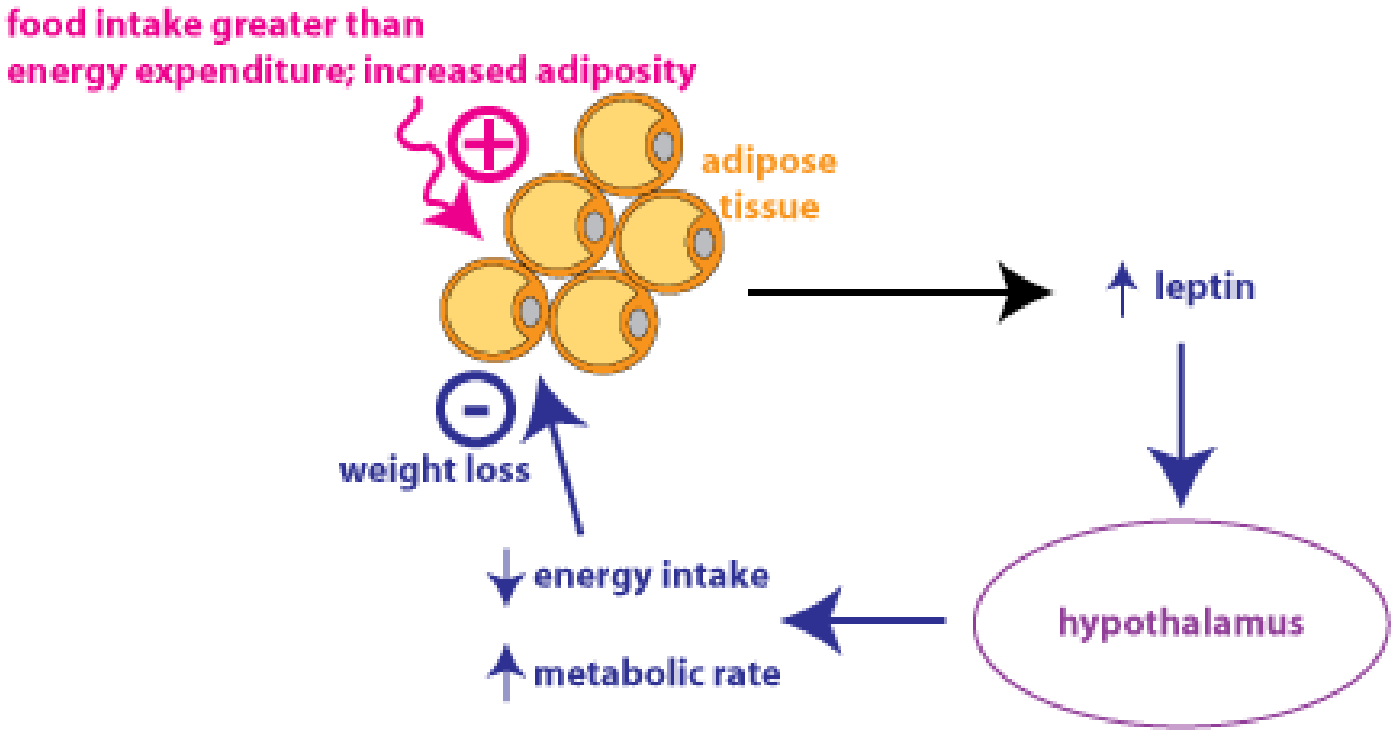
Obvod pasu	Zvýšené riziko	Vysoké riziko
Ženy	nad 80 cm	nad 88 cm
Muži	nad 94 cm	nad 102 cm

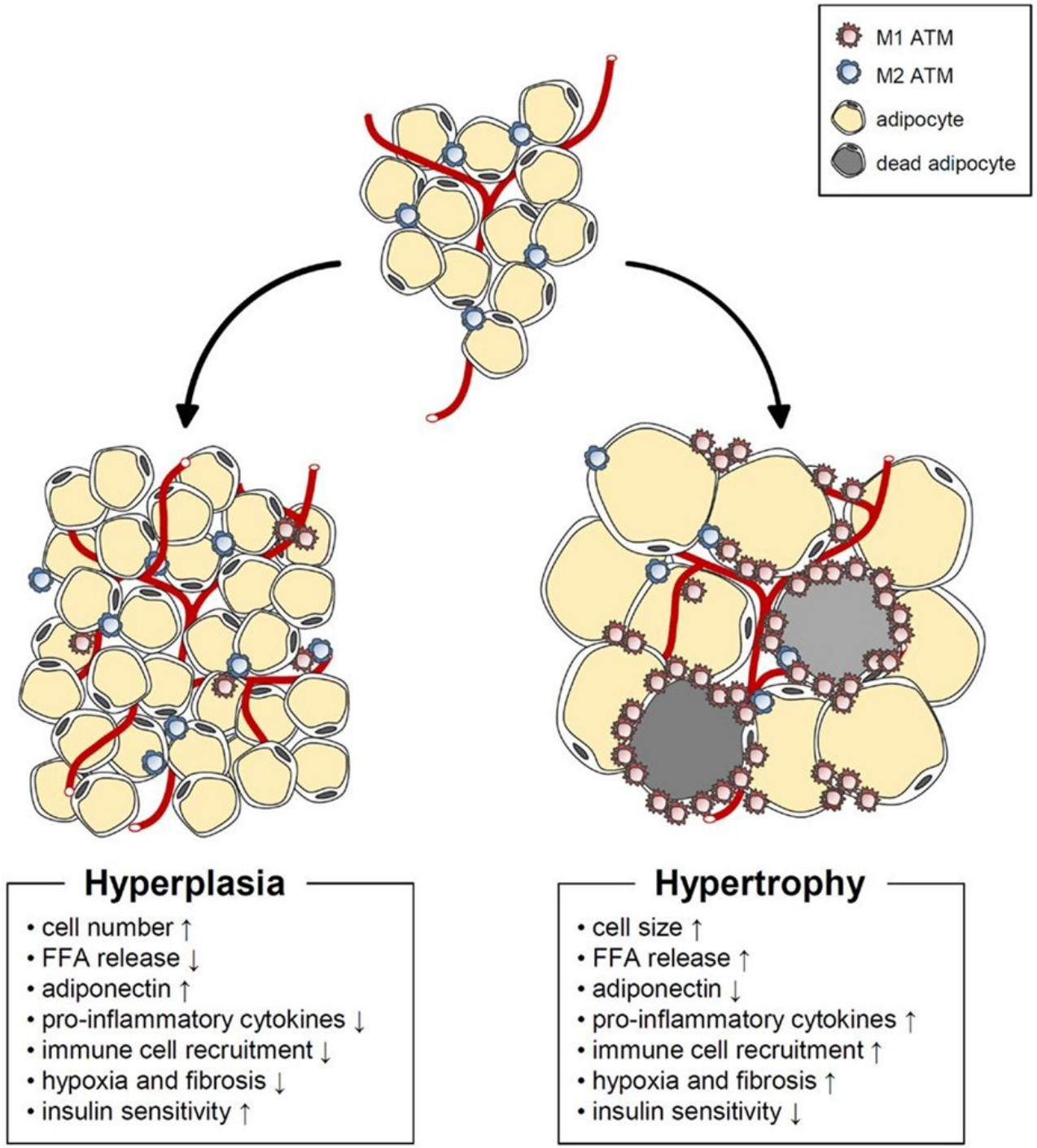

Skin
Subcutaneous fat by US
Rectus-abdominis muscle
Linea alba
Visceral fat by US
Aorta
Vertebral body

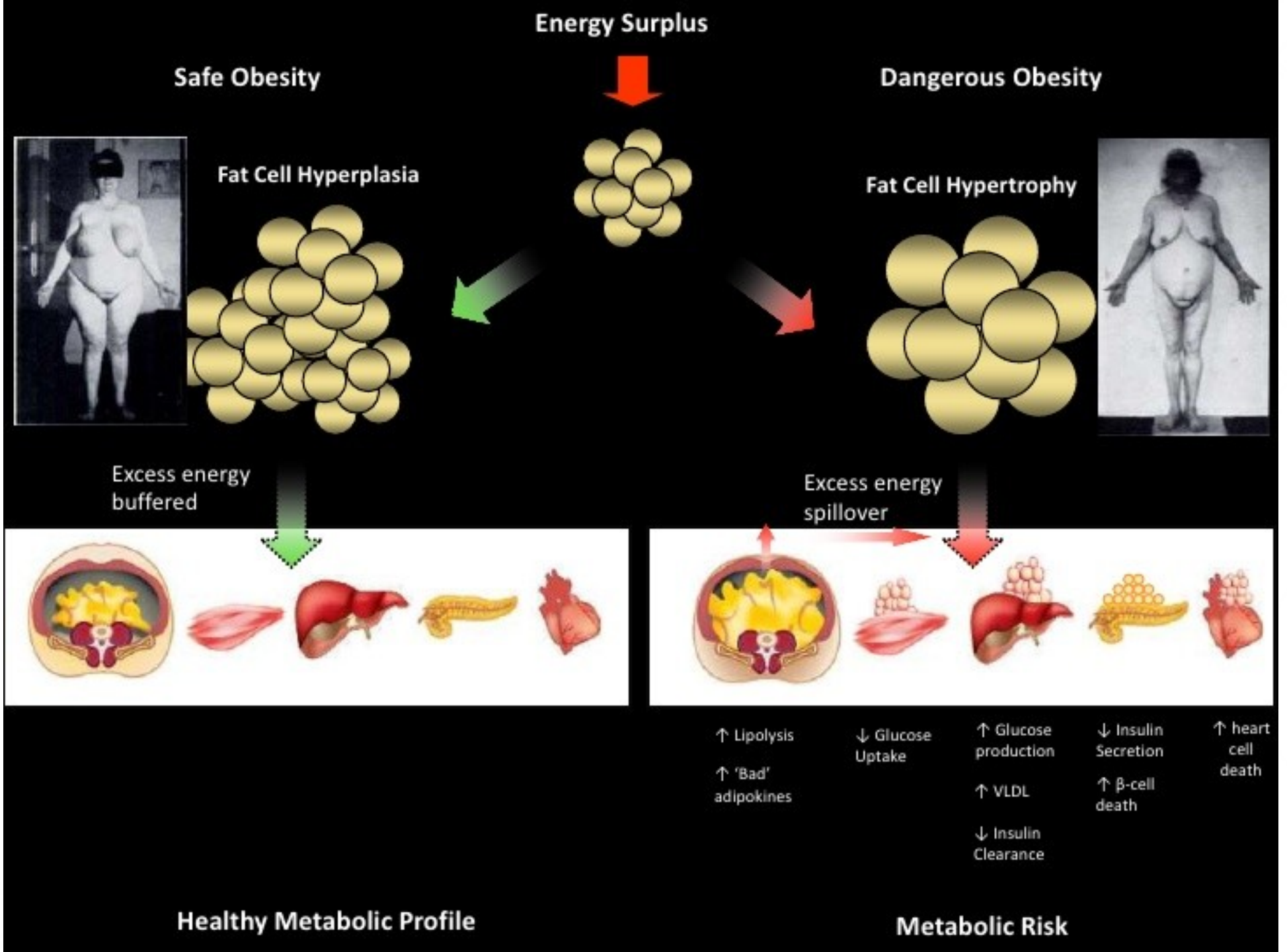

Subcutaneous
Retroperitoneal
Visceral

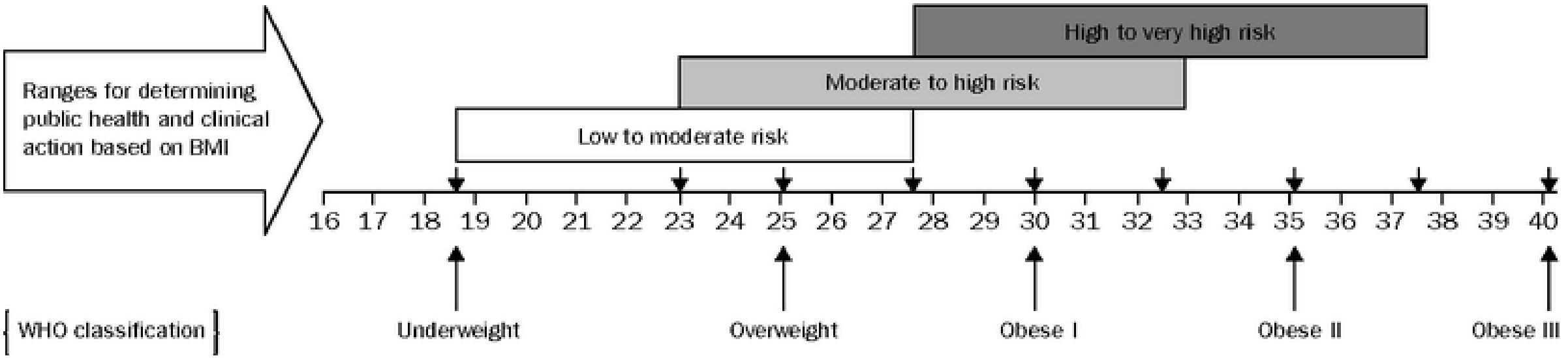

Testosterone
Aromatase
Estrogen


Log Serum Leptin
100.0
10.0
1.0
0
20
40
60
Body Fat (%)
Serum Leptin (ng/ml)
100
80
60
40
20
0
0
10
20
30
40
50
60
70
Body Fat (%)


food intake greater than
energy expenditure; increased adiposity
adipose
tissue
leptin
weight loss
energy intake
metabolic rate
hypothalamus


M1 ATM
M2 ATM
adipocyte
dead adipocyte
Hyperplasia
• cell number ↑
• FFA release ↓
• adiponectin ↑
• pro-inflammatory cytokines ↓
• immune cell recruitment ↓
• hypoxia and fibrosis ↓
• insulin sensitivity ↑
Hypertrophy
• cell size ↑
• FFA release ↑
• adiponectin ↓
• pro-inflammatory cytokines ↑
• immune cell recruitment ↑
• hypoxia and fibrosis ↑
• insulin sensitivity ↓


Energy Surplus
Safe Obesity
Dangerous Obesity
Fat Cell Hyperplasia
Fat Cell Hypertrophy
Excess energy buffered
Excess energy spillover
↑ Lipolysis
↑ 'Bad' adipokines
↓ Glucose Uptake
↑ Glucose production
↑ VLDL
↓ Insulin Clearance
↓ Insulin Secretion
↑ β-cell death
↑ heart cell death
Healthy Metabolic Profile
Metabolic Risk


Ranges for determining public health and clinical action based on BMI
High to very high risk
Moderate to high risk
Low to moderate risk
16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40
WHO classification
Underweight
Overweight
Obese I
Obese II
Obese III

Rating	Men	Women
Essential fat	2–5 %	10–13 %
Athletes	6–13 %	14–20 %
Fitness	14–17 %	21–24 %
Average	18–24 %	25–31 %
Obese	25 % +	32 % +

PHYSICAL STATUS: THE USE AND INTERPRETATION OF ANTHROPOMETRY

World Health Organization

Geneva 1995

Males	Females	Rating
5–10 %	8–15 %	Athletic
11–14 %	16–23 %	Good
15–20 %	24–30 %	Acceptable
21–24 %	31–36 %	Overweight
>24 %	>36 %	Obese

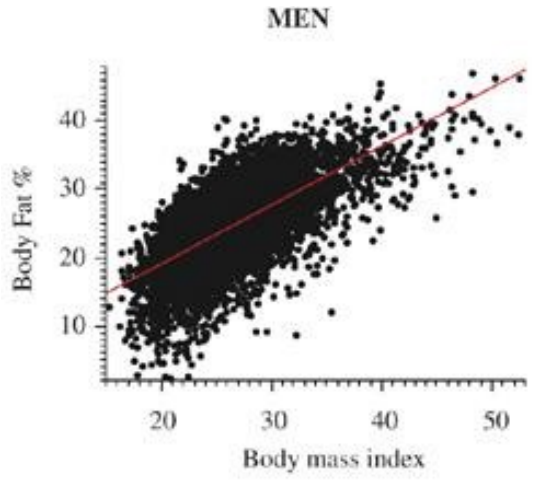
Sex and BMI	20–39 y	40–59 y	60-79 y
Women			
BMI <18,5	21 %	23 %	24 %
BMI ≥25	33 %	34 %	36 %
BMI ≥30	39 %	40 %	42 %
Men			
BMI <18,5	8 %	11 %	13 %
BMI ≥25	20 %	22 %	25 %
BMI ≥30	25 %	28 %	30 %

Obesity definition	Men	Women
Body fat percentage	>25 %	>35 %

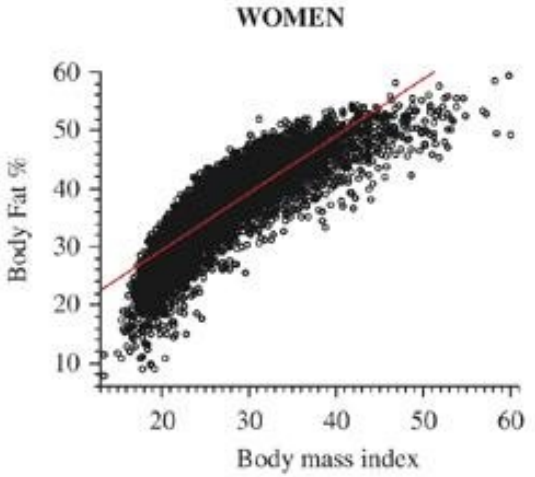
Sex	Men	Women
Normal range	10–20 %	18–28 %

	Men	Women
BMI ≥30	19,1 %	24,7 %
BF % >25/>35	43,9 %	52,3 %

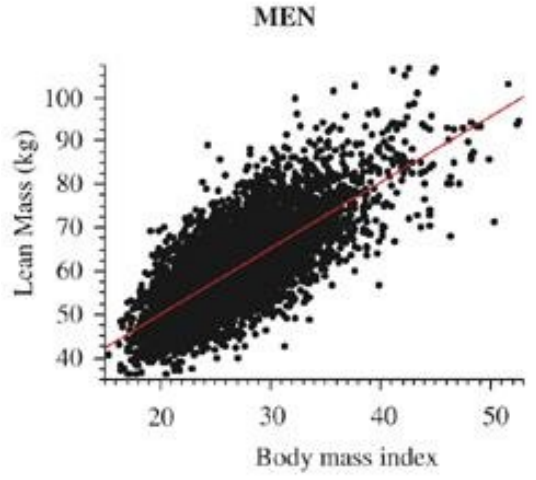
	Men	Women
Specifita	95 %	99 %
Senzitivita	36 %	49 %



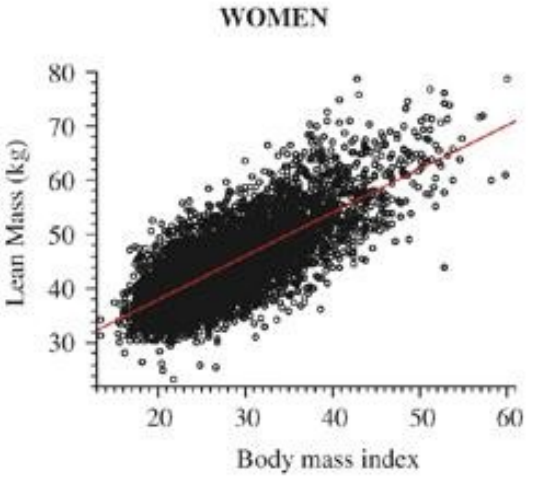
N = 6,580 Adjusted rho (ρ) = 0.65, p < 0.0001



N = 7,021 Adjusted rho (ρ) = 0.87, p < 0.0001



N = 6,580 Adjusted rho (ρ) = 0.73, p < 0.0001



N = 7,021 Adjusted rho (ρ) = 0.74, p < 0.0001

	Men	Women
Specifita	95 %	99 %
Senzitivita	36 %	49 %

Table 3 – Differences in metabolic characteristics and body composition in the at risk obese, obese and the metabolically normal individuals.

Characteristic	Metabolically Healthy	"At Risk" Obese	Metabolically Healthy Obese	Metabolically Obese Normal Weight
Visceral Fat	↓	↑	↓	↑
BMI	↓	↑	↑	↓
Fat Mass	↓	↑	↑	↑
Lean Body Mass	↑	-	-	↓
Insulin Sensitivity	↑	↓	↑	↓
Hepatic Fat	↓	-	-	↑
Triglycerides	↓	↑	↓	↑
HDL	-	↓	↑	-

↑ = High; ↓ = Low.
Metabolically Healthy: ideal metabolic profile and normal weight.
"At risk" Obese: increased body fat + abnormal metabolic profile.
Metabolically Healthy Obese: Increased fat mass + normal metabolic profile + high levels of insulin sensitivity.
Metabolically Obese Normal Weight: normal weight obese individual may or may not have metabolic syndrome and that body fat mas
percentage is required to define the term.

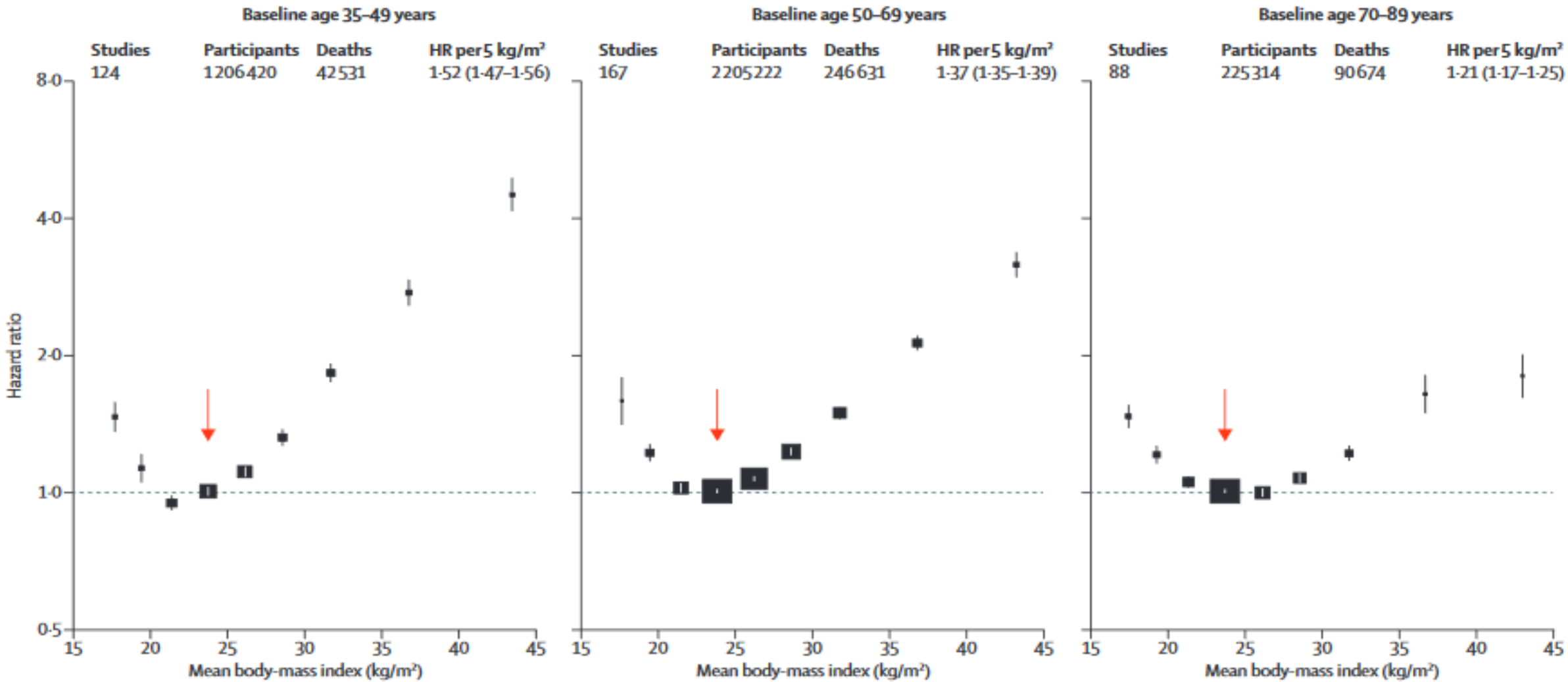
Lancet. 2016 Aug 20; 388(10046): 776–786.
doi: 10.1016/S0140-6736(16)30175-1

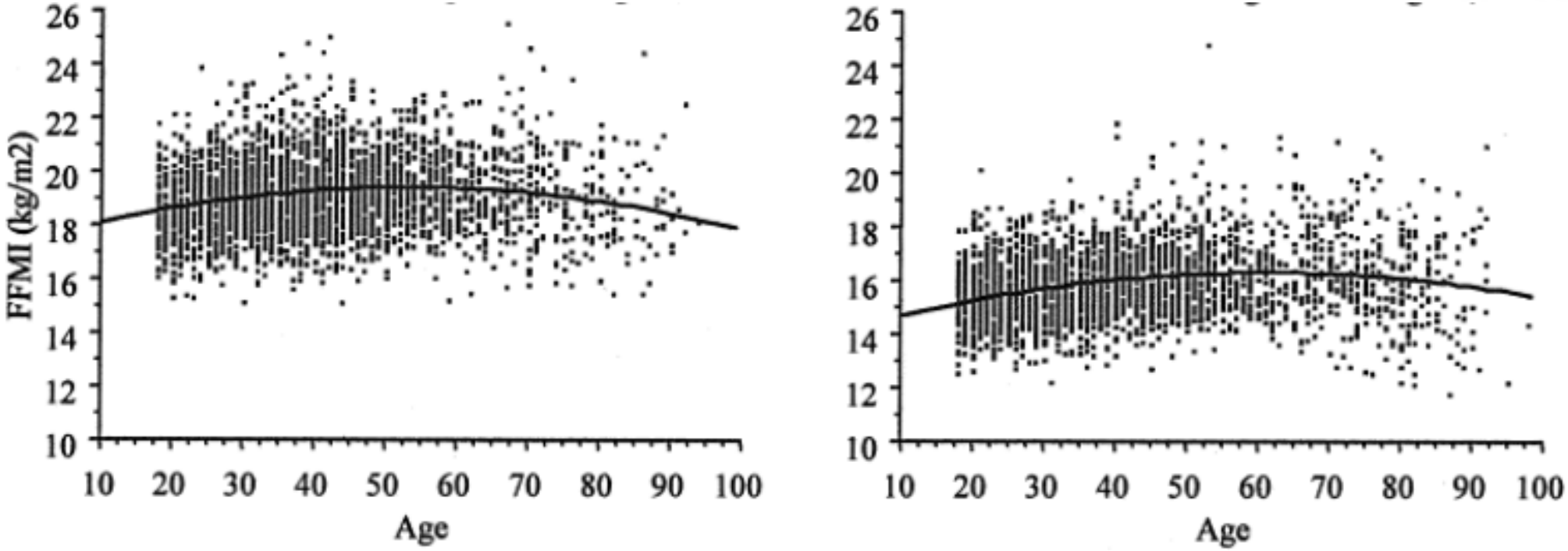
PMCID: PMC4995441
PMID: 27423262

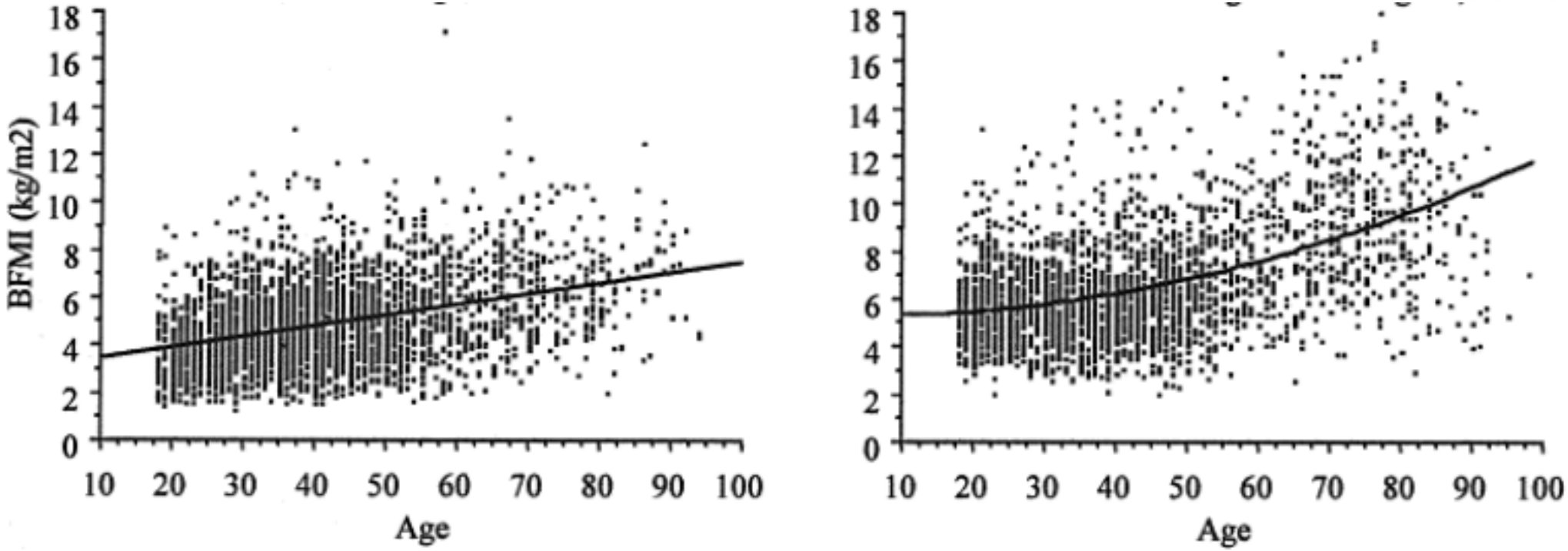
Body-mass index and all-cause mortality: individual-participant-data meta-analysis of 239 prospective studies in four continents

	15·0–<18·5 kg/m²	18·5–<20·0 kg/m²	20·0–<22·5 kg/m²	22·5–<25·0 kg/m²	25·0–<27·5 kg/m²	27·5–<30·0 kg/m²	30·0–<35·0 kg/m²	35·0–<40·0 kg/m²	40·0–<60·0 kg/m²
Participants/deaths	114 091/12 726	230 749/20 989	838 907/72 701	1075 894/98 833	821 303/84 952	428 800/45 341	330 840/37 318	80 827/9 179	30 044/3 840
HR (95% CI)	1·51 (1·43–1·59)	1·13 (1·09–1·17)	1·00 (0·98–1·02)	1·00 (0·99–1·01)	1·07 (1·07–1·08)	1·20 (1·18–1·22)	1·45 (1·41–1·48)	1·94 (1·87–2·01)	2·76 (2·60–2·92)

189 studies; 3 951 455 participants; 385 879 deaths. The primary prespecified analysis in never-smokers without known chronic disease at baseline, excluding the first 5 years of follow-up (with normal weight and overweight categories further subdivided into: 18·5–<20·0 kg/m², 20·0–<22·5 kg/m², 22·5–<25·0 kg/m², 25·0–<27·5 kg/m², and 27·5–<30·0 kg/m²). CIs were calculated using floating variance estimates (reflecting independent variability within each group, including the reference group). Reference group is 22·5–<25·0 kg/m². All analyses are adjusted for age and sex. Baseline BMI categories were defined by WHO. BMI=body-mass index. HR=hazard ratio.


Baseline age 35–49 years
Studies 124
Participants 1206420
Deaths 42531
HR per 5 kg/m² 1·52 (1·47–1·56)
Baseline age 50–69 years
Studies 167
Participants 2205222
Deaths 246631
HR per 5 kg/m² 1·37 (1·35–1·39)
Baseline age 70–89 years
Studies 88
Participants 225314
Deaths 90674
HR per 5 kg/m² 1·21 (1·17–1·25)
Hazard ratio
8·0
4·0
2·0
1·0
0·5
15
20
25
30
35
40
45
Mean body-mass index (kg/m²)


FFMI (kg/m2)
26
24
22
20
18
16
14
12
10
10 20 30 40 50 60 70 80 90 100
Age
26
24
22
20
18
16
14
12
10
10 20 30 40 50 60 70 80 90 100
Age


BFMI (kg/m2)
0
2
4
6
8
10
12
14
16
18
10
20
30
40
50
60
70
80
90
100
Age

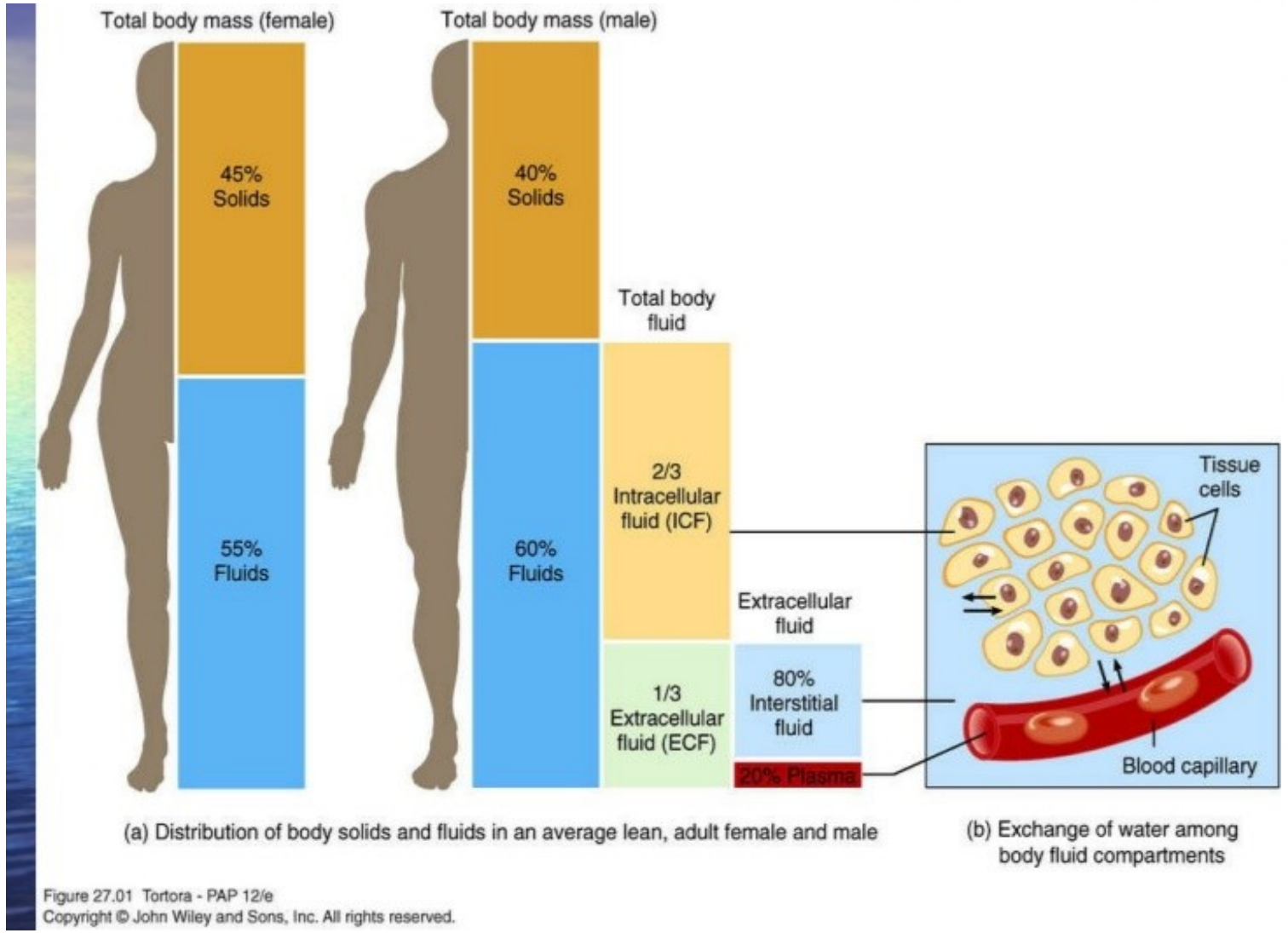
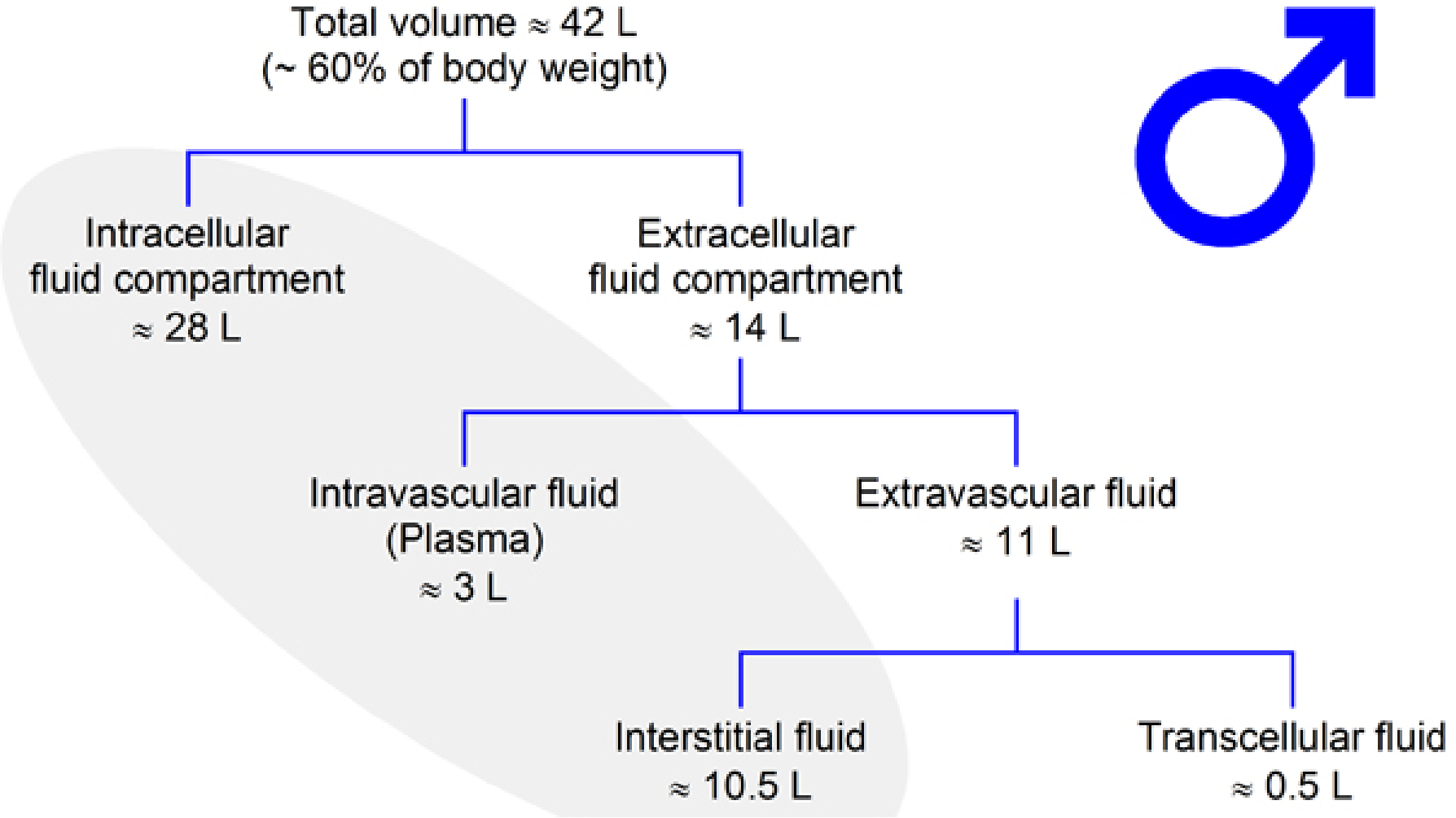
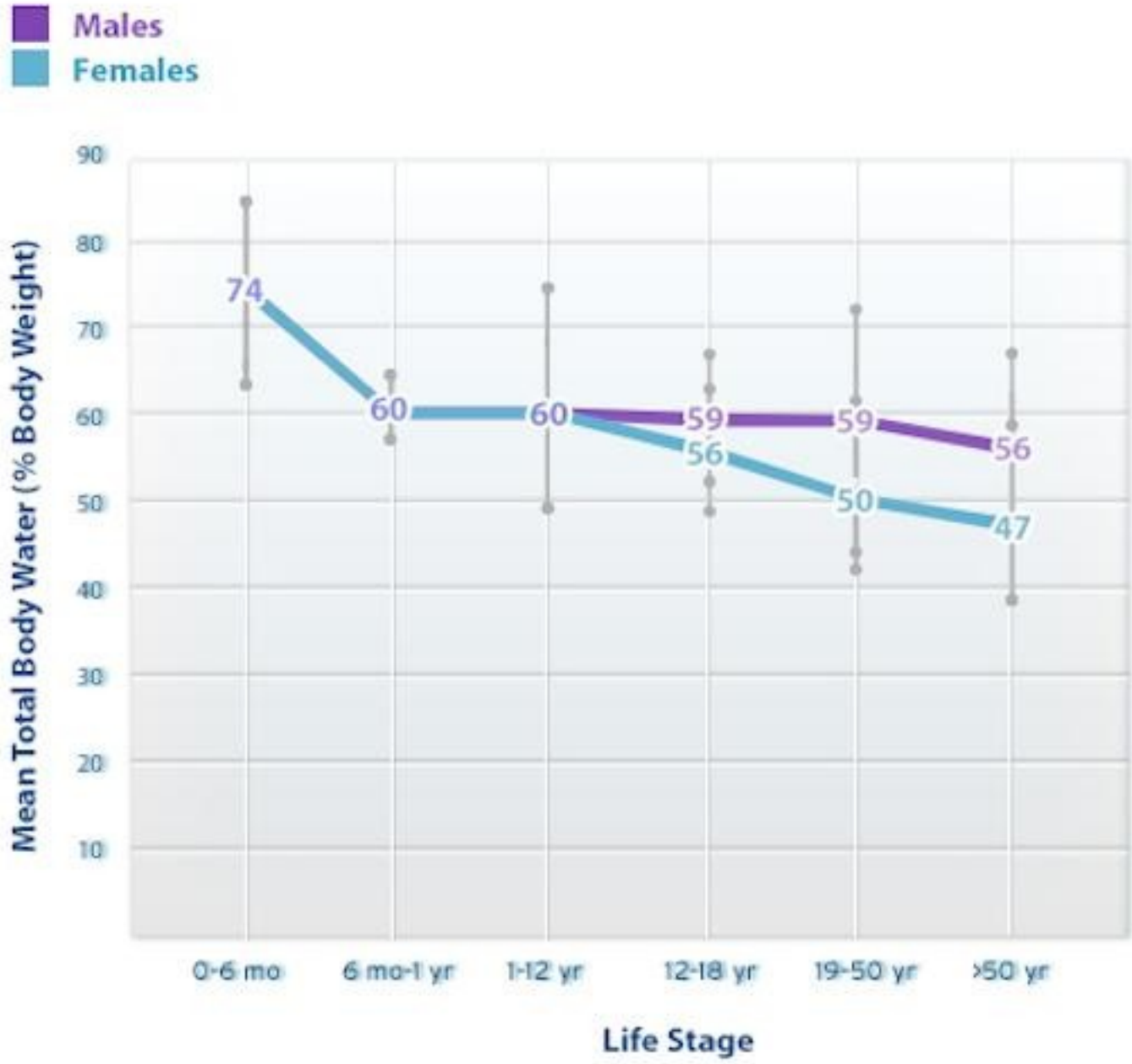
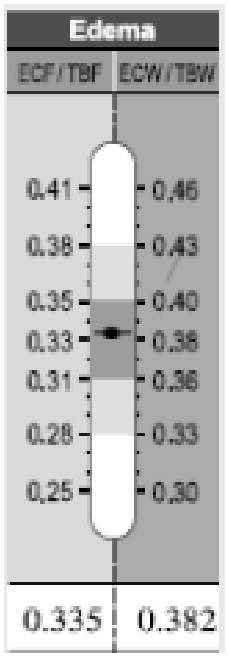


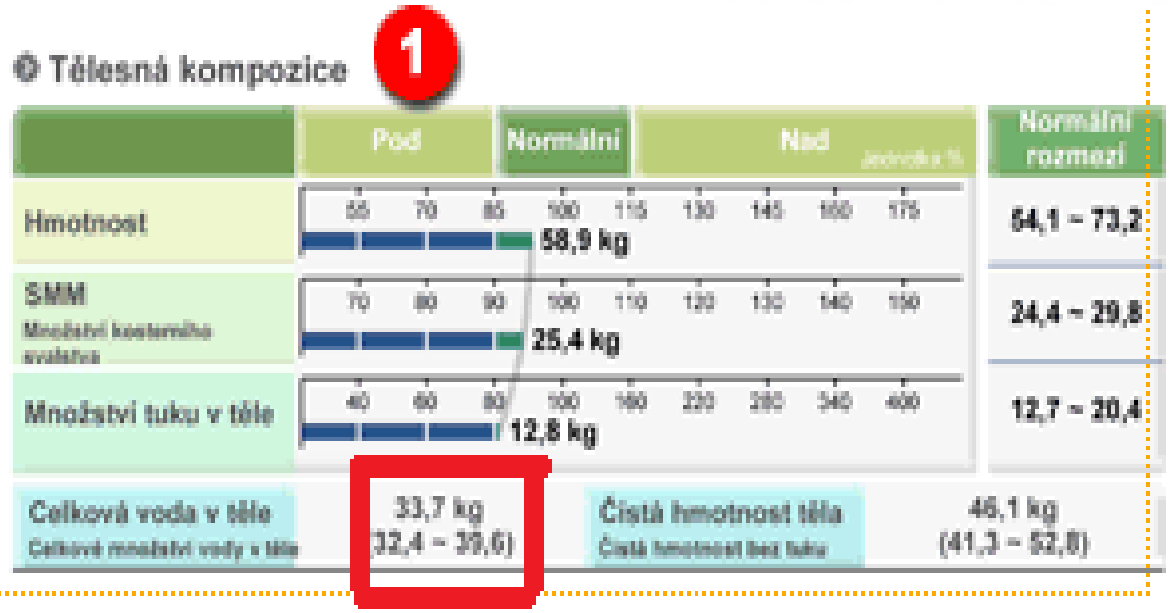
Figure 27.01 Tortora - PAP 12/e

Body Fluid Compartments of a 70-kg Adult Man



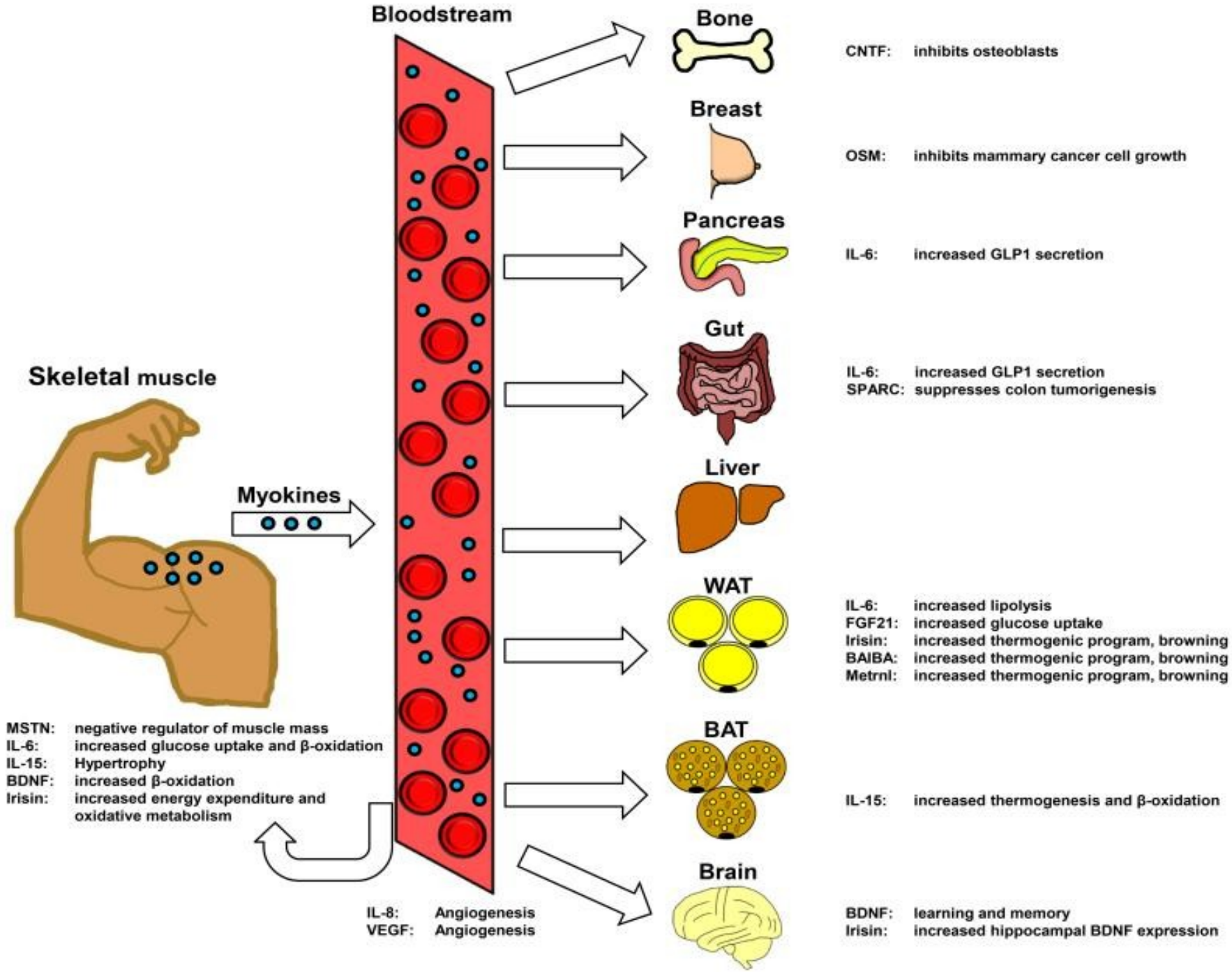

Males
Females
Mean Total Body Water (% Body Weight)
90
80
70
60
50
40
30
20
10
74
60
60
59
59
56
56
50
47
0-6 mo
6 mo-1 yr
1-12 yr
12-18 yr
19-50 yr
>50 yr
Life Stage


Edema
ECF / TBF
ECW / TBW
0.41
0.38
0.35
0.33
0.31
0.28
0,25
0,46
0,43
0,40
0,38
0,36
0,33
0,30
0.335
0.382


Tělesná kompozice
1
Pod
Normální
Nad
Normální rozmezí
Hmotnost
58,9 kg
54,1 ~ 73,2
SMM
Množství kostemího svalstva
25,4 kg
34,4 ~ 29,8
Množství tuku v těle
12,8 kg
12,7 ~ 20,4
Celková voda v těle
Celkové množství vody v těle
33,7 kg
(32,4 ~ 39,6)
Čistá hmotnost těla
Čistá hmotnost bez tuku
46,1 kg
(41,3 ~ 52,8)

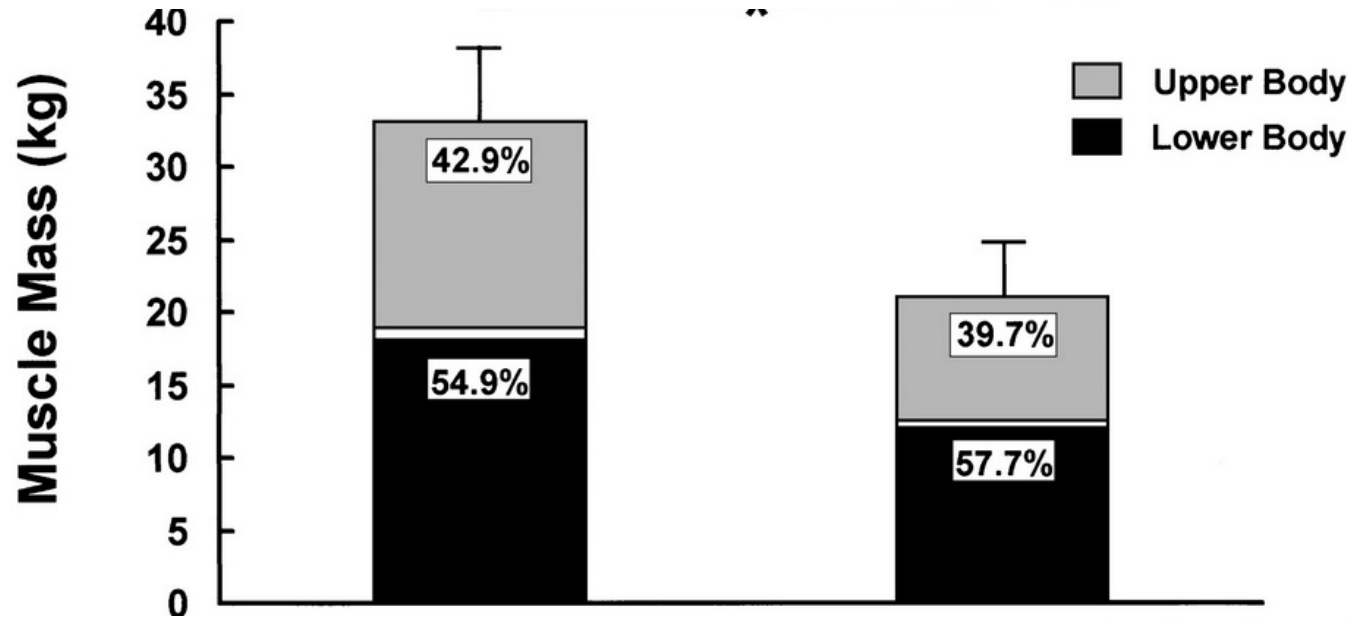
Složka	Procentuální zastoupení
Voda	73 %
Proteiny	20 %
Glykogen	1–2 %
Intramuskulární tuk	0,01–1 %, zdroje se velmi různí
Anorganické a další organické látky	<5

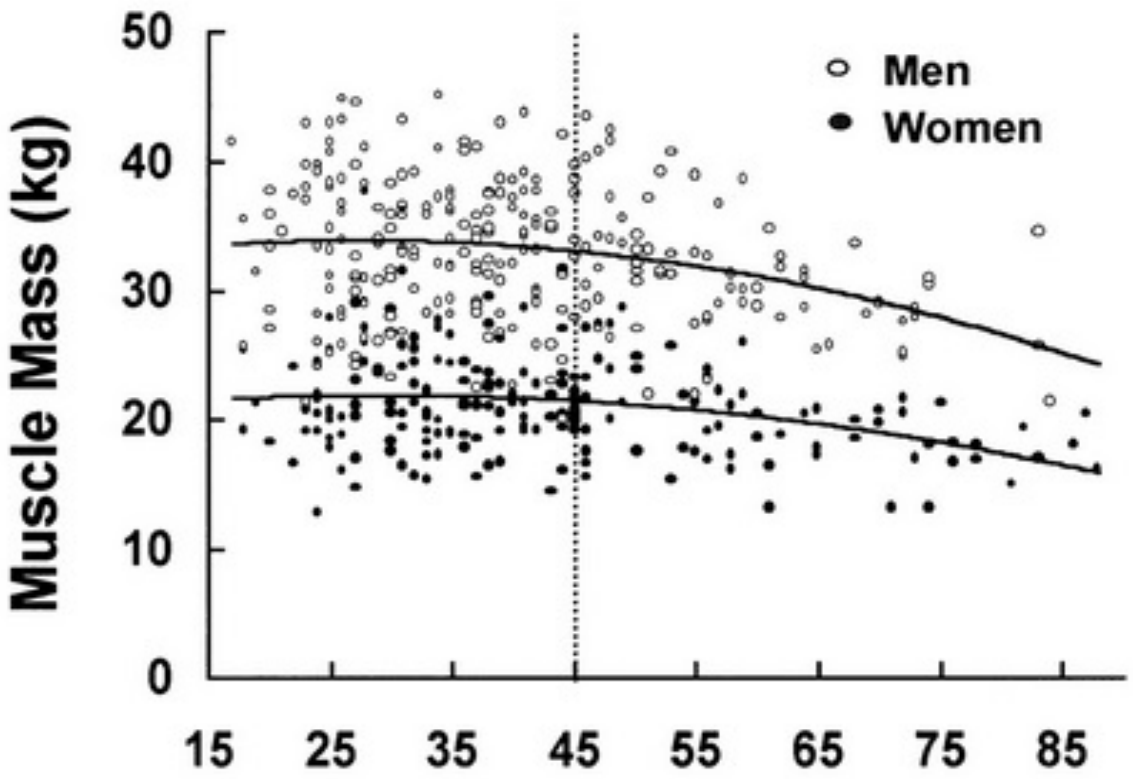
Orgán	Spotřeba energie	Procentuální zastoupení v potřebě energie	Hmotnostní zastoupení
Játra	200 kcal/kg/den	27 %	<6 %
Ledviny	440 kcal/kg/den	10 %	
Srdce	440 kcal/kg/den	7 %	
Mozek	240 kcal/kg/den	19 %	
Tuková tkáň	4,5 kcal/kg/den	6 %	15 %
Kosterní svalstvo	13–14,5 kcal/kg/den	20–30 %	30–50 %

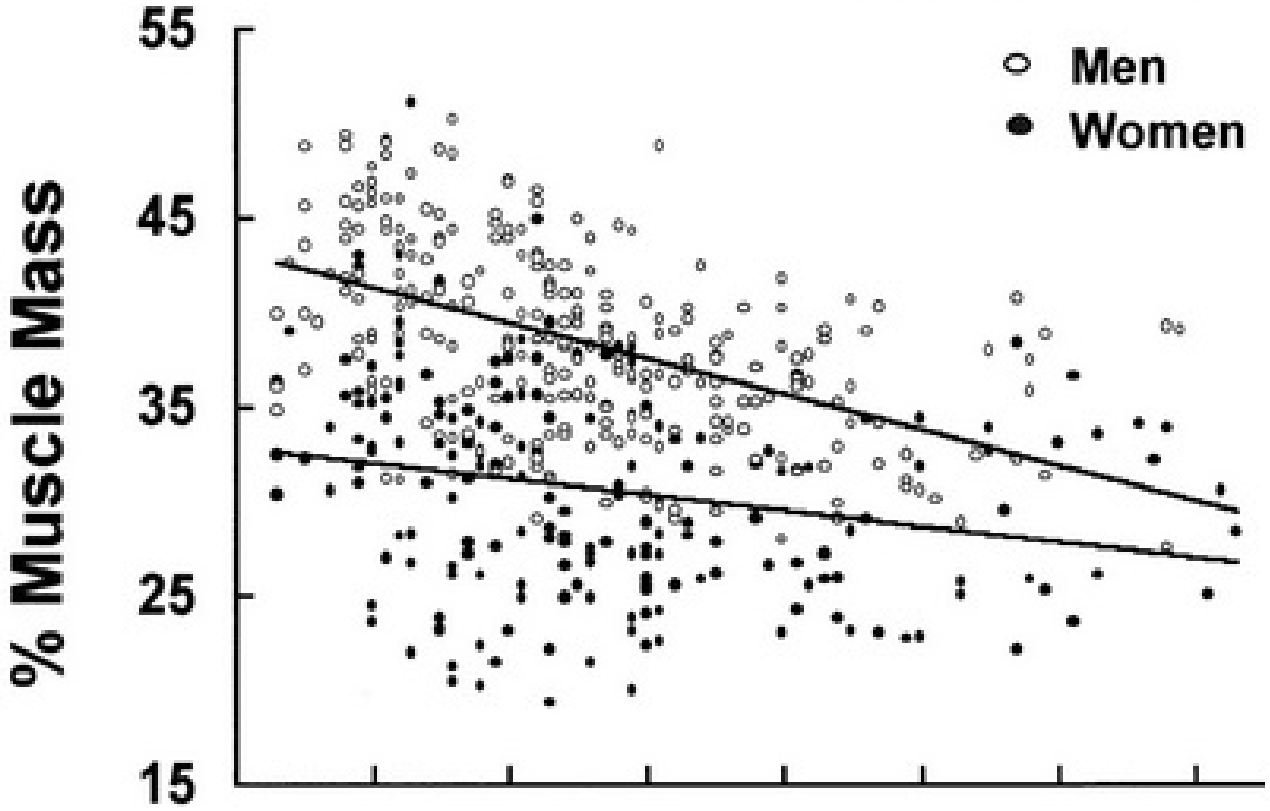

Bloodstream
Bone
CNTF: inhibits osteoblasts
Breast
OSM: inhibits mammary cancer cell growth
Pancreas
IL-6: increased GLP1 secretion
Gut
IL-6: increased GLP1 secretion
SPARC: suppresses colon tumorigenesis
Skeletal muscle
Myokines
Liver
WAT
IL-6: increased lipolysis
FGF21: increased glucose uptake
Irisin: increased thermogenic program, browning
BAIBA: increased thermogenic program, browning
Metrnl: increased thermogenic program, browning
BAT
IL-15: increased thermogenesis and β-oxidation
Brain
BDNF: learning and memory
Irisin: increased hippocampal BDNF expression
MSTN: negative regulator of muscle mass
IL-6: increased glucose uptake and β-oxidation
IL-15: Hypertrophy
BDNF: increased β-oxidation
Irisin: increased energy expenditure and oxidative metabolism
IL-8: Angiogenesis
VEGF: Angiogenesis

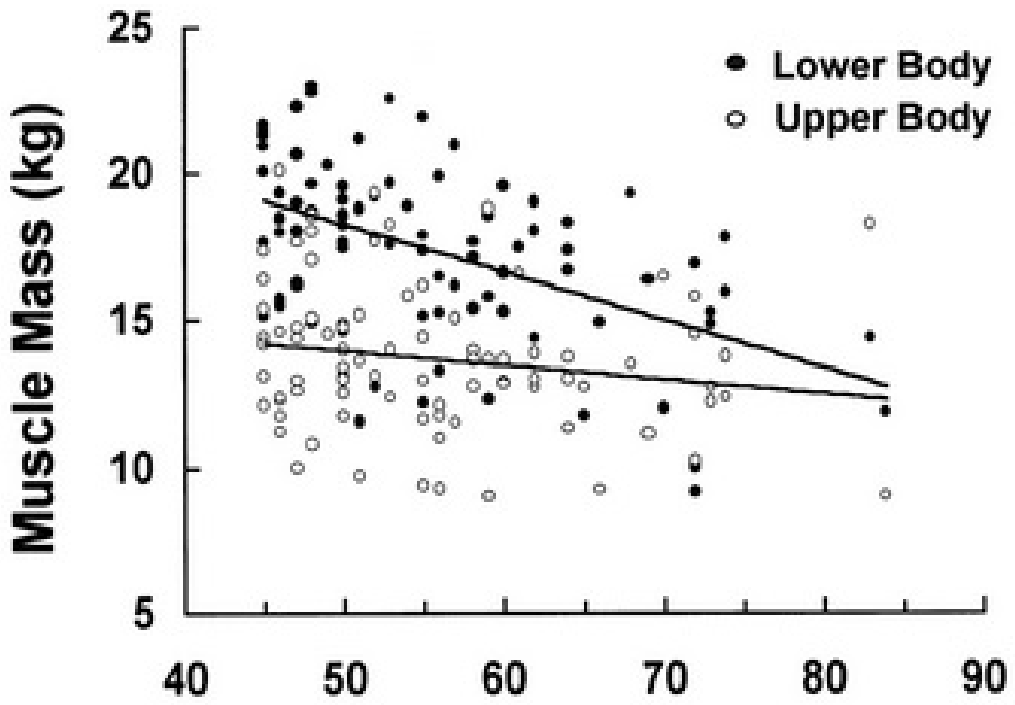
Gender and Age Range, yr	n	Weight, kg	Height, cm	BMI, kg/m^2	Total SM, kg	Relative SM, %	Lower Body, SM, kg	Upper Body, SM, kg
Men								
18–29	66	79.9 ± 15.4	178 ± 7	25.3 ± 4.5	33.7 ± 5.8	42.3 ± 4.4	18.5 ± 3.3	14.3 ± 2.9
30–39	77	89.0 ± 17.0	176 ± 7	28.2 ± 4.9	34.0 ± 4.7	39.1 ± 5.0	18.7 ± 3.0	14.7 ± 2.2
40–49	64	90.9 ± 16.6	177 ± 7	28.9 ± 4.5	33.5 ± 5.5	37.1 ± 4.0	18.3 ± 3.0	14.1 ± 2.6
50–59	36	90.0 ± 14.0	176 ± 6	28.9 ± 4.0	31.4 ± 4.8	35.1 ± 3.4	17.3 ± 2.7	13.5 ± 2.5
60–69	14	90.1 ± 11.5	177 ± 5	28.6 ± 3.5	30.2 ± 3.1	33.8 ± 3.9	16.7 ± 2.2	12.8 ± 1.6
70+	11	78.8 ± 12.1	173 ± 8	26.5 ± 4.5	27.8 ± 3.4	36.0 ± 7.3	13.8 ± 2.9	13.5 ± 2.8
All men	268	87.1 ± 16.2*	177 ± 7*	27.7 ± 4.7*	33.0 ± 5.3*	38.4 ± 5.1*	18.1 ± 3.1*	14.1 ± 2.6*

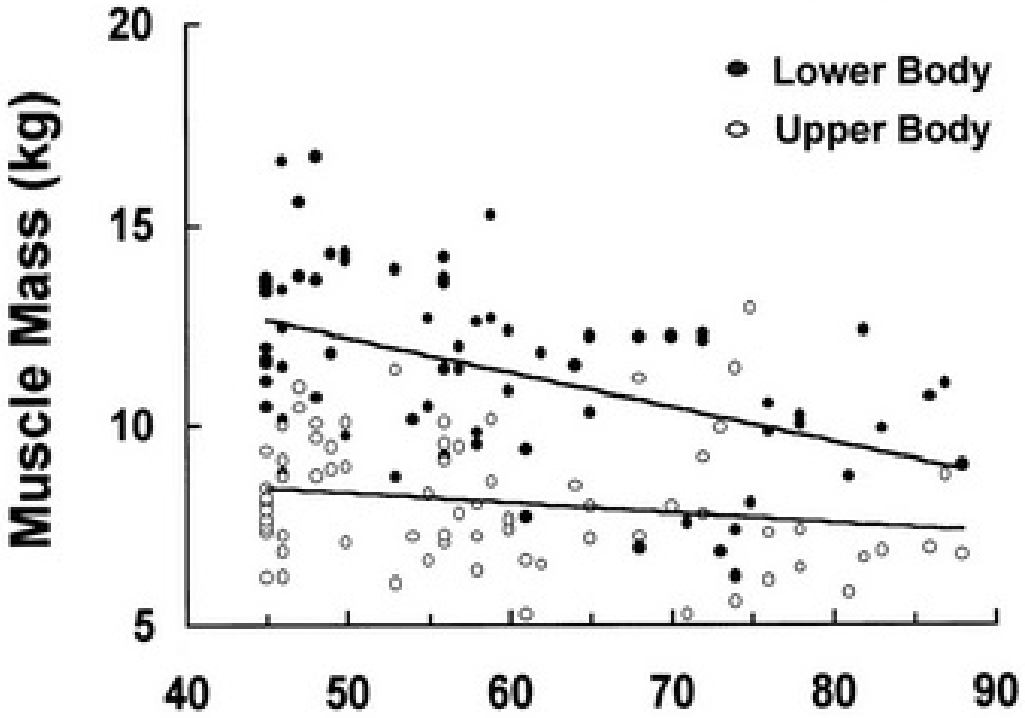
Gender and Age Range, yr	n	Weight, kg	Height, cm	BMI, kg/m^2	Total SM, kg	Relative SM, %	Lower Body, SM, kg	Upper Body, SM, kg
Women								
18–29	40	65.0 ± 16.8	164 ± 6	24.1 ± 5.3	21.8 ± 4.6	34.1 ± 5.7	12.5 ± 2.6	8.7 ± 2.6
30–39	63	73.6 ± 21.3	165 ± 7	27.0 ± 7.3	21.6 ± 3.7	30.6 ± 5.6	12.7 ± 2.5	8.5 ± 1.5
40–49	46	75.6 ± 17.1	162 ± 7	28.9 ± 6.0	21.4 ± 3.4	29.2 ± 5.0	12.7 ± 2.1	8.4 ± 1.3
50–59	21	72.7 ± 17.1	165 ± 8	26.8 ± 4.3	20.9 ± 3.4	29.1 ± 4.4	12.0 ± 2.0	8.3 ± 1.5
60–69	11	69.7 ± 16.8	162 ± 8	26.4 ± 5.6	18.4 ± 2.2	27.3 ± 4.6	10.5 ± 1.9	7.5 ± 1.5
70+	19	60.8 ± 12.2	157 ± 6	24.6 ± 4.9	18.0 ± 2.5	30.2 ± 4.7	9.7 ± 2.0	7.7 ± 2.1
All women	200	70.9 ± 18.2	163 ± 7	26.6 ± 6.2	21.0 ± 3.8	30.6 ± 5.5	12.2 ± 2.5	8.4 ± 1.8


Muscle Mass (kg)
40
35
30
25
20
15
10
5
0
42.9%
54.9%
39.7%
57.7%
Upper Body
Lower Body


Muscle Mass (kg)
50
40
30
20
10
0
15
25
35
45
55
65
75
85
Men
Women

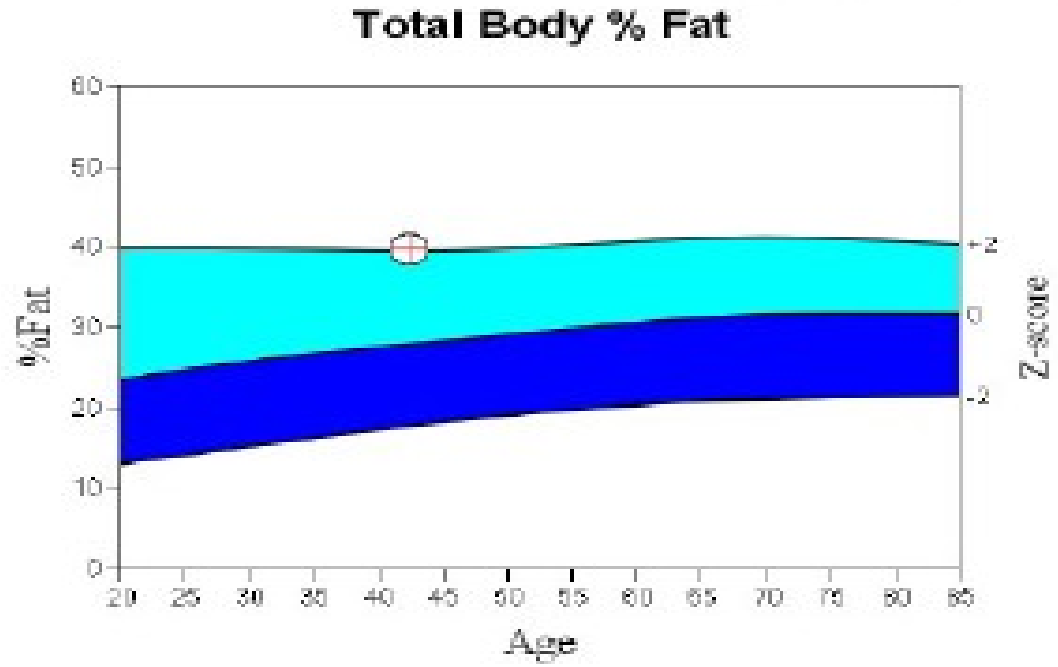

% Muscle Mass
55
45
35
25
15
Men
Women


Muscle Mass (kg)
25
20
15
10
5
40
50
60
70
80
90
Lower Body
Upper Body


Muscle Mass (kg)
20
15
10
5
40
50
60
70
80
90
Lower Body
Upper Body

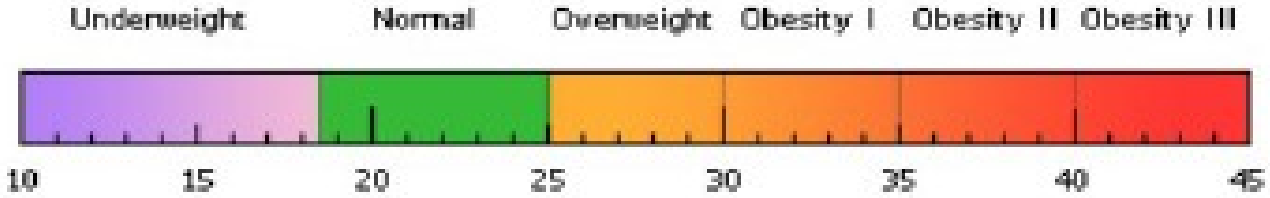
Compartments	Values	Total Body Water	Soft Lean Mass	Fat Free Mass	Weight	Normal Range
I C W *Intracellular Water* (ℓ)	24.3	38.7	49.9	52.8	68.0	22.2 ~ 27.1
E C W *Extracellular Water* (ℓ)	14.4					13.6 ~ 16.6
Protein (kg)	10.5					9.6 ~ 11.7
Mineral (kg)	3.54	*non-osseous* *osseous*: 2.91				3.31 ~ 4.04
Body Fat Mass (kg)	15.2					7.6 ~ 15.3

Název metody	Princip metody
Bioimpedanční metody (InBody, Bodystat, Tanita)	Různý odpor tkání (FFM vs. FM) pro procházející el. proud
Duální rentgenová absorpciometrie (DXA)	Odlišná absorpce rentgenového záření tkáněmi (FFM vs. FM vs. kostní hmota)
Podvodní vážení	Různá hustota tkání v organismu (FFM vs. FM) a objem těla vyšetřovaného
Celotělová pletysmografie (BOD POD)	Různá hustota tkání v organismu (FFM vs. FM) a objem těla vyšetřovaného
Magnetická rezonance (MRI)	Odlišné složení tkání z hlediska atomů



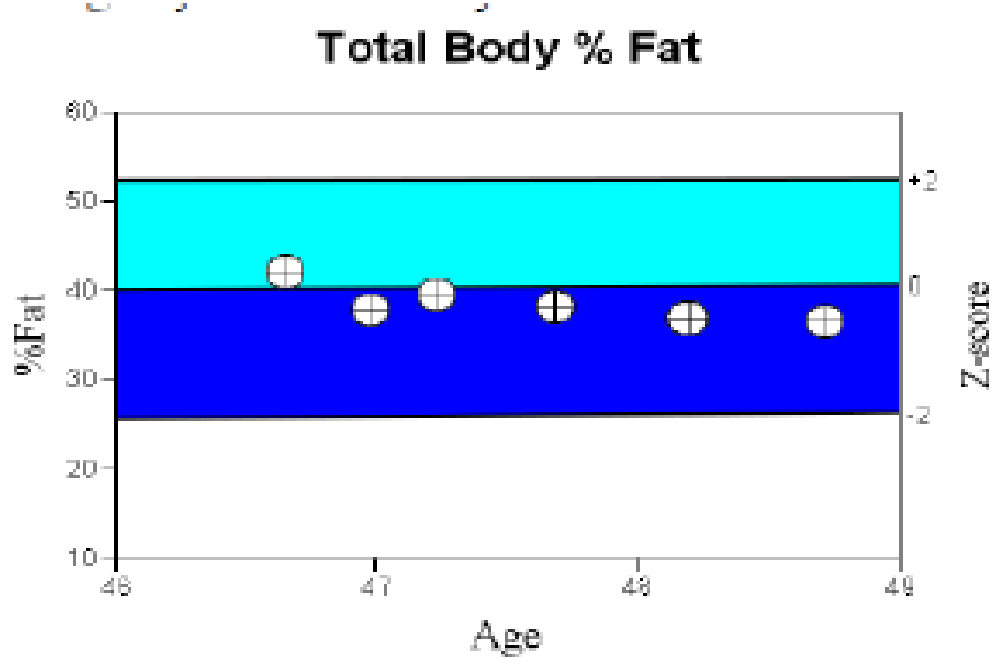
Source: 2008 NHANES White Male

World Health Organization Body Mass Index Classification
BMI = 46.6 WHO Classification



DXA Results Summary:

Region	BMC (g)	Fat Mass (g)	Lean Mass (g)	Lean+ BMC (g)	Total Mass Mass (g)	% Fat
L Arm	224.98	3050.1	5175.6	5400.6	8450.7	36.1
R Arm	218.96	3160.6	5310.0	5528.9	8689.6	36.4
Trunk	958.26	36755.5	47514.5	48472.8	85228.2	43.1
L Leg	595.01	10115.0	16027.3	16622.3	26737.3	37.8
R Leg	615.92	10097.8	16686.3	17302.2	27400.0	36.9
Subtotal	2613.13	63179.0	90713.7	93326.8	156505.8	40.4
Head	639.60	1610.2	4149.6	4789.2	6399.5	25.2
Total	**3252.74**	**64789.2**	**94863.3**	**98116.1**	**162905.3**	**39.8**



e: 2008 NHANES White Female

Total Body % Fat Results

Scan Date	Age	%Fat	Percentile		Change vs	
			YN	AM	Baseline	Previous
24.04.2014	48	36.5	53	28	-5.4	-0.3
15.10.2013	48	36.8	54	30	-5.1	-1.4
15.04.2013	47	38.2	61	38	-3.7	-1.3
29.10.2012	47	39.5	68	46	-2.5	1.6
30.07.2012	46	37.8	60	36	-4.1	-4.1
02.04.2012	46	41.9	78	61		

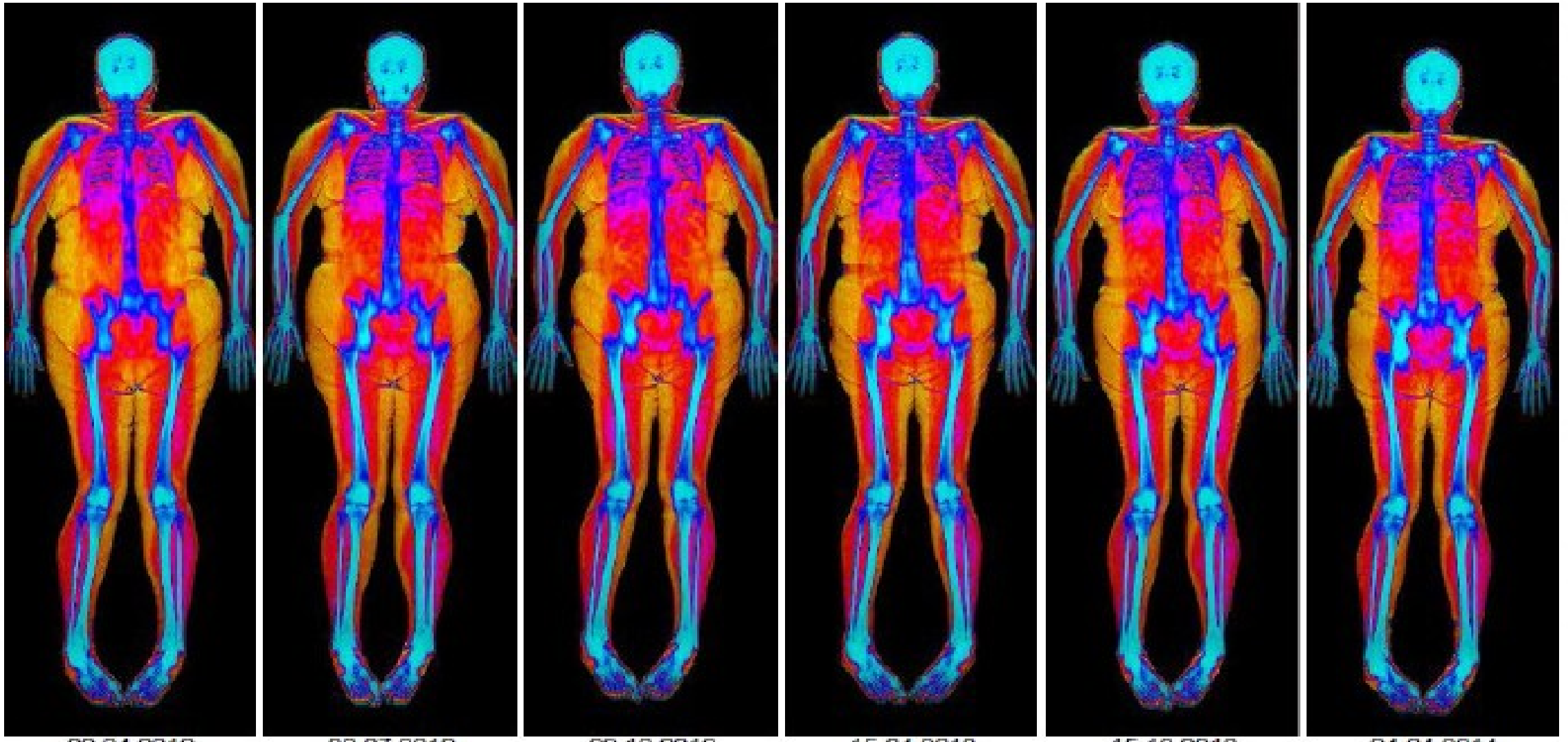
Total Lean+BMC Mass Results

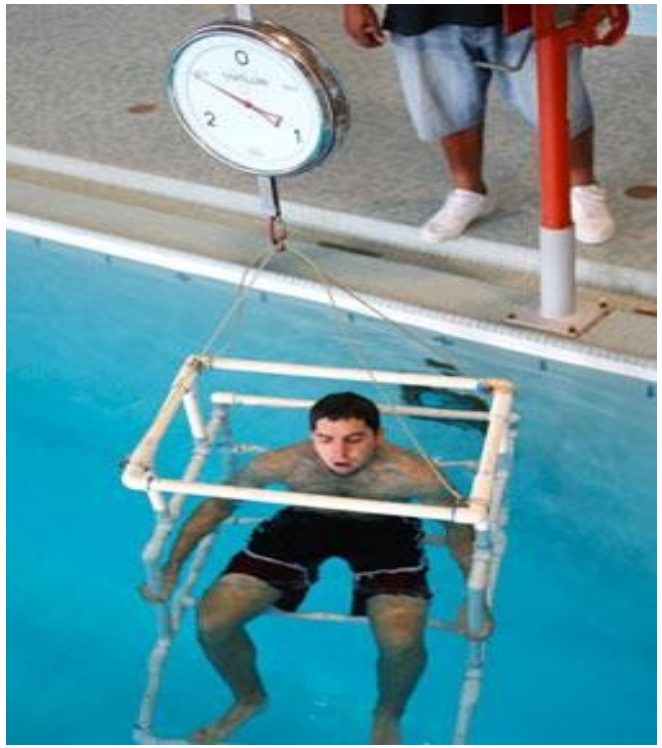
Scan Date	Age	Lean+ BMC (g)	Change/Month vs		Change vs	
			Baseline	Previous	Baseline	Previous
24.04.2014	48	56074	-378	-163	-9326	-1025
15.10.2013	48	57099	-451	167	-8301	998
15.04.2013	47	56101	-751	-608	-9298	-3335
29.10.2012	47	59437	-868	-866	-5963	-2590
30.07.2012	46	62027	-870	-870	-3373	-3373
02.04.2012	46	65400				

Total Mass Results

Scan Date	Age	Mass (g)	Change/Month vs		Change vs	
			Baseline	Previous	Baseline	Previous
24.04.2014	48	88354	-983	-321	-24256	-2013
15.10.2013	48	90368	-1209	-63	-22242	-379
15.04.2013	47	90746	-1765	-1353	-21864	-7423
29.10.2012	47	98169	-2103	-523	-14440	-1564
30.07.2012	46	99734	-3321	-3321	-12876	-12876
02.04.2012	46	112610				

YN = Young Normal AM = Age Matched


02.04.2012
30.07.2012
29.10.2012
15.04.2013
15.10.2013
24.04.2014



Tělesný kompartment	Hustota
FFM	1,0997 g/cm³
FM	0,9168 g/cm³

Znění rovnice pro výpočet hustoty těla u podvodního vážení
$D = W_a / [(W_a - W_s / D_w) - V_r + 0,1]$

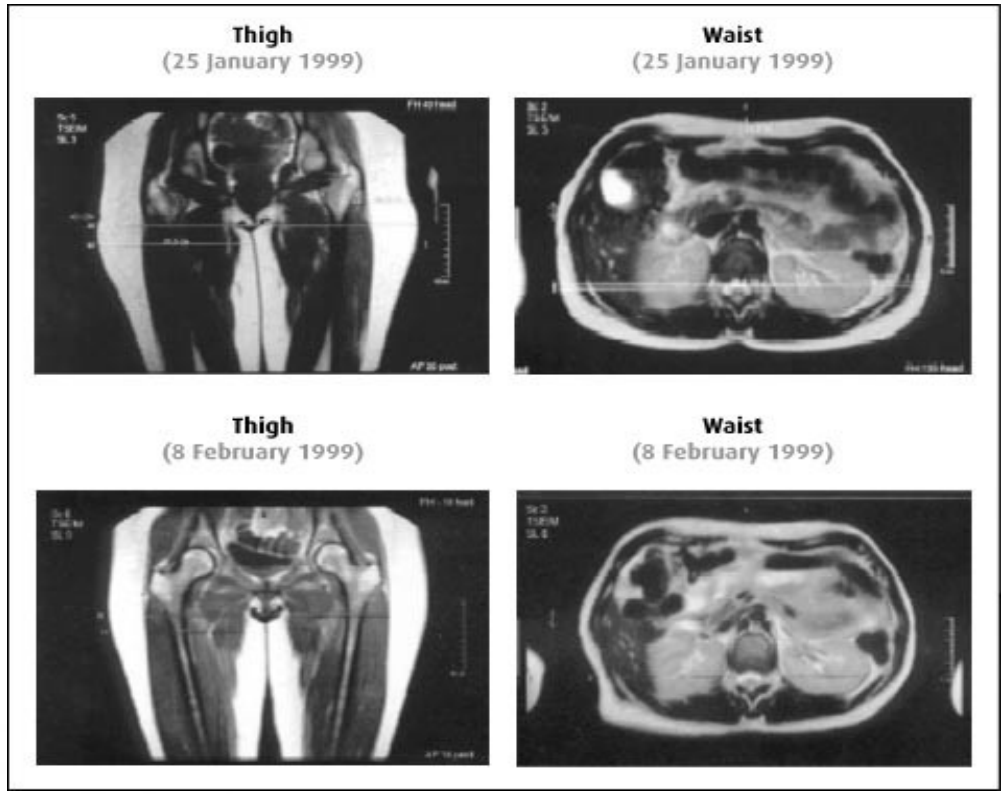
Tabulka 17: Znění rovnice týkající se hustoty těla u podvodního vážení

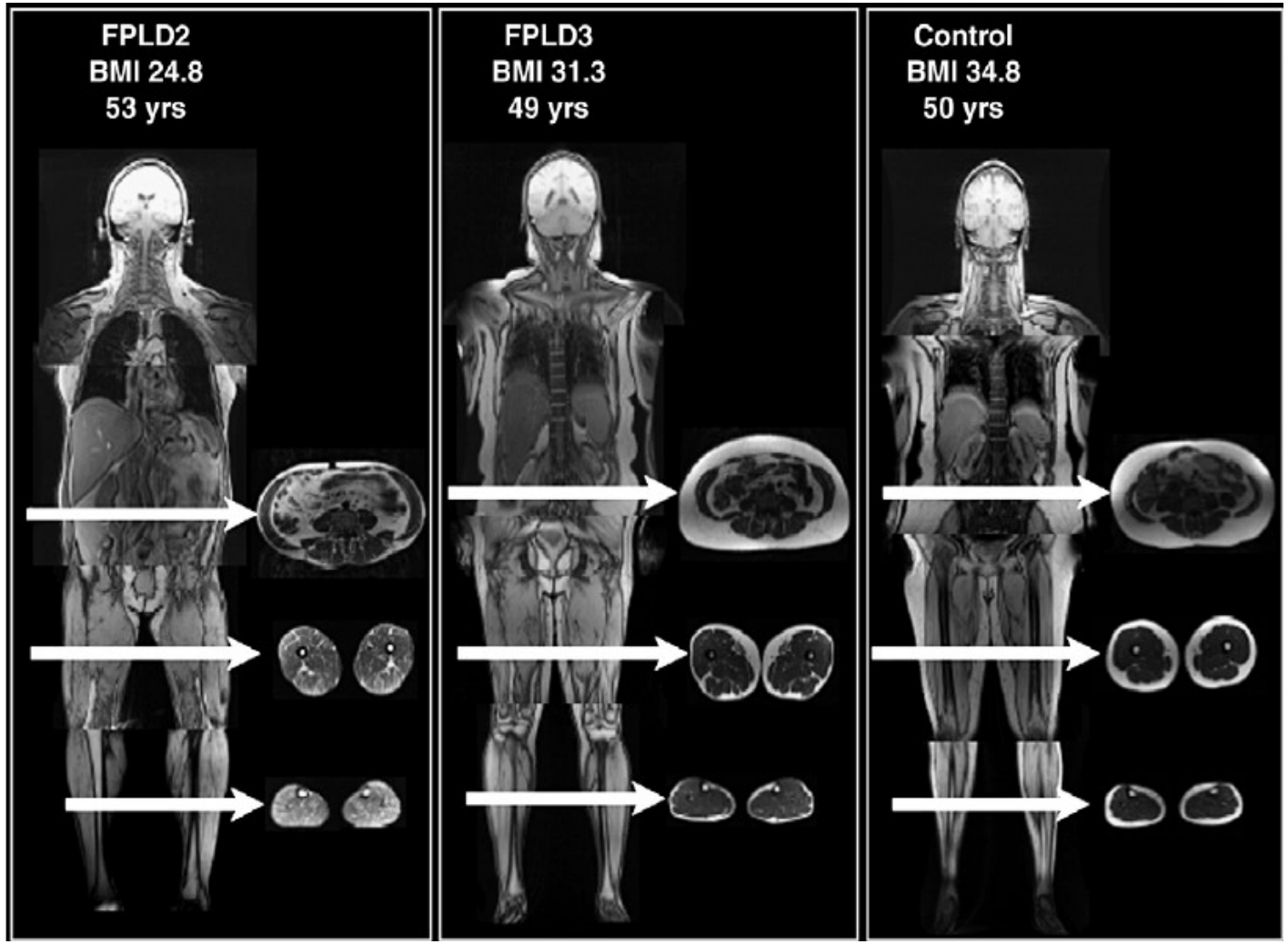
* W_a – hmotnost těla na vzduchu
* W_s – hmotnost těla pod vodou
* D_w – hustota vody při dané teplotě
* V_r – reziduální objem plic

Znění rovnice pro výpočet tělesného složení vycházející z hustoty těla
% BF = (4,57 / D – 4,142) × 100
% BF = (4,95 / D – 4,5) × 100

Tabulka 18: Znění rovnice pro výpočet tělesného složení založené na znalosti hustoty těla [244, 245]

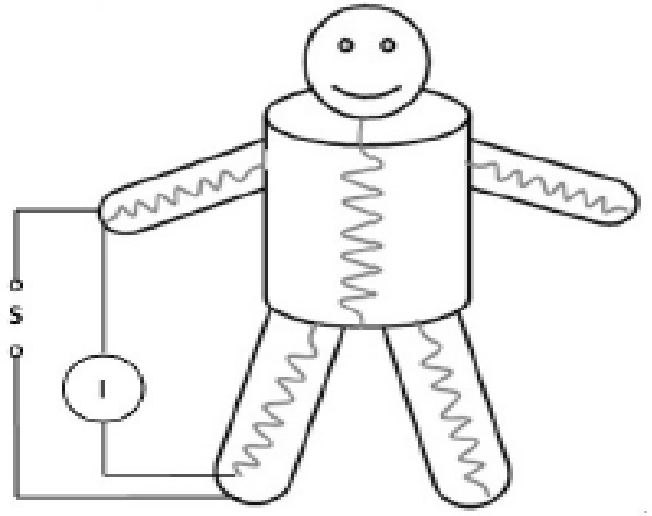
* % BF – procentuální zastoupení tukové tkáně
* D – denzita (hustota) těla


Thigh
(25 January 1999)
Waist
(25 January 1999)
Thigh
(8 February 1999)
Waist
(8 February 1999)


FPLD2
BMI 24.8
53 yrs
FPLD3
BMI 31.3
49 yrs
Control
BMI 34.8
50 yrs

OMRON HBF - 306C

Impedance (Z)



TBW = Ht² / Z

LBM = TBW/0,73

Tuk = Hmotnost - LBM

Z = L/A

Objem válce:

V = A x L

A = L/Z

Z = impedance – celkový tělesný odpor

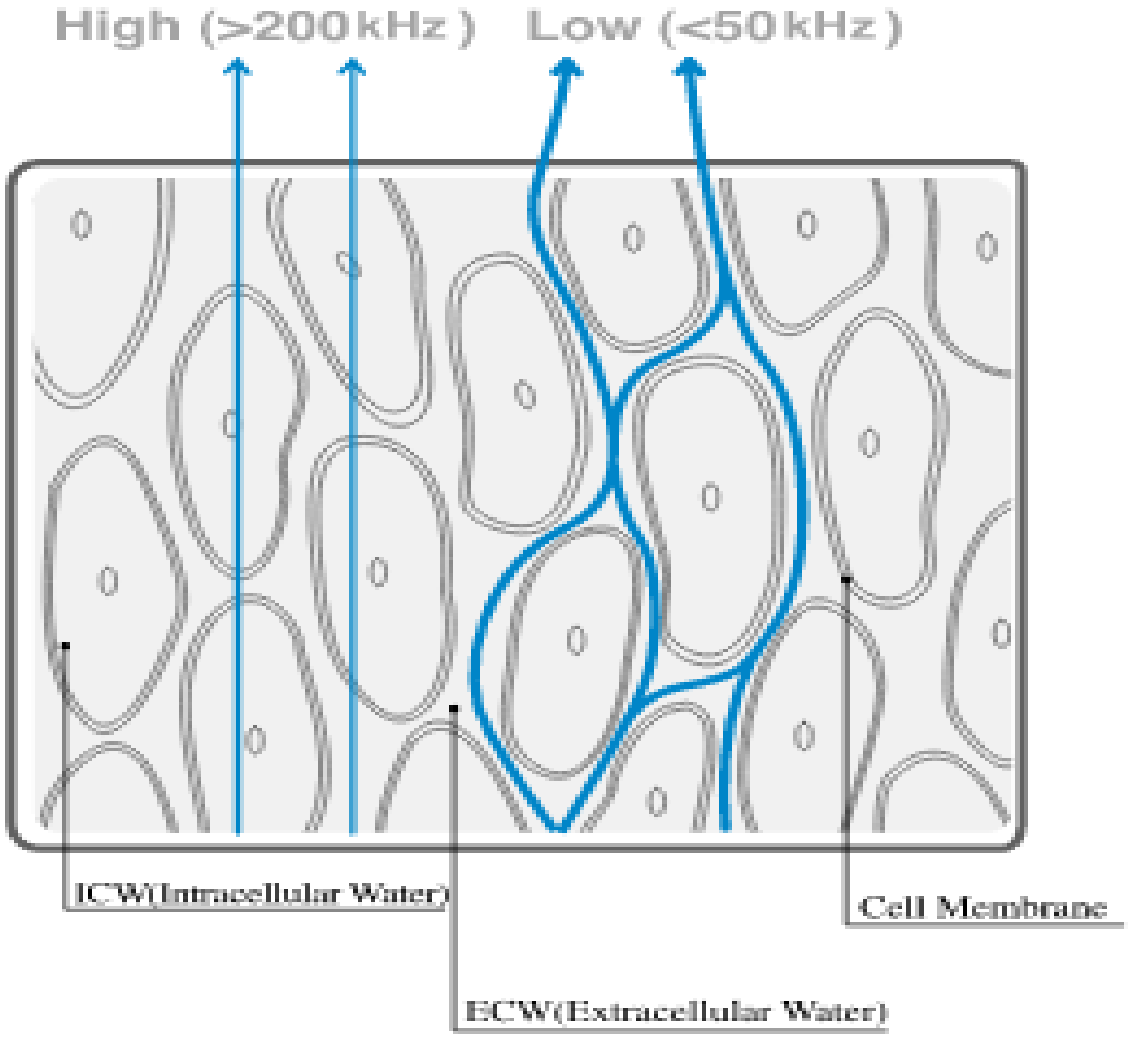
L = délka vodiče (cm)

A = plocha příčného průřezu (cm²)

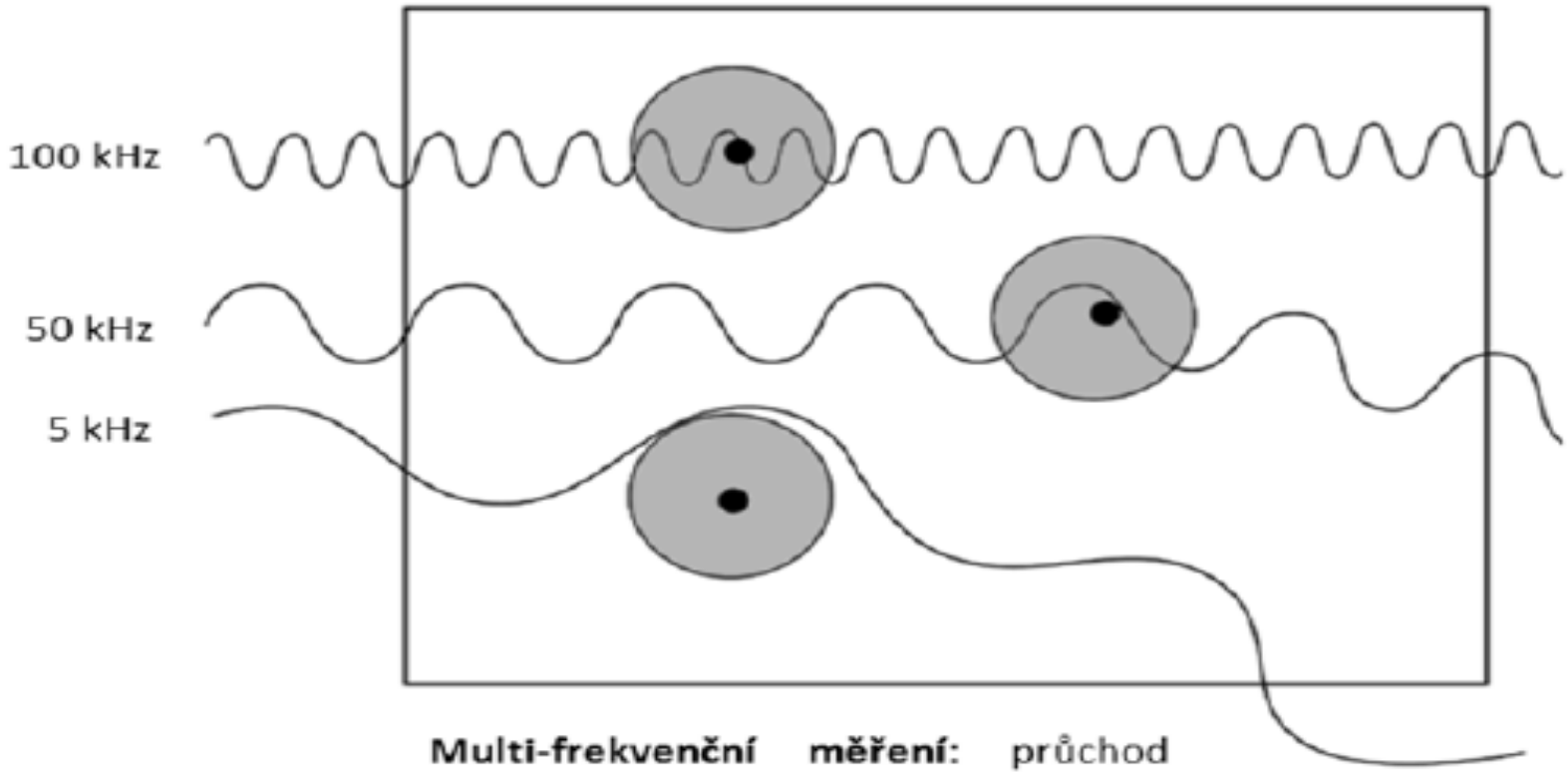
TBW = celková tělesná voda

Ht = tělesná výška (cm)

LBM = ATH = tukuprostá tělesná hmota


High (>200kHz)
Low (<50kHz)
ICW(Intracellular Water)
Cell Membrane
ECW(Extracellular Water)

Multifrekvenční BIA



Multi-frekvenční měření: průchod různých frekvencí elektrického proudu do tkání

Žádná odchylka při průchodu buněčnou membránou – měření celkové tělesné vody (TBW)

Mírná odchylka při průchodu buněčnou membránou – měření celkové tělesné vody (TBW) a buněčné tělesné hmoty (BCM)

Neprochází buněčnou membránou – měření extracelulární vody (ECW)

1-cylinder model

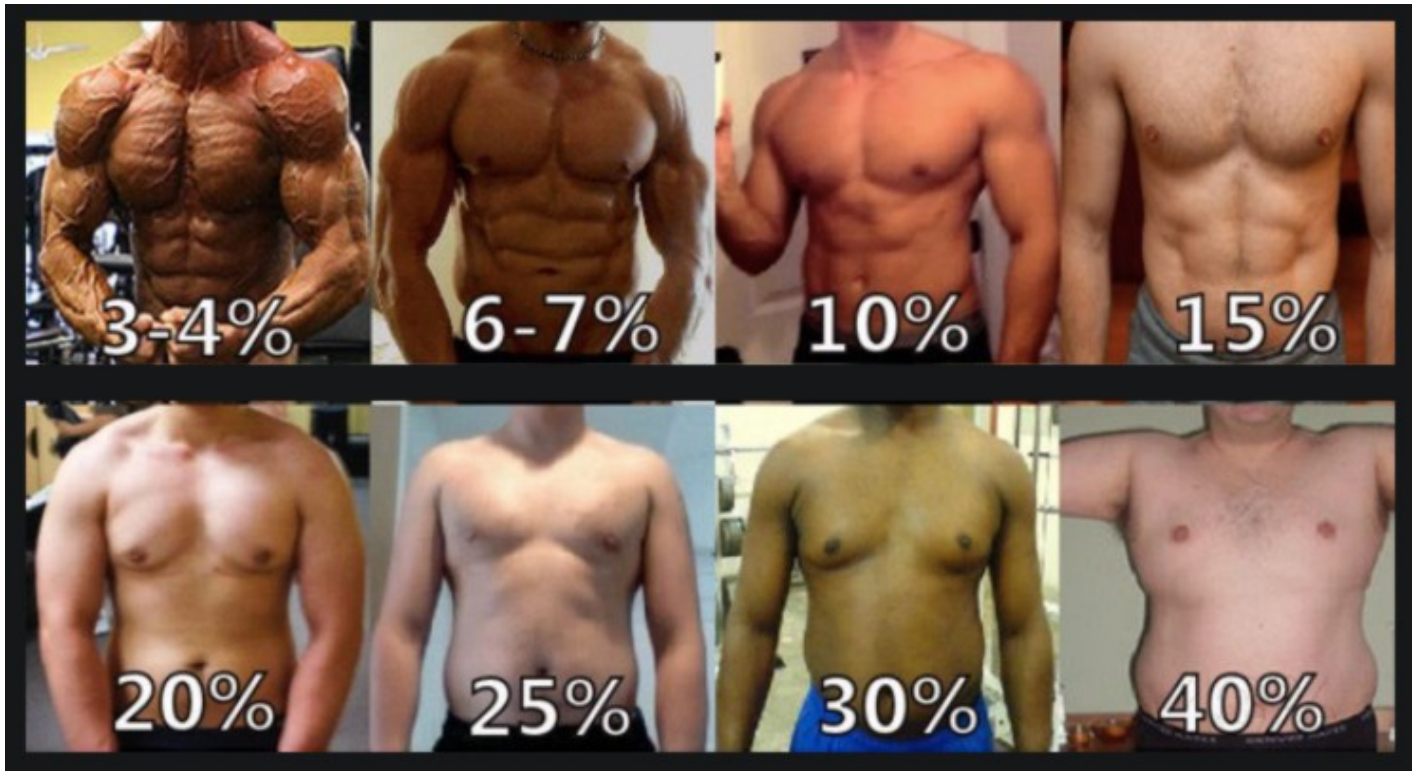
5-cylinder model

Název umístění elektrod	Místo na těle	Počet elektrod
Tetrapolární	Horní a dolní končetiny	4
Bimanuální	Horní končetiny	2
Bipedální	Dolní končetiny	2

Název přístroje	Počet samostatně měřených segmentů	Počet elektrod	Počet frekvencí el. proudu	Způsob výpočtu tělesného složení	Orientační pořizovací cena přístroje
InBody 770	5	4, 8-bodový dotykový systém	6	Žádný empirický odhad	400 000 Kč
InBody 230	5	4, 8-bodový dotykový systém	2	Žádný empirický odhad	169 400 Kč
Jawon IOI 353 Professional	5	4, 8-bodový dotykový systém	3	Žádný empirický odhad	99 260 Kč
Tanita BC-418	5	4, 8-bodový dotykový systém	1	Standard / athletic	109 900 Kč
Omron BF511 (fitness váha)	Neuvedeno	4, 8-bodový dotykový systém	1	Neuvedeno	1 800 Kč
Bodystat 1500	5	Záleží na měřené části těla	1	Žádný empirický odhad	20 900 Kč

Název přístroje	Počet samostatně měřených segmentů	Počet elektrod	Počet frekvencí el. proudu	Způsob výpočtu tělesného složení	Orientační pořizovací cena přístroje
InBody 120	5	4, 8-bodový dotykový systém	2	Žádný empirický odhad	80 000 Kč
InBody 170	5	4, 8-bodový dotykový systém	2	Žádný empirický odhad	110 000 Kč
InBody 370	5	4, 8-bodový dotykový systém	3	Žádný empirický odhad	200 000 Kč
InBody 570	5	4, 8-bodový dotykový systém	3	Žádný empirický odhad	300 000 Kč

Jedinec A	Jedinec B
190 cm	190 cm
90 kg	100 kg
81 kg FFM	90 kg FFM
9 kg FM	10 kg FM
10 % BF	10 % BF


3-4%
6-7%
10%
15%
20%
25%
30%
40%


15%


16-17%


17-18%


18%


18%


20%


20%

12-14% *Essential for survival. Elevated risk of infertility, anemia, osteoporsis, high mortality, amenorrhea, infection. may burn muscle for nutrition as not enough fat stores.*

14-15% *Very Low. Elevated risk of infertility, cardiovascular disease & diabetes. Most athletes complete at this percentage, but gain fat between tournaments for their health.*

BODY FAT FOR WOMEN

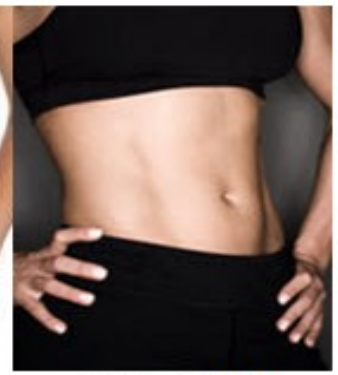
16-20% *Very Fit*

21-24% *Average*

25-31% *A Little Extra*

32+% *Overweight. Elevated risk of heart disease, cancer, stroke, type 2 diabetes, reduced life expectancy, sleep apnea, osteoarthritis, etc.*


20-21%


20-22%


25%


25%

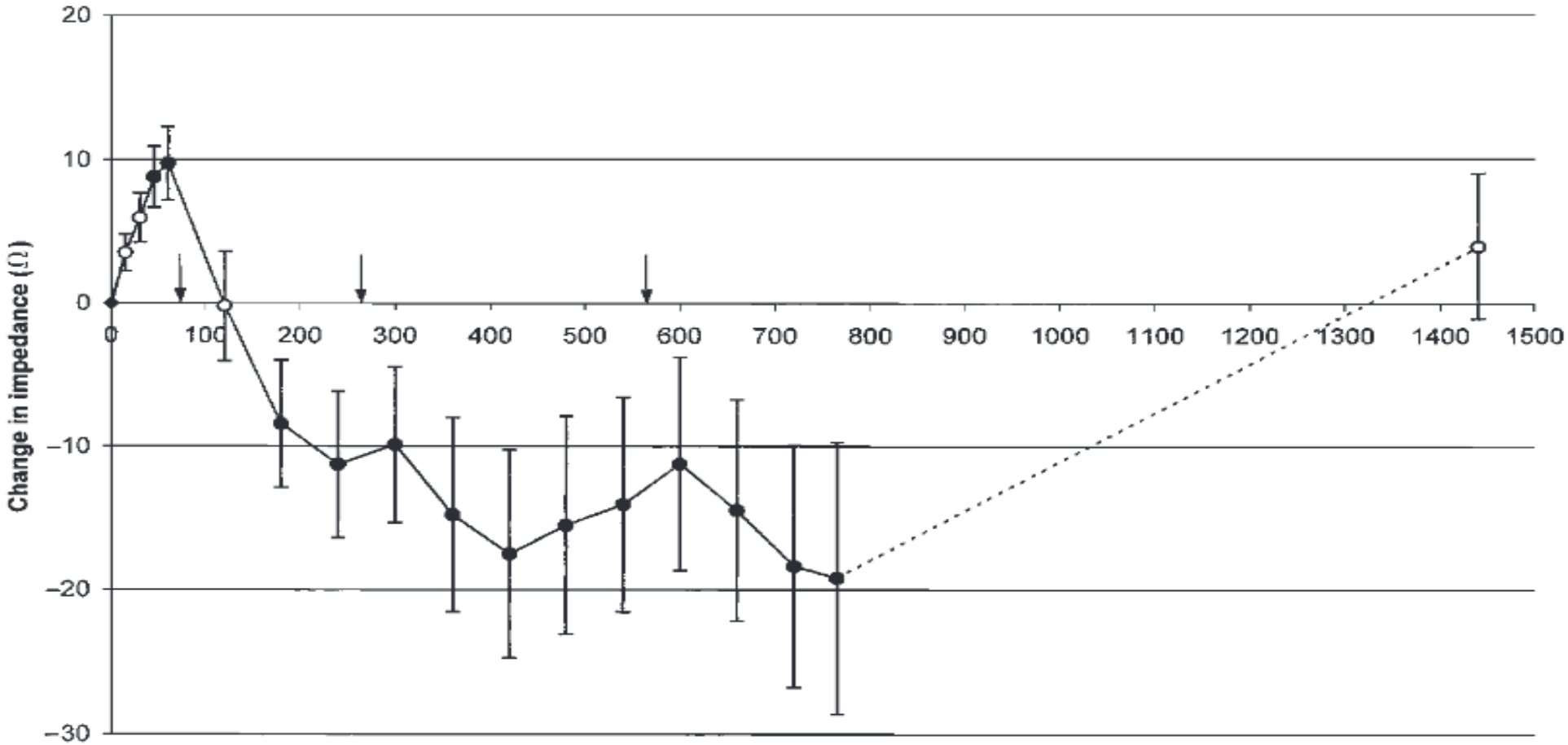

25-26%

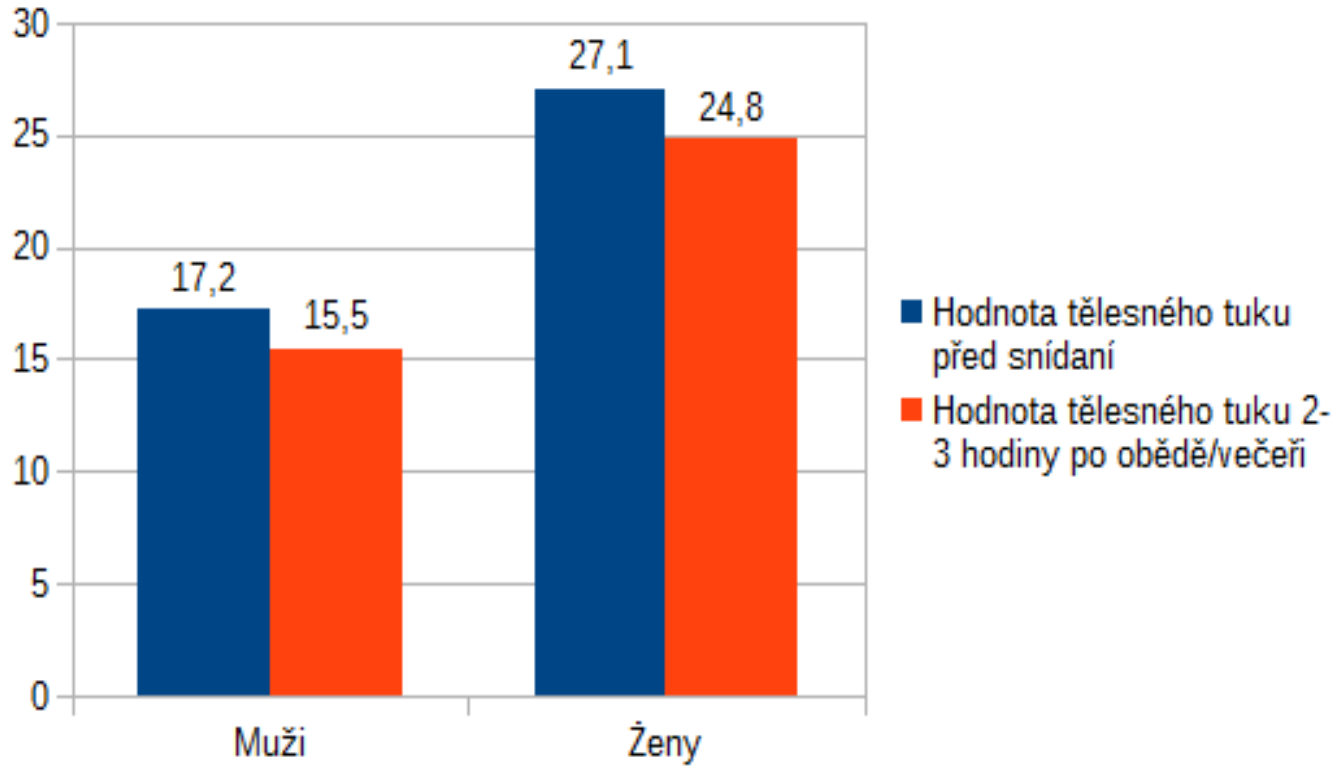

30%


35%


40%

Studie


20
10
0
−10
−20
−30
Change in impedance (Ω)
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
1400
1500


30
25
20
15
10
5
0
17,2
15,5
27,1
24,8
Muži
Ženy
Hodnota tělesného tuku před snídaní
Hodnota tělesného tuku 2-3 hodiny po obědě/večeři


InBody770

Body Composition Analysis

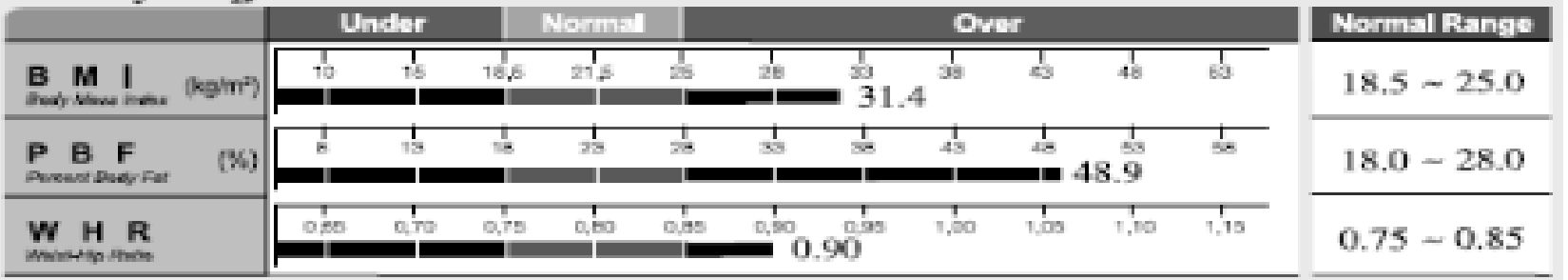
Compartments		Values	Total Body Water	Soft Lean Mass	Fat Free Mass	Weight	Normal Range
I C W Intracellular Water	(ℓ)	17.7	28.7	36.8	39.1	76.5	16.1 ~ 19.7
E C W Extracellular Water	(ℓ)	11.0					9.9 ~ 12.1
Protein	(kg)	7.7					7.0 ~ 8.5
Mineral	(kg)	2.76	osseous: 2.29				2.41 ~ 2.94
Body Fat Mass	(kg)	37.4					10.2 ~ 16.4

▸ *Mineral is estimated*

Muscle - Fat Analysis

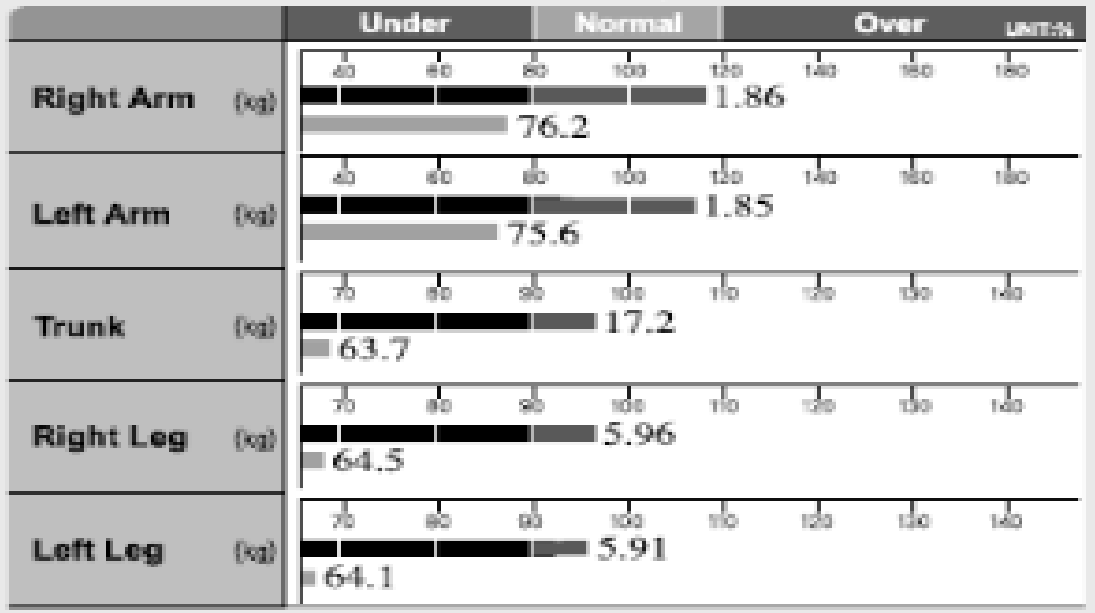
		Under / Normal / Over	Normal Range
Weight	(kg)	76.5	43.4 ~ 58.8
S M M Skeletal Muscle Mass	(kg)	21.1	19.2 ~ 23.5
Body Fat Mass	(kg)	37.4	10.2 ~ 16.4

Obesity Diagnosis



Normal Range
18.5 ~ 25.0
18.0 ~ 28.0
0.75 ~ 0.85

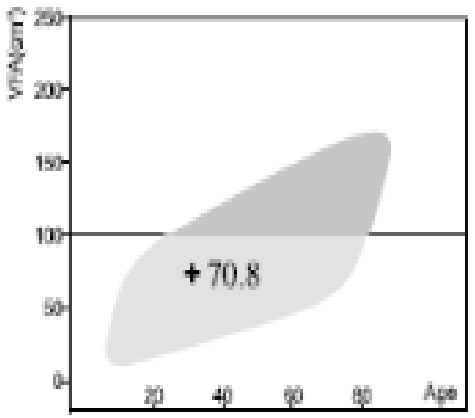
Lean Balance



Segmental Edema	
ECF / TBF	ECW / TBW
0.331	0.378
0.333	0.379
0.337	0.384
0.334	0.381
0.333	0.380

Edema	
ECF / TBF	ECW / TBW
0.41	0.46
0.38	0.43
0.35	0.40
0.33	0.38
0.31	0.36
0.28	0.33
0.25	0.30
0.335	0.382

Visceral Fat Area



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	☐ Obese	☑ Extremely Obese
WHR	☐ Normal	☐ Obese	☑ Extremely Obese

Body Balance

Upper	☑ Balanced	☐ Slightly Imbalanced	☐ Extremely Imbalanced
Lower	☑ Balanced	☐ Slightly Imbalanced	☐ Extremely Imbalanced
Upper-Lower	☐ Balanced	☑ Slightly Imbalanced	☐ Extremely Imbalanced

Body Strength

Upper	☐ Normal	☐ Developed	☑ Weak
Lower	☐ Normal	☐ Developed	☑ Weak
Muscle	☑ Normal	☐ Muscular	☐ Weak

Health Diagnosis

Body Water	☑ Normal	☐ Under	
Edema	☑ Normal	☐ Slight Edema	☐ Edema
Life Pattern	☑ Normal	☐ Alert ☐ Risky ☐ Highly Risky	

Additional Data

	(Normal Range)
Obesity Degree = 149 %	90 ~ 110
B C M = 25.4 kg	23.1 ~ 28.3
B M C = 2.29 kg	1.98 ~ 2.42
B M R = 1215 kcal	1130 ~ 1299

Anthropometry

NECK = 36.3cm	CHEST = 97.9cm
ABD = 109.9cm	HIP = 122.6cm
AC_R = 34.3cm	AC_L = 34.0cm
$THIGH_R$ = 58.8cm	$THIGH_L$ = 58.9cm
AMC = 26.6cm	

Weight Control

Target Weight	51.1	kg
Weight Control	- 25.4	kg
Fat Control	- 25.6	kg
Muscle Control	+ 0.2	kg
Fitness Score	54	Points

Impedance

R		RA	LA	TR	RA	LL
	1kHz	412.0	413.0	31.2	277.1	288.7
	5kHz	406.1	407.3	30.0	268.6	278.0
	50kHz	369.0	373.9	24.7	240.0	249.8
	250kHz	334.3	339.4	23.0	215.8	223.1
	500kHz	325.0	330.1	22.5	209.0	216.4
	1000kHz	248.4	254.0	18.1	194.2	195.0
Xc	5kHz	98.9	34.0	3.0	51.8	49.5
	50kHz	56.2	91.9	9.5	11.3	12.8
	250kHz	18.7	49.8	5.9	83.1	80.8


BODY
COMPOSITION
SEALED
THERAPY
IMPEDANCE
MARGIN
WATER
BODY
IMAGING
ESTIMATE
DESCRIBE
HALFWAY
SETTLE
ARM
BONE
TOMOGRAPHY
SCANS
REPEAT
POINTS
RESISTANCE
RESONANCE
THIGHS
ABDOMINAL
FRACTIONAL
SOMATIC
REPRODUCIBLE
ERROR
HOUR
MULTIPLE
SKELETAL
PERCENTAGE
LEAN
SECONDS
MEASURE
SIMPLE
WEIGHT
VOLUME
CIRCUMFERENCE
WEIGHING
NUTRITIONAL
TECHNIQUE
METHOD
REGIONAL
PRINCIPLES
QUANTIFY
LEANNESS
CALCULATED
MASS
FAT
AIR
BIOELECTRICAL
SUBCUTANEOUS
ANDROID
DISPLACEMENT
ALTERING
PROTEIN
CHAMBER
CONTRIBUTION
HEIGHT
FLIGHT
RESULTS
MARK
REGION
GIVE
CLINICAL
PHARMACEUTICAL
EXAMS
FITNESS
DEPLETION
BUTTOCKS
TOTAL
MONITORING
MEASUREMENT
MIDANALYSIS
RATIO
INTRAMUSCULAR
CREATININE
URINE
THICKNESS
LEGS
MINERAL
CALCULATION
MUSCULAR
EXPOSE
OPPOSED
SKINFOLD
EQUATIONS
GUN
TISSUE
PRECISE
MAGNETIC
COMPUTED
ELECTRICAL
CALIPERS
INTERVENTION
INCREASINGLY
TRUNK
DENSITY
COMPOSITION