

# **BODY COMPOSITION ANALYSIS (BCA MACHINE)**

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 **charder**<sup>®</sup>



## **BODY COMPOSITION ANALYSIS (BCA MACHINE)**

### **DESCRIPTION**

The Body Composition Analyzer applies artificial neural network algorithms to Bioelectrical Impedance Analysis (BIA), for more reliable and accurate measurement of body composition. Featuring advanced output parameters designed for evaluation of quality and health status, our results are formulated and validated with clinical trials, providing medical professionals with accurate and reproducible measurement data.

## FEATURES

### **(1) Body Composition Analysis**

Reliable, non-invasive Bioelectrical Impedance Analysis makes it easier to conduct regular monitoring of Body Composition. The calculated estimated weights of the body's compositional elements can be compared with standard results for context.

### **(2) Muscle-Fat Analysis**

Measurement of weight is important, but incomplete without further analyzing the amount of muscle and fat in a client. Understanding skeletal muscle and body fat proportions can help trainers formulate muscle and fat control recommendations.

### **(3) Obesity Analysis**

Different body fat indicators provide valuable information needed for a more useful evaluation of health. Percent Body Fat is a general indicator, while Waist-Hip Ratio and Visceral Fat are used as critical cut-off points for risk of obesity-related diseases which may not be immediately visible from the outside.

### **(4) Total & Segmental Analysis**

Measure muscle and fat more precisely with segmental analysis of the trunk, upper body, and lower body. Identify imbalances, and determine if segmental muscle is within normal range, tracking changes to better observe the effects of rehabilitation or training.

### **(5) Bioelectrical Vector Impedance Analysis (BIVA)**

Bioelectrical Vector Impedance Analysis (BIVA) uses direct measurements of reactance and resistance, allowing it to provide reliable comparisons and evaluations of cellular hydration and nutritional status - even for individuals with abnormal hydration - making it easier for trainers to recommend detailed health checks if needed, helping to keep clients safe.

**(6) Phase Angle**

Phase angle decreases with illness and old age, making it an important indicator of health, and an absolute necessity for a professional body composition evaluation. Compare phase angle with respective gender and age, placing results into context.

**(7) Muscle Quality**

Track changes in quality, not just quantity! In elderly populations, muscle strength can decline much more rapidly than muscle mass. By evaluating muscle effectiveness through cellular estimation of grip strength health, professionals now have a more useful indicator that may provide early warning for fall risk.

**(8) Body Fat Percentiles**

Compare body fat percentages with similar population, placing results in context of age, gender, and ethnicity. What's "normal" for a 20-year old doesn't necessarily apply to an 80-year old, and this module helps the subject better understand comparative results.

**(9) Edema Index**

Identify abnormalities in intracellular/extracellular fluid proportion, using the edema index as an indicator and warning sign for diseases affecting body fluid balance, including impaired heart and function.

**(10) Research Information**

The MA801 provides a wide variety of body composition output parameters of particular relevance for research, and includes various indexes used as early warning signs for malnutrition, obesity, and sarcopenia.

## Advanced Body Composition Analysis Outputs

### Abdominal Fat

The location and amount of Visceral Fat correlates with metabolic risk more than total body fat, and has been determined to be a more reliable method of identifying subjects at risk for cardiovascular diseases than current definitions of obesity.

### Bioelectrical Impedance Vector Analysis (BIVA)

Traditional BIA's reliance on standard body water proportion makes it less reliable for use for patients with illnesses affecting body water. BIVA's direct measurement of resistance (R) and reactance (Xc) values compared with normal populations allows for fluid and cellular monitoring even for "abnormal" patients, increasing BIA reliability in clinical use.

### Phase Angle (Percentiles)

Measurement of quantity is of limited utility for evaluation of health. Through tracking of Phase Angle, an indicator strongly correlating with age and health, evaluation of patient's cellular status corresponding context can be made.

### Muscle Quality

Through measurement of cellular quality, the MA801 can provide estimates of potential handgrip strength, used as a clinical marker for poor mobility, and a better predictor of sarcopenia than muscle mass. Comparison between dynamometer and estimate places subject's strength level in context.

### Edema Index

Extracellular Water Proportion is a major risk indicator for all-cause mortality, kidney deficiency, and cardiovascular disease, providing potential early warning for health complications requiring preventative action.



Key Specifications	
Bioelectrical Impedance Analysis (BIA)	25 Impedance Measurements: 5 frequencies (5kHz, 20kHz, 50kHz, 100kHz, 250kHz) for 5 segments (Right Arm, Left Arm, Trunk, Right Leg, Left Leg)
Electrodes	8-point Tactile Electrode Design
Display	1280 x 800 pixels, 10.1-inch color touchscreen LCD
Capacity / Graduation	Max Capacity 300kg (0.1kg graduation)
Applicable Age	6-85 years old
Output / Transmission	USB 2.0 x3, RS232 x1, Bluetooth, Wi-Fi, RJ45 Ethernet
Data Storage	100,000 Measurements (data transfer available via USB, Bluetooth, or Wi-Fi)
Measurement Duration	Less than 50 seconds
Device Dimensions	875 (L) x 463 (W) x 1205 (H): mm 33.4 (L) x 18.2 (W) x 47.4 (H): inches
Device Weight	About 31kg (68lbs)

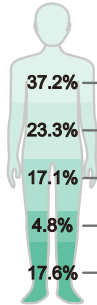
Result Sheet Output	
Body Composition Analysis	Intracellular Water, Extracellular Water, Total Body Water, Protein, Mineral, Body Fat Mass, Soft Lean Mass, Fat-Free Mass, Weight
Muscle-Weight Analysis	Weight, Skeletal Muscle Mass, Body Fat Mass
Obesity Analysis	Body Mass Index, Percent Body Fat, Waist-Hip Ratio
Abdominal Fat (L4-L5)	Visceral Fat, Subcutaneous Fat
Total & Segmental Analysis	Lean Mass (Whole Body, Right Arm, Left Arm, Trunk, Right Leg, Left Leg) Fat Mass (Whole Body, Right Arm, Left Arm, Trunk, Right Leg, Left Leg)
BIVA	Bioelectrical Impedance Vector Analysis
Phase Angle	50kHz whole-body phase angle percentiles for adults
Muscle Quality	Estimated grip strength (N, kg)
Health Score	Combined evaluation of body composition results
Percentage Body Fat Percentiles for Adults	Comparison of Percent Body Fat with comparable gender, age, ethnicity
Edema Index	Extracellular Water/Total Body Water Ratio
Research Information	Basal Metabolic Rate, Waist-Hip Ratio, Waist Circumference, Visceral Fat Area, Body Cell Mass, Right Arm Circumference, Left Arm Circumference, Arm Muscle Circumference, Total Body Water/Fat-Free Mass, Fat-Free Mass Index, Fat Mass Index, Skeletal Muscle Index
Impedance	5kHz, 20kHz, 50kHz, 100kHz, 250 kHz

Medical Result Sheet

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Name	ID	Ethnicity	Height	Gender	Age	Measured Time
John	7347204154	Asian	181.0 cm	Male	32	2019.03.28 16:15

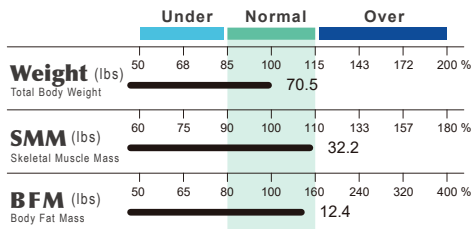
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Body Composition Analysis						
Compartments	Values	TBW	SLM	FFM	Weight	Normal Range
<b>ICW</b> (lbs) Intracellular Water	26.2	42.6	54.7	58.1	70.5	25.0 ~ 30.5
<b>ECW</b> (lbs) Extracellular Water	16.4					15.3 ~ 18.7
<b>Protein</b> (lbs)	12.1	8.0 ~ 11.4				
<b>Mineral</b> (lbs)	3.4	2.3 ~ 3.9				
<b>BFM</b> (lbs) Body Fat Mass	12.4	7.0 ~ 14.1				

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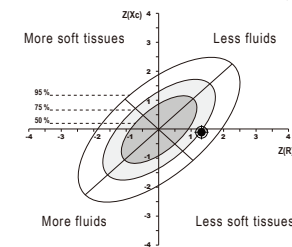
Muscle - Fat Analysis



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BIVA

Bioelectric Impedance Vector Analysis



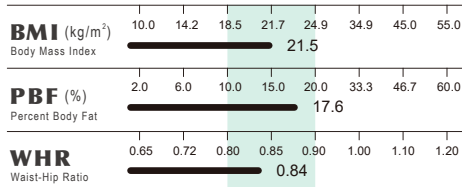
Health Score

72.4/100 Points

The healthy score is an arbitrary score based on the measured lean mass index, fat mass index, skeletal muscle index, and phase angle for the motivation of the subject.

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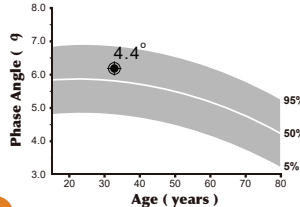
Obesity Analysis



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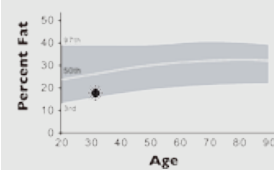
Phase Angle

Whole-body phase angle (50 kHz)



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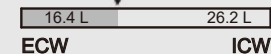
Percentage body fat percentiles for adults



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Edema Index

0.385



Abdominal Fat (L4-L5 vertebrae)



Visceral Fat  
52.0 cm<sup>2</sup>



Subcutaneous Fat  
94.8 cm<sup>2</sup>

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Muscle Quality

383 ~ 468 N  
39 ~ 48 kgf

Right Hand



357 ~ 436 N  
36 ~ 44 kgf

Left Hand

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Total & Segmental Analysis

Whole Body	* Lean Mass	Fat Mass	Phase Angle
	54.7 kg (44.8 - 67.3kg)	12.4 kg (7.0 - 14.1kg)	6.1°

Right Arm	* Lean Mass	Fat Mass
	3.1 kg (2.7 - 4.0kg)	0.4 kg (0.2 - 0.4kg)

Left Arm	* Lean Mass	Fat Mass
	3.2 kg (2.7 - 4.0kg)	0.4 kg (0.2 - 0.4kg)

Right Leg	* Lean Mass	Fat Mass
	9.3 kg (8.1 - 12.1kg)	1.7 kg (1.1 - 1.7kg)

Trunk	* Lean Mass	Fat Mass
	25.3 kg (20.6 - 30.9kg)	6.9 kg (4.1 - 6.1kg)

Left Leg	* Lean Mass	Fat Mass
	9.4 kg (8.1 - 12.1kg)	1.8 kg (1.1 - 1.7kg)

\* represents the classification of Lean Mass.

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Research Information

Basal Metabolic Rate	1625 kcal
Waist-Hip Ratio	0.84
Waist circumference	78.0 cm
Visceral Fat Area	52.0 cm <sup>2</sup>
Body Cell Mass	37.7 kg
Right Arm Circumference	27.8 cm
Left Arm Circumference	28.7 cm
Arm Muscle Circumference	25.4 cm
TBW / FFM	73.4 %
Fat-free Mass Index	17.7 kg/m <sup>2</sup>
Fat Mass Index	3.8 kg/m <sup>2</sup>
Skeletal Muscle Index	9.8 kg/m <sup>2</sup>

Impedance

	RA	LA	TR	RL	LL
5kHz	361.9	355.6	25.2	273.0	272.6
20kHz	339.4	331.8	22.1	253.3	252.9
50kHz	326.3	318.5	20.5	244.7	243.8
100kHz	330.4	322.2	18.1	243.7	243.1
250kHz	305.8	329.6	12.2	229.2	227.4

1.0.0.40

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MUSEUM HILL CENTRE, MUSEUM ROAD  
P.O. BOX 75534 00200  
NAIROBI, KENYA  
Tel: 0720 714 337  
Email: [info@medsurgehealth.co.ke](mailto:info@medsurgehealth.co.ke)  
Web: [www.medsurgehealth.co.ke](http://www.medsurgehealth.co.ke)