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A New Standard for Body Water Analysis

BWA 2.0

A New Standard for Body Water Analysis

In the last 20 years, body composition analysis has established itself as a standard practice in various fields, and InBody has continuously strived to further expand its application to specialized areas, such as dialysis, rehabilitation, nutrition, and etc.

With the need for the precise measurement of body water, InBody introduces a new standard for body water analysis, BWA 2.0.

The BWA 2.0 is equipped with state-of-the-art 3MHz technology and provides extensive research parameters for professionals to better suit diverse patients with different conditions and medical specialties than ever before.

Cole-Cole Plot Graph for Monitoring Changes in Body Water and Cellular Integrity

Statistical Analysis by Age, Based on InBody Big Data

Clamp Electrode for High Reproducibility

Covering Wide Range of Subjects / Patients and Conditions

Extensive Research Parameters for Professionals

BWA Highlights

Cole-Cole Plot Graph for Monitoring Changes in Body Water and Cellular Integrity

With Cole-Cole plot graph, BWA provides accurate Segmental Body Phase Angle measurements at 5, 50, and 250kHz enhancing sensitivity to the changes in fluid and cellular integrity resulting from various diseases and conditions.

Statistical Analysis by Age, Based on InBody Big Data

Based on 13 million sets of InBody Big Data, InBody provides averages and standard deviation graphs for each result parameter according to age. It allows for comparative evaluation between different or same age groups for a more objective body composition analysis.

Clamp Electrode for High Reproducibility

The Clamp Electrode is a combination of two forcep electrodes, which acts as an indicator attached to the wrist and ankle for high reproducibility. The flexible design of the forcep ensures the electrodes to closely adhere to wrist and ankle even during the articular movements.

Covering Wide Range of Subjects / Patients and Conditions

More precise results can be obtained and utilized by entering the patient status information such as amputation, paralysis, lymphedema, and vascular access region.

Extensive Research Parameters for Professionals

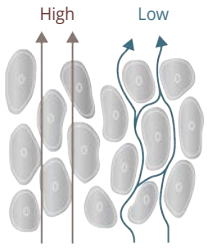
Select from a range of distinct optional parameters for clinical and research purposes.

- Water Control Calculator: to set target ECW Ratio
- Age-specific graph: to evaluate and compare the body composition result by age
- BIVA (Bioelectrical Impedance Vector Analysis): to evaluate the hydration and nutritional status in comparison to their demographic group

InBody Technology on BWA

Body Composition Evaluation by Age Based on InBody Big Data

InBody provides age-specific graphs for each body composition analysis parameter based on globally accumulated InBody Data. With this, a comprehensive analysis is provided so that you can compare your data to the data of the young age group (T-score) and the same age group (Z-score).

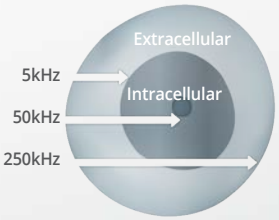


Multi-Frequency for In-Depth Analysis

Low frequencies do not pass through the cell membranes well so they mainly reflect ECW, while high frequencies pass through the cell membranes and therefore reflect both ECW and ICW.
By using multi-frequencies, InBody measures ECW and ICW separately and measures TBW accurately to check the water balance. As the newest technological advancement, InBody utilizes the 3Mhz frequency, which enables the precise measurement of a more diverse range of patients and subjects with special body compositions. Furthermore, the technology that enabled the utilization of 3MHz also ensures the measurement stability from other frequencies even when there are outside interferences.
* ECW: Extracellular Water, ICW: Intracellular Water, TBW: Total Body Water

High Reproducibility and Accuracy Assured by 16-Point Clamp Electrodes

The 16-Point Clamp Electrodes were developed in a way so that the electrodes can be positioned on the wrist and ankle bone. It allows the instructor to place the electrode in the proper position and secures the reproducibility by minimizing the measurement errors. This technology also exempted the resistance from the hands and feet, which secures a more accurate results. With the 16-Point Clamp Electrodes, two different measurement modes are provided which enables users to choose between Research (Distal) and Medical (Proximal), depending on their purposes.

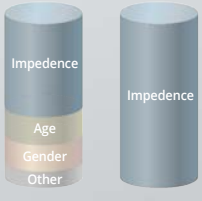


Multi-frequency Reactance Data for Enhanced Clinical Use

Reactance is a resistance that occurs in cell membranes, which is related to the cellular health such as somatic cell mass, structural integrity, and physiological functional level of the cell. Besides 50kHz, InBody improved segmental reactance measurement technology in 5kHz, 250kHz as well. Through this, InBody provides more parameters which can be used in various clinical fields to pre-screen diseases and evaluate nutritional status.

Direct Segmental Measurement-BIA

Each of our body segments is different in length and cross-sectional area. Arms and legs are longer and narrower in comparison to the trunk, so their impedance values are higher than the trunk. On the other hand, the trunk is shorter and wider than the arms and legs, so its impedance value is lower. However, the trunk muscle mass accounts for almost half of the whole body muscle mass, which is why a small impedance change in the trunk has a greater impact on the amount of whole body muscle mass. Therefore, the trunk must be measured separately in order to measure the whole body muscle mass accurately.



No Estimations or Empirical Equations

In the past, the conventional BIA devices used empirical estimations to compensate technological limitations of whole body measurement and use of single low frequency. To calculate the body composition by these conventional BIA devices, they needed to add statistical data such as age and gender in order to calculate results. However, InBody overcame these limitations with technologies of using Multi-Frequency, Direct Segmental Measurement, and 16-Point Clamp Electrodes System so that BWA provides results that are not affected by age, ethnicity or gender. Only reference ranges or scores based on age and gender are used as a basis for evaluating the values determined.

BWA Application

Nutrition

Monitor body composition change for nutritional evaluation.

Kim, H.S., Lee, E.S., Lee, Y.J., Jae Ho Lee, C. T.L., & Cho, Y.J (2015) Clinical Application of Bioelectrical Impedance Analysis and its Phase Angle For Nutritional Assessment of Critically Ill Patients. Journal of the Korean Society for Parenteral and Enteral Nutrition, 7(2), 54-61

Nephrology

Obtain useful insights on dialysis patients' hydration and nutrition status.

Ando, M., Suminaka, T., Shimada, N., Asano, K., Ono, J. I., Jikuya, K., & Mochizuki, S. (2018). Body water balance in hemodialysis patients reflects nutritional, circulatory, and body fluid status. Journal of Biorheology, 32(2), 46-55.

Geriatric

Monitor muscle mass and muscle imbalances to screen sarcopenia with SMI, which are related to risks of fall and frailty.

Yoshimura, Y., Wakabayashi, H., Bise, T., & Tanoue, M. (2018). Prevalence of sarcopenia and its association with activities of daily living and dysphagia in convalescent rehabilitation ward inpatients. Clinical Nutrition, 37(6), 2022-2028.

Rehabilitation

Monitor injury and post-surgical recovery.

Yoshimura, Y., Bise, T., Nagano, F., Shimazu, S., Shiraishi, A., Yamaga, M., & Koga, H. (2018). Systemic inflammation in the recovery stage of stroke: its association with sarcopenia and poor functional rehabilitation outcomes. Progress in Rehabilitation Medicine, 3, 20180011.

Cardiology

Pre-screen the risk factors of cardiovascular disease.

Thomas, E., Gupta, P. P., Fonarow, G. C., & Horwich, T. B. (2019). Bioelectrical impedance analysis of body composition and survival in patients with heart failure. Clinical cardiology, 42(1), 129-135.

Professional Sports

Manage body composition to enhance performance and minimize injury risk.

Almăjan-Guţă, B., Rusu, A. M., Nagel, A., & Avram, C. (2015). Injury frequency and body composition of elite Romanian rugby players. Timisoara Physical Education and Rehabilitation Journal, 8(15), 17-21.

Application

Validations of More Than 3,000 Research Papers

Study 1

HIGH ACCURACY AND REPRODUCIBILITY OF FAT FREE MASS & PERCENT BODY FAT MEASUREMENTS COMPARED WITH DEXA

The measurement (mean ± SD) for FFM with DXA was 52.8 ± 11.0, and BIA was 53.6 ± 11.0. Delta (S-MFBIA vs DXA) was 0.8 ± 2.2 (5% limits of agreement −3.5 to +5.2), and concordance correlation coefficient (CCC) was 0.98 (95% CI, 0.97–0.98). The measurements (mean ± SD) for PBF with DXA was 37.5 ± 10.6% and S-MFBIA was 36.6 ± 11.3%. Delta (S-MFBIA vs DXA) was −0.9 ± 2.6 (5% limits of agreement 6.0 to +4.2), and CCC was 0.97 (95% CI, 0.96–0.98).

Hurt, Ryan T., et al. "The Comparison of Segmental Multifrequency Bioelectrical Impedance Analysis and Dual-Energy X-ray Absorptiometry for Estimating Fat Free Mass and Percentage Body Fat in an Ambulatory Population."
Journal of Parenteral and Enteral Nutrition (2020).

Study 2

HIGH CORRELATION WITH D2O DILUTION METHOD FOR TOTAL BODY WATER

The study concluded that the BIA device InBodyS10 showed good test-retest precision (%CV = 5.2 raw; 1.1 after outlier removal) and high accuracy to D_2O for Total Body Water[$TBWD_2O$ = 0.956 TBWBIA, R^2= 0.92, root mean squared error(RMSE) = 2.2kg]. %Fat estimates from DXA, ADP, D_2O, and BIA all showed high correlation with the Lohman model.

Ng, Bennett K., etal."Validation of rapid 4-component body composition assessment with the use of dual-energy X-ray absorptiometry and bioelectrical impedance analysis."
The American journal of clinical nutrition 108.4 (2018) :708-715.

Study 3

HIGH ACCURACY WITH COMPUTED TOMOGRAPHY FOR MUSCLE MASS

It was suggested that estimating muscle mass using DXA and BIA(InBody720) is a preferred method for diagnosis of sarcopenia in kidney transplant recipients. Both DXA and InBody showed high correlation with CT.

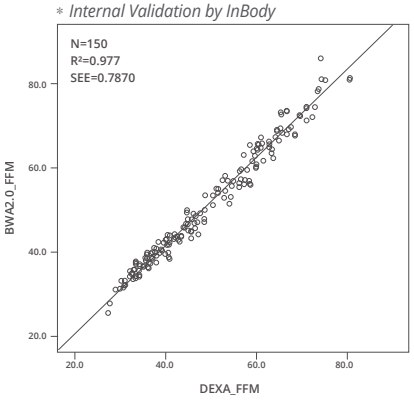
Yanishi, M.,etal."Dual energy X-ray absorptiometry and bioimpedance analysis are clinically useful for measuring muscle mass in kidney transplant recipients with sarcopenia."
Transplantation proceedings.Vol.50.No.1.Elsevier, 2018.

Study 4

HIGH CORRELATION OF FAT FREE MASS BETWEEN DEXA AND BWA2.0

Total of 150 results were analyzed, excluding duplicate data from the same subject. Fat Free Mass measured by BWA2.0 had a very high correlation with DEXA of R^2=0.977 or higher. (P value < 0.05)

* *Internal Validation by InBody*



* *Total: 150 Male: 74, Female: 76*

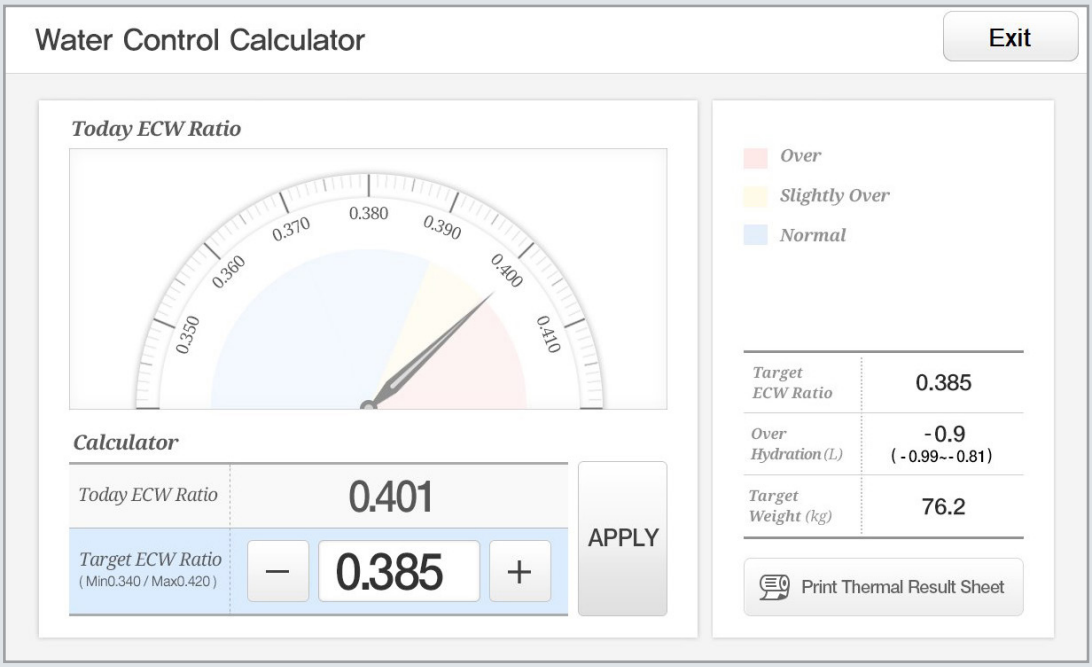
FFM(kg)	Total	Male	Female
	Mean±SD(range)	Mean±SD(range)	Mean±SD(range)
DEXA	49.09 ± 12.95(27.2~80.8)	59.49 ± 9.19(37.6~80.8)	38.97 ± 6.42(27.2~57.6)
BWA2.0	50.88 ± 13.61(25.4~86.0)	61.82 ± 10.00(38.6~86.0)	40.23 ± 6.17(25.4~58.1)

Extensive Research Parameters for Professionals

Select from a range of optional parameters for clinical and research purposes

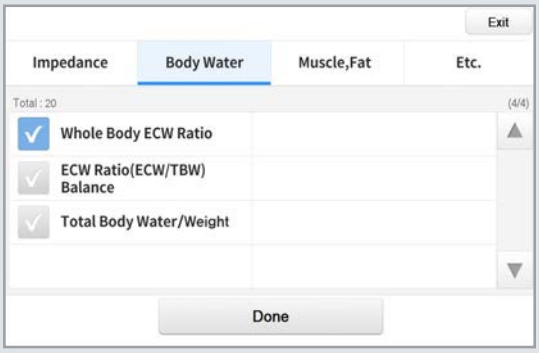
Water Control Calculator

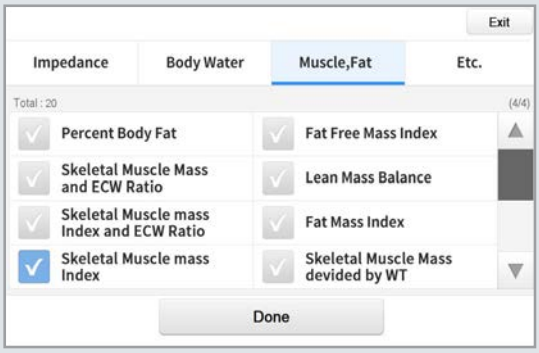
Set the Target ECW Ratio depending on the hydration status of dialysis and heart failure patients.



Up to 20 Optional Parameters

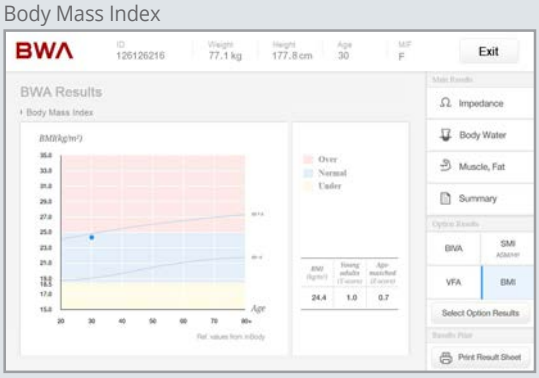
Provides up to 20 optional parameters for a customized experience. Select from parameters, such as age-specific graph, segmental analysis, and body composition results that are available at a glance.



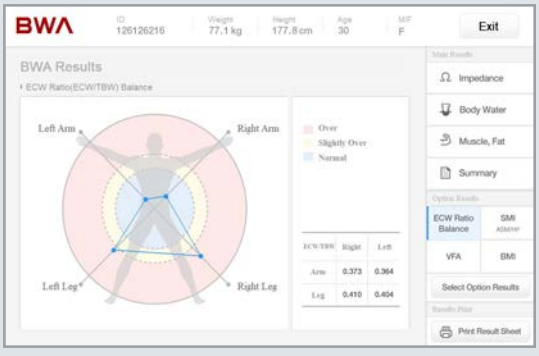


Skeletal Muscle mass Index

Body Mass Index



ECW Ratio (ECW/TBW) Balance



Bioelectrical Impedance Vector Analysis

Product Overview

Various Features and Optional Components of BWA

LCD
Sharp 10.1" touch screen

Battery
BWA battery for mobile use

Test Posture
Measurable in a lying, seated or standing position

InBody USB
Easy data back up with InBody USB

Thermal Printer (Optional)
Easy-print out BWA results

Clamp Electrode
Patented dual forcep structure of Clamp Electrodes ensures high reproducibility

BWA Cart
Customized BWA Cart to easily arrange the Clamp Electrodes

BWA Portable Case (Optional)
Convenient way of carrying BWA for mobility

Adhesive Electrodes and Tape (Optional)
BWA Electrode Tapes for patients with difficulty in using Clamp Electrode

Body Water Result Sheet

BWA Body Water

[BWA2.0]

InBody

ID	Height	Age	Gender	Test Date / Time
John Doe	173cm	41	Male	2021.03.31. 15 : 44

1 Body Water Composition

	Under	Normal	Over	
TBW Total Body Water (L)		31.3		
ICW Intracellular Water (L)		18.3		
ECW Extracellular Water (L)		13.0		

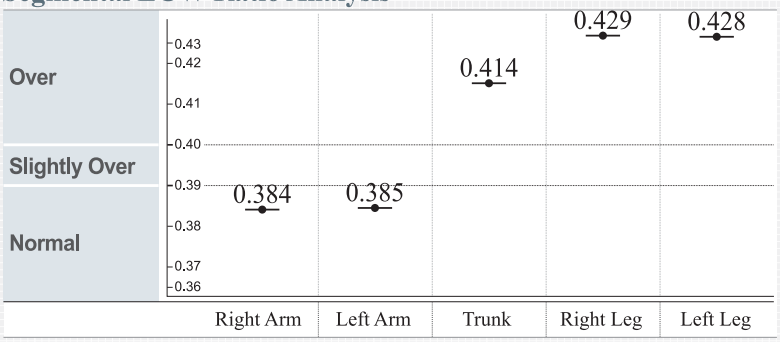
2 ECW Ratio Analysis

	Under	Normal	Over	
ECW Ratio			0.415	

3 Segmental Body Water Analysis

	Under	Normal	Over	
Right Arm (L)		1.95		
Left Arm (L)		2.03		
Trunk (L)		17.0		
Right Leg (L)		5.10		
Left Leg (L)		5.09		

4 Segmental ECW Ratio Analysis



5 Body Water Composition History

	(kg) / (L)	20.07.21 15:11	20.08.27 14:58	20.09.20 15:02	20.11.23 15:23	20.12.21 15:00	21.02.19 14:52	21.03.20 15:12	21.03.31 15:44
Weight	(kg)	64.5	64.3	64.1	64.4	64.7	66.8	67.9	64.0
TBW Total Body Water	(L)	30.6	30.6	30.5	30.6	30.7	32.7	34.3	31.3
ICW Intracellular Water	(L)	18.0	18.1	18.0	18.1	18.1	19.1	19.9	18.3
ECW Extracellular Water	(L)	12.6	12.5	12.5	12.5	12.6	13.6	14.4	13.0
ECW Ratio		0.411	0.410	0.410	0.409	0.410	0.416	0.419	0.415

☑ Recent ☐ Total

6 Body Composition Analysis

Protein	8.0 kg	(9.9 ~ 12.1)
Minerals	2.60 kg	(3.43 ~ 4.19)
Body Fat Mass	22.1 kg	(7.9 ~ 15.8)
Fat Free Mass	41.9 kg	(50.4 ~ 61.6)
Bone Mineral Content	2.16 kg	(2.82 ~ 3.44)

7 Muscle-Fat Analysis

Weight	64.0 kg	(55.9 ~ 75.7)
Skeletal Muscle Mass	21.9 kg	(28.2 ~ 34.4)
Soft Lean Mass	39.7 kg	(47.5 ~ 58.1)
Body Fat Mass	22.1 kg	(7.9 ~ 15.8)

8 Obesity Analysis

BMI	21.4 kg/m²	(18.5 ~ 25.0)
PBF	34.5 %	(10.0 ~ 20.0)

9 Research Parameters

Basal Metabolic Rate	41.9 kg	(50.4 ~ 61.6)
Waist-Hip Ratio	1275 kcal	(1428 ~ 1663)
Waist Circumference	1.14	(0.80 ~ 0.90)
Visceral Fat Area	145.0 cm²	

10

Obesity Degree	97 %	
Body Cell Mass	26.2 kg	(90 ~ 110)
Arm Circumference	30.2 cm	(32.8 ~ 40.2)
Arm Muscle Circumference	27.1 cm	
TBW/FFM	74.8 %	
FFMI	14.0 kg/m²	
FMI	7.4 kg/m²	

Whole Body Phase Angle

Proximal

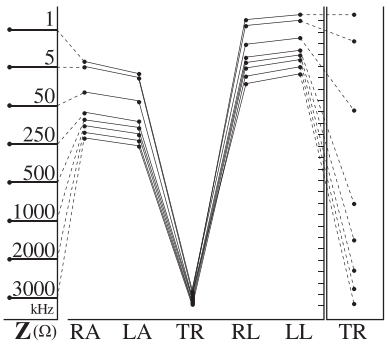
ϕ(°) 50 kHz | 3.8°

Segmental Body Phase Angle

Proximal	RA	LA	TR	RL	LL
ϕ(°) 5 kHz	2.2	2.0	2.2	1.6	1.5
50 kHz	4.9	4.8	5.0	2.8	2.6
250 kHz	4.8	4.7	5.9	3.1	2.8

11 Impedance

Proximal



[Clamp Type, Lying Posture]

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Result Sheet Interpretation

1 Body Water Composition

50-70% of our body is composed of water. Body water is distributed between all the cells and fluids in our body. Most of it is present in the cells while the rest is in the form of blood and interstitial fluid. The water inside the cell membrane is called intracellular water, and the water outside the cell membrane is called extracellular water.

2 ECW Ratio Analysis

The extracellular water ratio shows the balance status of body water. The ratio between intra and extracellular water remains constant at about 3:2 ratio in healthy individuals, and when this balance is broken down edema may occur.

3 Segmental Body Water Analysis

Segmental Body Water Analysis helps to understand the water balance by analyzing the total body water in each part of the body. Changes in body water corresponds to the changes in muscle mass. However, in the case of a subject who has health issue, the amount of body water may increase even if there is no increase in muscle mass. Therefore, it is necessary to check whether Extracellular Water Ratio is normal in segments.

4 Segmental ECW Ratio Analysis

Segmental ECW Ratio is displayed in a graph so you can easily determine if the ICW and ECW are balanced.
By analyzing the ECW Ratio, you can assess if there is a problem with body water circulation. This can help monitor the recovery of post-surgery or hemodialysis patients.

5 Body Water Composition History

Body Water History provides the changes in Weight, Skeletal Muscle Mass, Intracellular Water, Extracellular Water, Extracellular Water Ratio. Take the BWA test periodically to monitor your progress.

6 Body Composition Analysis

Body composition is a method of describing what the body is made of. BWA offers quantitative values and normal ranges for four core body components: Body Water, Protein, Minerals, and Fat.

7 Muscle-Fat Analysis

The balance between Skeletal Muscle Mass and Body Fat mass is a key health indicator. Muscle-Fat Analysis shows this balance by comparing the length of the bars for Weight, Skeletal Muscle Mass, and Body Fat Mass.

8 Whole Body Phase Angle

Phase Angle is related to the health status of the cell membrane. Strengthening of the cellular membrane and structural function will increase the Phase Angle, while damage or a decrease in function will result in a decrease in the Phase Angle.

9 Segmental Body Phase Angle

Segmental Phase Angle indicates the Phase Angle of each part of the body, representing the level of structural integrity and function of the cell membrane.

10 Bioeletrical Impedance Vector Analysis

BIVA stands for Bioelectrical Impedance Vector Analysis. The position of the tested subject is located on a graph which is based on the measured Resistance (R) and Reactance (Xc) for evaluation. The relative position is evaluated and monitored to see the changes in body water and muscle mass in a set period time for the tested subject.

11 Impedance

Impedance is the resistance that occurs when weak alternating current is applied to the human body. BWA visualizes the impedance with the graph, so you can easily detect if there is reversed impedance error by checking crossed lines in the impedance graph. Below the impedance graph, you can also check the error codes.

Body Composition Result Sheet

BWA [BWA2.0]

InBody

ID	Height	Age	Gender	Test Date / Time
John Doe	173cm	41	Male	2021.03.31. 15 : 44

Body Composition Analysis

	Values	Total Body Water	Soft Lean Mass	Fat Free Mass	Weight
Total Body Water (L)	31.3 (37.0 ~ 45.2)	31.3	39.7 (47.5 ~ 58.1)	41.9 (50.4 ~ 61.6)	64.0 (55.9 ~ 75.7)
Protein (kg)	8.0 (9.9 ~ 12.1)	non-osseous			
Minerals (kg)	2.60 (3.43 ~ 4.19)				
Body Fat Mass (kg)	22.1 (7.9 ~ 15.8)				

Muscle-Fat Analysis

	Under	Normal	Over
Weight (kg)	64.0		
SMM Skeletal Muscle Mass (kg)	21.9		
Body Fat Mass (kg)	22.1		

Obesity Analysis

	Under	Normal	Over
BMI Body Mass Index (kg/m²)	21.4		
PBF Percent Body Fat (%)	34.5		

Segmental Lean Analysis

Based on ideal weight ▬▬ Based on current weight ▬▬

	Under	Normal	Over	ECW Ratio
Right Arm (kg)	2.50			0.384
(%)	82.1			
Left Arm (kg)	2.61			0.385
(%)	85.6			
Trunk (kg)	21.6			0.414
(%)	88.7			
Right Leg (kg)	6.45			0.429
(%)	76.2			
Left Leg (kg)	6.43			0.428
(%)	75.9			

ECW Ratio Analysis

	Under	Normal	Over
ECW Ratio	0.415		

Body Composition History

	20.07.21 15:11	20.08.27 14:58	20.09.20 15:02	20.11.23 15:23	20.12.21 15:00	21.02.19 14:52	21.03.20 15:12	21.03.31 15:44
Weight (kg)	64.5	64.3	64.1	64.4	64.7	66.8	67.9	64.0
SMM Skeletal Muscle Mass (kg)	21.5	21.6	21.5	21.6	21.7	23.0	24.0	21.9
PBF Percent Body Fat (%)	35.0	34.8	34.8	34.9	35.0	33.0	32.3	34.5
ECW Ratio	0.411	0.410	0.410	0.409	0.410	0.416	0.419	0.415

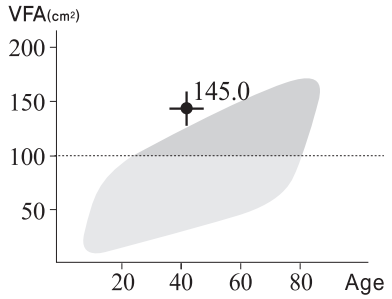
☑ Recent ☐ Total

InBody Score

/ 100 Points

* Total score that reflects the evaluation of body composition. A muscular person may score over 100 points.

Visceral Fat Area



Weight Control

Target Weight	65.9 kg
Weight Control	+ 1.9 kg
Fat Control	-12.2 kg
Muscle Control	+ 14.1 kg

Research Parameters

Intracellular Water	18.3 L	(23.0~28.0)
Extracellular Water	13.0 L	(14.0~17.2)
Basal Metabolic Rate	1275 kcal	(1428~1663)
Waist-Hip Ratio	1.14	(0.80~0.90)
Body Cell Mass	26.2 kg	(32.8~40.2)
SMI	6.0 kg/m²	

Whole Body Phase Angle

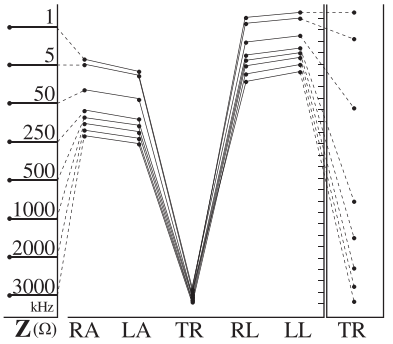
Proximal	
ϕ(°) 50 kHz	3.8°

Segmental Body Phase Angle

Proximal	RA	LA	TR	RL	LL
ϕ(°) 5 kHz	2.2	2.0	2.2	1.6	15
50 kHz	4.9	4.8	5.0	2.8	2.6
250 kHz	4.8	4.7	5.9	3.1	2.8

Impedance

Proximal



[Clamp Type, Lying Posture]
[000/000/000]

Evaluation Result Sheet

BWA Evaluation

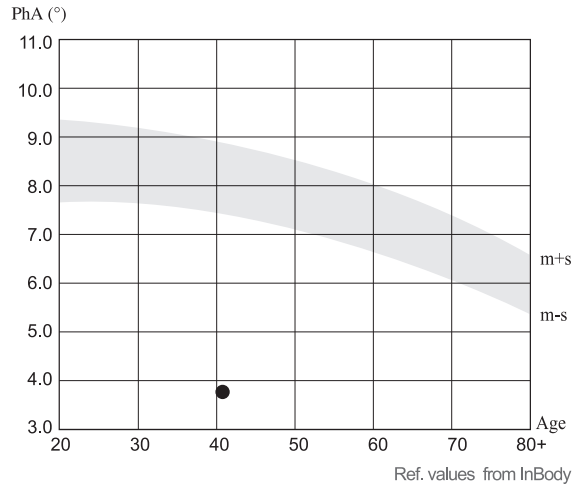
[BWA 2.0]

InBody

ID	Height	Age	Gender	Test Date / Time
John Doe	173cm	41	Male	2021.03.31. 15 : 44

Research Parameters

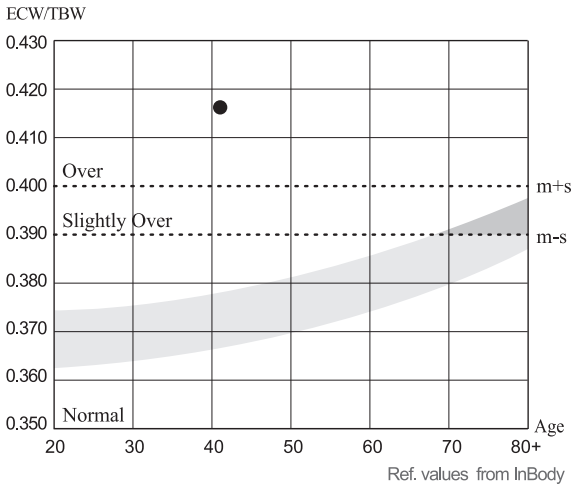
Whole Body Phase Angle_50kHz



PhA (°)	Young adults (T-score)	Age-matched (Z-score)
3.8	- 5.6	- 5.9

Body Water Evaluation

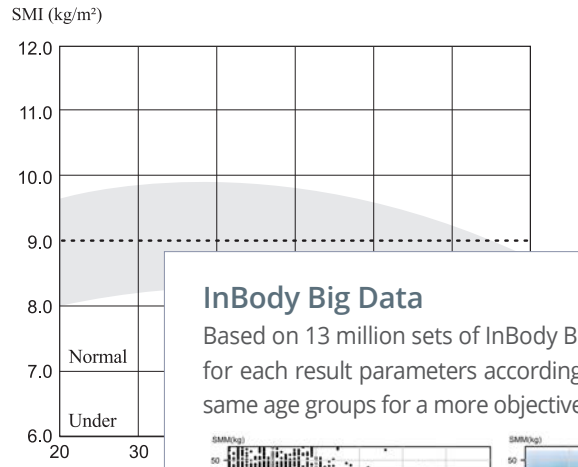
Whole Body ECW Ratio



ECW/TBW	Young adults (T-score)	Age-matched (Z-score)
0.415	8.0	7.7

Muscle · Nutrition Evaluation

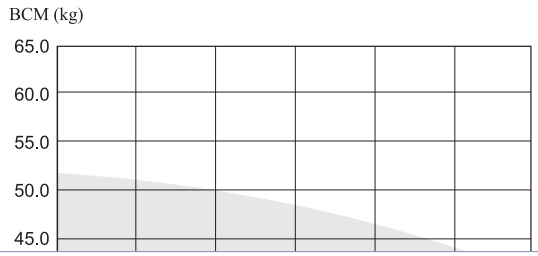
Skeletal Muscle mass Index



SMI (kg/m²)
6.0

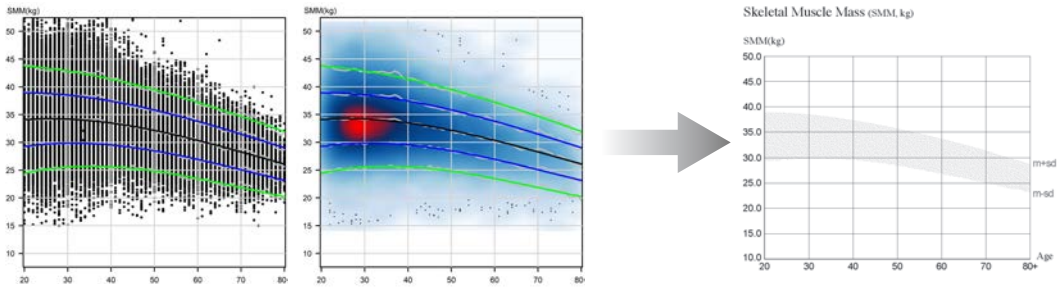
Research Parameters

Body Cell Mass



InBody Big Data

Based on 13 million sets of InBody Big Data, InBody provides averages and standard deviation graphs for each result parameters according to age. It allows for comparative evaluation between different or same age groups for a more objective body composition analysis.



* *InBody Big Data is used for the evaluation by age which is shown as T-Score and Z-score that indicate the relative position of subject. It does not affect the subjects' body composition analysis result.*

* *Depending on the country, the graph will be set differently.*

Research Result Sheet

BWA Research

[BWA2.0]

InBody

ID	Height	Age	Gender	Test Date / Time
John Doe	173cm	41	Male	2021.03.31. 15 : 44

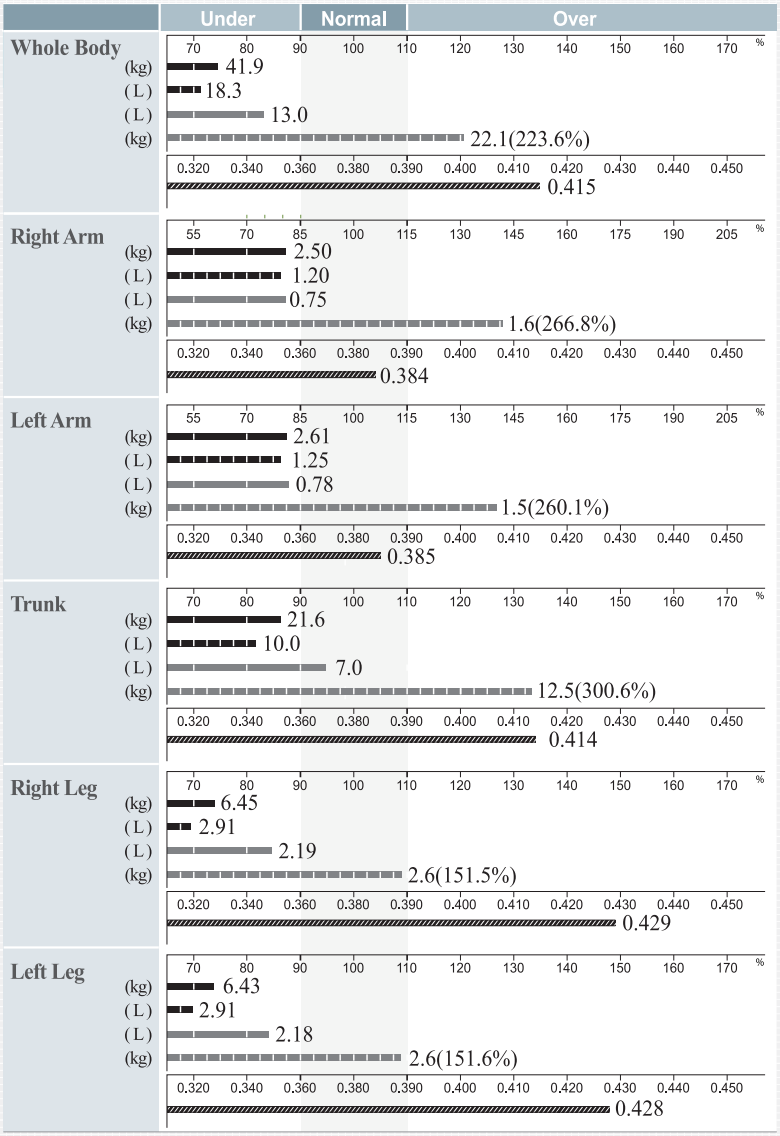
Body Composition Summary

	FFM	FM	ICW	ECW	TBW	ECW/TBW
Right Arm	2.50 kg	1.6 kg	1.20 L	0.75 L	1.95 L	0.384
Left Arm	2.61 kg	1.5 kg	1.25 L	0.78 L	2.03 L	0.385
Trunk	21.6 kg	12.5kg	10.0 L	7.0 L	17.0 L	0.414
Right Leg	6.45 kg	2.6 kg	2.91 L	2.19 L	5.10 L	0.429
Left Leg	6.43 kg	2.6 kg	2.91 L	2.18 L	5.09 L	0.428
Whole Body	41.9 kg	22.1 kg	18.3 L	13.0 L	31.3 L	0.415
Weight		64.0 kg				

The difference between the whole body values and sum of segmental values are from the craniocervical region.

Body Composition Analysis

Lean Mass ICW ECW
Fat Mass ECW/TBW



Research Parameters

Body Mass Index	21.4 kg/m²	(18.5~25.0)
Percent Body Fat	34.5 %	(10.0~20.0)
Skeletal Muscle Mass	21.9 kg	(28.2~34.4)
Soft Lean Mass	39.7 kg	(47.5~58.1)
Protein	8.0 kg	(9.9~12.1)
Mineral	2.60 kg	(3.43~4.19)
Bone Mineral Content	2.16 kg	(2.82~3.44)
Basal Metabolic Rate	1275 kcal	(1428~1663)
Waist Hip Ratio	1.12	(0.80~0.90)
Waist Circumference	100.8 cm	
Visceral Fat Area	145.0 cm²	
Obesity Degree	97 %	(90~110)
Body Cell Mass	26.2 kg	(32.8~40.2)
Arm Circumference	30.2 cm	
Arm Muscle Circumference	27.1 cm	
TBW/FFM	74.8 %	
Fat Free Mass Index	14.0 kg/m²	
Fat Mass Index	7.4 kg/m²	
Skeletal Muscle mass Index	6.0 kg/m²	

Whole Body Phase Angle

Proximal

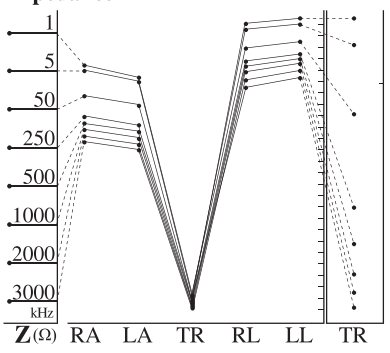
ϕ(°) 50 kHz | 3.8°

Segmental Body Phase Angle

Proximal	RA	LA	TR	RL	LL
ϕ(°) 5 kHz	2.2	2.0	2.2	1.6	1.5
50 kHz	4.9	4.8	5.0	2.8	2.6
250 kHz	4.8	4.7	5.9	3.1	2.8

Impedance

Proximal



[Clamp Type, Lying Posture]
[000/000/000]

Comparison Result Sheet

BWA Comparison

[BWA2.0]

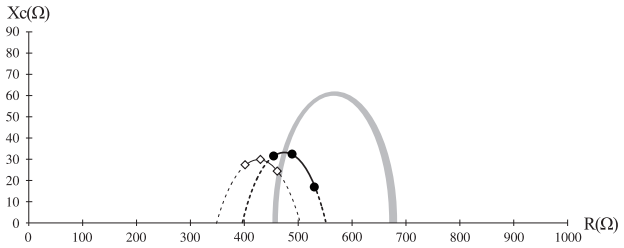
InBody

ID	Height	Age	Gender	Test Date / Time
John Doe	173cm	41	Male	2021.03.31. 15 : 44

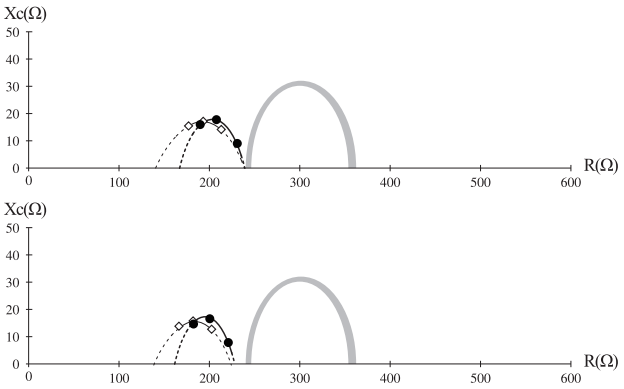
Today's Results — Recent Results — Standard median curve

(2021.03.20 15:12)

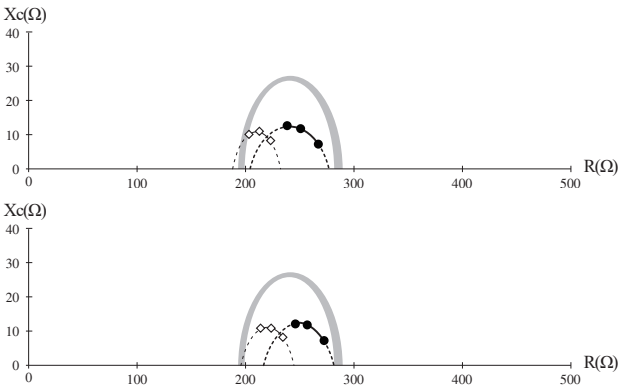
Whole Body		Today	Recent	Difference
Weight	(kg)	64.0	67.9	-3.9
SMM Skeletal Muscle Mass	(kg)	21.9	24.0	-2.1
Body Fat Mass	(kg)	22.1	21.9	+0.2
ECW Ratio		0.415	0.419	-0.004
Phase Angle	(°)	3.8	3.9	-0.1



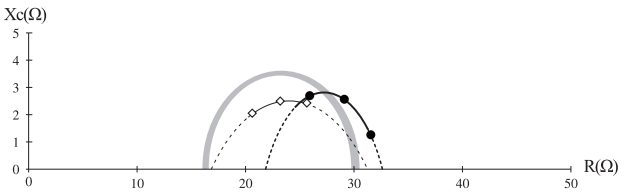
Right Arm		Today	Recent	Difference
Lean Mass	(kg)	2.50	2.75	-0.25
ECW Ratio		0.384	0.386	-0.002
Phase Angle	(°)	4.9	4.8	+0.1
Left Arm		**Today**	**Recent**	**Difference**
Lean Mass	(kg)	2.61	2.91	-0.30
ECW Ratio		0.385	0.387	-0.002
Phase Angle	(°)	4.8	4.7	+0.1



Right Leg		Today	Recent	Difference
Lean Mass	(kg)	6.45	6.93	-0.48
ECW Ratio		0.429	0.433	-0.004
Phase Angle	(°)	2.8	2.9	-0.1
Left Leg		**Today**	**Recent**	**Difference**
Lean Mass	(kg)	6.43	6.82	-0.39
ECW Ratio		0.428	0.432	-0.004
Phase Angle	(°)	2.6	2.6	0.0



Trunk		Today	Recent	Difference
Lean Mass	(kg)	21.6	23.0	-1.4
ECW Ratio		0.414	0.419	-0.005
Phase Angle	(°)	5.0	6.0	-1.0



Body Composition Result Sheet for Children

BWA [BWA 2.0]

InBody

ID	Height	Age	Gender	Test Date / Time
John Doe	139.4cm	10	Male	2021.03.31. 16:40

Body Composition Analysis

Total amount of water in my body	Total Body Water	(L)	19.1 (18.0 ~ 22.0)
What I need to build muscles	Protein	(kg)	5.1 (4.9 ~ 5.9)
What I need for strong bones	Mineral	(kg)	1.91 (1.66 ~ 2.04)
Where my excess energy is stored	Body Fat Mass	(kg)	8.9 (3.8 ~ 7.7)
Sum of the above	Weight	(kg)	35.0 (27.3 ~ 36.9)

Muscle-Fat Analysis

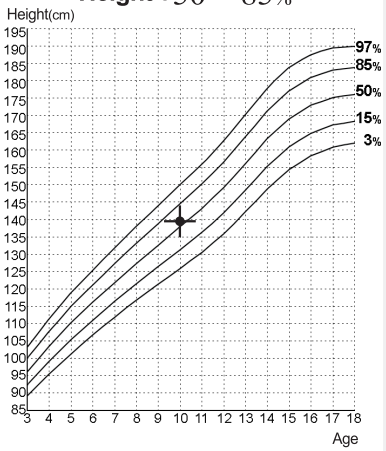
	Under	Normal	Over
Weight (kg)	55 70 85 100 115 130 145 160 175 190 205 %		35.0
SMM Skeletal Muscle Mass (kg)	70 80 90 100 110 120 130 140 150 160 170 %	13.3	
Body Fat mass (kg)	40 60 80 100 160 220 280 340 400 460 520 %	8.9	

Obesity Analysis

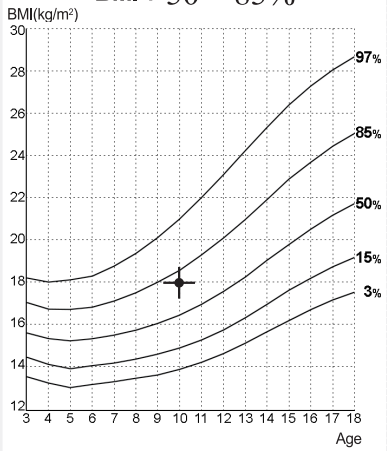
	Under	Normal	Over
BMI Body Mass Index (kg/m²)	7.9 10.9 13.9 16.4 18.6 20.2 22.2 24.2 26.2 28.2 30.2	18.0	
PBF Percent Body Fat (%)	0.0 5.0 10.0 15.0 20.0 25.0 30.0 35.0 40.0 45.0 50.0	25.6	

Growth Graph

Height : 50 ~ 85%



BMI : 50 ~ 85%



* 7 growth charts of weights for ages were truncated at 10 years of age.

Body Composition History

		19.07.15 14:22	19.11.19 09:30	20.01.29 15:18	20.03.15 11:00	20.06.21 15:00	20.09.19 14:52	20.12.20 15:12	21.03.31 16:40
Height	(cm)	134.5	135.2	136.4	137.2	137.9	138.5	139.0	139.4
Weight	(kg)	30.8	31.3	32.0	32.8	33.5	34.0	34.4	35.0
SMM Skeletal Muscle Mass	(kg)	12.5	12.7	12.8	13.0	13.1	13.1	13.2	13.3
PBF Percent Body Fat	(%)	20.4	20.7	21.6	22.3	23.1	24.3	25.1	25.6

☑ Recent ☐ Total

Growth Score

85 / 100 Points

* If tall and within great body comparison standards, the growth score may surpass 100 points.

Nutrition Evaluation

Protein	☑ Normal	☐ Deficient	
Minerals	☑ Normal	☐ Deficient	
Body Fat	☐ Normal	☐ Deficient	☑ Excessive

Obesity Evaluation

BMI	☑ Normal	☐ Under	☐ Slightly Over	☐ Over
PBF	☐ Normal	☐ Slightly Over	☑ Over	

Body Balance Evaluation

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

Segmental Lean Analysis

Right Arm	0.95 kg
Left Arm	0.94 kg
Trunk	10.8 kg
Right Leg	3.41 kg
Left Leg	3.37 kg

Research Parameters

Basal Metabolic Rate	933 kcal	(948 ~1077)
Child Obesity Degree	109 %	(90 ~110)

Whole Body Phase Angle

Proximal

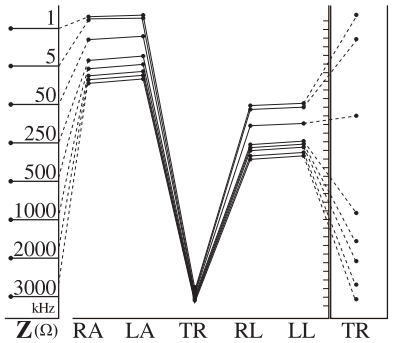
ϕ(°) 50 kHz | 4.3°

Segmental Body Phase Angle

Proximal	RA	LA	TR	RL	LL
ϕ(°) 5 kHz	1.4	1.4	3.0	1.9	1.8
50 kHz	3.6	3.3	6.8	5.0	4.8
250 kHz	3.7	3.6	9.4	5.0	4.9

Impedance

Proximal



[Clamp Type, Lying Posture]

[000/000/000]

Thermal Result Sheet

BWA 2021/03/31 15:44

ID : John Doe
Height : 173cm Age : 41
Gender: Male Weight : 64.0kg

[Clamp Type, Lying Posture]

Muscle-Fat Analysis

		Normal Range
Weight	64.0 kg	(55.9~75.7)
Skeletal Muscle Mass	21.9 kg	(28.2~34.4)
Soft Lean Mass	39.7 kg	(47.5~58.1)
Body Fat Mass	22.1 kg	(7.9~15.8)

Obesity Analysis

		Normal Range
BMI	21.4 kg/m²	(18.5~25.0)
Percent Body Fat	34.5 %	(10.0~20.0)

Segmental ECW Ratio Analysis

		Normal Range
Right Arm	0.384	(0.360~0.390)
Left Arm	0.385	(0.360~0.390)
Trunk	0.414	(0.360~0.390)
Right Leg	0.429	(0.360~0.390)
Left Leg	0.428	(0.360~0.390)

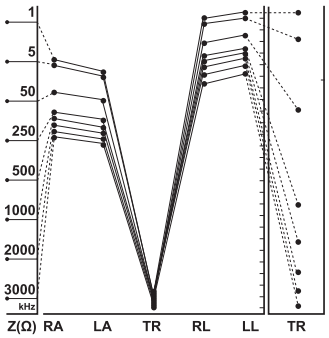
Body Water Analysis

		Normal Range
Intracellular Water	18.3 L	(23.0~28.0)
Extracellular Water	13.0 L	(14.0~17.2)
Total Body Water	31.3 L	(37.0~45.2)

Proximal

Whole Body Phase Angle 3.8 °

Impedance



InBody
www.inbody.com

BWA 2021/03/31 15:44

ID : John Doe
Height : 173cm Age : 41
Gender: Male Weight : 64.0kg

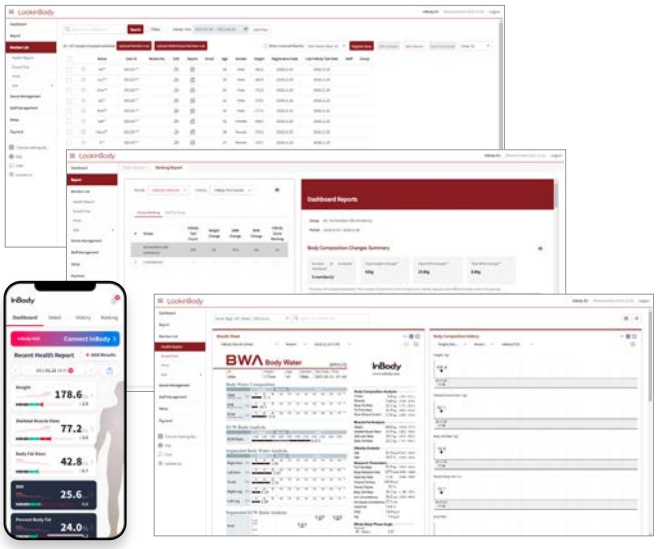
Water Control

ECW Ratio	0.415
Target ECW Ratio	0.385
Over Hydration	-1.5 L (-1.65~-1.35)
Target Weight	65.5 kg

Data Management Program

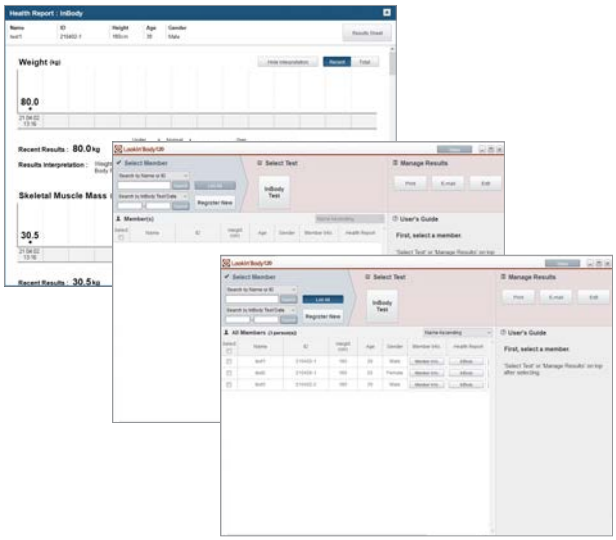
LookinBody WEB (Cloud)

A cloud-based client and data management solution designed to optimize performance and deliver a better user experience. Try a free 1-month demonstration by contacting regional managers.

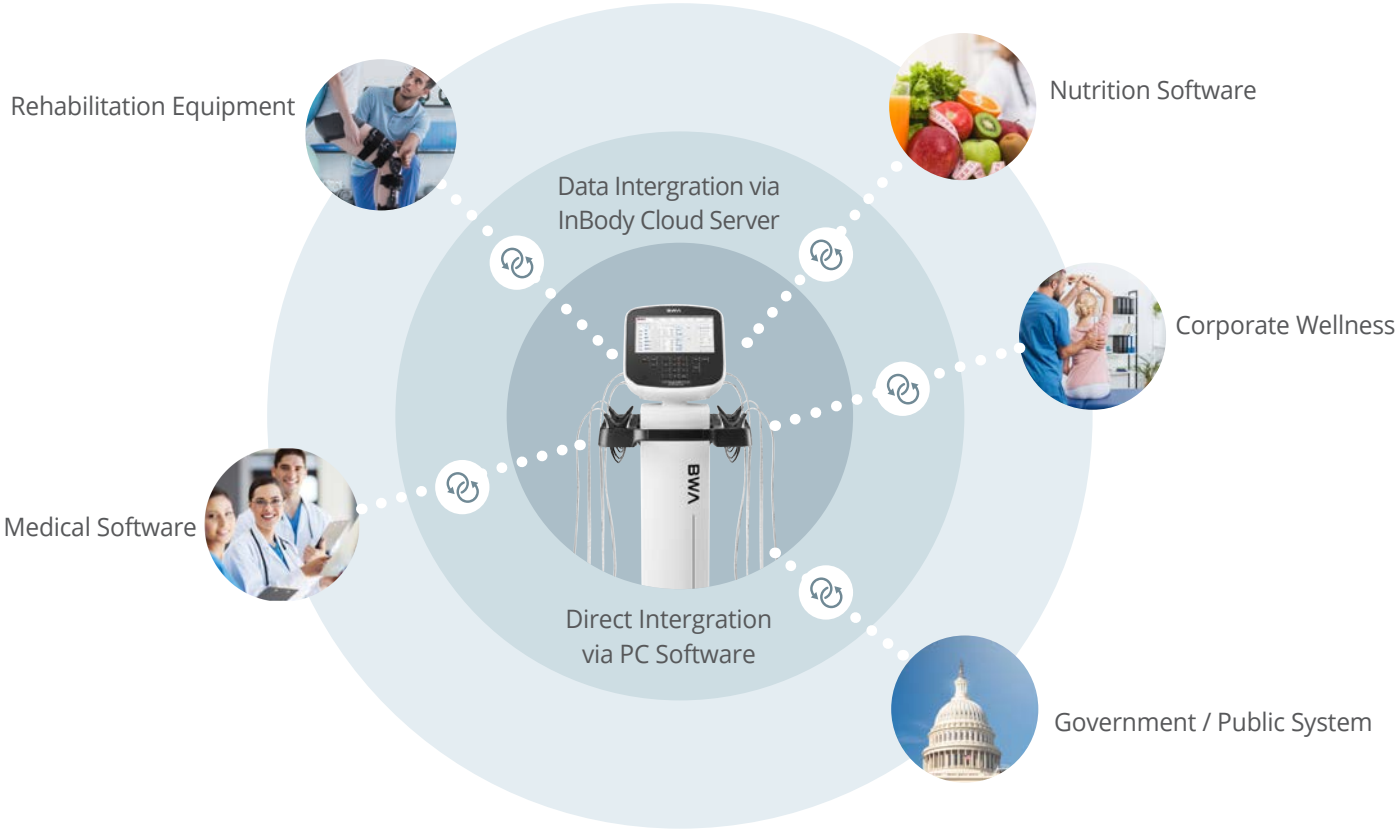


LookinBody120 (PC Software)

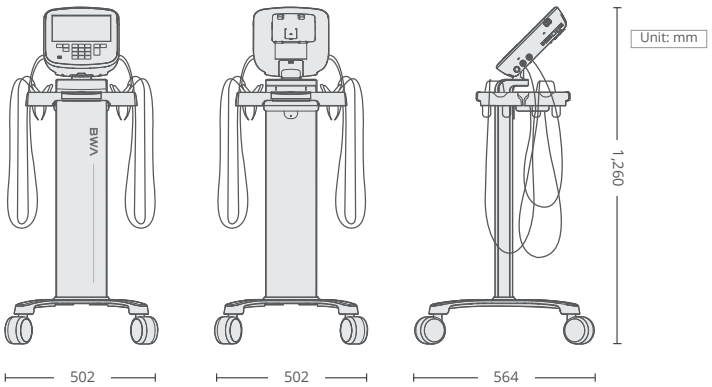
LookinBody120 allows you to view and manage all BWA data generated from your BWA device.



InBody Integration Solution



Specifications



BWA 2.0 BODY WATER ANALYZER

Bioelectric Impedance Analysis (BIA) Measurement Item	Bioelectrical Impedance(Z)	40 Impedance Measurements by Using 8 Different Frequencies (1kHz, 5kHz, 50kHz, 250kHz, 500kHz, 1MHz, 2MHz, 3MHz) at Each of 5 Segments (Right Arm, Left Arm, Trunk, Right Leg and Left Leg)	
	Phase Angle	15 Phase Angle Measurements by Using 3 Different Frequencies (5kHz, 50kHz, 250kHz) at Each of 5 Segments (Right Arm, Left Arm, Trunk, Right Leg, and Left Leg)	
Electrode Method	16-Point Clamp Electrodes		
Measurement Method	Direct Segmental Multi-Frequency Bioelectrical Impedance Analysis (DSM-BIA) Simultaneous Multi-Frequency Bioelectrical Impedance Analysis (SMF-BIA)		
Body Composition Calculation Method	No Empirical Estimation (Age and Gender does not affect the result)		
Optional Items	Thermal Printer (TP100), BWA Portable Case, BWA Adhesive Electrodes and Tape and BWA Battery Pack		
Logo Display	Name, Address and Content Information can be shown on Result Sheet		
Digital Results	LCD Screen, LookinBody Web, LookinBody120		
Type of Result Sheets	Body Water Result Sheet, Body Composition Result Sheet, Evaluation Result Sheet, Research Result Sheet, Comparison Result Sheet, Result Sheet for Children, and Thermal Result Sheet		
Voice Guidance	Audible guidance for test in progress and test complete		
Data Storage	Saves up to 100,000 measurements (When ID is entered)		
Administrator Menu	Setup: Configure settings and manage data Troubleshooting: Additional information to help use the BWA2.0		
InBody USB	Copy, backup, or restore the LookinBody test data (data can be viewed on Excel or LookinBody120)		
Barcode Reader	Member ID will be automatically inputted when the Barcode is scanned		
InBodyBAND Series Recognition Function	Recognizes the InBodyBAND series of the subject and automatically inputs personal information to the BWA2.0		
Fingerprint Recognition Function	Recognizes the fingerprint of the measurer and automatically inputs personal information to the BWA2.0		
Backup data	Backup data form BWA2.0 with an InBody USB		
QR Code	See your result on the InBody mobile App		
Applied Rating Current	1kHz : 70uA (+-10uA), Over 5kHz : 300uA (+-30uA)		
Adapter	Bridgepower (BPM040S12F07)	Power Input	AC 100-240V, 50-60Hz, 1.2A (1.2A-0.6A)
		Power Output	DC 12V, 3.4A
	Mean Well (GSM40A12-P1IR)	Power Input	AC 100-240V, 50-60Hz, 1.0-0.5A
		Power Output	DC 12V, 3.34A
Display Type	1280 x 800 10.1inch Color TFT LCD		
Internal Interface	Touchscreen, Keypad		
External Interface	RS-232C 4EA, USB Host 2EA, USB Slave 1EA, LAN(10/100T) 1EA, Bluetooth 1EA, Wi-Fi 1EA		
Compatible Printer	BWA compatible printers available at www.inbodyservice.com		
Dimensions	322(W) x 282(L) x 81.5(H): mm		
Equipment Weight	3.3kg (7.27lb, BWA only)		
Test Duration	About 90 seconds for Medical Mode, about 180 seconds for Research Mode		
Operation Environment	10~40°C (50 ~ 104°F), 30~75% RH, 70~106kPa		
Storage Environment	-10~70°C(14~158°F),10~80% RH, 50~106kPa (No Condensation)		
Weight Range	10 ~ 250kg (22.0 ~ 551.2lb)		
Age Range	3~99 years		
Height Range	95~220cm (3ft 1.40in ~ 7ft 2.61in)		

Body Water Result Sheet	Result parameters and Result interpretation • Body Water Composition (Total Body Water, Intracellular Water, Extracellular Water) • ECW Ratio Analysis • Segmental Body Water Analysis (Right Arm, LeftArm, Trunk, Right Leg, Left Leg) • Segmental ECW Analysis (Right Arm, Left Arm, Trunk, Right Leg, Left Leg) • Body Water Composition History (Weight, Total Body, Intracellular Water, Extracellular Water, Extracellular Water Ratio) • Muscle-Fat Analysis (Weight, Skeletal Muscle Mass, Soft Lean Mass, Body Fat Mass) • Obesity Evaluation (BMI, Percent Body Fat)	• Research Parameters (Fat Free Mass, Basal Metabolic Rate, Waist-Hip Ratio, Visceral Fat Area, Obesity Degree, Body Cell Mass, Arm Circumference, Arm Muscle Circumference, TBW/FFM, FMI, FFMI, SMI) • Blood Pressure (Max/Min/Pulse Rate, Avg/Pulse pressure/R.P.P) • Result Interpretation QR Code • QR Code • Segmental Body Phase Angle (5kHz, 50kHz, 250kHz: Right Arm, Left Arm, Trunk, Right Leg, Left Leg) • Whole Body Phase Angle (50kHz) • Impedance Graph (Each segment and each frequency)
Body Composition Result Sheet	Result parameters and Result interpretation • Body Composition Analysis (Total Body Water, Protein, Mineral, Body Fat Mass, Fat Free Mass, Soft Lean Mass, Weight) • Muscle-Fat Analysis (Weight, Skeletal Muscle Mass, Body Fat Mass) • Obesity Analysis (Body Mass Index, Percent Body Fat) • Segmental Lean Analysis • Segmental Fat Analysis • Segmental ICW Analysis • Segmental ECW Analysis • ECW Ratio Analysis (ECW Ratio) • Body Composition History (Weight, Skeletal Muscle Mass, Percent Body Fat, ECW Ratio) • InBody Score • Visceral Fat Area (Graph) • Weight Control (Target Weight, Weight Control, Fat Control, Muscle Control) • Body Type (Graph) • Nutrition Evaluation (Protein, Minerals, Fat Mass) • Obesity Evaluation (BMI, Percent Body Fat)	• Body Balance Evaluation (Upper, Lower, Upper-Lower) • Percent Abdominal Fat (Graph) • Visceral Fat Level (Graph) • Research Parameters (Extracellular Water, Intracellular Water, Skeletal Muscle Mass, Fat Free Mass, Basal Metabolic Rate, Waist Circumference, Visceral Fat Level, Visceral Fat Area, Obesity Degree, Bone Mineral Content, Body Cell Mass, Arm Circumference, Arm Muscle Circumference, FMI, FFMI, SMI, Recommended Calorie Intake, Calorie Expenditure of Exercise, InBody Score) • Blood Pressure (Max/Min/Pulse Rate, Avg/Pulse pressure/R.P.P) • Result Interpretation QR Code • QR Code • Segmental Body Phase Angle (5kHz, 50kHz, 250kHz: Right Arm, Left Arm, Trunk, Right Leg, Left Leg) • Whole Body Phase Angle (50kHz) • Impedance Graph (Each segment and each frequency)
Evaluation Result Sheet	• Whole Body ECW Ratio (ECW/TBW): (T-Score, Z-score) • Visceral Fat Area (VFA,cm²): (T-Score, Z-score) • Body Mass Index (BMI,kg/m²): (T-Score, Z-score) • Bioeletrical Impedance Vector Analysis (BIVA) • Whole Body Phase Angle_50kHz (PhA,°): (T-Score, Z-score) • ECW Ratio (ECW/TBW) Balance (Right Arm, Left Arm, Trunk, Right Leg, Left Leg): Evaluation • Percent Body Fat (PBF,%): (T-Score, Z-score) • Skeletal Muscle mass Index (SMI,m²): (T-Score, Z-score) • Fat Mass Index (FMI,kg/m²): (T-Score, Z-score) • Fat Free Mass Index (FFMI,kg/m²): (T-Score, Z-score) • Lean Mass (LM) Balance(Right Arm, Left Arm, Trunk, Right Leg, Left Leg): Amount, Evaluation	• Skeletal Muscle Mass and ECW Ratio (SMM,% & ECW/TBW) • Skeletal Muscle mass Index and ECW Ratio (SMI,kg/m² & ECW/TBW) • Waist Hip Ratio (WHR): (T-Score, Z-score) • Body Cell Mass (BCM,kg): (T-Score, Z-score) • Outer Circumference(cm) • Weight (kg): (T-Score, Z-score) • Skeletal Muscle Mass/WT, • Extracellular Mass/Body Cell Mass (ECM/BCM): (T-Score, Z-Score) • Total Body Water/Weight (%): (T-Score, Z-Score)
Research Result Sheet	• Body Composition Summary (Fat Free Mass, Body Fat Mass, Intracellular Water, Extracellular Water, Body Water, ECW Ratio, Weight) • Body Composition Analysis (Lean Mass, ICW, ECW, Fat Mass, ECW/TBW): Whole Body, Right Arm, Left Arm, Trunk, Right Leg, Left Leg • Research Parameters (BMI, Percent Body Fat, Percent Abdominal Fat, Visceral Fat Area, Obesity Degree, Waist Circumference, FMI, Skeletal Muscle Mass, FFMI, SMI, Protein, Body Cell Mass, Mineral, Bone Mineral Content, Basal Metabolic Rate, Arm Circumference, Arm Muscle Circumference, TBW/FFM) • Segmental Phase Angle (5kHz, 50kHz, 250kHz: Right Arm, Left Arm, Trunk, Right Leg, Left Leg) • Whole Body Phase Angle (50kHz) • Impedance Graph (Each segment and each frequency)	
Comparison Result Sheet	• Weight, Skeletal Muscle Mass, Body Fat Mass, ECW Ratio, Phase Angle: Whole Body (Current Result, Previous Result, Current-Previous Result difference) • Lean Mass, ECW Ratio, Phase Angle: Right Arm, Left Arm, Trunk, Right Leg, Left Leg (Current Result, Previous Result, Current-Previous Result difference) • Cole-Cole Plot (Today, Recent, Standard Median Curve)	
Body Composition Result Sheet for Children	Result parameters and Result interpretation • Body Composition Analysis (Total Body Water, Protein, Mineral, Body Fat Mass, Weight) • Muscle-Fat Analysis (Weight, Skeletal Muscle Mass, Body Fat Mass) • Obesity Analysis (Body Mass Index, Percent Body Fat) • Growth Graph (Height, Weight, BMI) • Growth Score • Body Composition History (Height, Weight, Skeletal Muscle Mass, Percent Body Fat) • Nutrition Evaluation (Protein, Minerals, Fat Mass) • Obesity Evaluation (BMI, Percent Body Fat) • Body Balance (Upper, Lower, Upper-Lower) • Segmental Lean Analysis (Right Arm, Left Arm, Trunk, Right Leg, Left Leg)	• Segmental Body Water Analysis (Right Arm, Left Arm, Trunk, Right Leg, Left Leg) • Research Parameters (Intracellular Water, Extracellular Water, Basal Metabolic Rate, Child Obesity Degree, Bone Mineral Content, Body Cell Mass, FFMI, FMI) • Blood Pressure (Max/Min/Pulse Rate, Avg/Pulse pressure/R.P.P) • Result Interpretation QR Code • QR Code • Segmental Body Phase Angle (5kHz, 50kHz, 250kHz: Right Arm, Left Arm, Trunk, Right Leg, Left Leg) • Whole Body Phase Angle (50kHz) • Impedance Graph (Each segment and each frequency)
Thermal Result Sheet	• Muscle-Fat Analysis (Weight, Skeletal Muscle Mass, Soft Lean Mass, Body Fat Mass) • Obesity Evaluation (BMI, Percent Body Fat) • Segmental Lean Analysis • Segmental ECW Ratio Analysis • Body Water Composition (Total Body Water, Intracellular Water, Extracellular Water) • Body Composition Analysis (Protein, Minerals, Body Fat Mass, Fat Free Mass, Bone Mineral Content) • Segmental Body Water Analysis • Segmental Fat Analysis • Segmental Lean Analysis (human shaped graph)	• Segmental ECW Ratio Analysis (human shaped graph) • Research Parameters (Extracellular Water, Intracellular Water, ECW Ratio, Skeletal Muscle Mass, Protein, Minerals, Bone Mineral Content, Body Cell Mass, Percent Abdominal Fat, Waist Circumference, Visceral Fat Area, Obesity Degree, Basal Metabolic Rate, Arm Circumference, Arm Muscle Circumference, FMI, FFMI, SMI, TBW/FFM) • Whole Body Phase Angle (50kHz: Right side of the body) • Segmental Phase Angle (5kHz, 50kHz, 250kHz: Right Arm, Left Arm, Trunk, Right Leg, Left Leg) • Impedance (Each segment and each frequency)

* Specifications may change without prior notice.

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