EVOLT

EVOLT 360 IN CLINICAL PRACTICE

Revolutionizing patient health assessment in the medical industry

ADVANCED BODY COMPOSITION INSIGHTS

Beyond conventional metrics like weight and BMI, body composition analysis (BCA) in the medical industry offers insightful information about a patient's health using techniques like bioelectrical impedance analysis (BIA). The body's composition is measured by BIA and includes

Fat Mass and Fat-Free Mass:

Assists in determining how fat is distributed throughout the body, which helps with the diagnosis and treatment of diseases like malnutrition and obesity.

Muscle Mass:

Suitable for assessing muscle condition and detecting ailments impacting muscle size, including sarcopenia, muscular dystrophy, or various metabolic diseases.

Monitoring Changes Over Time:

BCA aids in monitoring alterations in body composition during medical treatments, including nutritional therapy, rehabilitation, or weight loss programs.

Hydration Levels:

BIA is capable of estimating the total amount of water in the body, offering valuable insights into an individual's hydration status. This ability is particularly important in the effective management of medical conditions that are associated with fluid balance.

Metabolic Rate:

BIA has the capability to calculate basal metabolic rate, which is instrumental in gaining insights into energy consumption. This understanding is crucial for developing tailored nutrition and weight management strategies. By measuring basal metabolic rate, BIA provides valuable information that can be used to create individualized dietary plans and manage weight effectively, ensuring a more precise approach to health and wellness.

Disease Risk Assessment:

Results from BIA can be effectively utilized to evaluate the potential risk of diseases linked to body composition. This includes, but is not limited to, illnesses like cardiovascular diseases and diabetes, which are known to correlate with variations in body composition.

By providing a more comprehensive understanding of a patient's body composition, BIA aids healthcare professionals in making informed decisions regarding treatment plans, personalized interventions, and monitoring overall health.

CUTTING EDGE TECHNOLOGY

See What You're Made of

Reveal the efficiency of your consultation through the Evolt 360 Test

DATE	01/30	02/13	02/28	03/14	04/03	04/24	05/15	05/23
Weight KG/LBS	195.8	196.0	199.3	198.4	195.1	193.8	194.9	194.9
SMM KG/LBS SKELETAL MUSCLE MASS	104.5	103.0	105.6	104.9	104.3	101.4	104.3	102.1
TOTAL BODY FAT %	5.0	6.4	5.9	5.9	5.0	6.8	5.0	7.0
TOTAL BODY WATER KG/LBS	138.8	132.1	135.1	134.5	133.4	130.1	133.4	130.5

The Evolt 360 uses a scientifically validated test known as Bioelectrical Impedance Analysis (BIA). It is considered the fastest, non-invasive method of screening total body composition.

- Bioelectrical Impedance (BIA) works by passing a safe, low intensity electrical current through the body via the tactical points on the machine (feet and hands). In very basic terms, the resistance to flow of the current determines the difference between muscle mass, fat mass (including visceral and subcutaneous), water and mineral.

- The Evolt 360 advanced measuring system uses a 5-compartment model,which essentially provides a more accurate measure than a 1 compartment system (ie. Such as a single scale that claims to use BIA technology).

- BIA was the science originally developed for the use in monitoring hospital patients after surgery, as well as in other areas of medicine, from Nephrology to Oncology, in Sports Science, Fitness, and Medical wellness, in Nutrition, Weight Management, Diabetes and Lifestyle monitoring.

- BIA has been used for many years in the medical field to assess lean tissue losses in oncology patients. It is widely used and validated in science as a safe, reliable and repeatable measure of body composition

BODY COMPOSITION MEASUREMENTS

Weight
Total body weight

Total Body Water & Percentage
Total weight of fluid and percentage

ICW
Intracellular water is a measure of fluid found inside the cell

Total Body Fat Mass
Weight of total mass of body fat

Skeletal Muscle Mass
Total weight of skeletal muscle mass and percentage

ECW
Extracellular water is a measure of fluid found outside the cell

Subcutaneous Fat Mass
Total weight of subcutaneous fat mass

BMR (Basal Metabolic Rate)
Estimated daily calories required at total rest

Protein
Estimated total body protein, which is a key component of muscle mass

Visceral Fat Mass
Total weight of visceral fat mass

Muscle Score
Muscle mass is judged by calculating the amount of muscle mass against your height and then the amount is classified

Segmental Analysis of Body Fat and Muscle Mass
Distribution of muscle mass and body fat across the limbs and torso to determine muscular balance

Visceral Fat Level
Indication of level of internal fat surrounding organs

Body Mass Index
Indicates the relationship between your height and weight

MEDICAL APPLICATIONS

GENERAL PRACTICE

General Practitioners can benefit from using bioelectrical impedance analysis in a number of patient health evaluation and treatment scenarios.

Understanding BIA - Using a non-invasive technique, BIA evaluates the composition of the body. It calculates the body's resistance to minute electrical currents, which enables you to determine your body's water, fat, and lean mass. These metrics can be very important for tracking and evaluating nutrition.

Applications in Weight Management - Tracking weight increase or decrease is a specialisation of BIA. You may provide your patients more individualised nutrition and exercise suggestions and ensure that they preserve muscle mass while shedding fat if you can differentiate between fat mass and lean body mass

Dietary Assessment - Body composition changes over time can be evaluated using BIA in patients with dietary excesses or deficiencies. This is very helpful for treating disorders including cachexia, anorexia, and obesity.

Monitoring Chronic Diseases - In the management of long-term ailments such as liver disease, renal illness, and heart failure, BIA can be very helpful. Body water compartments are frequently altered by various disorders; BIA can assist in monitoring these changes and modifying treatment regimens as necessary.

Elderly Care - BIA can be used to evaluate frailty and sarcopenia, or loss of muscle mass, in elderly people. This data is essential for assessing fall risk and customising fitness regimens.

Integration with Other Measurements - BMI, waist circumference, clinical history, and laboratory testing should all be done in addition to BIA when performing clinical assessments. A more precise assessment of health is ensured by this all-encompassing method.

Patient Engagement - By involving patients in their healthcare journey, BIA results can be a potent tool. Observing noticeable alterations in their body composition may encourage people to follow lifestyle advice. A valuable viewpoint on patient health that goes beyond conventional metrics is provided by BIA integration into your practice, enabling more complex and efficient medical care.

Tailored Treatment Plans - Tailored treatment plans can be informed by the comprehensive body composition analysis obtained by the Evolt 360. For example, the GP may decide to modify the treatment plan to incorporate resistance training or dietary counselling if the patient on GLP-1 therapy is losing muscle mass in addition to fat.

Patient Engagement and Motivation - Patients may get quite motivated when they observe observable changes in their body composition. Visual and quantitative data from the Evolt 360 can help patients adhere to GLP-1 medication and related lifestyle changes.

Early Identification of Possible Problems - Consistent Evolt 360 use can aid in the early identification of any unfavourable changes in body composition, such as a noticeable loss of muscle, which may call for a modification of

GENERAL PRACTICE

Research and Data Collection - Research can benefit from the Evolt 360's data collection. GPs can help advance knowledge of the safety and efficacy of GLP-1 medication by monitoring the changes in body composition of their patients.

Safety & Non-Invasiveness - The Evolt 360's BIA technology is non-invasive, safe, and rapid, making it appropriate for routine patient monitoring without putting patients through undue discomfort or inconvenience.

General practitioners can manage patients undergoing GLP-1 therapy for fat loss with the use of the Evolt 360 BIA. Its thorough analysis supports patient involvement, tailored treatment planning, and therapeutic safety and efficacy monitoring. In the context of managing obesity, regular use of this technology can improve patient outcomes and overall quality of treatment.

BARIATRICS

Body composition scanners are employed in the weight loss industry to assess and track changes in an individual's body composition, which includes fat, muscle, water, and bone mass.

BIA is essential for understanding the patient's physiological makeup and guiding targeted therapies to enhance the success of weight management programs, making it the ideal tool to implement into clinical practice. The BIA test provides comprehensive results that can be used to educate and engage the patient as well as track health improvements throughout patient interventions (**Kim et al. 2011**) (**Aragon et al. 2017**).

Bariatric professionals can use the BIA device to -

- Assess muscle-fat balance and visceral fat for comprehensive health risk assessments.
- Identify fluid imbalances related to inflammation or underlying disease.
- Monitor changes to determine efficacy of treatments and further guide health recommendations to ensure long-term success.

Baseline Assessment:

Body composition scanners offer a preliminary overview of an individual's body composition. This initial assessment serves as a foundation for designing customized weight loss programs that are uniquely suited to meet the specific requirements of each person.

Tracking Progress

Frequent body composition scans enable both individuals and health professionals to track variations in fat mass, muscle mass, and overall body composition progressively. By doing so, they provide valuable insights into the progress of a weight loss program. This continuous monitoring is crucial for evaluating the success of the regimen and allows for timely modifications to be made, ensuring the program remains effective and aligned with individual goals.

BARIATRICS

Motivation

Observing favourable shifts in body composition as reflected in scan outcomes can act as a powerful source of motivation for individuals embarking on weight loss journeys. These scan results provide concrete, visual proof of their progress, offering a clear demonstration of how their efforts are translating into physical changes. This not only boosts motivation but also reinforces the commitment to their health goals, making the weight loss journey more rewarding and encouraging continued effort.

Health Monitoring:

Beyond aesthetics, body composition scanners contribute to overall health monitoring. Reduction in excess fat can be associated with improved metabolic health, reduced risk of certain diseases, and enhanced overall well-being.

Nutritional Guidance:

Body composition analysis delivers detailed insights into the effects of diet and exercise on various components of the body. This critical information assists individuals in steering towards a well-rounded diet and an exercise routine that's suitable for their specific body needs. By understanding the unique impact of their lifestyle choices on their body's composition, individuals can make informed decisions to optimize their health regimen. This approach ensures a more targeted and effective strategy for achieving their health and fitness goals.

Setting Realistic Goals:

Gaining insight into the specific distribution of fat and muscle in the body enables users to establish practical and attainable objectives for weight loss. This knowledge fosters a more balanced and long-term strategy for weight management. By having a clear understanding of their body's composition, individuals can tailor their goals to align with their unique physical makeup, leading to a healthier and more effective approach to reducing body fat and improving overall better health.

TRACKING TREATMENT OF GLP-1

General Practitioners can find the Evolt 360 Body Composition Analyser (BIA) to be a useful tool in evaluating and tracking the efficacy of GLP-1 medications for weight loss.

Thorough Evaluation of Body Composition - The Evolt 360 offers a thorough examination of body composition, encompassing visceral fat, lean muscle mass, and fat mass. This is important to know while monitoring patients receiving GLP-1 therapy because the main goal of these medications is fat loss, especially visceral fat. A more sophisticated comprehension of alterations in body composition beyond mere weight reduction is made possible by the extensive data obtained by the Evolt 360.

Tracking Changes in Visceral Fat - GLP-1 medications are well-known for their ability to reduce visceral fat, which has been connected to metabolic diseases. GPs can evaluate the efficacy of GLP-1 medication in decreasing this high-risk fat depot by using the Evolt 360's capacity to detect visceral fat precisely, which gives them valuable information about the drug's effects on metabolic health.

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CARDIOVASCULAR FUNCTION

BIA plays a vital role in evaluating cardiovascular health in patients. It particularly addresses issues such as increased blood volume, heightened levels of body water, and the resulting strain on the heart, which are common consequences of obesity-related conditions. While Body Mass Index (BMI) is widely utilized to assess the risk of cardiovascular diseases, it notably fails to consider visceral fat, which is frequently associated with an elevated risk of cardiovascular complications. Unlike BMI, BIA provides a more detailed assessment by enabling doctors to differentiate between muscle and fat content in the body, a critical aspect in managing cardiovascular health (**Sato et al., 2018; Hancu et al., 2015**).

BIA is not only instrumental in the treatment of cardiovascular diseases but also plays a significant role in enhancing the outcomes of surgical procedures. This technique ensures that cardiologists can rely on its outputs to accurately mirror changes occurring within the patient. In a time-efficient manner, taking less than one minute, cardiology professionals utilizing BIA can achieve several objectives:

- Obtain precise fluid measurements, assisting in the development of effective fluid management strategies.
- Monitor the patient's nutritional status in a detailed manner, allowing for well-informed nutritional interventions.
- Track the patient's progress with accuracy and utilize this data to predict outcomes of surgical procedures effectively.

DIABETES

BIA is an essential instrument for doctors to better comprehend their patients who are overweight or at risk of diabetes. This technology consistently measures body fat percentage, total body water, lean body mass, and visceral fat area. The latter is particularly significant in diabetes, as high levels of visceral fat are linked with the disease. Type 2 Diabetes is associated with obesity and elevated visceral fat. Physicians need to grasp their patient's body composition to evaluate the risk of diseases like diabetes. A deeper understanding of body composition can impact diabetes occurrence, and in certain cases, improving body composition can mitigate diabetic conditions (**Kangetal 2015**) (**Davenport & Wilicombe, 2009**).

- Acquire precise measurements of muscle, fat, and visceral fat to evaluate the risk of disease and obesity.
- Track the effectiveness of interventions aimed at enhancing glycemic control and preventing the progression of diabetes-related complications.
- Identify fluid imbalances caused by inflammation.

NEPHROLOGY

BIA serves as a valuable tool in dialysis programs, streamlining the treatment process. This technology simplifies decision-making in dialysis by determining optimal treatment strategies and establishing the correct goal weight for patients. Healthcare professionals utilize BIA to:

- Acquire precise fluid measurements for managing target weight.
- Evaluate muscle and fat composition for dietary adjustments.
- Detect segmental fluid imbalances, which may indicate circulatory issues.

Traditionally, doctors have depended on indirect indicators of fluid retention to decide the extent of fluid extraction or the conclusion of dialysis sessions, often resulting in intradialytic complications. Direct assessment of fluid levels enhances the accuracy of dialysis and assists in setting appropriate goal weights for patients.

By monitoring changes in body composition and fluid accumulation between dialysis sessions, physicians can more accurately determine the amount of water to be removed, aiding in achieving a suitable goal weight. By basing goal weights on concrete measurements of body composition and fluid content, physicians can reduce the risk of complications such as hypotensive or hypertensive episodes during interdialytic periods. This improvement in dialysis efficacy not only alleviates patient symptoms but also leads to better long-term outcomes and increased adherence to treatment schedules (**Lee et al., 2001**).

ONCOLOGY

BIA offers several advantages for physicians in the field of oncology:

Assessment of Body Composition: BIA provides detailed information about body composition, including lean body mass, fat mass, and total body water. This is crucial in oncology for monitoring the nutritional status of cancer patients, as malnutrition and changes in body composition can significantly impact the prognosis and treatment outcomes.

Monitoring Treatment Response: BIA can be used to monitor changes in body composition during cancer treatment. This is particularly useful for assessing the effectiveness of certain therapies and for adjusting treatment plans based on the patient's physiological response.

Early Detection of Lymphedema: In breast cancer patients, BIA can be used for the early detection of lymphedema, a common side effect of breast cancer treatment. Early detection and intervention can prevent the progression of this condition.

Non-Invasive and Safe: BIA is a non-invasive method that can be easily performed in a clinical setting. It's safe for patients, including those with implants and pacemakers, which makes it widely applicable in various oncological situations.

Cost-Effective and Time-Efficient: Compared to other body composition analysis methods like DEXA (Dual-Energy X-ray Absorptiometry), BIA is more cost-effective and quicker, making it suitable for frequent monitoring without significantly adding to the patient's burden or healthcare costs.

Customizing Nutritional Support: BIA helps in customizing nutritional support for cancer patients. By understanding the patient's body composition, physicians can tailor dietary recommendations and interventions more effectively to support their overall health and treatment response.

Prognostic Value: Some studies suggest that body composition parameters obtained through BIA may have prognostic value in certain types of cancer, potentially aiding in risk stratification and treatment planning.

Enhanced Patient Care: Overall, the use of BIA can contribute to more personalized and effective patient care in oncology. By providing detailed insights into a patient's physiological status, it enables more tailored and responsive treatment strategies.

PHYSIOTHERAPY

BIA offers several advantages when applied to physiotherapy. BIA is a valuable tool in physiotherapy for its ability to provide detailed and actionable data on body composition, muscle mass, and hydration status, which are key components in designing and monitoring effective rehabilitation programs.

Body Composition Assessment: BIA provides detailed information about body composition, including fat mass, lean body mass, and body water. This is crucial in physiotherapy for designing personalized treatment plans, particularly for patients needing weight management or those with conditions influenced by body composition.

Muscle Mass Monitoring: BIA can track changes in muscle mass. For physiotherapy patients recovering from injuries or surgeries, monitoring muscle growth or atrophy is important for evaluating the effectiveness of rehabilitation programs.

Hydration Status: BIA gives insights into a patient's hydration status. Proper hydration is essential for muscle and joint health, which is a key focus in physiotherapy.

Non-Invasive and Quick: The procedure is non-invasive and quick, making it suitable for repeated use in clinical settings. This is beneficial for ongoing monitoring of physiotherapy patients.

Accessible and Portable: Many BIA devices are portable, allowing for use in various settings, including clinics, hospitals, and even at home. This flexibility is advantageous in physiotherapy for both clinicians and patients.

Helps in Tailoring Rehabilitation Programs: By providing detailed body composition data, BIA helps physiotherapists tailor rehabilitation programs to the specific needs of the patient, improving the effectiveness of the treatment.

Monitoring Progress and Setting Goals: The quantitative data from BIA can be used to set realistic goals and monitor progress over time, which is motivating for patients and helps in adjusting treatment plans as needed.

Useful for a Wide Range of Patients: BIA can be used for a wide range of patients, including the elderly, athletes, and those with chronic conditions, making it a versatile tool in physiotherapy.

EATING DISORDERS

Research suggests that using Bioelectrical Impedance Analysis (BIA) is effective in assessing the body composition of patients with eating disorders during their treatment.

This method is more informative than just monitoring weight changes, as it doesn't fully capture the specific alterations in different body compartments. BIA offers the benefit of treating each patient as their own comparison point, potentially enabling a tailored nutritional plan based on observed changes in body composition. This includes -

- Establishing a baseline for Lean Body Mass and Protein Mass in response to undernutrition,
- Setting a benchmark for Total Body Fat in a treatment strategy, and tracking Visceral Fat Mass.

Additionally, BIA could be valuable in providing insights into the Basal Metabolic Rate (BMR) in patients with anorexia, and may be worth exploring in the assessment of other types of protein malnutrition. Therefore, in the care of a skilled clinician who is knowledgeable about both the BIA technology and human metabolism, BIA can be an extremely useful tool in treating patients suffering from restrictive eating disorders (**Saladino 2014**).

Advantages in Nutritional Therapy and Dietetics:

- Repeatable assessment of body composition to create customized treatment plans, enabling a more personalized approach to healthcare.
- Monitor and protect lean body mass to maintain metabolic health, patient movement, and musculoskeletal integrity, crucial for overall physical wellbeing.
- Assist in identifying and tracking conditions like Sarcopenia (muscle loss with aging), Cachexia (wasting syndrome), and malnutrition, enhancing patient care and recovery.
- Support the diagnosis, management, and follow-up of patients for whom BMI may not be appropriate, such as in cases of Bariatric surgery, eating disorders, and individuals with acute or chronic illnesses, providing a more comprehensive view of patient health.
- Optimize nutritional intake and dietary habits to boost immune system function, essential for disease prevention and health maintenance.
- Address gastrointestinal issues through dietary modifications, improving digestive health and alleviating symptoms of disorders such as IBS or food intolerances.
- Contribute to better management of chronic diseases such as diabetes, heart disease, and hypertension through diet and lifestyle changes.
- Offer guidance on nutrient supplementation for those with deficiencies or specific health needs, ensuring a balanced and adequate nutritional status.
- Educate patients and caregivers on healthy eating practices, portion control, and the importance of balanced meals for long-term health benefits.
- Collaborate with other healthcare professionals to deliver integrated care, ensuring a holistic approach to patient wellness and recovery.

MUSCLE CENTRIC MEDICINE & THE FUTURE OF PREVENTATIVE HEALTH

A medical speciality known as "Muscle-Centric Medicine" centres on the critical role that muscle health plays in determining one's general health and well-being. The medical world has been paying more attention to this idea because of its novel approach to treating and preventing a range of illnesses. Key elements of muscle-centric medicine include the following:

Muscle as a Metabolic Organ - This perspective sees muscle as an important metabolic organ in addition to a mechanical structure that facilitates movement. The regulation of glucose, lipid metabolism, and total metabolic efficiency are all mediated by muscles.

Impact on Chronic Diseases - The field of muscle-centric medicine highlights the connection between the health of the muscles and chronic conditions like diabetes, obesity, heart disease, and certain types of cancer. It is believed that maintaining muscle mass and function is essential for both managing and avoiding these disorders.

Ageing and Sarcopenia - Sarcopenia is the term for the natural loss of muscular mass that occurs as people age. In order to age healthily, it is crucial to treat this loss of muscle, according to muscle-centric medicine.

Nutritional Focus - Sustaining muscular health is thought to require proper nutrition, especially a sufficient protein intake. This method frequently includes dietary suggestions that give priority to the development and maintenance of muscle.

Exercise Prescription - A key component of muscle-centric medicine is consistent physical activity, particularly strength and resistance training. These kinds of activities are essential for developing and preserving strength and muscular mass.

Holistic Health View - This method incorporates muscle health within the larger context of general health. It takes into account lifestyle choices, mental health, and the ways in which muscle health effects and is affected by other bodily systems.

Personalized Medicine - Muscle-Centric Medicine frequently uses individualized treatment regimens to maximize muscle mass and function since it recognises that each person's needs for maintaining good muscle health might differ greatly.

Preventive Healthcare - This strategy seeks to provide preventive care that can lessen the chance or severity of many diseases and enhance quality of life by emphasizing muscular health.

Although muscle-centric medicine is a relatively new idea, it is gaining popularity because of its all-encompassing approach to health and ability to enhance results in a wide range of medical disorders. It emphasizes how crucial muscle health is for total metabolic and physiological health in addition to mobility and strength.

THE SCIENCE OF BIA

The Evolt 360 Bioelectrical Impedance Analysis (BIA) machine is an FDA, TGA and CE approved medical device delivering an 8-point, multi-frequency, segmental body composition analysis using the science of BIA as well-researched and validated in peer-reviewed published literature. The most notable publications being –

- **Meleleo et al 2017** Evaluation of body composition with Bioimpedance
- **Bera 2014** Bioelectrical impedance methods for non-invasive health monitoring
- **Castizo Oliver et al 2018** Bioelectrical impedance vector analysis BIVA in sport and exercise A systematic review
- **Ying et al 2011** Accuracy of direct segmental multi-frequency bioimpedance analysis
- **Aragon et al 2017** ISSN position stand diets and body composition

BIA as a technology is consistently used within medicine and medical research –

- **Raeder et al 2018** Validity of BIA in estimation of FFM in colorectal cancer patients with highlighted sections
- **Sergi et al 2014** Assessing appendicular skeletal muscle mass with BIA
- **Desport et al 2003** Validation of bioelectrical impedance analysis in patients with amyotrophic lateral sclerosis
- **Widen et al 2014** body comp changes in pregnancy
- **Wolfe 2006** The underappreciated role of muscle in health and disease

THE SCIENCE OF BIA

- One of the most important uses for BIA is establishing the myriad of anatomical and physiological changes that occur with aging and age-related disease, which are well documented within published literature and form the basis of our understanding of an individual's ability to undertake exercise activities across the lifespan. As a fundamental overview, in relation to BIA in particular, there are a number of key changes that occur as part of the aging process, that include, but are not limited to the following -

- MVO2 decreases 5-15% / decade after 25yrs (approx 5ml.kg-1.min-1 btn ages of 25 & 65yrs) (**Heath et al 1981**).

- Decreases in both maximal cardiac output and maximal AVO2 difference contribute to the age-associated reduction in VO2max (**Stratton et al 1994**).

- Elite Masters as low as 0.1% decline pa.
  Max HR decreases 6-10bpm per decade – responsible for much of the age-associated decrease in max Q (**Pollock et al 1997**).

- Evidence also indicates that older adults have smaller stroke volumes during maximal exercise (**Stratton et al 1994**).

- Older adults rely on the Frank-Starling mechanism to a great extent to achieve the increase in stroke volume during maximal exercise, as evidenced by their increased end diastolic volumes (**Fleg et al 1994**).
  SV & HR → Q → O2 delivery.

- In contrast, plasma, red cell, and total blood volumes are lower in older adults (**Davey & Seals 1994**).

- Older adults have reduced early diastolic filling at rest and during exercise compared with young adults, perhaps because of reduced left ventricle compliance (**Levy et al 1993**).

- As a result, older adults rely on late atrial diastolic filling to a greater extent than young adults both at rest and during exercise.
  End systolic volumes during maximal exercise are also usually larger in older adults, resulting in reduced ejection fractions (**Fleg et al 1995**).

- Left ventricular contractility appears to be reduced in older adults during maximal exercise compared with young adults (**Fleg et al 1995**).

- Blood pressures and systemic vascular resistance are also higher during maximal exercise in older versus young adults (**Fleg et al 1995**).

- Older women have lower systolic blood pressure and cardiac, end diastolic, and stroke volume indices, and higher systemic vascular resistance during maximal exercise (**Rodeheffer et al 1984**).

PRACTICAL USE OF BIOELECTRICAL IMPEDANCE

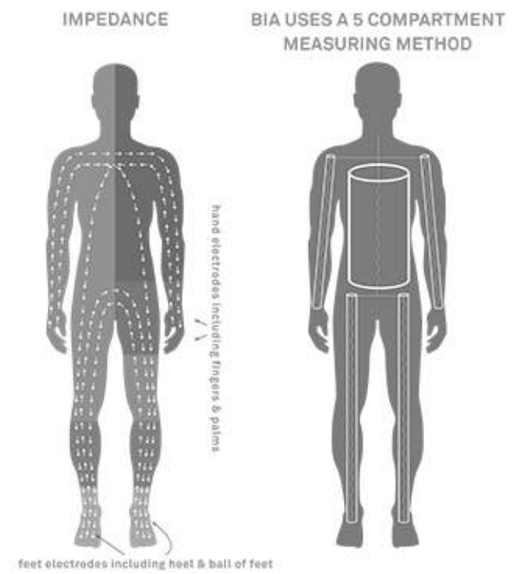
The sophisticated digital application of the Evolt 360 BIA product allows an API feed that can be provided to feed results directly to the patient's My Health Record as well as General Practitioner's/Allied Health/General Practice CRM.

The digital API fed results fill the gap in the collection process by providing validated body composition data rather than just surveys and self-reported data by the patient.

- Protein or malignant malnutrition
- Severe malnutrition
- Protein-calorie and 3rd degree malnutrition
- Moderate or 2nd degree malnutrition
- Mild or 1st degree malnutrition
- Nutrition disease or dietary inadequacy
- Progressive Lipodystrophy
- Fluid loss, dehydration
- Fluid retention
- Excessive weight, fat
- Diseased muscle
- Malnutrition following GI surgery
- Diseased musculoskeletal system
- Activity decrease, functional
- Muscular wasting
- Edema
- Anorexia
- Excessive weight gain
- Excessive weight loss (unknown causes)
- Aging debility
- Body structure musculoskeletal
- Insufficient nourishment, mineral deficiencies
- Follow up of cancer chemotherapy
- Injury and progressive rehabilitation
- Insufficient physical exercise
- Screening for nutritional and metabolic disorders
- Basal Metabolic Rate establishment
- Non-invasive physiological assessment of body balance relating to upper and lower extremities

USE AND FUNCTION OF BIA

The BIA Device is non-invasive and quick, requiring the patient to remove shoes and socks only. The process takes less than a minute and provides a full report, allowing the patient to establish a baseline measure. It is a useful tool to establish whether there needs to be any immediate medical intervention as well as a useful monitoring tool as part of a sound preventative health plan or monitoring of treatment plans.



RELIABILITY VALIDATION

The following study was recently conducted at the University of South Queensland (USQ) to assess the reliability of the Evolt360 for test-retest monitoring for physically active adults (exercising 3 or more times a week) between the ages of 20-40 years old. The findings conclude the following:

Measurements of how similar or different two sets of measurements are.

Coefficient of Variation (CV): It shows how much the measurements vary relative to their average. For lean mass, fat mass, and mineral, the CV values are:

Lean mass: On average, the estimates differ by about 0.69% of the mean estimate.

Fat mass: On average, the estimates differ by about 1.39% of the mean estimate.

Mineral: On average, the estimates differ by about 0.66% of the mean estimate.

Plus/minus values (±) tell us the range within which most of the measurements fall

Table 3. Test re-test reliability of the Evolt 360 estimates for lean mass, fat mass and mineral content.

Variable	Mean scan 1	Mean scan 2	Mean difference	*p*	SEM	ICC (95%CI)	CV (%)
Lean mass (kg)	61.16±12.87	61.32±12.92	-0.19	0.22	0.152	0.99 (0.997-0.999)	0.69±0.91%
Fat mass (kg)	17.38±6.39	17.32±6.34	0.06	0.46	0.075	0.99 (0.997-0.999)	1.39±1.57%
Mineral content (kg)	4.56±0.90	4.56±0.93	0.002	0.80	0.01	0.99 (0.998-0.999)	0.66±0.84%

Data are displayed as mean ± standard deviation (SD).
Legend: p, p-value (from two-tailed paired t-tests); SEM, standard error of the mean; ICC, intra-class correlation; CI, confidence interval; CV, coefficient of variation.

In Conclusion, the Evolt 360 scanner's results were found to be very reliable and consistent. The two scans showed very little difference, which suggests that the measurements obtained were almost identical and highly trustworthy (table 3)

EVOLT SPECIFICATION

Model	EV360
Measuring method	Tetra-polar electrode method using 8 touch electrodes.
Frequency Range	5, 50, 250 kHz
Measuring site	Whole body and Segmental measurement (arms, legs, and trunk)
Main items	[Result for Body Composition Analysis] Body Composition Analysis (Weight, LBM, Body fat, SLM, Protein, Mineral, TBW), Muscle/Fat analysis (Weight, SMM, Fat mass), Obesity analysis (BM, PBF, Obesity degree, AC), Abdominal analysis (WHR, VFL, VFA), Control guide (Weight and control, Muscle mass and control, Fat mass and control, Target to control, control to week, Duration to control), ECW, Body composition change (Weight, SMM, Fat mass), Comprehensive evaluation (Body type, Biological age, BMR, TEE, BCM), Balance assessment (Upper body L/R, Lower body L/R), Segmental(Left arm, Right arm, Left leg, Right leg, Trunk) Fat mass/Lean mass, Impedance (Segmental & Frequency), Blood pressure (when connected with blood pressure monitor of our company), QR code [Body Composition Analysis (Weight, LBM, Body fat, SLM, Protein, Mineral, TBW), Muscle/Fat analysis (Weight, SMM, Fat mass), Obesity analysis (BMI, PBF, WHR), Comprehensive evaluation (Body type, BMR, TEE, BCM, Obesity degree), Balance assessment (Upper body L/R, Lower body L/R), Control guide (Target weight, Weight control, Muscle control, Fat control), Segmental(Left arm, Right arm, Left leg, Right leg, Trunk) Fat mass/Lean mass, Impedance (Segmental & Frequency), QR code
Current	Within 180μA ± 15
Power supply	Input: 100-240VAC, 50/60Hz, 1.5 A Output: +12V, 5.0A
Display	12.5 Inch Wide Color LCD
Input device	Touch screen
Transmitting device	USB port, HDMI Port, Ethernet Port
Printing device	USB port
Dimension	430×676×1020mm(D x W× D × H, +10mm)
Weight	About 19kg / Approx. 41.8lbs
Measuring range	100 ~ 950 Ω
Measuring time	Approx. 30 seconds
Input height	50 ~ 220 cm / 1ft 7.7in ~ 7ft 2.6in
Measuring weight	10 ~ 250 kg / 22lb ~ 551.1lbs
Applicable age	7-99 (Subject to valid age of consent in applicable jurisdiction)
Operation ambient	Ambient temperature range +5 to +40 °C. Relative humidity range 15 to 93 % (non condensing) Atmospheric pressure range 70 kPa (700 mbar) to 106 kPa (1060 mbar)
Storage ambient	Ambient temperature range -25 to +70 °C Relative humidity range lower than 93 % RH
Software name and version	EV360 .AP.1.0.19 & BCA-CE3F/V5.26.G & VNBCA-360/v0.19.2. NOTE. For purpose of improvement, specifications and design are subject to change without notice.

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Interested in a complimentary demonstration to explore the clinical applications of the Evolt 360 or to receive a no-obligation offer? Reach out to our Evolt Team.

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