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Healthy Habits for Happiness

Powerful support for early **Sarcopenia detection**

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Whether your patient's experience of Sarcopenia is due to aging, chronic illness, acute conditions, or lifestyle factors, the health costs of late diagnosis are clear.

With Tanita bio-impedance analysis, you will benefit from the highest levels of precision and accuracy, with technology validated against the gold standard in body composition.

Specialist measurements support your accurate diagnostic, clinical and prescribing decisions so that each patient can receive tailored support.

Early detection and treatment is key

There is a growing body of evidence indicating **poor nutritional status** (as measured by a range of markers including fat-free mass & muscle mass) is linked with **poorer patient outcomes and worse prognosis.**[1], [2], [3], [4], [5], [6], [7], [8], [9], [10], [11], [12], [13]

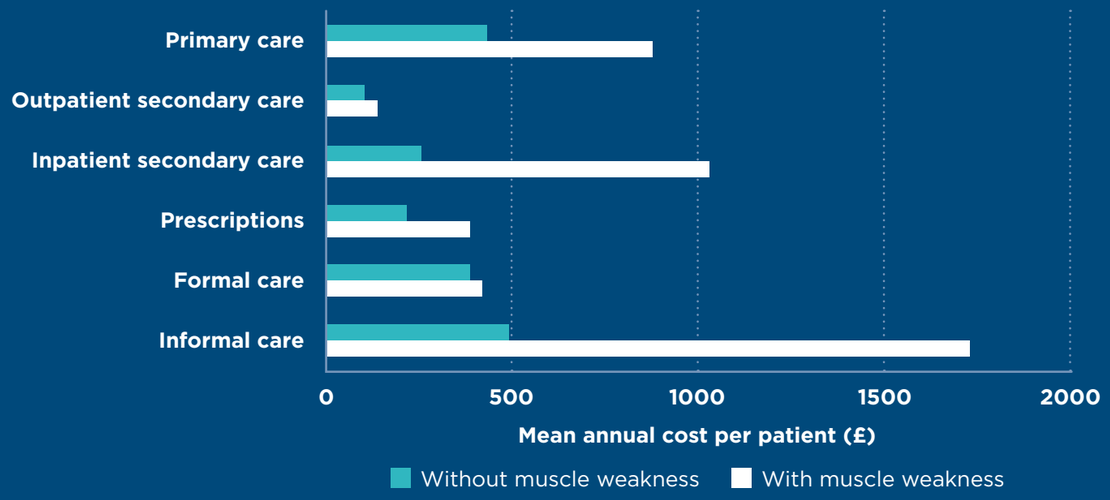
Sarcopenia is an independent risk factor for mortality in all patients and as such, was reclassified as a disease in 2016.[14]

Cachexia is the **immediate cause of death** for **1 in 5 cancer patients.**[15]

Patients particularly **at risk** from **surgical complications, increased hospital stays, poorer recovery and mortality** include **cancer patients, patients with COPD and CF and patients suffering from renal disease.**

The cost of Sarcopenia

It is estimated that Sarcopenia results in treatment related annual excess costs of £2.5 billion in the UK.[16]



Sarcopenia is also associated with increased risk of:

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Increasing the risk of Sarcopenia

Sarcopenia is a progressive loss of muscle mass and function as a consequence of aging. However, it is increasingly being observed in younger people.[17]

The risk of developing or progressing Sarcopenia is increased by:

Sedentary lifestyle

Smoking

Poor diet and malnutrition

Genetic factors

Some neurological conditions (stroke, Parkinson's disease, multiple sclerosis, myasthenia gravis, etc).

Inflammatory disease

Physical disability

Cachexia

Who is the sarcopenic patient?

Weight and BMI alone do not allow for accurate estimation of lean mass vs fat mass.

It is impossible to diagnose without a holistic assessment of body composition.

Body composition analysis enables you to quickly and easily diagnose low muscle mass and sarcopenia. Tanita technology uses bio-impedance analysis to provide an accurate assessment of body composition.

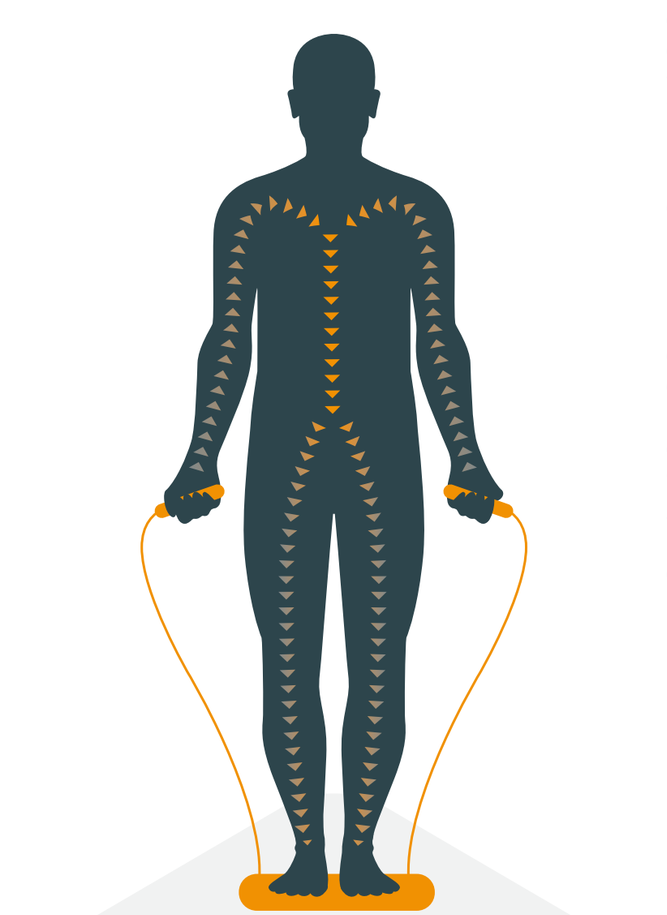
Body composition and bio-impedance analysis

How does it work?

Electrodes send a very low voltage, safe electrical current through your feet, legs and abdomen.

In segmental models you will also hold 4 electrodes and the signal is passed from arm to arm and a cross sectional hand to foot.

Tanita multi frequency technology is able to penetrate the cell membrane, offering a much more accurate interpretation of body composition.



What does it measure?

Resistance (R)

Resistance is the effect on an alternating current caused by 'resistivity' or the energy dissipating characteristics of the body. A low resistance is consistent with a high amount of fat-free mass.

A high resistance is consistent with a lower amount of fat-free mass. Old single frequency technology could only measure resistance.

Resistance is related to water in the body. Low resistance, indicating high conductivity, is due to large amounts of water in the body. As fat-free mass within the body is approximately 75% water, resistance in the body is proportional to the amount of fat-free mass. Resistance is measured in units called ohms.

Reactance (X)

Reactance is the effect on an alternating current caused by the capacitance, or energy storage of the body. By measuring reactance, it is possible to determine the body's capacitance and the size and integrity of body cell mass. A high capacitance or high reactance indicates large quantities of intact cellular membranes.

Measurements available

Weight

(BMI) Body Mass Index
Indicates the relationship between weight and height

Body Fat Mass
The weight of fat in the body

Body fat percentage
The percentage of total body weight which is fat

Visceral Fat Rating
Indicates the level of fat surrounding the vital organs, This type of fat contributes most to the risk of developing heart disease, diabetes and some cancers

Total Body Water
The total amount of water in the body as a percentage of body weight

Intracellular and Extracellular Water*
Indicates how much water is held within the cells versus water held outside of cells. A good indicator of cellular health and oedema

Muscle Mass (lean mass)
The weight of muscle within the body; Includes skeletal muscle, smooth muscle and cardiac muscle

Skeletal Muscle Mass
The weight of the skeletal muscle alone

BMR (Basal Metabolic Rate)
Number of calories the body needs at rest

Metabolic Age
Age the body is rated at according to the BMR value

Physique Rating
Assesses physique according to the ratio of body fat and muscle mass

Bone Mineral Mass
The weight of the bone mineral element of the skeleton

Segmental Body Composition*
Body fat and muscle are analysed segmentally in order to assess fat and muscle distribution

Muscle Mass Balance*
Illustrates any imbalance between muscle mass in the body

Leg Muscle Score*
Can be an early indicator of future frailty

Phase Angle*
Phase Angle is the direct measurement of the integrity of cell membranes and how well they function

Sarcopenic Index*
Indicates the degree to which the patient may be sarcopenic

*only available on some models

How accurate is Tanita bio-impedance analysis?

Tanita BIA monitors have been extensively validated against alternative methods of assessing body composition and providing bio-impedance analysis ensuring precision, accuracy and **scientific excellence.**

Independent studies worldwide highlight Tanita as the BIA **Gold Standard** within the scientific community.

The Tanita Advisory Board (TMAB) ensures Tanita remains at the forefront of scientific advances.

Tanita invest in ground breaking research projects including the world's first child centiles for body fat and muscle mass, the health of older people and sarcopenic obesity.

Award winning Japanese manufacturing which guarantees the highest quality and meets strict international quality standards.

Tanita utilises 4C methodology in refining our algorithms and regression equations to ensure **the most accurate bio-impedance and body composition analysis available.**

GOLD STANDARD
TECHNOLOGY

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Welcome to the next level in **4c**curacy

Introducing the 4-Compartment measurement from Tanita

Tanita continues to offer the most accurate calculation of fat, lean mass (or muscle) and bone mineral density available, but with 4C monitoring we go even further, giving an unparalleled, 4-Compartment measurement.

Our new 4C method will enable you to fully assess levels of body fat, protein, bone mineral mass and water within the body.

What is the 4-Compartment (4C) model?

The 4C model divides **body weight** into **fat, water, mineral,** and **protein** using the **gold standard** method for measuring each element.

The 4C model involves the measurement of body mass or weight, total body volume (air displacement), total body water (D20), and bone mineral (DXA); however, specialized laboratory equipment is required minimizing the availability of the 4C method to many clinicians and researchers.

"The 4-Compartment model is a gold standard method to assess body composition in many conditions such as over and under nutrition, hydration, obesity and sarcopenia."

Professor Angelo Pietrobelli
Verona University Medical School
TMAB Member

Fat mass
97%
accuracy as compared with the 4C method[18]

Fat free mass
98%
accuracy as compared with the 4C method[18]

Muscle mass
98%
accuracy as compared with the 4C method[18]

Total body water
98%
accuracy as compared with the 4C method (D20)[18]

Benefits of the use of BIA in Oncology

Applications of BIA

- **Prehabilitation:**
  - Identification of patients at risk of deterioration/poor prognosis due to sarcopenia/malnourishment
  - Improved personalisation of interventions to support nutritional status and physical fitness
  - Improved ability to measure the effectiveness of interventions and improve patient outcomes
- **Improved patient adherence** to MDT planned treatments[19]
- Reduction in the risk of toxicity and improvements in efficacy in chemotherapy compared with weight/BMI related doses[20]
- Rehabilitation planning, monitoring and support

Potential outcomes from measuring, monitoring and maintaining lean mass

- **Support reductions in:**
  - Mortality rates
  - Inpatient stays and readmissions
  - Treatment times
  - Treatment toxicity
- **Support improvements in:**
  - Clinical decision making
  - Patient outcomes and prognosis
  - Quality of life
  - Individualised patient care and empowerment

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Benefits of the use of BIA in Urology

Applications of BIA

- Support fluid management in patients undergoing renal dialysis[21]
- Support diagnosis of underhydration and the effects on residual renal function
- Identify malnutrition and sarcopenia in patients and support appropriate interventions

Potential outcomes from measuring, monitoring and maintaining lean mass

- **Support reductions in:**
  - Adverse events associated with fluid imbalance
  - Mortality rates
  - Inpatient stays and readmissions
- **Support improvements in:**
  - Clinical decision making
  - Patient outcomes and prognosis
  - Quality of life
  - Individualised patient care and empowerment

Benefits of the use of BIA in Respiratory Care

Applications of BIA

- Incorporation of BIA into the diagnosis pathway to better assist staging of respiratory disease[22], [23]
- Replace BMI with BIA in the BODE model[24], [25]
- Use BIA to support clinical decision making and treatment strategies.

Potential outcomes from measuring, monitoring and maintaining lean mass

- **Support reductions in:**
  - Mortality rates
  - Inpatient stays and readmissions
- **Support improvements in:**
  - Clinical decision making
  - Patient outcomes and prognosis
  - Quality of life
  - Individualised patient care and empowerment

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Benefits of the use of BIA in Bariatrics and Weight Management

Applications of BIA

- Accurately assess total body composition to review the requirement for and effectiveness of the intervention[26]
- Supports the creation of individualised plans based on patient need
- Monitor and preserve lean mass post surgery to protect metabolic health[27] and patient mobility
- Monitor and preserve healthy body fluid levels for increased health and the detection of post surgical issues

Potential outcomes from measuring, monitoring and maintaining lean mass

- **Support reductions in:**
  - Risk of developing diabetes
  - Risk of musculoskeletal conditions, frailty, falls and fractures
  - Mortality rates
  - Inpatient stays and readmissions
- **Support improvements in:**
  - Clinical decision making
  - Patient outcomes and prognosis
  - Quality of life
  - Individualised patient care and empowerment

Notes

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References

1. Ingadottir AR; Beck AM; Baldwin C; Weekes CE; Geirsdottir OG et al. Source Clinical nutrition (Edinburgh, Scotland); Jun 2017
2. O'Connor B.; Lorton C.; Brady B.; Ui Dhuibhir P.; Higgins S. et al. Source Supportive Care in Cancer; 2017; vol. 25 (no. 2)
3. Sarhill N.; Christie R.; Tahir A.; Mahmoud F.A. Source American Journal of Hospice and Palliative Medicine; 2003; vol. 20 (no. 6); p. 465-473
4. Bhuachalla E.; Cushen S.; Daly L.; Dwyer F.; Power L. et al. Source Proceedings of the Nutrition Society; Jan 2015; vol. 74
5. Casanova M.; Chaparro M.; Gisbert J.P.; Molina B.; Merino O. et al. Source Journal of Crohn's and Colitis; Mar 2016; vol. 10
6. Jansen I; Prager M; Valentini L; Büning C Source The British journal of nutrition; Sep 2016; vol. 116 (no. 6); p. 1061-1067
7. Mulasi U; Kuchnia AJ; Cole AJ; Earthman CP Source Nutrition in clinical practice : official publication of the American Society for Parenteral and Enteral Nutrition; Apr 2015; vol. 30 (no. 2); p. 180-193
8. Thibault R; Makhlouf AM; Mulliez A; Cristina Gonzalez M; Kekstas G et al. Source Intensive care medicine; Sep 2016; vol. 42 (no. 9); p. 1445-1453
9. Thibault R; Makhlouf AM; Mulliez A; Cristina Gonzalez M; Kekstas G et al. Source Intensive care medicine; Sep 2016; vol. 42 (no. 9); p. 1445-1453
10. Kafri MW; Potter JF; Myint PK Source European journal of clinical nutrition; Jun 2014; vol. 68 (no. 6); p. 677-682
11. Minn Y.K.; Suk S.H.; Koh I.S.; Hwang S.-H.; Park J.H. et al. Source Neurology; Apr 2016; vol. 86 (no. 16)
12. Kerimoglu OS; Pekin A; Yilmaz SA; Yavas G; Beyhekim F et al. Source The journal of obstetrics and gynaecology research; Mar 2015; vol. 41 (no. 3); p. 449-455
13. Mikamori M; Miyamoto A; Asaoka T; Maeda S; Hama N et al. Source Journal of gastrointestinal surgery : official journal of the Society for Surgery of the Alimentary Tract; Mar 2016; vol. 20 (no. 3); p. 611-618
14. Arango-Lopera, V.E., Arroyo, P., Gutiérrez-Robledo, L.M. et al. J Nutr Health Aging (2013) 17: 259. https://doi.org/10.1007/s12603-012-0434-0
15. Fearon KC, Glass DJ, Guttridge DC. Cancer cachexia: mediators, signaling, and metabolic pathways. Cell Metab 2012; 16: 153–166.
16. Pinedo-Villanueva, R., Westbury, L.D., Syddall, H.E. et al. Calcif Tissue Int (2019) 104: 137. https://doi.org/10.1007/s00223-018-0478-1
17. Wicks, S., et al, Nutritional and Therapeutic Interventions for Diabetes and Metabolic Syndrome (Second Edition), 2018, Pages 279-292
18. Nishizawa, M & Ikeda, Y (2018) 'Effectiveness of measuring body composition and metabolism in diet'. Metabolic Sensing - Learn the Metabolism in Health, Dieting, Beauty, Medicine and Brain. CMC Publishing Co., Chapter 6, Page 49
19. Collins et al., Supportive Care in Cancer; Jul 2017; p1-9
20. Prado et al, 2013, Anti-cancer agents in medicinal chemistry; Oct 2013; vol. 13 (no. 8); p. 1197-1203
21. Multiple frequency bioimpedance devices to guide fluid management in people with chronic kidney disease having dialysis. Diagnostics guidance Published: 21 June 2017 https://www.nice.org.uk/guidance/dg29
22. Nyberg et al., (2015) Why and How Limb Muscle Mass and Function Should Be Measured in Patients with Chronic Obstructive Pulmonary Disease. Ann Am Thorac Soc Vol 12, No 9, pp 1269–1277
23. Steiner (2007) Sarcopaenia in chronic obstructive pulmonary disease. Thorax 2007;62:101–103.
24. Schols et al. (2005) Body composition and mortality in chronic obstructive pulmonary Disease. Am J Clin Nutr 2005;82:53–9
25. Schols, AMWJ. (2010) Body composition in COPD; stepping back or moving forward? Respiratory Medicine (2010) 104, 157e158
26. Pietrobelli et al (2014) Sarcopenic obesity: clinical diagnostic potential of 8-electrode multi-segment BIA. Pennington Biomedical Research Center, USA.
27. Lee, Jihye et al (2016) 'Associations of Sarcopenia and Sarcopenic Obesity With Metabolic Syndrome Considering Both Muscle Mass and Muscle Strength' Journal of preventive medicine and public health. vol. 49,1.

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