THE EVOLOUTION OF BIA

Bodystat
BODY COMPOSITION TECHNOLOGY



STAGE 1 : THE SCALE

Measuring Total Weight



STAGE 2 : SINGLE FREQUENCY BIA

Assessing Quality of Weight



STAGE 3 : DUAL FREQUENCY BIA

Understanding Fluid Compartments



STAGE 4 : MULTI-FREQUENCY BIA

Precision in Fluid Compartment Analysis



STAGE 5 : BIOIMPEDANCE SPECTROSCOPY (BIS)

Moving Beyond Regression Equations

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THE EVOLUTION OF BIA

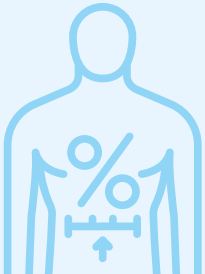


STAGE 1
THE SCALE

Measuring
Total Weight

Clinicians recognised that total body weight could correlate with various health outcomes. This stage reflects the simplest approach to body composition, where weight alone was used to infer health status. However, it did not differentiate between muscle, fat, bone, or water content.

Viewed as a homogeneous mass, with no distinction between different types of tissue or fluids.





STAGE 2
SINGLE FREQUENCY BIA

Assessing
Quality of Weight

With single frequency BIA (50 kHz), clinicians moved beyond mere weight to understand the quality of mass. This method allowed for an estimation of body fat and lean body mass but was limited in distinguishing between different fluid compartments due to its reliance on one frequency.

Begins to differentiate between lean mass (muscle, organs, bones) and fat mass but lacks precision in fluid distribution analysis.



STAGE 3
DUAL FREQUENCY BIA

Understanding Fluid
Compartments

Dual frequency BIA introduced the ability to differentiate somewhat between extracellular water (ECW) and intracellular water (ICW), providing a clearer picture of fluid status. This was crucial for conditions where fluid balance is critical, like in renal or heart failure patients.

Now includes a basic separation of fluid compartments, recognising the body as having both an internal (ICW) and external (ECW) fluid environment, alongside fat and lean mass.

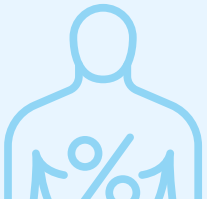


STAGE 4
MULTI-FREQUENCY BIA

Precision in Fluid
Compartment Analysis

Multi-frequency BIA uses several frequencies to analyse body composition more precisely, enhancing the accuracy of ECW and ICW measurements. This stage allows for a better understanding of how fluid is distributed across different tissues and how this relates to health or disease.

Recognises the body as a complex system with varied fluid environments within different tissues, offering a detailed view of muscle mass, fat mass, and hydration status.





STAGE 5
BIOIMPEDANCE SPECTROSCOPY (BIS)

Moving Beyond
Regression Equations

BIS uses a wide spectrum of frequencies allowing differentiation between ECW and ICW without relying on regression equations. This provides insights into fluid dynamics, tissue health and metabolic activity at a cellular level, making it invaluable for highly personalised medical diagnostics and treatment monitoring.

BIS goes beyond simple compartment models to understand the dynamic nature of body fluids and its impact on health.

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BODY COMPOSITION

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