Professional body composition and nutrition analysis:

BODYSTAT® 1500MDD Touch Screen

THE SCIENCE BEHIND CLINICAL BODY ASSESSMENT

www.bodystat.com

Bodystat®
BODY COMPOSITION TECHNOLOGY

WORKING WITH WEIGHT LOSS PROFESSIONALS

The importance of weight management has become increasingly topical over recent years.

Obesity has been linked to the following diseases:

- Coronary heart disease
- Stroke
- High blood pressure
- Type 2 diabetes
- Cancers, such as endometrial, breast, and colon cancer
- High total cholesterol or high levels of triglycerides
- Liver and gallbladder disease
- Sleep apnea and respiratory problems
- Degeneration of cartilage and underlying bone within a joint (osteoarthritis)
- Reproductive health complications such as infertility
- Mental health conditions.

The Bodystat 1500MDD offers accurate body composition assessment, early cardiovascular risk detection, as well as being a perfect weight management tool for fitness & health professionals . The Bodystat range of Bio-Impedance Analysis (BIA) devices has been used in many medical research studies and proven to provide excellent levels of accuracy for ongoing health management.

The 1500MDD also boasts new powerful software with upgraded functionality and new early detection tools, covering everything from core cellular health to underlying disease and muscle wastage. Simple to use, the 1500MDD has been created to complement the work of the weight loss and weight management professional.

MOTIVATE FOR IMPROVED RESULTS

Motivation is an essential part of effective weight management, and indeed general health. The touch screen provides a colourful visual tool to show your clients their improvement, no matter how small. Trend graphs in the software allow you to monitor progress and small changes in fat or lean mass will show significant changes in cardiac risk graphs and health management.

Using the windows software, you create a personal file for each client which can then be used to track changes over the course of treatment and remedial actions. This profile can be personalised with your own name and logo where required.

EARLY DETECTION AND PREVENTION

Although the Bodystat 1500MDD is not a diagnostic device, it does provide early detection of cellular disease or illness within the body. As well as providing necessary information on body composition, the 1500MDD also shows a 'Wellness Marker™' or impedance ratio, demonstrating a general status in health:

- Early detection of cellular health issues
- Detection of potential underlying disease
- Detection of muscle wasting
- Changes in health status
- Malnutrition, including the clinically obese.

KNOWLEDGE IS POWER

With knowledge comes power. For your patients or clients, knowledge also means the power to inspire change, and that can transform lives – with obvious referral benefits to the health professional and organisation.

The Bodystat 1500MDD gives you increased knowledge through the measurement of:

- Fat weight
- Fat-free mass *
- Total weight ranges **
- Total body water
- Dry lean weight **
- Body mass index
- Body fat mass index (BFMI)
- Fat-free mass index (FFMI)
- Basal metabolic rate
- Extracellular water
- Intracellular water
- Impedance raw data
- Wellness Marker™**
- Daily kcalorie requirements
- Waist / hip ratio
- Resistance
- Reactance
- Phase Angle *.

*Directly measured & unique to Bodystat
**Methodology is unique to Bodystat

Wellness Marker™ & PHASE
IDENTIFY NUTRITIONAL STATU

WELLNESS MARKER™
(Impedance Ratio)

"The goal is to foster improvements in global health by using scientific advances for the prevention, early detection and treatment of disease. Only 5% of medical people pay attention to early detection. If you could increase that 5% to 30%, it would extend lives, lower costs and do all sorts of things." (Financial Times, Wealth Quarterly)

The objective of Bodystat's unique Wellness Marker™ is to provide health professionals with a tool for early detection of cellular change before it becomes clinically obvious.

By combining the information obtained from the measurement of body fat, fat-free mass and the Wellness Marker, even malnourished obese subjects may be identified.

There is always a danger that high levels of body fat may obscure an underlying serious illness developing, such as cancer or other wasting diseases. By monitoring an individual's unique Wellness Marker it may be possible to detect the advent of a potentially serious medical condition.

Healthy individuals with good cellular status tend to have a lower Wellness Marker while the unhealthy have higher values. The lower the marker, the healthier and more hydrated the body cells; the higher the marker, the less healthy.

Bodystat's unique Wellness Marker, measuring at two frequencies is specifically designed to quickly and non-invasively assess overall cellular health status and the earliest signs of cellular malfunction.

DATA ANALYSIS OF OBESE FEMALE & MALE MEASUREMENT DATA

Gender	Age	Weight kg	Height m	BMI	BFMI	FFMI	BF %	BF kg	FFM kg	Imped 5 kHz	Imped 50 kHz	Resis 50 kHz	React 50 kHz	Phase Angle	Wellness Marker
Female	29	127.1	1.6	49.6	28.3	21.4	57.0	72.4	54.7	590	513	510	58.0	6.5	0.869
Female	42	129.0	1.6	48.3	26.1	22.2	54.0	69.7	59.3	511	432	428	55.9	7.4	0.845
Female	50	126.6	1.6	50.3	30.5	19.8	60.7	76.8	49.8	609	547	544	47.4	5.0	0.898
Female	27	146.3	1.7	49.3	26.6	22.7	53.9	78.9	67.4	491	432	429	43.0	5.7	0.880
Female	29	120.4	1.6	46.1	23.6	22.6	51.1	61.5	58.9	524	441	437	56.3	7.3	0.842
Male	30	167.1	1.7	59.6	31.7	27.9	53.2	88.9	78.2	513	442	439	51.0	6.6	0.862
Male	40	162.7	1.8	49.3	22.9	26.5	46.3	75.4	87.3	460	407	404	40.1	5.7	0.885
Male	33	142.0	1.6	56.2	25.8	30.3	46.0	65.3	76.7	394	343	340	36.6	6.2	0.871
Male	42	187.0	1.9	50.6	23.3	27.3	46.1	86.2	100.8	397	351	348	33.5	5.5	0.884
Male	34	151.9	1.7	50.1	22.3	27.8	44.5	67.6	84.3	429	379	377	36.8	5.6	0.883

INTERPRETATION OF DATA
The highlighted Female of 50 years old appears to be MALNOURISHED and has been singled out for these reasons:

Highest % Fat
Lowest FFMI - yet she does not have the highest BMI - signifies the importance of FFMI

Highest Wellness Marker values - HIGH values, closer to 1.00 may indicate probably poor cellular health **Lowest Phase Angle** - LOW values indicate probably poor cellular health

QUESTION TO CONSIDER:
Do these collective values indicate that there may, in addition, be an underlying disease developing?

Phase Angle

Phase Angle (PA) is a direct measurement, (not a calculation using equations) of your cell membrane. It is currently used in hospitals to monitor nutritional assessment; however this measurement has also found its way into the fitness industry with its statistical correlation with muscle strength (lean muscle mass).

Measuring a person's PA is simple, quick and non-invasive, much like measuring body composition.

Recent research has led PA to be accepted as a global health marker. PA provides a quantitative value to establish a base line & track change over time to develop trends of it's direction of measurement.

A lowering of PA reflects a deterioration of health, whereas an increased PA indicates an improvement of health, often related to an increase in lean muscle mass through strength training, eating healthily or general fitness and wellness.

Rinninella, E et al., (April 2018) "Phase Angle & Impedance Ratio : Two Specular ways to analyze Body Composition". *Annals of Clinical Nutrition,* 2018, 1:1003.

E ANGLE:
US

ADVANCED NUTRITIONAL ANALYSIS

Bioelectrical Impedance Analysis (BIA) is becoming a preferred method to establish and monitor malnutrition. Many research papers have examined the relationship between Phase Angle and malnutrition and have found a correlation between low Phase Angle and higher nutritional risk. Population groups used in both research and clinical practice include nephrology, HIV, oncology and surgical patients.

Alternative methods, such as blood tests, arm circumferences, and skin-fold tests are time consuming, require training and may be affected by other nutritional changes. Traditional methods may also miss subtle changes in body cell mass (intracellular water and metabolic tissue). Malnutrition is characterised by changes in the integrity of the cellular membrane, marked by fluid shifts. Study of Phase Angle, as a reflection of water distribution between ICW/ECW water is an easy, quick, non-invasive way to ascertain nutritional status.

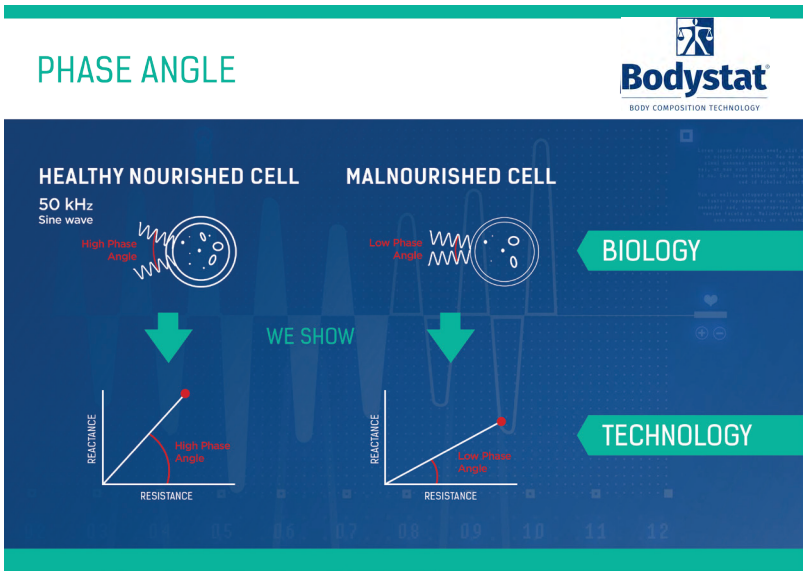
CLINICAL PRACTICE APPLICATIONS

A low PA is indicative of diminished cellular integrity and thus a reduced survival time. Equally, a higher PA suggests larger quantities of intact cell membranes and thriving health.

The PA reflects the relative contribution of body fluid (resistance) and cellular membrane integrity (reactance). Malnutrition reduces cellular membrane mass and integrity and promotes shifts in fluid balance. As a consequence of these changes the PA decreases. Conversely, a higher PA implies larger body cell mass and preserved membrane integrity.

The greater the cell's capacitance, the greater the difference in phase shift between voltage and the current. Consequently the higher the PA.

Refer to Articles section of our website for supportive scientific publications.



Not to diagnose or treat any medical condition

1500MDD TOUCH SCREEN: APPLICATIONS

+ COPD – Fat-free mass is an independent predictor of mortality irrespective of fat mass... supports the inclusion of body-composition assessment as a systematic marker of disease severity in COPD staging.

Schols, Annie MWJ et. al. (July 2005) "Body composition and mortality in chronic obstructive pulmonary disease" *Am J of Clinical Nutrition,* **Vol 82 No1** 53-59

+ DIABETICS – Overweight and obesity are associated with the development of type 2 diabetes. Thus, it is important for clinicians to accurately measure and monitor the body composition of at-risk individuals and patients with diabetes.

Stolarczyk, Lisa M et al. (September 1 1999) "Assessing body composition of adults with diabetes" *Diabetes Technology & Therapeutics* **Vol 30:** 289-296

+ EATING DISORDERS – Bulimic patients with a past had lower percentage of body fat, lower muscle mass and higher percentage of extra-cellular fluid.

Francisco, J Vaz et al. (2003) "History of anorexia nervosa in bulimic patients: Influence on body composition" *Int J of Eating Disorders* **Vol 34:** 148-155

+ ELDERLY – Improved estimation of body composition in elderly subjects by use of age-specific prediction equations.

Reilly JJ et al. (September 1994) *The European Group for Research into Physical Activity for the Elderly.* II International Conference

Further research publications are available from our website with continuous updates.

+ HIV/AIDS – Body composition testing can be used to monitor lipodystrophy and wasting, two problems associated with HIV.

Loss of BCM (5% loss within 6 months) is a significant contributor to the morbidity and mortality associated with wasting diseases. Cichock, M (2007) *American Heart Association*

+ MALNUTRITION/UNDERNUTRITION/ NUTRITION – Malnutrition results in a loss of body cell mass (BCM) accompanied by an expansion of the extracellular mass (ECM).

Shizgal, Harry M. MD. (29th June 2006 - online) *"Body composition of patients with malnutrition and cancer" presented at the Fourth Annual Nutrition Symposium on Current Concepts in Nutritional Management of the Patient with Cancer.*

+ OBESITY – Severe obesity is accompanied by large increases in fat-mass and alterations in the composition of fat-free mass, in particular total body water and its extra-cellular compartment.

Das SK. (2005) *Current Opinion in Clinical Nutrition and Metabolic Care* **Vol 8** No.6: 602-606

+ PAEDIATRICS – Body composition in children is of increasing interest within the contexts of childhood obesity, clinical management of patients and nutritional programming as a pathway to adult disease.

Wells LC. (May 2003) "Body composition in childhood: effects of normal growth and disease" Proc Nutr Soc. **Vol 62** 2: 5210-8

Specification & Software

BODY MANAGER PRO SOFTWARE

The included Body Manager Pro software is ideal for use when subsequent repeat tests are performed in order to track an individual's progress. The software includes four main features:

- **Body Composition -** Providing detailed analysis of the whole body. These reports comprise of the Body Composition Professional and Simplified Reports.
- **Trends -** This tracks the results over a period of time to assess change and progress.
- **Heath Report -** Based on the Framingham Study, this gives a general health report including smoking, diabetes, blood pressure and Cholesterol.
- **Weight Loss Report -** this unique programme enables a selection of varying intensity exercises and their duration, calculating the calories burned and the number of weeks required to achieve target weight.

Optional Extra

BODYSTAT® PRINTER

- Portable thermal printer fitted with blue-tooth offering clear, immediate print out of results at point of measurement.
- battery operated and light weight.

SPECIFICATION

Technology	Bio-Impedence Analysis (BIA)
Impedance Measuring Range	20 - 1300 ohms
Accuracy	Impedance 2-3 Ω Resistance (50 kHz): +/- 2 Ω Reactance (50 kHz): +/- 1 Ω Phase Angle (50 kHz): +/- 0.2º
Test Current	620 Micro-Amps R.M.S. (Root Mean Square)
Frequencies	5 & 50 (KiloHertz)
Calibration	A calibrator is supplied for independent verification from time to time.
Configuration	2 LEMO lead wires (removable)
Computation Time	3 seconds
PC Communication	USB interface
GENERAL	
Operating Temperature	+ 5 ºC to + 40 ºC
Storage Temperature	0 ºC to + 60 ºC
Relative Humidity	70% less up to +60 ºC non-condensing. It should not be used in an area where condensation could form on the inside of the unit housing.
Atmospheric Pressure	860 hPa to 1060 hPa
Internal Power Source	Duracell MN1500 alkaline batteries, 6 x AA (LR6) 1.5v non-rechargable
Dimensions	240mm L x 155mm W x 30mm H (5" Colour Touch Screen)
Weight	Unit weight - 410 grams
Low Battery	A battery power bar can be seen in the top right corner of the display. If the unit has been switched ON and no data has been entered for 2 minutes, an alarm signal sounds to warn that the unit is still on and the battery is in use. Automatic shut off if left unattended for 3 minutes.
Service	There are no servicable parts other than the need for periodic battery replacement.
Quality Standards	Manufactured to strict ISO 13485:2003 quality standards. Fully accredited by the Medical Devices Directive (MDD) with it's CE0120 marking and for EN60601, also FDA cleared.

The Bodystat®1500MDD Touch screen is not a Diagnostic Device

CE 0120

ABOUT BODYSTAT®

Bodystat Ltd, based on the Isle of Man (British Isles), has been established since 1990 and is a registered ISO 13485:2003 company. We specialise solely in BIA Technology and are dedicated to expanding the knowledge of this to improve health and well-being. We have an extensive range of research papers dedicated solely as non-commercial, free materials for educators.

Our devices are manufactured in the U.K. Made to the highest specifications and use only the best electrical components. The high quality of our devices ensures accurate results that are both reproducible and reliable.

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