HBO | HOSPITAL BODYGRAM®

The medical software specifically designed for healthcare organizations

Science in body composition | AKERN

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Reliable and clinically relevant results across all bioimpedance fields

BODYGRAM® HBO is a software platform for acquiring, processing, storing and printing of body composition assessments measured with **AKERN®** impedance analyzers.

Akern®'s progress and innovation in your hands

With more than 40 years of Research & Development, over **4000 peer reviewed articles** and a global market distribution, **AKERN®** solution is considered the reference for body composition experts.

Specifically designed to support healthcare professionals identify patients body composition alterations

Multi algorithm body composition parameter assessment

Bivariate norms of the bioelectrical impedance vector based on data of over 20.000 subjects

Different software interaction levels (Admin, User, Reader)

GDPR compliant

Main functions

BIAVECTOR® NOMOGRAM

AKERN® has been the first company in 1994 to introduce the Bioelectrical Impedance Vector Analysis (BIVA) within a body composition software. The **Biavector®** offers a direct interpretation of the hydration and nutritional status and is based on normal bivariate statistic distribution of over 20.000 subjects. Being based only on tissue electrical properties, body mass and volume assessments are not influenced by errors derived from predictive equations (standard BIA analysis). Impedance data interpretation further evolved with the introduction of **Hydragram®** and **Nutrigram® scales**.

HYDRATION: THE HYDRAGRAM® SCALE

Hydragram® provides the true hydration state of the subject by giving the percentage of fluids in the fat free mass. Percentage values correlate with the position of the impedance vector on the **Biavector®** nomogram and follow the displacement along the major axis. **Hydragram®** classifies subjects as Hyperhydrated, Normohydrated, or Dehydrated according to the Moore et al curves[1]. Subjects with altered hydration can be further stratified according to the degree of fluid alteration (mild, moderate or severe). The use of the **Hydragram®** scale for hydration state evaluation and monitoring has been spreading increasingly also in clinical setting in association with other specific biomarkers such as BNP, ProBNP, nGAL3 [2, 3, 4].

NUTRITION: THE NUTRIGRAM® SCALE

Nutrigram® provides an estimate of creatinine excretion (Ucr/24h) calcutaded directly from the body cell mass. Creatinine is an indirect product of muscle cells totally secreted by the kidney. The amount of creatinine detected in the 24h is used as a parameter to define the subject's cellular mass. **Nutrigram®** values correlate with the position of the vector on the **Biavector®** nomogram and follow the displacement along the minor axis. This parameter was recently validated and is of high value in the management of patients at high risk of malnutrition who require timely nutritional support [5].

INDICES FOR SCREENING AND DIAGNOSIS OF MALNUTRITION AND SARCOPENIA ASSESSMENT

Fat Free Mass Index (FFMI) and **Fat Mass Index (FMI)**: **BODYGRAM® software** can monitor the nutritional status over time through the use of FFMI and FMI curves for Caucasian subjects from 18 to 98 years of age.

Appendicular Skeletal Muscle Index (ASMI): This parameter represents the quantity of muscle mass in the four limbs. By applying the equation developed by prof. Sergi et al [6,7], using DXA as reference method, a highly specific and sensitive marker for low muscle condition is provided . ASMI equation by Akern has been formally recognized by the European consensus for Sarcopenia diagnosis (EWGSOP 2).

Standardized Phase Angle (SPA): This value represents the Phase angle (PA) adjusted for sex, age and BMI. The PA "normal range" (expressed in percentiles) changes according to age, sex and BMI, therefore, Standardized phase angle (SPA), allows to compare individuals with different sex and age and BMI[8].

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Specific features

OFFLINE WORKSPACE

BODYGRAM® HBO is an offline software that works through a Desktop application (for Windows and MacOS) to guarantee specific confidentiality and privacy needs often required by public institutions.

AUTOMATIC DATABASE IMPORT

BODYGRAM® HBO automatically imports database from previous **BODYGRAM®** software versions without data loss.

SCIENTIFIC UPDATE

BODYGRAM® HBO is a recently validated platform updated with the latest progress in clinical research.

GDPR COMPLIANCE

BODYGRAM® HBO patient data management is compliant with the EU GDPR regulation 2016/679.

CUSTOMIZED REPORTS

BODYGRAM® HBO includes a new tool that allows the user to choose which specific elements to be included in printed report, to better guide the subject along his path.

CE MEDICAL DEVICE

BODYGRAM® HBO is a CE marked Class I Medical software.

References:

1) Moore, Francis D., and Caryl Magnus Boyden. *"Body cell mass and limits of hydration of the fat free body: Their relation to estimated skeletal weight."* Annals of the New York Academy of Sciences 110.1 (1963): 62–71.

2) Valle, Roberto, et al. *"Optimizing fluid management in patients with acute decompensated heart failure (ADHF): the emerging role of combined measurement of body hydration status and brain natriuretic peptide (BNP) levels."* Heart failure reviews 16.6 (2011): 519–529.

3) Massari, Francesco, et al. *"Bioimpedance vector analysis predicts hospital length of stay in acute heart failure."* Nutrition 61 (2019): 56–60.

4) Maioli, Mauro, et al. *"Bioimpedance-guided hydration for the prevention of contrast-induced kidney injury: the HYDRA study."* Journal of the American College of Cardiology 71.25 (2018): 2880–2889.

5) Cereda, Emanuele, et al. *"Validation of a new prognostic body composition parameter in cancer patients."* Clinical Nutrition (2020).

6) Sergi, Giuseppe, et al. *"Assessing appendicular skeletal muscle mass with bioelectrical impedance analysis in free-living Caucasian older adults."* Clinical nutrition 34.4 (2015): 667–673.

7) Cruz-Jentoft, Alfonso J., et al. *"Sarcopenia: revised European consensus on definition and diagnosis."* Age and ageing 48.1 (2019): 16–31.

8) Cornejo-Pareja, Isabel, et al. *"Phase angle and standardized phase angle from bioelectrical impedance measurements as a prognostic factor for mortality at 90 days in patients with COVID-19: A longitudinal cohort study."* Clinical Nutrition (2021).

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