

#### Related Literature:

- 1) Prevalence and Risk Factors of Sarcopenia Among Nursing Home Older Residents - F. Landi, G. Onder et al. ; J Gerontol A Biol Sci Med Sci (2011) first published online March 10, 2011 doi:10.1093/gerona/glr035
- 2) Sarcopenia: European consensus on definition and diagnosis: Report of the European Working Group on Sarcopenia in Older People Age Ageing (2010) 39(4): 412-423 first published online April 13, 2010 doi:10.1093/ageing/afq034
- 3) Bioimpedance vector analysis as a measure of muscle function - K. Norman, M.Pierlich, J.Kondrup - Clinical Nutrition 28 (2009) 78-82
- 4) Comparison of hand dynamometers in elderly people - R.S. Guerra et al. ; The Journal of Nutrition, Health & Aging Volume 13, Number 10, 907-912
- 5) The association between nutritional status and handgrip strength in older Rwandan refugees - Pieterse S. ; Manandhar M.; European Journal of Clinical Nutrition 2002, vol.56 n°10, pp.933
- 6) Use of handgrip strength in the assessment of the muscle function of chronic kidney disease patients on dialysis: a systematic review - V. O. Leal, D. Mafra et al. Nephrol. Dial. Transplant. (2011) 26 (4): 1354-1360.
- 7) Age-associated changes in skeletal muscles and their effect on mobility: an operational diagnosis of sarcopenia. - Laurentani F., Russo C., Bandinelli S. et al. ; J Appl Physiol 2003; 95: 1851-60.
- 8) Skeletal muscle cutpoints associated with elevated physical disability risk in older men and women. - Janssen I, Baumgartner R, Ross R et al. ; Am J Epidemiol 2004; 159: 413-21.
- 9) Estimation of skeletal muscle mass by bioelectrical impedance analysis. - Janssen I, Heymsfield SB, Baumgartner RN et al. ; J Appl Physiol 2000; 89: 465-71.



#### Technical Specifications:

Weight: 0,3 kg  
Size: 6,35 x 4,72 x 19,68  
Display: Liquid crystal  
Power Supply: 9 Volt, alkaline  
Precision/Accuracy: 0,05 kg (o 1,0% of the strength)  
Maximum Capacity: 90 kg  
Operating Temperature: -20 °C / + 50 °C



Product of  
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# DynEx

the new generation  
of electronic dynamometers  
for measuring hand strength

for clinical and  
rehabilitative use





An assessment of the contractile strength of the hand's flexor muscles using DynEx handgrip may be used:

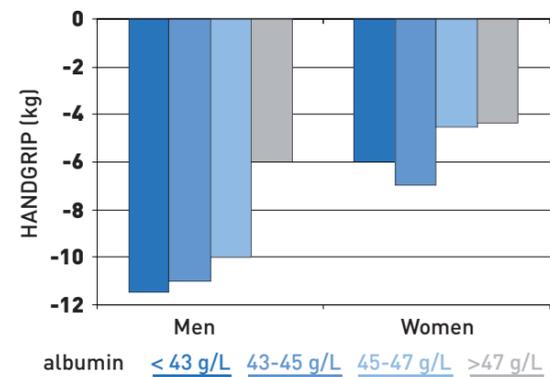
- for setting up a rehabilitation treatment,
- for assessing nutritional status,
- for establishing a mortality risk index in patients with acute diseases,
- as a prognostic factor for progression of diseases with high metabolic impact
- as an indicator of the general muscle strength.

Numerous studies have shown that the "hand grip" test may be used as a nutritional assessment technique (Wang, 2005) and is also useful for assessing short term changes in the nutritional status.

The electronic DynEx dynamometer is a professional instrument, precise, versatile, reliable and userfriendly. The plastic frame, refined electronic and modular handle make it lightweight and easy to use; a tangible benefit for weak patients and those with cognitive impairment. DynEx digital technology allows you to store the data. The internal software offers the possibility of statistically processing the measurements recorded in real time and viewing the average values, standard deviation and variation.



### Variation of hand strength in three years for Albuminemia classes



Longitudinal Aging Study Amsterdam Schalk BWM et al., 2005

DynEx Hand Grip provides three Dynamometer modes:

- **Max Grip-Strength Test** that can also be performed on a series of consecutive measurements (up to 10). DynEx provides automatic ally calculation of the statistics: Average strength, Standard Deviation and Coefficient of Variation. The updated statistics is displayed after each acceptable measurement and saved to memory.
- **Endurance Grip-Strength Test**: allows you to check the time a patient manages to retain a given target load, which is established after an initial measurement of the maximum strength. DynEx records each workload decrease by at least 10%. At the end of the test, it is possible to view the progress of the loading/duration.
- **Rapid Exchange Strength Test**: allows you to compare the right/left hand exchange in a time period of 0.8 or 1.5 seconds, in order to measure the capacity to immediately close both hands sequentially, in a series of 10 or 20 exchanges. At the end of the test, each measurement can be viewed Individually, with the statistics related to the series.

The statistics show the Average Strength, Standard Deviation and Coefficient of Variation of measurements series.

### A SYSTEM FOR REVEALING SARCOPENIA

Hand Grip Strength (force with which the hand can grip) measures the total strength of the muscles of the upper limbs, usually correlated with the strength of other muscles of the body. Hand Grip is a sensitive tool for assessing the short term changes of the nutritional status and an effective help for screening malnutrition; thanks to these characteristics, it is often used as an indicator of health and as a nutritional evaluation technique.

Hand Grip has a strong predictive power for important variables in gerontological research, such as disabilities, increased risk of complications and mortality. Recent research has shown that the hand strength can be revealed as a very useful single marker, with numerous advantages with respect to other types of measurements and tests. Measurements with DynEx are inexpensive and non-invasive, can be made anywhere and do not require specialized personnel.



EWGSOP A.J. Cruz-Jentoft et al. Recommended algorithm for diagnosing the presence of Sarcopenia in the elderly

Sarcopenia is a syndrome characterized by a progressive and generalized loss of muscle mass and strength with a risk of adverse outcomes such as physical disabilities, poor quality of life and death. Early diagnosis of Sarcopenia is crucial in terms of prevention and treatment.

The EWGSOP (European Working Group on Sarcopenia in Older People) recommends using the presence of both low muscle mass and low muscle function (an assessment of muscle strength with the Hand Grip Test) for the diagnosis of Sarcopenia, reduced muscle strength associated with reduced muscle mass values are useful clinical markers for early detection, as well as an evaluation tool for the management of Sarcopenia. Analysis of body composition through bioelectrical impedance (BIA) has been recommended for the evaluation of the total muscle mass. The combination of DynEx and BIA 101 (Akern/RJL Systems) was proposed as both a nutritional surveillance tool and for assessing motor efficiency.

Janssen I, Heymsfield SB, Baumgartner RN et al.; 2000 - (9)

