

Handgrip strength measurement | Reference values

Webb (1989)

Webb (1989) developed reference values per age category and per sex. The values are based on handgrip strength by the non-dominant hand, although he describes that there is no big difference between the dominant and the non-dominant hand. The reference values are the cut-off points at 85% of the muscle mass: minimal acceptable handgrip strength per age and sex on 85% of the normal value.

Age (years)	Female (kg)	Male (kg)
15	28	42
20	29	43
25	30	44
30	30	45
35	30	45
40	30	45
45	30	45
50	29	45
55	28	44
60	27	43
65	25	41
70	23	39
75	20	37
80	18	35
85	15	32
90	11	29
95	8	26

Based on table V, Webb (1989)

Shenkin

The subject squeezes the handgrip dynamometer using his dominant or non-dominant hand. The grip strength is expressed in kilogram or Newton. It is important that the position of the subject is standardised: sitting, shoulders relaxed, the elbow in a 90-degree angle, the upperarm not touching the body.



Fidanza

Fidanza uses the dominant hand, lets the subject squeeze and at the same time bend his forearm and notes the best of three readings. His reference table is classified in age- and sex categories and reproduces the grip strength in Newton (Fidanza pg. 108, table 3.1). If grip strength is 85% or less of the normal grip-strength, The subject is supposed to be malnourished (Guo, 1996).

Literature and further reading

- Shenkin A., Cederblad G., Elia M., Isaksson B. (1996) 'Laboratory assessment of protein-energy status', Clinica Chimica Acta; 253:S5-S59.
- Guo e.a.. 'Hand grip strength: an indicator of nutritional state and the mix of postoperative complications in patients with oral and maxillofacial cancers'. British Journal of Oral and Maxillofacial Surgery 1996; 34: 325-327.
- Hunt D.R. 'Handgripstrength. A simple prognostic indicator in surgical patients'. JPEN 1985; 9 : 701-704.
- Fidanza F. 'Nutritional assessment, a manual for population studies'. Uitg. Chapman and Hall, 1991.
- Webb A.R., Newman L.A. et al. 'Hand grip dynamometry as a predictor of postoperative complications. Reappraisal using age standardized grip strengths'. JPEN 1989;13:30-33.

Klidjian uses the non-dominant hand (3x, best reading counts), but does not describe a standardised position.

- Klidjian A.M., Foster K.J., Kammerling R.M., Cooper A., Karran S.J.. Relation of anthropometric and dynamometric variables to serious postoperative complications. BMJ 1980; 281: 899.
- Klidjian, A.M., Archer T.J., Foster K.J., Karran S.J. Detection of dangerous malnutrition. JPEN1982 6(2): 119-21.

The usefulness of the measurements according to the method of Klidjian is described in:

- Humphreys J, de la Maza P, Hirsch S., Barrera G. Gattas V., Bunout D..Muscle strength as a predictor of loss of functional status in hospitalized patients. Nutrition 2002, 18: 616-620.
- Hunt D.R., Rowlands B.J., Johnston D. Hand Grip Strength- A simple Prognostic Indicator In Surgical Patients. JPEN 1985, vol 9, no 6: 701-704 .