SOP #2006
Grip strength test

- Always review the SOP before beginning administration of the measurement tool.
- Always read the SOP instructions verbatim to the participant.
- Never modify the procedure or instructions (a modified test is invalid/incomplete).
- Always notify the coordinator if you have any doubt or questions about the SOP.

Description

The grip strength test provides a quantitative measurement of the maximum voluntary strength of the hand and forearm muscles during a finger flexion task. It serves as an indicator of hand function.

Equipment

- □ Standard or digital JAMAR® (Sammons Preston) dynamometer
- □ Footrest or pillow (as needed)
- □ Chair with armrests

Equipment preparation

JAMAR® (Sammons Preston) dynamometer must be set to the second handle position (from the inside of the device)

Participant preparation

Starting position:

- □ The participant is seated comfortably on a chair with the back against the chair backrest, the feet flat on the floor. If the feet do not touch the floor, a footrest is placed under the feet, or a pillow is positioned behind their back.
- □ The tested arm is positioned against the body, shoulder neutrally rotated, elbow flexed to 90º (parallel to the floor), the forearm supported on the armrest, forearm and wrist in a neutral position (wrist: extension [0° to 30°] and ulnar deviation [0° to 15°]).
- □ The participant holds the dynamometer in the tested hand.



Examiner instructions

- □ The examiner holds the distal end of the readout dial to prevent the device from falling, while supporting its weight without creating a fixed point, as this may induce compensatory movements
- □ The examiner verifies the participant's position and monitors any compensatory movements.

Test administration

Demonstration
The examiner may provide a demonstration if necessary.

Practice
A submaximal practice trial may be performed to ensure correct understanding of the movement, confirm the absence of pain, and verify the stability of the position.

Procedure

- □ The standardized instructions are provided to the participant:
  "We are going to use this device to measure the strength of your hand muscles. When I say 'Go', you must squeeze the handle as hard as you can for 5 seconds. We will repeat the exercise 3 to 5 times for each hand. Do you have any questions?"
- □ The participant is instructed to exhale while squeezing to avoid holding their breath.
- □ At the ***"Go"*** signal, the participant begins squeezing the dynamometer. Throughout the contraction, the examiner repeatedly gives verbal encouragement for approximately 3 to 5 seconds.:
  "Hard, hard, hard, hard"
  At the end of this period, the participant is instructed to stop squeezing:
  "Relax"
- □ 3 to 5 trials are performed with each hand, alternating between the dominant and non-dominant side to reduce the impact of fatigue. The dynamometer is reset to 0 prior to each repetition.

Trial(s)

Three trials are performed; however, up to two additional trials must be performed if any of the trials are considered invalid (deviation from the starting position, dynamometer touching the thigh, effort considered submaximal) or if a staircase effect is observed (strength 1st trial < 2nd trial < 3rd trial).

Result

The strength measured by the dynamometer is recorded on the scoring sheet in kilograms. The validity of the result of each trial must be recorded on the scoring sheet (valid or invalid).

* Use a standard or digital JAMAR® (Sammons Preston) dynamometer set to the second handle position (from the inside of the device) to ensure comparability with published normative values obtained under the same conditions.

Ensure regular calibration of the device in accordance with the manufacturer's recommendations.

References
Beveriy P. Horowitz, Robert Tollin & Gary Cassidy (1997) Grip Strength, Physical & Occupational Therapy In Geriatrics, 15:1, 53-64, DOI: 10.1080/J148v15n01_04
Mathiowetz V, Kashman N, Volland G, Weber K, Dowe M, Rogers S. Grip and pinch strength: normative data for adults. Arch Phys Med Rehabil 1985;66:69-74.
Helen C. Roberts, Hayley J. Denison, Helen J. Martin, Harnish P. Patel, Holly Syddall, Cyrus Cooper, Avan Aihie Sayer, A review of the measurement of grip strength in clinical and epidemiological studies: towards a standardised approach, Age and Ageing, Volume 40, Issue 4, July 2011, Pages 423–429, https://doi.org/10.1093/ageing/afr051