Handgrip strength (HGS) is one of the clinical characteristics of protein-calorie malnutrition as described by the Academy of Nutrition and Dietetics (The Academy) and the American Society for Parenteral and Enteral Nutrition (ASPEN) and is a data point for sarcopenia as described by the European Working Group on Sarcopenia in Older People; (EWGSOP), and by the Foundation for the National Institutes of Health Biomarkers Consortium (FNiH). This session will address historical clinical and research use of handgrip strength, demonstrate methodology using a digital handgrip dynamometer (Jamar Plus®) as described by the American Society of Hand Therapists (ASHT); engage the audience in correct positioning as an examiner and patient, and discuss patient interaction, documentation and unique situations. Other materials and forms will be referenced to enable attendees to collaborate with their local teams to learn the ASHT methodology and apply it to clinical practice and local quality or research projects. The first portion of the presentation will be lecture and demonstration; then attendees will practice positioning in place.

Objectives:

1. Gain insight into the history and applications of handgrip strength measurement as both a clinical and research instrument which supplies relevant clinical information and brings value in evaluation of individuals and populations at risk of malnutrition and sarcopenia.


3. Learn the correct methodology, patient and examiner positions, practice basics as seated and documentation of results; provide access to resources that support such competency training to other RDNs at their own worksites.

Methodology


https://www.asht.org/practice/clinical-assessment-recommendations

The 2012 Consensus, jointly published by the Academy and by ASPEN, includes these Grip Strength References:


Disclaimers:

Completion of this session does not denote competency. Competency is determined by departmental and organizational policy and learning requirements.

Grip strength examination and results do not independently determine if a patient is malnourished. The results and analysis must be interpreted by an experienced and competent clinician, the exam performed with correct equipment and methodology and analyzed in conjunction with all other clinical and non-clinical information available at the time of the patient examination. The DTR is able to perform the examination and record results. The DTR will communicate with the RDN who will interpret and document the clinical analysis.

It is critical that all persons performing the grip examination strictly adhere to the ASHT methodology in order to achieve meaningful clinical results. The methodology taught in this Session is that of the American Society of Hand Therapists (ASHT), which is considered the “gold standard.” (www.asht.org). This methodology is also preferred by the American Society of Surgery of the Hand. The methodology requires the Jamar Plus® digital or dial hand dynamometer (www.pattersonmedical.com or www.performancehealth.com or other sources). At the time of this Session, there is no business relationship or remuneration by the author with Patterson Medical, Performance Health, the American Society of Hand Therapists or the American Society of Surgery of the Hand.

At the time of the Session, the American Society for Enteral and Parenteral Nutrition and the Academy of Nutrition and Dietetics have not described a preferred methodology or equipment for hand grip examination for the purpose of nutrition or medical diagnoses of protein-calorie malnutrition in adults. Should these professional groups make future recommendations, learners are encouraged to update their skills to meet those recommendations.

This Session is solely for educational purposes and is not intended to diagnose or treat disease or replace assessment or treatment by qualified health professionals.

Simulated Practice Examination Instructions


Form small group of about 3. Identify (and rotate practice between), Patient, Examiner and Spotter.

Seating arrangements

Adjust seating the best you can. Patient and examiner are seated and ‘face’ one another.

Patient position:

Seat “patient” with arms not resting on chair arms, so arms are free, sitting straight up. Shoulder is adducted, the elbow flexed at 90 degrees with forearm and wrist in neutral position. Hips and knees at approximately 90-degrees. Client arm is not resting on chair arm.

Normally examiner would be seated such that examiner is directly opposite “patient.” To practice, have one person be the “spotter” is to observe and correct the “patient” and “examiner” to assure accurate positioning and that correct methodology as performed.
Simulated Dynamometer or Jamar Plus®

If no real Jamar Plus® dynamometer is available, a simulated foam core or cardboard version can be used to practice positioning.

For the real dynamometer: Handle in 2nd position of Jamar Plus®. Dial (buttons and readout) are turned AWAY from patient and not shown to patient.

Check digital dynamometer for correct settings: on, Lbs. or Kg, and setting “LR 4”

Examiner places dynamometer in hand of patient, and gently supports the base to prevent accidental dropping.

When instructed to grip, grip force is applied smoothly, without rapid wrenching or jerking motion.

No visual or auditory feedback about performance is provided to patient during examination.

Instructions to Patient: This test will tell me your maximum grip strength. When I say “Go”, grip as hard as you can until I say “Stop”. Before each trial, I will ask you, “are you ready?” and then tell you to “Go.” Stop immediately if you experience any unusual pain or discomfort at any point during the testing.

Do you have any questions?

Are you Ready?

Go!

Then as the client begins to squeeze, the examiner should say: “Harder....harder....harder...Relax”

The examiner should tell the client to relax when the dial of the dynamometer levels off and starts to drop after approximately 3 to 5 seconds of gripping. (Or the readout ‘freezes’ if a digital dynamometer)

Examiner reads and records result.

Immediately checks patient position and switches hands, about 15 seconds or less between hands; Selects “TEST” button before each test if digital dynamometer, and performs exam on opposite hand.

Performs exam on each opposite hand 3 times, for total of 6 tests.

Right hand

Left hand

Right hand
Nutrition-Focused Physical Examination for Adults, Part 2: Grip Strength in Patient Functional Assessment

Left hand

Right hand

Left hand

Thank patient.

SIMULATION Results Hand Grip Strength Worksheet Results in Blue

<table>
<thead>
<tr>
<th>Pt Age</th>
<th>Sex</th>
<th>Actual: Right</th>
<th>Actual: Left</th>
<th>Normal (LBS)</th>
<th>“Alert” level (LBS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>76</td>
<td>M</td>
<td>29.2</td>
<td>26.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>26.5</td>
<td>25.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>22.2</td>
<td>24.7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>R hand Mean lbs.</td>
<td></td>
<td></td>
<td></td>
<td>65.7</td>
<td>23.7</td>
</tr>
<tr>
<td>L hand Mean lbs.</td>
<td></td>
<td></td>
<td></td>
<td>55.0</td>
<td>21.0</td>
</tr>
</tbody>
</table>

Patient within Norm: Y or N

Patient below “Alert”?: Y or N

Instructions:

. Before exam: locate the worksheet and use the sex-appropriate chart for patient age, hand, dynamometer, measurement preference of lbs. or kg, the normal means and alert levels for right and left hands for your patient. (Chart came with dynamometer equipment).

. For the practice session, this form has been pre-filled-in, in the specified space for the “Normal,” for that patient’ age and sex, and the “Alert Level,” both taken from the provided normalization table in the Toolkit, for the patient age, sex and hand.

. Conduct the simulation exam, alternately on each hand, recording the highest score read from dynamometer on each test for each hand. You will have 3 scores for each hand. The sum the score from each hand and divide by three to obtain the average for that hand respectively.

. Average and record the average score (Mean) for each hand and record in the respective box (using simulated results).

. Compare the patient’s average score for each hand to the reference normal and the Alert Level. Circle “Yes” or “No” depending on if patient is within norm or below alert level.

. **AFTER EXAM SESSION:**

. Document the measurement results.
Nutrition-Focused Physical Examination for Adults, Part 2:
Grip Strength in Patient Functional Assessment

Document your clinical analysis as part of overall nutritional assessment.

For Academy Members: There is a Grip Strength Examination Toolkit available as a member benefit for select Dietetic Practice Groups of the Academy of Nutrition and Dietetics. The Toolkit is for educational purposes and will be available from the respective Dietetic Practice Group websites upon notification to members. Dynamometry equipment is not included and is to be purchased separately. A pattern for a simulated dynamometer is included in the Toolkit. Some DPG’s allow non-member purchase.

Dietitians in Nutrition Support (DNS) and affiliated groups
Clinical Nutrition Management (CNM)
Oncology Nutrition (ON)
Medical Nutrition (MN)
Healthy Aging (HA)
Nutrition and Dietetic Educators and Preceptors (NDEP)

The Toolkit and accompanying webinar are designed for individuals or peer groups to study, practice and collaborate in order to correctly perform, analyze and document grip strength. Grip strength is a functional assessment and one of the clinical characteristics of protein-calorie malnutrition, as described in the 2012 Consensus Statement: Academy of Nutrition and Dietetics and American Society of Parenteral and Enteral Nutrition: characteristics recommended for the identification and documentation of adult malnutrition (undernutrition). This document was jointly published by the Academy of Nutrition and Dietetics and the American Society of Parenteral and Enteral Nutrition, in their respective journals in 2012. (Erratum in JAND November 2012).

The methodology and equipment described is by the American Society of Hand Therapists (ASHT), and was originally printed April 2017, in Support Line, the publication of the Dietitians in Nutrition Support Dietetic Practice Group of the Academy of Nutrition and Dietetics. The ASHT method is reprinted in the various DPG Newsletters, and is included in the Toolkit. The accompanying pre-recorded webinar, forms, practice guidance, reading, normalization tables, references and quiz will be accessed on the various DPG websites or as the DPG manages quizzes and CPE. The program includes simulation materials for those without the equipment. The methodology and equipment presented is preferred by the ASHT and by the American Society of Surgery of the Hand.

Results worksheet

<table>
<thead>
<tr>
<th>Pt Age</th>
<th>Sex</th>
<th>Actual: Right</th>
<th>Actual: Left</th>
<th>Normal (LBS)</th>
<th>“Alert” level (LBS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measure #1 lbs.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Measure #2 lbs.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Measure #3 lbs.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>R hand Mean lbs.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>L hand Mean lbs.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Patient within Norm</td>
<td></td>
<td>Y or N</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Patient below “Alert”?</td>
<td></td>
<td>Y or N</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

NOTE: Normalization tables used with the Jamar® dynamometer:
Nutrition-Focused Physical Examination for Adults, Part 2:
Grip Strength in Patient Functional Assessment

Sample Results Reporting

Date:  Time:
Hand Grip Strength Examination – Method: American Society of Hand Therapists 2016
Equipment: Jamar Plus Digital Hand Dynamometer

<table>
<thead>
<tr>
<th></th>
<th>Readings in pounds force</th>
<th>Mean for age and sex</th>
<th>Normal mean for age and sex</th>
<th>Alert level minus 2 SD for age and sex</th>
</tr>
</thead>
<tbody>
<tr>
<td>Right Hand</td>
<td>***; ***; ***; ***</td>
<td>***</td>
<td>*** pounds</td>
<td></td>
</tr>
<tr>
<td>Left Hand</td>
<td>***; ***; ***; ***</td>
<td>***</td>
<td>*** pounds</td>
<td></td>
</tr>
</tbody>
</table>

Sample phrasing of statement of results:

Patient Position: (example) Seated straight up in chair with arms bent at 90 degrees.
Patient agreed to exam.
Patient tolerated exam.
Also present for exam:

Potential Sample phrasing of results reporting:
Right and left hand mean is within 2 Standard Deviations from the mean and is within normal range.
Right hand mean is within 2 Standard Deviations from the mean and within normal range.
Left hand mean is within 2 Standard Deviations from the mean and within normal range.

Right and left hand mean is beyond minus 2 Standard Deviations beyond the mean and measurably reduced.
Right hand mean is beyond minus 2 Standard Deviations from the mean and measurably reduced.
Left hand mean is beyond minus 2 Standard Deviations from the mean and measurably reduced.

Right and left hand mean are within normal range for age and sex, but trending towards minus 2 standard deviations beyond the mean.
Right hand mean is within normal range for age and sex, but trending towards minus 2 standard deviations beyond the mean.
Left hand mean is within normal range for age and sex, but trending towards minus 2 standard deviations beyond the mean.

Clinician Signature
Pattern for Simulated Dynamometer

Instructions:
- Cut out on foam core or cardboard.
- Use for practice in positioning patient and examiner.