**Content and Face Validity of The Chicago-Quick Hand Function Test (C-QHFT)**

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**Abstract**

**Background**

The evaluation and assessment of hand function, impairment, and psychomotor abilities necessitate using standardized outcome measures, particularly performance-based outcome measures (PBOMs). The intricate nature of hand functioning, involving numerous components for diverse tasks, presents a challenge for comprehensive measurement through a singular outcome measure. In-hand manipulation (IHM) and psychomotor skills, as cognitive components, further contribute to the multifaceted functionality of the human hand. Despite professional standards advocating for outcome measures, a literature gap exists concerning PBOMs employed in adult hand function assessment. Existing outcome measures (OMs) do not seem to comprehensively assess hand function. A critical review of the literature reveals a lack of OMs that incorporate finger-to-palm translation, palm-to-finger translation, shift and stabilization of IHM, and psychomotor skills in test performance, indicating a need for the development of such a tool (Kruger et al., 2021).

**Purpose**

This study introduces a novel outcome measure, The Chicago-Quick Hand Function Test, designed to rapidly and comprehensively assess in-hand manipulation and dexterity, thereby addressing the gaps in hand function assessment tools. The primary objectives of this study include exploring the content and face validity of the C-QHFT.

**Methods**

A qualitative and quantitative non-experimental design was used to facilitate the development of the new assessment tool. The study incorporates quantitative methods, such as the content validity index (CVI) and qualitative methodologies, to explore face validity and enhance the instructional manual associated with C-QHFT.

**Results**

The Item-level CVI (I-CVI) for various components of C-QHFT, as evaluated and agreed upon by ten experts, ranged from 0.9 to 1. The sum of I-CVI/Average (S-CVI/Ave.) yielded a score of 0.95, reflecting the average proportion of items deemed relevant by all experts. Constructive expert feedback contributed to refining the instructional manual, particularly concerning cues and their incorporation into the scoring process.

**Conclusions**

The C-QHFT is a cost-effective, compact, and easily administered outcome measure, encompassing pincer grasp, voluntary release, four components of IHM, fine motor coordination, dexterity, and psychomotor skills. This study represents an initial step in the standardization of C-QHFT. Subsequent investigations focus on concurrent validity, interrater reliability, intrarater reliability, known group validity, and age-related normative data. It is anticipated that occupational therapy, physical therapy, certified hand therapy, medicine, and neuropsychology professionals will find C-QHFT a preferred outcome measure for evaluating hand function, impairment, and psychomotor analysis.

*Keywords:* Hand function, outcome measures, in-hand manipulation, dexterity, occupational therapy, content validity, face validity

**What this Article Adds**

The C-QHFT is an outcome measure for in-hand manipulation and dexterity, which will help occupational therapists, certified hand therapists, hand surgeons, and neuropsychologists assess hand function or hand impairment comprehensively, accurately, and efficiently.

**Introduction**

**Problem Background**

The human hand performs functions like prehension, grasp, manipulation, dexterity, fine motor coordination (FMC), and release, and plays a pivotal role in self-care, leisure activities, and work (Lee & Jung, 2015; Reissner et al., 2019). Given its frequent usage, its optimal function is integral to an enhanced quality of life (Leversedge et al., 2011). Successful hand function involves joint motions, muscle strength, motor tasks, sensory abilities, and cognition (Exner, 2010; Lee & Jung, 2015; Reissner et al., 2019; Ritter & Haschke, 2015). The six primary components of hand function include prehension, grasp/release, dexterity, IHM, FMC, and psychomotor skills (Exner, 2010; Exner, 1992; Lee & Jung, 2015; Reissner et al., 2019; Ritter & Haschke, 2015; Yong et al., 2022). Dexterity, characterized by precise, rapid, and resourceful hand movements, demands speed, accuracy, efficiency, and cognitive abilities (Yong et al., 2020). IHM, introduced by C.E. Exner, is crucial for tasks like writing, scissoring, and buttoning, involving shift, rotation, finger-to-palm, palm-to-finger translation, and stabilization (Exner, 1989, 1990a, 1990b; Kruger et al., 2021). The hand's utility hinges on cognition for meaningful and efficient task completion (Cioni & Sgandurra, 2013), with psychomotor ability involving cognitive and motor processes for movement-related actions (Sandy, 2022).

The contemporary importance of OMs has witnessed a discernible change in their use, including increasing clinical applications, reporting mechanisms, documentation practices, and employing OMs to support intervention. Health professionals, including occupational therapists, physical therapists, hand surgeons, and neuropsychologists, utilize hand OMs to assess impairment, hand function, and psychomotor skills (Bryden & Roy, 2005).

A suitable outcome measure should be cost-effective, easy to administer, compact, not require specific training, and possess robust psychometric properties (Causby et al., 2014; Fawcett, 2013; Jebsen et al., 1969; Kaplan, 2007; Pattison et al., 2015; Yusoff, 2019). There is no evidence of an affordable and easy-to-administer standardized tool comprehensively assessing hand function. Kruger and colleagues advocate for the development of such an instrument (Kruger et al., 2021).

Addressing this gap, the C-QHFT proposes a quick and easily administered assessment tool for comprehensive hand function evaluation, encompassing grasp, prehension, dexterity, FMC, IHM (including stabilization), and psychomotor skills. C-QHFT does not require specific training. Instrument development involves equipment creation, standardization of administration protocols, and establishing reliability and validity (Aaron & Jansen, 2003). This study focuses on the first steps, determining the domain and examining content and face validity (Zamanzadeh et al., 2015), positioning C-QHFT as a potential standardized outcome measure.

**Literature Review**

The intricacies of hand function, incorporating prehension, grasp, IHM, dexterity, and FMC, pose challenges in developing outcome measures that adequately cover these constructs in test performance. While numerous outcome measures claim to assess hand function, each presents unique challenges. As part of the instrument development for the C-QHFT, a literature review was conducted indicating that there are at least 22 outcome-based assessment tools that purport to measure hand function. These measures include the Arthritis Hand Function Test (AHFT), Box and Block Test (BBT), Crawford Small Parts Dexterity Test (CSPDT), Corbett Targeted Coin Test (CTCT), Functional Dexterity Test (FDT), Grooved Pegboard Test (GPT), Jebsen-Taylor Hand Function Test (JTHF), Minnesota Manual Dexterity Test (MMDT), Minnesota Rate of Manipulation (MRMT), Moberg Pick-Up Test, Nine Hole Peg Test (NHPT), O'Connor Finger Dexterity Test, O'Neill Hand Function Assessment, Purdue Pegboard Test (PPT), Radboud Skills Test, Rosenbusch Test of Finger Dexterity, Sequential Occupational Dexterity Assessment (SODA), Smith Hand Function Evaluation, Sollerman Hand Function Test, Southampton Hand Assessment Procedure (SHAP), Test d'Evaluation de la performance des Membres Supérieurs des Personnes Agées (TEMPA), and Upper Extremity Function Test (UEFT).

Among the reviewed measures, the CTCT stands out as the most similar outcome measure to the C-QHFT, utilizing palm-to-finger translation and palmar stabilization. However, CTCT lacks comprehensive psychometric properties, and it does not measure palm-to-finger translation in the same manner that the C-QHFT assesses this skill. The Grooved Pegboard Test (GPT) distinguishes itself as a unique finger dexterity test, incorporating a psychomotor component in test performance due to the unidirectional ridge on the pegs aligning with the grove on the board (Yancosek & Howell, 2009). The literature review underscores a knowledge gap, as none of the existing outcome measures comprehensively assess hand function. There is a pressing need to develop an outcome measure that incorporates grasp and voluntary release, fine motor coordination, various components of in-hand manipulation, psychomotor skills, and dexterity in task performance. Such a comprehensive measure would address the current limitations in evaluating the multifaceted nature of hand function.

**Instrumentation**

**The C-QHFT Kit**

The C-QHFT is designed to assess hand function comprehensively in patients with mild to moderate hand impairment who do not have moderate to severe cognitive impairment. The Principal Investigator (PI) has developed the C-QHFT kit. It is comprised of a board, four quarters, and four pennies. An additional penny and quarter are included to account for instances where a coin lands on the floor and proves challenging to retrieve during the test. The board features a small bowl on one side and a slot on the other, exhibiting specific dimensions. The test administration entails adhering to precise instructions facilitated by a specifically designed tool, the C-QHFT kit. No specialized training is required for administering the test, but strict adherence to standardized instructions, detailed in Appendix A, is imperative.

The test necessitates 25 square feet of space and typically concludes within a timeframe of five to ten minutes, inclusive of setup. The administrator utilizes a digital clock, such as one available on the phone, to record the time accurately. Board dimensions are 250.8 mm x 170.64 mm x 32.95 mm. Figure 1 provides a visual representation of the various dimensions of the kit, elucidating its structural intricacies and design elements.

**Figure 1**

*Illustrating various dimensions of the C-QHFT*



**Task Objective**

The task objective is to alternately pick up quarters and pennies with one hand, switch them in the palm, and place the coins into the slot until all eight coins are successfully placed as quickly as possible.

**Scoring**

The time-only score quantifies the speed of the hand dexterity; the time-plus penalty score quantifies the quality of the performance (Aaron & Jansen, 2003). The total raw score is the addition of the time to complete the task, the number of corrective cues required, and the number of times the coin falls out of hand/fingers. The final score is the average score of two trials.

**Methods**

This study employs a methodological quasi-experimental design encompassing qualitative and quantitative approaches to facilitate developing and assessing C-QHFT. Specifically, the investigation delves into the content and face validity of the C-QHFT, serving as a subset within a larger study examining various psychometric properties of the tool. The Institutional Review Board office of Rocky Mountain University of Health Professions obtained the study's ethical approval.

To assemble the expert panel, invitations were disseminated via social media, emails, and phone calls to over forty Occupational Therapists (OTs) and Certified Hand Therapists (CHTs). The expert panel members, who met specific inclusion criteria, were sought as follows:

* 1. Currently practicing professionals: OTs or other medical professionals holding the CHT credential.
	2. Maintenance of OT or CHT credentials in good standing for the preceding five years.
	3. Comfort and familiarity with hand outcome measures such as NHPT, BBT, and FDT.
	4. Professional experience in working with adult clients.

With the aim of recruiting a maximum of 12 members, interest was received from 13 eligible participants. Unfortunately, three members could not participate due to scheduling conflicts, resulting in the final attendance of ten expert panel members. All participants were OTs, with one member holding dual OT and PT credentials and three holding CHT credentials. Of ten experts, nine belong to the US and one to Canada. The average therapy experience of the expert panel exceeded twenty-five years.

The expert panel received introductory materials, including a brief overview of the C-QHFT and an instructional video illustrating test administration. A two-hour virtual focus group conducted over Zoom provided an opportunity to elaborate on the literature gap and the imperative for a comprehensive hand-function outcome measure. The expert panel received the C-QHFT manual and scoring sheet with criteria and observed pre-recorded videos of clients from distinct age groups (18, 62, and 74 years old) executing the test. Subsequently, the panel members scored the tests and participated in a Qualtrics XM survey designed to elicit their feedback on content and face validity (Qualtrics, 2020).

The survey comprised six questions related to domain or construct items and five questions addressing face validity, as detailed in Appendix A. Respondents could express their agreement or disagreement on each construct item. Each item would earn one point from an expert for Agree and Strongly Agree and no point for Disagree and Strongly Disagree. Face validity questions were open-ended. Following data collection from the survey, a group discussion ensued among the expert panel to further elucidate and refine the outcomes obtained during the survey analysis.

**Analyses/Results**

We used the Content Validity Index to analyze the content validity of C-QHFT. Table 1 shows the agreement scores on six domain items from ten experts. Feedback from five open-ended questions and the discussion group was qualitatively analyzed using Atlas.ti software, generating themes and codes (ATLAS.ti, 2023). Table 2 concisely lists the themes and codes and interprets the expert panel's input.

**Table 1**

*The Relevance Ratings on the Item Scale by Ten Experts (Yusoff, 2019)*

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Domain Items | E 1 | E 2 | E 3 | E 4 | E 5 | E 6 | E 7 | E 8 | E 9 | E 10 | E inA. | I-CVI |
| Voluntary grasp and release | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 9 | 0.9 |
| Finger-to-palm translation | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 10 | 1 |
| Palm-to-finger translation | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 10 | 1 |
| Stabilization | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 9 | 0.9 |
| Dexterity: (Coordination, Speed, Efficiency, and Accuracy) | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 10 | 1 |
| Psychomotor | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 9 | 0.9 |
| Proportion Relevance = Sum of A./ # of Construct Items  | 1 | 1 | 1 | 0.833 | 1 | 0.833 | 1 | 0.833 | 1 | 1 |  |  |
| S-CVI/Ave. |  |  |  |  |  |  |  |  |  |  |  | 0.95 |

*Note.*  E- Expert, A.- Agreement, Ave.- Average, I-CVI - Item-level Content Validity Index

* I-CVI = Expert in Agreement/ Total # of Experts, e.g., I-CVI for psychomotor = 9/10 = 0.9
* S-CVI/Ave. = Sum of I-CVI/# of Construct Items = (0.9 +1+1+0.9+1+0.9)/6 = 0.95
* Proportion Relevance = Sum of A. / # of Construct Items, e.g., the proportion level relevance for Expert #1 = 1 and Expert #4 = 0.833
* Average proportion of Items judged as relevant across all ten Experts = Sum of proportion relevance/ # of Experts =(1+1+1+ 0.833+1+0.833+1+0.833+1+1)/10 = 0.95

**Table 2**

*Qualitative analysis of Feedback from the Experts based on survey and group discussion*

|  |  |  |
| --- | --- | --- |
| Themes | Codes | Findings |
| Administration Procedures | Needs clarity, Cues, Wordy, Instructions | Improvements are needed in the instructional manual on how and when cues are given and which cues are included in the score. |
| C-QHFT Scoring | Needs clarity, Cues, Easy, Clear, Understandable | This theme got mixed responses, but there were concerns about cues and how to account for them in the scoring. |
| Comparing C-QHFT with other PBOM for hand | Hand, Test, Outcome measure, Assessment, Test, Good, Better, Many aspects, In-hand manipulation, Translation, Pinch | Overall, C-QHFT received positive feedback about measuring in-hand manipulation in comparison to other tools. We learned about CTCT from two experts who use it in their practice. The CTCT incorporates palm-to-finger translation and ulnar stabilization. |
| Utility of the C-QHFT in clinical practice | Ortho, Neuro, Injuries, Useful, Comprehensive, Good, Treatment, Intervention, Level | This theme received encouraging comments. Many asked if they could start using this tool in their practice, and most experts agreed that it is a useful hand assessment tool that could be used in hand injuries and orthopedic and neurological cases. A few agreed with PI sentiments that C-QHFT is not a tool of choice in patients with moderate to severe hand or cognitive impairment. |
| Improvement recommendation C-QHFT | Improvement, Cues, Score, Instruction, Fix | This theme echoed similar comments as in the earlier themes about cues and their incorporation in the score. One expert suggested limiting the cues and providing them only when needed.The other suggestion was to limit the instruction on which grasp they need and how many fingers they need to pick up the coins.  |

**Discussion**

The content validity analysis (Table 1) for C-QHFT reveals I-CVIs ranging between 0.9 and 1 across all six domains, with an overall S-CVI/Ave. of 0.95. These values surpass the benchmarks for excellent content validity set by Shi et al. (2012) and Lynn (1986). Notably, disagreements arose among experts for three C-QHFT domain items—Voluntary Grasp and Release, Stabilization, and Psychomotor—while unanimous agreement prevailed for the remaining items.

Qualitative analysis of expert feedback highlights a thematic need for improved clarity in manual instructions, particularly regarding cues' timing, delivery, and incorporation into scoring. Despite this concern, experts express optimism about C-QHFT's potential superiority over existing PBOMs for assessing hand function and dexterity. Positive feedback suggests perceived utility in real-world occupational therapy settings.

In summary, while face validity indicates promise for C-QHFT, refinements in instruction manuals, specifically addressing cues and scoring, are essential. The acknowledgment of potential limitations in patients with moderate to severe hand or cognitive impairment underscores considerations for its clinical applicability.

**Implications for Occupational Therapy Practice**

The C-QHFT has significant implications for OT practice. It offers a comprehensive assessment of hand function, incorporating essential components like finger-to-palm translation, palm-to-finger translation, ulnar stabilization, and psychomotor skills. This allows occupational therapists to gain insights into clients' hand abilities, facilitating targeted interventions. The efficiency of C-QHFT in assessment is noteworthy, as its quick and easy-to-administer nature makes it practical in clinical settings. Occupational therapists can seamlessly integrate this outcome measure, optimizing both time and resources. C-QHFT aligns with occupational therapy goals by focusing on IHM components and addressing deficits that may impact daily activities. The assessment aids in the identification and quantification of hand impairments, providing valuable information for treatment planning and goal setting.

The insights derived from C-QHFT assessments inform the development of patient-centered interventions. Therapists can design tailored treatment plans targeting specific challenges identified during the evaluation. The seamless integration of C-QHFT into rehabilitation programs for individuals with mild hand or cognitive impairment is facilitated by its compact design and ease of use. This makes it suitable for various therapeutic settings. As a standardized outcome measure, C-QHFT enables therapists to monitor changes in hand function over time. This tracking allows for ongoing assessment, adaptation of interventions, and the demonstration of therapy effectiveness to clients and healthcare professionals. Moreover, C-QHFT serves as a valuable tool for training and educating occupational therapy students and practitioners. Its standardized nature ensures consistency in training and promotes a common understanding of the assessment process.

**Conclusion**

In conclusion, the examination of existing performance-based outcome measures reveals a notable gap in addressing critical hand function components. The absence of finger-to-palm translation, palm-to-finger translation, ulnar stabilization, and psychomotor elements in established measures underscores the need for a novel instrument. This study advocates for the development of the Chicago-Quick Hand Function Test, aligning with Kruger et al.'s recommendation for an affordable, compact, and easy-to-administer outcome measure tailored for occupational therapists. While C-QHFT addresses these gaps, its journey toward establishing efficacy requires rigorous validation processes. This inaugural study establishes excellent content validity for C-QHFT and provides insights for refining the instructional manual, particularly cues and scoring methodologies. Future investigations should focus on interrater reliability, test-retest reliability, concurrent validity, and normative data collection, utilizing an improved instructional manual. This systematic progression aims to position C-QHFT as a credible tool for occupational therapists, certified hand therapists, hand surgeons, and neuropsychologists.

**Acknowledgments**

Gratitude is extended to Sohum Kumar for his instrumental contributions in designing the logo, recording and editing client videos for the focus group and serving as a voice actor in the instructional video. Special appreciation is also extended to Harshada Kumar, MSOT, OTR, for her role as a hand model in the instructional video. A very special thanks to D. P. Jha, an OT in India, for providing the logistic support in developing the prototype of the C-QHFT kit.

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# **Appendix A**

# The C-QHFT Instruction Manual

1. The test involves a C-QHFT board, four quarters, and four pennies (one additional penny and a quarter are provided if the coin lands on the floor and is difficult to retrieve during the test).
2. Clients are comfortably seated in a chair, and the kit is placed in front of the clients on a table of appropriate height.
3. Position the kit so that the bowl is closer to the testing hand and the slot is closer to the non-testing hand. The middle of the kit should be aligned with the midline of the clients. Each side of the kit has a yellow marker in the middle to help position the kit in the middle of the clients. The yellow marker should align with the client's midline.
4. Place four quarters towards the top of the bowl, four pennies towards the bottom, and one extra quarter and penny on the table towards the bowl.
5. The test starts with the dominant hand first.
6. Each cue earns one penalty point (one cue = one second).
7. Each coin drop from the palm or fingers earns one penalty point. (one coin drop = one second).
8. If a corrective cue is given during the coin drop, it accounts for two penalty points: one for the coin drop and another for the corrective cue.
9. The administrator provides the prompts needed to perform the test accurately. The administrator keeps count of corrective cues/prompts provided to the client. Encouraging cues provided, such as you are doing good, that is right, etc., are not accounted for in the penalty point.
10. The administrator keeps count of the # of times the coins fall out of the palm or fingers. If the coin drops in the bowl, it is still counted as a drop.
11. Total Raw Score = Time it takes to complete the task + # of corrective cues required to complete the task + # of times the coin falls out of hand/fingers using the qualitative assessment, and the administrator notes down the deficits.
12. Noted deficits are used for intervention or documentation purposes only. It does not account for the final score.
	1. Grasp
	2. Release
	3. IHM
		1. Finger-to-palm translation
		2. Stabilization
		3. Palm-to-finger translation
	4. Dexterity
	5. Coordination
	6. Motor speed
	7. Cognitive skills
		1. Attention
		2. Memory
		3. Difficulty following directions
		4. Any other cognitive challenges
13. The administrator demonstrates the test to the client:
	1. Pick up a quarter and roll it into your palm.
	2. While holding the quarter in your palm, pick up a penny.
	3. Roll the penny into your palm and shift the quarter to your fingertips.
	4. Place the quarter into the slot.
	5. Repeat steps 1-4, alternating placement of quarters and pennies in the slots.
	6. [C-QHFT Demonstration Video](https://www.youtube.com/watch?v=ylmxDvsOmWc)
14. One practice trial with each hand to be tested is mandatory.
15. If needed, the administrator clears up client doubts before the test begins.

**Client's Instructions provided by the Test Administrator**

1. The objective is to alternately pick up quarters and pennies with one hand, switch them in the palm, and place the coins into the slot until all eight coins are successfully placed as quickly as possible, as demonstrated by me.
2. You earn penalty points when the administrator provides cues and prompts during the test if the test is not performed as instructed.
3. You also earn penalty points when the coin drops from the palm or fingers.
4. You pick up the dropped coin if it is within your reach with the same hand and continue with the test.
5. If it falls outside your reach, I will pick up the coin for you, and you will continue with extra coins that are kept on the table for such events.
6. Use the hand being tested to maneuver the coins.
7. Hold the kit with a non-testing hand to stabilize the Board if needed.
8. The timer starts when you touch the first quarter and ends when you place the last coin in the slot.
9. I will demonstrate the test for you.
10. Ask me if you have questions before you start the test.

# **Appendix B**

# Score Sheet

Name (Initials only; please include middle initial if you have one):\_\_\_\_\_\_\_\_Age:\_\_\_\_\_ Hand dominance:\_\_\_\_\_ Gender:\_\_**\_** Ethnicity\_\_\_\_\_\_\_\_ Profession: \_\_\_\_\_\_\_\_\_\_ Hobbies in which you frequently use your hands (please list): \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Diagnoses that may affect hand function: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Declaration:** I declare that I do not have any health issues that I know of which will affect hand function \_\_\_\_\_\_\_\_(Initials only)

**Screening:**

1. Point to a corner in the room and count one to five: Pass \_\_\_ Fail\_\_\_\_
2. Pick up a coin while holding another coin in the palm: Pass \_\_\_ Fail\_\_\_\_

\*Please do not proceed with testing if the participant fails in either of the two screenings

Enter the test data in Table 3

**Table 3**

*Test Scores*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| C-QHFT Scoring Criteria | Dominant Hand (Trial 1) | Non-dominant Hand (Trial 1) | Dominant Hand (Trial 2) | Non-dominant Hand (Trial 2) |
| Time in seconds: |  |  |  |  |
| # of cues used: |  |  |  |  |
| # of times the coin dropped: |  |  |  |  |
| **Total Raw Score** = Time it takes to complete the task + # of corrective cues required to complete the task + # of times coin falls out of hand/fingers |  |  |  |  |
| Final Score = Average Score of two trials  |  |  |  |  |
| \*Deficits that may have affected performance (Check all that apply) |
| **Prehension** |
| * Grasp
 |  |  |  |  |
| * Release
 |  |  |  |  |
| **In-Hand Manipulation**  |
| * Finger-to-palm translation
 |  |  |  |  |
| * Stabilization
 |  |  |  |  |
| * Palm-to-finger translation
 |  |  |  |  |
| **Dexterity** |
| * Coordination/Motor accuracy
 |  |  |  |  |
| * Motor speed
 |  |  |  |  |
| **Cognitive skills** |
| * Attention
 |  |  |  |  |
| * Memory
 |  |  |  |  |
| * Difficulty in following the direction
 |  |  |  |  |
| Any other cognitive and behavioral challenges (low frustration tolerance, anxiety, etc.): |
| Any other factors that may have influenced performance (such as insufficient light, background noise or distraction, competitiveness, etc.):  |
| NHPT (time in seconds) |  |  |  |  |
| If tested for NHPT, circle the test order: C-QHFT 1st/NHPT 2nd or NHPT 1st / C-QHFT 2nd |

Is the participant available for a retest within one-to-two weeks: Yes \_\_ No\_\_\_

Schedule the date and time for the Retest: \_\_\_\_\_\_

Test administrator Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_