Shriners Hospital Upper Extremity Evaluation

Date

Therapist Signature

Name Age Diagnosis

History

Subjective - Goals of patient & family; functional limitations

RIGHT		WNL With Following Exceptions	LEFT	
A	P	**RANGE OF MOTION**	A	P
		Shoulder Abduction		
		Shoulder Flexion		
		Shoulder Internal Rotation		
		Shoulder External Rotation		
		Elbow Flexion		
		Elbow Extension		
		Forearm Supination		
		Forearm Pronation		
		Wrist Flexion		
		Wrist Extension		
		Finger Flexion		
		Finger Extension		
		Thumb CMC Palmar Abd.		
		Thumb CMC Radial Abd.		
		Thumb MCP		

Tone

Modified Ashworth Scale

0 No increase in muscle tone.		2 More marked increase in muscle tone through most of the ROM, but the part is easily moved.	
1 Slight increase in tone, manifested by a catch & release, or by minimal resistance at the end of the ROM when the affected part is moved into flexion or extension.		3 Considerable increase in tone, passive movement is difficult.	
		4 Affected part is rigid in flexion or extension.	

		Independent	Dependent	Assist	Comments
ADL's	UE dressing				
	LE dressing				
	Orthotic				
	Shoes				
	Socks				
	Fasteners				
	Hygiene				

Shriners Hospitals for Children
Greenville Hospital
Shriners Hospital Upper Extremity Evaluation

Form # 15280-19

addressograph

Fig. E-1A

First page of the Shriners Hospital for Children Upper Extremity Evaluation form. This page includes patient demographic information, subjective assessment of patient and family goals, active and passive range of motion measurements, tone assessment, and subjective assessment of the subject's performance of activities of daily living. A = active, P = passive, CMC = carpometacarpal joint, Abd = abduction, MCP = metacarpophalangeal joint, ROM = range of motion, ADL = activities of daily living, UE = upper extremity, and LE = lower extremity. Reproduced with permission from the Shriners Hospital for Children, Greenville, South Carolina.

Dynamic Positional Analysis (Place an X in appropriate observation)

Spontaneous Functional Analysis	Activity	Thumb Segment			Finger Segment			Wrist Segment			Forearm Segment					Elbow Segment		
		palm	close	open	flexion	neutral	extension	flexion	neutral	extension	extreme pronation	pronation	neutral	supination		extreme flexion	flexion	extension
0 1 2 3 4 5	Money from wallet																	
0 1 2 3 4 5	Fold paper																	
0 1 2 3 4 5	Tear paper																	
0 1 2 3 4 5	String bead																	
0 1 2 3 4 5	Unscrew bottle cap																	
0 1 2 3 4 5	Pull playdough apart																	
0 1 2 3 4 5	Cut playdough with knife																	
	Throw large ball																	
	Accept coins/change																	
	Receive 5																	
	Take hand to mouth																	
	Touch opposite ear with palm																	
	Place sticker on ball																	
0 1 2 3 4 5	Put socks on																	
0 1 2 3 4 5	Fasten shoe																	
	Crawl																	

Functional Classification System

0 Does not use-Extremity not utilized in any capacity for completion of task.
1 Poor passive assist-Uses as stabilizing weight only
2 Passive assist-Can hold onto object placed in hand & may stabilize it for use by other hand
3 Poor active assist-can actively grasp object & hold it weakly
4 Active assist-Can actively grasp object, stabilize it well, & may manipulate it against other hand
5 Spontaneous use, partial to complete-Performs bimanual activities easily; may use hand spontaneously or without reference to other hand

Grasp / Release Analysis

Position	Grasp	Release
Wrist Flexion	Y N	Y N
Wrist Neutral	Y N	Y N
Wrist Extended	Y N	Y N

Comments: (Web space, MCP instability)

Form # 15280-19

Fig. E-1B

Second page of the Shriners Hospital for Children Upper Extremity Evaluation form. Spontaneous functional analysis is graded from 0 to 5 for nine tasks, using the functional classification system, modified from the House functional classification[24,29]. Dynamic positional analysis is graded for five upper extremity limb segments utilizing sixteen tasks. The first four tasks ("money from wallet" to "string bead") are utilized to grade thumb and finger alignment. The next four tasks ("unscrew bottle cap" to "throw large ball") are utilized to grade wrist alignment. The next four tasks ("accept coins/change" to "touch opposite ear with palm") are utilized to grade the forearm segment alignment. The final four tasks ("place sticker on ball" to "crawl") are utilized to grade elbow alignment. Grasp/release analysis evaluates the ability to perform grasp and release ("yes or no" for each function) with the wrist held in three positions. Y = yes, N = no, and MCP = metacarpophalangeal joint. Reproduced with permission from the Shriners Hospital for Children, Greenville, South Carolina.

SHUEE Scoring Form

Patient Name _____ Patient # _____

Date	Initials	Spontaneous Functional Analysis						Dynamic Positional Analysis					Grasp / Release		
		Total Score			Percentage			Total Score		Percentage			Total Score		%
		/ 45						/ 60					/ 6		
		/ 0	/ 1	/ 2	/ 3	/ 4	/ 5	Thumb	Finger	Wrist	Fore-arm	Elbow	Flex	Neut	Ext
								/12	/12	/12	/12	/12	/ 2	/ 2	/ 2

Comments, e.g. intervention & date, score changes, etc. _____

Date	Initials	Spontaneous Functional Analysis						Dynamic Positional Analysis					Grasp / Release		
		Total Score			Percentage			Total Score		Percentage			Total Score		%
		/ 45						/ 60					/ 6		
		/ 0	/ 1	/ 2	/ 3	/ 4	/ 5	Thumb	Finger	Wrist	Fore-arm	Elbow	Flex	Neut	Ext
								/12	/12	/12	/12	/12	/ 2	/ 2	/ 2

Comments, e.g. intervention & date, score changes, etc. _____

Date	Initials	Spontaneous Functional Analysis						Dynamic Positional Analysis					Grasp / Release		
		Total Score			Percentage			Total Score		Percentage			Total Score		%
		/ 45						/ 60					/ 6		
		/ 0	/ 1	/ 2	/ 3	/ 4	/ 5	Thumb	Finger	Wrist	Fore-arm	Elbow	Flex	Neut	Ext
								/12	/12	/12	/12	/12	/ 2	/ 2	/ 2

Comments, e.g. intervention & date, score changes, etc. _____

Date	Initials	Spontaneous Functional Analysis						Dynamic Positional Analysis					Grasp / Release		
		Total Score			Percentage			Total Score		Percentage			Total Score		%
		/ 45						/60					/ 6		
		/ 0	/ 1	/ 2	/ 3	/ 4	/ 5	Thumb	Finger	Wrist	Fore-arm	Elbow	Flex	Neut	Ext
								/12	/12	/12	/12	/12	/ 2	/ 2	/ 2

Comments, e.g. intervention & date, score changes, etc. _____

Shriners Hospitals for Children
Greenville
SHUEE Scoring Form

Form # 15310-05 10/04

addressograph

Fig. E-2

Shriners Hospital for Children Upper Extremity Evaluation scoring form. Scores from four evaluations may be recorded and compared on the form. Raw scores for each component of the assessment are recorded. The scores are totaled for each segment and are recorded as a percentage of the maximum possible score. Flex = flexion, Neut = neutral, and Ext = extension. Reproduced with permission from the Shriners Hospital for Children, Greenville, South Carolina.

Fig. E-3

A tutorial for the Shriners Hospital for Children Upper Extremity Evaluation. Reproduced with permission from the Shriners Hospital for Children, Greenville, South Carolina.

SHRINERS HOSPITAL UPPER EXTREMITY EVALUATION (SHUEE)

Developed at Shriners Hospitals for Children
Greenville, South Carolina

© 2005 a work by Shriners Hospitals for Children
All rights reserved. This material contains valuable proprietary products and trade secrets of the Shriners Hospitals for Children, embodying substantial creative efforts and confidential information, ideas and expressions. No part of this material may be disclosed, used, reproduced or transmitted in any form or by any me ans, electronic, optical, me chanical, satellite, radio wave or otherwise, including photocopying, recording, duplicating, or in connection with any information, image or object, storage, retrieval or transmission system of any kind, without permission in writing from the Shriners Hospitals for Children.

Disclaimer
Certain sections of this CD deal with health and medical related issues. Please note that such CD is not intended to supplant any in-person medical consultation or examination. Always seek the advice of a trained health professional with any questions you may have regarding this CD. Never disregard professional medical advice or delay in seeking medical treatment due to information obtained from this CD. Any information received from this CD is not intended to diagnose, treat, or cure. This CD is for information purposes only. The information on this CD is not intended to replace proper medical care.

This manual is intended to instruct on the correct administration of the SHUEE. After reading through the Introduction, Test Administration, and Test Scoring and Interpretation sections, proceed to the Case Studies section to view example SHUEE videos. Blank scoring forms are provided under the Forms section for practice. Correct scores for each case study are provided with the videos.

Note about videos: Videos are in MPEG-4 .avi format. If you have on older PC that cannot play these files, you may need to install the appropriate codec to play this format. Click here for instructions on how to install these files.

Note about PDF documents: Some documents contained in this manual are in .pdf format. The Adobe Acrobat reader needs to be installed to view these files. This application can downloaded from the internet at the following address - www.adobe.com.

Table of Contents

Click on each item to go directly to that information

Introduction

Objectives

Historical Background

Description of the Test

Clinical and Research Applications

Test Administration

Testing Materials

Videotaping

Subject Preparation

Evaluator Guidelines

Evaluation Form

General Information

Demographic Info

Subjective

Range of Motion

Tone

Activities of Daily Living

Analyses: Spontaneous Functional / Dynamic Positional / Grasp and Release

Overview

Activities

Test Scoring and Interpretation

Scoring

Spontaneous Functional Analysis

Dynamic Positional Analysis

Grasp and Release Analysis

Scoring Form

Spontaneous Functional Analysis

Dynamic Positional Analysis

Grasp and Release Analysis

Interpretation of Results

References

Forms

Case Studies

SHRINERS HOSPITAL UPPER EXTREMITY EVALUATION

OBJECTIVES

This manual provides the examiner with an overview of the administration and interpretation of the Shriners Hospital Upper Extremity Evaluation (SHUEE). Evaluator training prior to clinical application of the SHUEE should include:

- Reading this manual
- Viewing the Key Interpretation video
- Completing the Video Proficiency test

Information regarding the assembly of a test kit has also been provided in this manual.

HISTORICAL BACKGROUND

The SHUEE was developed in November 1996 to assess the segmental, dynamic alignment of the involved upper extremity in clients with hemiplegic cerebral palsy when performing functional tasks. Review of the literature revealed evaluation tools that measured those tasks that could be completed, but no standardized methods for documenting the manner in which the functional tasks were performed. Such information is essential in designing interventions and documenting outcome.

The SHUEE was initially developed as a screening test to determine which clients were appropriate candidates for BOTOX injections to the involved upper extremity. It has subsequently been used to trend upper extremity function, select surgical interventions, and document the effects of such interventions.

Because the shoulder is rarely addressed surgically in clients with cerebral palsy, the SHUEE focuses on segmental analysis of elbow, forearm, wrist, thumb and fingers. Observation of shoulder girdle is recommended, but not currently included in the SHUEE.

DESCRIPTION OF THE TEST

The SHUEE is a video-based evaluation that was designed for use with clients with hemiplegic type cerebral palsy. The SHUEE presents a descriptive profile for comparing dynamic segmental alignment of the upper extremity, pre-and post intervention. The SHUEE has a numerical score for comparing a clients own scores to one another.

The test consists of two pages. The first page evaluates the client through standard measurements of active and passive range of motion (ROM), tone, and a history-based assessment of the performance of activities of daily living. The second page evaluates the spontaneous use of the involved extremity and the segmental alignment of the extremity while performing tasks on demand. The SHUEE is designed to evaluate both functional and spontaneous abilities, as well as to document dynamic segmental alignment when performing tasks.

The SHUEE is video-based for several reasons. This allows it to be viewed at a later date. During administration of the test, the client can complete all tasks in a dynamic fashion without starting and stopping for the evaluator to record data. The SHUEE may be evaluated by a multi-disciplinary team consisting of occupational/physical therapists, physicians, and family, resulting in a more comprehensive treatment plan. The videotaped SHUEE becomes an invaluable part of the medical record, documenting functional alignment and pre/post intervention for comparative study.

CLINICAL AND RESEARCH APPLICATIONS

Although to date the SHUEE has only been evaluated for use with clients with hemiplegic cerebral palsy between the ages of 3 and 18 years, other potential applications exist. Further clinical testing is necessary before these other applications can be recommended.

© 2005 a work by Shriners Hospitals for Children

TESTING MATERIALS

The SHUEE utilizes the following testing materials. Click on each image to see a larger image.

Billfold style wallet to hold paper money

8 x 10 sheet of standard weight paper

Two 2” in diameter and approximately ½” thick, flat sided, wooden beads

Stiff cord for stringing beads

Three dollar sized bills made of standard weight paper

Four plastic coins of any size

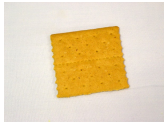
One wide-mouth 2-2 ½” screw cap clear 16 oz. bottle

One can Play-Doh®

Standard fork and knife (not child size)

Shoe with tie fastener

Sock



Cracker

Stickers of any size or type

One 30” ball

VIDEOTAPING

Any standard video recorder, with a tripod, can be used for the taping evaluation. Sound recording is not needed. The taping area should be spacious enough for the client to toss the large ball and crawl towards camera. An 8’ x 8’ area is adequate.

The videographer should be aware of which body segment is being analyzed. Table I can be provided to videographer as a reference. This allows the videographer to adjust camera angles as needed. If a second person is not available, the SHUEE can be performed by one person with the camera stationary. In this situation, it is helpful to have a video monitor to ensure proper camera angles. The activities section of this manual describes camera angle specifics for each task.

SUBJECT PREPARATION

For best observation of client’s extremity, remove all caps/hats, restrain long hair, and roll up sleeve of involved extremity above the elbow. Optimal position of the camera relative to client is important during video recording. The camera needs to be focused only on client’s upper body and the table top. It is not necessary to have evaluator in camera angle. Position client sideways to the camera with uninvolved side closest to the camera and involved side furthest from the camera. This position allows best visibility of the involved hand and thumb during video. Repositioning of the client and/or camera is occasionally necessary to optimize subsequent visual analysis of the appropriate planes of motion at each joint. For best postural control, client should be seated at a table. A table with wheels is optimal to allow it to be rolled out of the way for certain tasks. For clarity for later viewing, a clutter-free background with light blue background is suggested. To reduce clutter during filming, the test bag should be on the floor at the evaulator's feet. Items should be removed from the bag prior to the test. Click here for a photo of a typical test area.

EVALUATOR GUIDELINES

With experience, the evaluator can perform the test in 15 minutes. While the SHUEE does provide specific verbal instructions, the SHUEE does not limit verbal interactions between evaluator and client. For example, the evaluator is encouraged to provide positive feedback. The optimum sequence for administration of the SHUEE can be found on Table I. Modification of sequence to suit the client or evaluator needs or preferences is acceptable.

SHUEE TEST ITEM SEQUENCE (SEGMENT ANALYZED)	
MONEY FROM WALLET	(THUMB/FINGER)
FOLD PAPER	(THUMB/FINGER)
TEAR PAPER	(THUMB/FINGER)
STRING BEAD	(THUMB/FINGER)
UNSCREW BOTTLE CAP	(WRIST)
PULL PLAY-DOH® APART	(WRIST)
CUT PLAY-DOH® WITH KNIFE	(WRIST)
ACCEPT COINS/CHANGE	(FOREARM)
RECEIVE "5"	(FOREARM)
TAKE HAND TO MOUTH	(FOREARM)
TOUCH OPPOSITE EAR WITH PALM	(FOREARM)
PUT SOCK ON	(ELBOW)
TIE SHOE	(ELBOW)
PLACE STICKER ON BALL	(ELBOW)
THROW LARGE BALL	(WRIST)
CRAWL	(ELBOW)

Table 1: SHUEE Test Item Sequence (table can be printed and laminated to aid in completion of the test)

EVALUATION FORM

GENERAL INFORMATION

(See Page 1 of SHUEE)

- **Demographic Information**

  - Client Name
  - Age – current year and month
  - Client's Diagnosis
  - History – include any significant birth history or previous surgery

- **Subjective (may be asked of client or parent/guardian)**

  - Functional limitations – what movements prevent the client from being able to accomplish tasks?
  - What task would the client like to be able to perform?
  - What "new" movement would help the most?
  - What are the goals of the client and family?

- **Range of Motion**

  - Standard passive and active range of motion assessments are completed with the limb segments in anatomical positions. For brevity, record only those areas that are not within normal limits. “Within normal limits” is defined as being within 10 degrees of normal range. [1]

- **Tone**

  - Circle the number corresponding to the client’s degree of tone as noted by the Modified Ashworth Scale. [2]

- **Activities of Daily Living (may be asked of client or parent/guardian)**

  - Domains
    - Upper extremity dressing
    - Lower extremity dressing
    - Orthotics
    - Shoes
    - Fasteners
    - Hygiene
  - Scoring of Independence Level
    - Independent – with no assistance needed by caregiver
    - Assistance – client is able to perform task with minimum assistance
    - Dependent – maximum assistance needed for task or completely dependent on caregiver for task
  - Comments
    - Specific clarification of the performance of the task

SPONTANEOUS FUNCTIONAL ANALYSIS (SFA), DYNAMIC POSITIONAL ANALYSIS (DPA), AND GRASP/RELEASE ANALYSIS (GRA)

(See Page 2 of SHUEE)

Overview

The second page consists of the analysis sheet for Spontaneous Functional Analysis (SFA), Dynamic Positional Analysis (DPA), and Grasp/Release Analysis (GRA). The examiner will present 16 tasks to the client. These activities have been grouped together to evaluate specific joint movement. These tasks are developmentally age appropriate tasks addressing the areas of Activities of Daily Living, Fine Motor and Gross Motor Skills. The GRA is done after the tasks related to the SFA and DPA have been completed. A DPA score will be given to all 16 tasks while a SFA score will only be given to 9 of the 16 tasks.

Activities

All items must be placed on table, presented at midline, without reference to which hand should be used unless otherwise noted. Suggested sequence of tasks can be found on Table 1. Prior to starting test, state the reason for the test. Example: “I am going to ask you to do some things, like string beads, things like that. Show me how you normally would do it. Go ahead and take off one of your socks and shoes. It doesn’t matter which one.”

Click each task to watch an example video clip. All video examples, with exception of sock donning and shoe tying, are simulated to illicit a zero on the SFA scale to allow demonstration of the therapist physically cueing the child.

1. **Money From Wallet**

   Action: Present client with billfold style wallet and ask client to remove paper bills while observing the thumb/finger position.

   Verbiage: “Take the paper money out of the wallet like you normally would.”

If client doesn't use involved extremity, physically cue by touching involved upper extremity and say, "Now do it again, letting this hand help." Replace money in wallet and repeat task.

Camera: Focus on webspace of thumb, making certain it is visible.

2. **Fold Pieces of Paper**

Action: Hand client sheet of plain paper to fold in any fashion and observe thumb/finger position. Roll table out of way to elicit two-handed use.

Verbiage: "Now fold this paper in ½ in any fashion."

If involved hand isn't used, physically cue by touch and say, "Now let this hand help."

Camera: Focus on web space of thumb, making certain it is visible.

3. **Tear Piece of Paper**

Action: Once paper is folded, ask client to tear paper. Evaluator may initiate three tears. Paper does not have to be torn on fold. This task demonstrates thumb/finger position.

Verbiage: "I'm going to start tearing this paper and I want you to finish it."

Camera: Focus on web space of thumb, making certain it is visible.

4. **String Large Bead**

Action: Client will be given string and 3 large beads and asked to string beads. This task demonstrates thumb/finger position.

Verbiage: "Now I want you to string these beads."

If involved upper extremity isn't used, remove bead and say, "Let's do it again and let this hand help." Physically cue by touching involved upper extremity.

Camera: Focus on web space of thumb, making certain it is visible.

5. **Unscrew Bottle Cap**

Action: Client is handed a bottle with a screw cap and asked to remove cap. Client should hold bottle with involved upper extremity. Cap may be loosened by examiner and does not have to be replaced by the client. Wrist position is observed in this task.

Verbiage: "Please take the top off of this bottle."

After client completes task, ask them to repeat it. Place cap back onto bottle and state, "Now, I want you to do that one more time." This is simply for ease of scoring.

If client doesn't include involved extremity, physically cue client by touching involved extremity and saying, "Now do it again, letting the other hand help." Replace cap and repeat task.

Camera: Focus on wrist angle, view should be radial (thumb side) of wrist.

6. **Pull Play-Doh® Apart**

Action: Examiner molds Play-Doh® into cylindrical shape and client is asked to pull Play-Doh® apart at least three times while wrist position is observed.

Verbiage: "Now tear this Play-Doh® into three pieces." If client doesn't include involved extremity, physically cue client by touching involved extremity and saying, "Now do it again, letting the other hand help."

Camera: Focus on wrist angle, view should be radial (thumb side) of wrist.

7. **Cut Play-Doh® With Knife**

Action: Examiner molds Play-Doh® into a flat circle for cutting and presents client with knife and fork. It is understood that client uses dominant hand for cutting, however, for evaluation purposes, client must hold knife in involved hand while wrist position is observed.

Verbiage: "Pretend this is something good to eat and show me how you would cut it."

If the client states he cannot cut, state, "Just do the best you can." Typically clients will use dominant side for holding knife. If this is the case, say to client, "I know this sounds crazy, but I want you to put the knife in this hand." At that time, physically cue client by touching involved extremity.

Camera: Focus on wrist angle, view should be radial (thumb side) of wrist.

8. **Throw Large Ball**

Action: Examiner gives client large ball and asks client to throw ball back. The ball can be tossed or bounced. This task is usually performed twice, videotaping from both sides, observing wrist position.

Verbiage: "Now let's stand up. I want you to stand over here."

(Move table out of way and guide client to approximately four feet across from therapist with involved extremity furthest from camera.) "I want you to toss this ball to me and I'll toss it back." After two tosses, state, "Now, let's switch places." Guide client to where you were standing, placing involved extremity closest to camera. The ball is then tossed again two times.

Camera: Focus on wrist angle, view should be radial (thumb side) of wrist.

9. **Accept Change**

Action: Examiner gives three coins to client, placing each into open palm of involved side to demonstrate supination. Remove table so subject does not use table to facilitate supination.

Verbiage: "Let me give you these coins."

If client uses non-involved hand physically cue client by touching involved extremity and state, "Now let's try it with this hand".

Camera: Camera should be focusing on forearm and angle may need to be looking along length of forearm from hand to get best view of supination.

10. **Receives "5"**

Action: Examiner asks client to receive low "5" with involved extremity demonstrating supination. Remove table so client does not use table to facilitate supination.

Verbiage: "Let me give you 5."

If client uses non-involved hand, physically cue client to use involved extremity and state, "Let's do it with this hand". If child then attempts to give you 5, reiterate, "No, I want to give you five". "Can you turn your hand up towards the ceiling like this?" and demonstrate supination.

Camera: Camera should be focusing on forearm and angle may need to be looking along length of forearm from hand to get best view of supination.

11. **Take Object to Mouth**

Action: Examiner provides client with a cracker to eat and observes client taking cracker to his/her mouth with involved side to demonstrate supination. If client doesn't demonstrate supination, ask them to place palm to mouth to facilitate this.

Verbiage: "Now I want you to show me how you would eat this. You don't have to eat it if you don't want to. Just take it to your mouth."

If client uses non-involved hand, physically touch involved hand and state, "Now use this hand". If client does not supinate state, "Now can you place your palm on your mouth, like this?" Evaluator then demonstrates palm to mouth.

Camera: Camera should be focusing on forearm and angle may need to be looking along length of forearm from hand to get best view of supination.

12. **Touch Opposite Ear**

Action: Examiner asks client to touch contralateral ear with the palm of the involved upper extremity to demonstrate supination.

Verbiage: "Can you touch this palm to this ear? Like this?" Evaluator then touches involved hand and contralateral ear. Evaluator then demonstrates palm to contralateral ear. If client states he cannot, state, "Just do your best."

Camera: Camera should be focusing on forearm and angle may need to be looking along length of forearm from hand to get best view of supination.

13. **Place Sticker on Ball**

Action: Examiner asks client to place sticker on ball, using involved side, with ball placed at arm's length from client. Client may need physical cues to remain at arm's length distance from ball to demonstrate elbow extension.

Verbiage: "Put this sticker on this ball."

Camera: Focus on elbow directly from side to note elbow extension.

14. **Put Socks On**

Action: Client should have one sock and shoe removed. Client demonstrates sock donning, assisting with involved extremity to demonstrate elbow extension.

Verbiage: "Go ahead and put your sock back on for me."

If client doesn't assist with involved extremity, physically cue client by touching involved extremity and say, "Now let this arm help". If child flexes lower extremity which prevents upper extremity elbow extension, instruct the child to, "Put your leg on the floor and let me see you do it again".

Camera: Focus on elbow directly from side to note elbow extension.

15. **Fastening Shoes**

Action: Client demonstrates fastening shoes with involved upper extremity. Clients who are too young or refuse to fasten shoes may be evaluated as they assist with this activity. The objective is to look at elbow extension in reaching to the shoe, not their ability to complete the task.

Verbiage: "Now tie your shoe." If client states he cannot, state, "Just pretend you are tying". If he doesn't use involved upper extremity in task, physically cue by touching involved upper extremity, and state, "Let this hand help". If child keeps lower extremity flexed or crossed, ask client, "Put your leg down and reach for your shoe".

Camera: Focus on elbow directly from side to note elbow extension.

16. Crawl

Action: Client is asked to crawl towards camera in quadruped position demonstrating elbow extension on the involved side. Client only needs to crawl approximately four or five feet.

Verbiage: "I know this is silly, but I want you to get down and crawl towards the camera." If client commando crawls or creeps, ask child, "Can you come up on your hands and knees?"

Camera: Focus on elbow directly from side to note elbow extension.

Grasp/Release Analysis

Action: Once the client performs the 16 tasks, the therapist or client then positions the wrist in: flexion, neutral, extension.

The therapist asks client to take bead from therapist. Bead should be held by side, not flat, and not stuffed into client's hand. A comment section is available to document if the client is able to perform with difficulty or ease.

Verbiage: "Now I want you to stand over here." Move client in front of background positioning the client between the therapist and camera. Support the forearm with the radial (thumb) side towards camera. If the wrist is not already held in a flexed position, flex wrist and ask, "Can you take this bead from me?" " Now can you straighten your wrist and still pick up the bead?" Then, therapist must position wrist and then once again ask client to grasp bead while therapist holds in neutral. "Now can you bring your wrist all the way up and pick up the bead?" Then, therapist must position wrist and then once again ask client to grasp bead while therapist holds in extension. For some clients, placing them into wrist extension will take maximum physical effort on therapist's part. Reposition client to allow ulnar side of hand to be closest to camera and repeat all three tasks with same directions.

Camera: Focus on wrist angle; view should be radial and then ulnar side of wrist

© 2005 a work by Shriners Hospitals for Children

SCORING

The SHUEE data collection form consists of 2 pages. The first page is primarily descriptive and requires no scoring. The second page is utilized during the video taped portion and requires scoring of the Spontaneous Functional Analysis (SFA), the Dynamic Positional Analysis(DPA), and the Grasp/Release(GRA) segments on the actual SHUEE form. The SFA score is circled and the DPA score is marked in the grid with a check mark.

Spontaneous Functional Analysis (SFA)

In order to assess the client's actual function of the affected extremity, a spontaneous use score is recorded. For this portion of the scoring, a modified House scale is used. The scale is shown in Table II. The SFA is recorded for 9 of the 16 tasks. During these nine tasks, the examiner will first evaluate the client for spontaneity of use. The Spontaneous use score should always be comleted first. Optimal score would be to achieve a score of 5, spontaneous use partial to complete. It is important to remember during administration that the client is presented with the task but no verbal reference is made to use of the affected limb. After observation, the evaluator will circle the number that correlates with the House definition of spontaneous use. It is important to note that for task #7, cutting PLAY doh® with knife task, the SFA is determined by the initial grasp of either fork or knife, whereas the DPA requires grasp of knife with involved extremity. For video examples of each activity level, click on the Example identifiers in Table II.

TABLE II

MODIFIED HOUSE SCALE [3]			
CLASS	DESIGNATION	ACTIVITY LEVEL	EXAMPLES
0	Does not use	Extremity not utilized in any capacity for completion of task.	Example 1 Example 2
1	Poor Passive Assist	Uses as stabilizing weight only.	Example 1 Example 2
2	Passive Assist	Can hold onto object placed in hand; may stabilize the object for use by other hand.	Example 1 Example 2
3	Poor Active Assist	Can actively grasp object and stabilize object for use by other hand.	Example 1 Example 2
4	Active Assist	Can actively grasp and stabilize object for use by other hand; may manipulate object with affected hand.	Example 1 Example 2
5	Spontaneous use, partial to complete	Performs bimanual activities easily; may use the hands spontaneously or without reference to the other hand.	Example 1 Example 2

Dynamic Positional Analysis (DPA)

Once the SFA is completed for a task, the evaluator will then record the second score, DPA. If the client did not use the affected limb for initial task completion, then the limb is touched and encouraged to be used. The second score for each of the 16 activities is related to joint and limb segment movement. The DPA documents the dynamic, segmental alignment of the extremity when performing the task. Clients who perform tasks on demand (i.e. not spontaneously) can still be effectively evaluated using this portion of the evaluation. The DPA assesses five functional/anatomical segments.

Thumb Segment Alignment

- **Thumb In Palm** – Any combination of metacarpophalangeal joint (MCP) flexion or interphalangeal joint (IP) flexion resulting in the thumb being placed beneath the fingers, in the palm. No visible web space is seen, from any angle at the first web space.
- **Thumb Web Space Closed** – No visible space at the first web space. Thumb is adducted and may have a hyperextended IP joint, but does not cross index metacarpal into palm. No visible web space is seen, from any angle at the first web space.
- **Thumb Web Space Open** – Thumb MCP in abduction. Any visible web space constitutes an “open” score. Client able to extend or abduct thumb to grasp object. Client does not have to maintain abducted posture to be given this score.

Finger Segment Alignment

Fingers are graded as a group because they frequently move in composite flexion or extension. The tasks used for thumb evaluation are used for finger evaluation.

- **Flexion -** MCP maintained in greater than 45° flexion. Fingers are held in palm, in variable flexion pattern at DIP joints.
- **Neutral –** Fingers are held in midrange with adequate alignment for task. Fingers easily fluctuate between flexion and extension patterns with no joint aberrations.
- **Extension –** Fingers are held in hyperextension at MCP or IP joints. Associated swan neck deformities or extensor splaying may also be present.

Wrist Segment Alignment

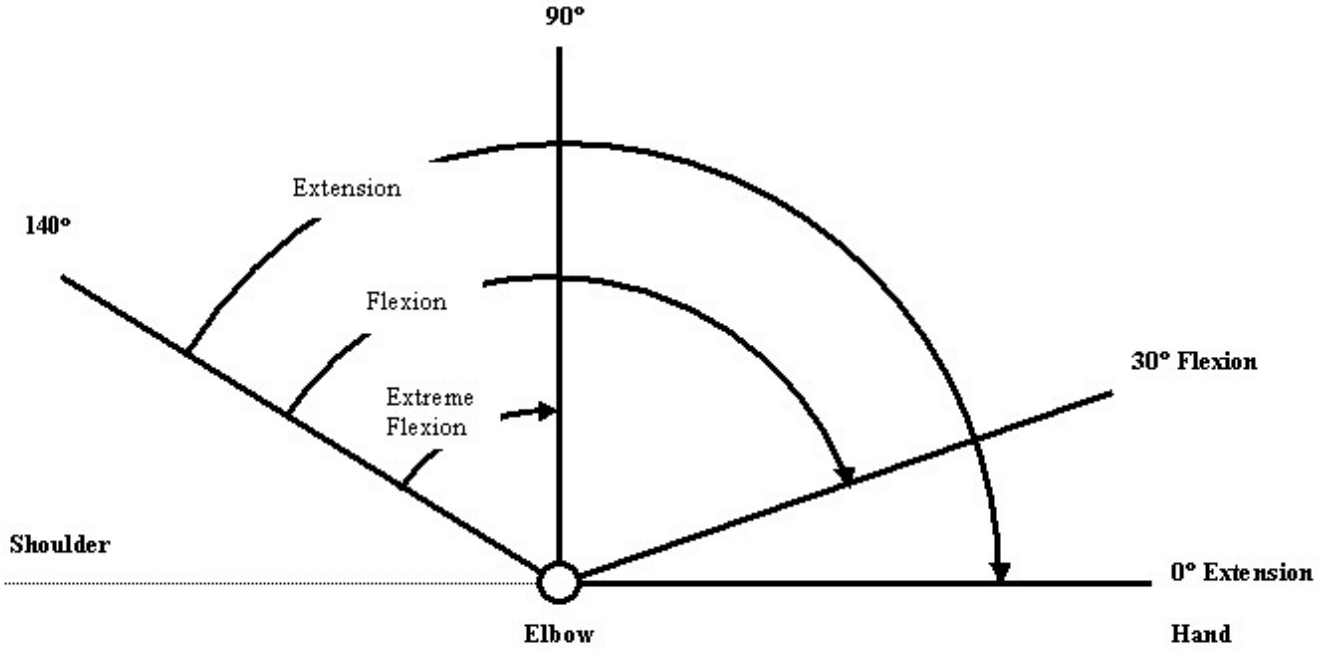
- **Flexion –** Wrist is held in flexed position throughout task; with or without ulnar deviation; any measurement between 0° - 80° of flexion.[4]
- **Anatomical neutral –** Wrist in anatomical neutral position of 0º for all or portion of task; with or without ulnar deviation.
- **Extension –** Wrist extends past anatomical neutral position for all or portion of the task; any measurement between 0° - 70° of extension.
- **Ulnar deviation –** Wrist is held in an ulnarly deviated position throughout task; any measurement between 0° - 30°.
- **Neutral –** Wrist is in the neutral plane; within 5° of neutral.
- **Radial deviation –** Wrist is held in a radial deviated position throughout task; any measurement between 0° - 20°.

Forearm Segment Alignment

- **Extreme pronation –** Excessive pronation, no active supination, resulting in palm away from body; any measurement 91° or greater.
- **Pronation –** Pronated at rest with no active supination during task, resulting in palm to floor; any measurement 0° - 90°.
- **Neutral –** Active movement from pronated position to neutral, resulting in 0° palm towards body.
- **Supination –** Active movement beyond neutral to supination with palm open to face. Anything 0° - 90°.

Elbow Segment Alignment

- **Extreme flexion –** Client is unable to actively extend past 90º.
- **Flexion –** Client is unable to extend past 30º.
- **Extension –** Client is able to extend between 30º and 0º.



The thumb/finger tasks were chosen to elicit thumb abduction and the use of the fingers with in a neutral range. The wrist tasks encourage wrist extension with no ulnar or radial deviation. The forearm tasks elicit supination. The elbow tasks require elbow extension. An “x” is placed on the grid that corresponds to the segmental alignment of the extremity.

Grasp and Release Analysis (GRA)

The GRA records if the client can or cannot grasp and release the object with the wrist in the three different positions. A yes (Y) or no (N) for grasp and release is provided contingent on clients ability to close and open fingers with the wrist maintained in each position. The optimal outcome would be for the client to open and close the fingers grasping the bead with the wrist in all three positions.

Click here for examples of optimal grasp and release for each position.

Comments

This space is available to document the quality of the grasp and release, the tightness of the web space, the MCP instability, or any other factor that the evaluating therapist deems necessary for complete evaluation.

SHUEE SCORING FORM

Since the SHUEE was created to present a descriptive profile for comparing the dynamic segmental alignment of the upper extremity, pre and post intervention, a SHUEE scoring form summary sheet was designed so the evaluator could review numerous SHUEE scores. This form provides a total score and a percentage for each of the scoring sections.

The following describes the manner in which the marks on the second page of the SHUEE form are converted to a numerical fashion and documented on the SHUEE Scoring form.

Spontaneous Functional Analysis

- Nine tasks are scored
- Modified House Scale 0 to 5 (less to more spontaneous) is used
- Highest possible score equals 45 (normal spontaneous use)

Calculation

- Sum numbers of tasks scored at each house level (0-5)

(from SHUEE form)

Spontaneous Functional Analysis						Activity
0	1	2	3	4	5	Money from wallet
0	1	2	3	4	5	Fold paper
0	1	2	3	4	5	Tear paper
0	1	2	3	4	5	String bead
0	1	2	3	4	5	Unscrew bottle cap
0	1	2	3	4	5	Pull playdough apart
0	1	2	3	4	5	Cut playdough with knife
						Throw large ball
						Accept coins/change
						Receive 5
						Take hand to mouth
						Touch opp. ear with palm
						Place sticker on ball
0	1	2	3	4	5	Put socks on
0	1	2	3	4	5	Fasten shoe
						Crawl

(from Summary Form)

Spontaneous Functional Analysis					
Total Score			Percentage		
	/ 45				
1/ 0	1/ 1	2/ 2	4/ 3	1/ 4	0/ 5

- Multiply sum number of tasks at each house level by the numerical value of each House level

Spontaneous Functional Analysis					
Total Score			Percentage		
	/ 45				
1/ 0	1/ 1	2/ 2	4/ 3	1/ 4	0/ 5
0	1	4	12	4	0

- Sum these values to determine the total score

  0+1+4+12+4=21

- Divide total score by highest possible score
- Multiply by 100
- Express score as percentage of normal or optimal score

Spontaneous Functional Analysis					
Total Score			Percentage		
	21/ 45			47%	
1/ 0	1/ 1	2/ 2	4/ 3	1/ 4	0/ 5
0	1	4	12	4	0

Dynamic Positional Analysis

- 5 segments analyzed_
- 4 tasks for each segment_
- score: 0 to3(pathological alignment to normal or optimal alignment)
- Highest possible score equals 72 (normal or optimal alignment)

Calculation

- Convert positional scores to numerical values

Thumb Segment			Finger Segment			Wrist Segment						Forearm Segment				Elbow Segment		
0	1	3	0	3	0	1	2	3	0	3	0	0	1	2	3	1	2	3
palm	close	open	flexion	neutral	extension	flexion	neutral	extension	ulnar deviation	neutral	radial deviation	extreme pronation	pronation	neutral	supination	extreme flexion	flexion	extension

- Sum the scores for each anatomical segment

(from SHUEE scoring form)

	Thumb Segment		
Activity	0 palm	1 close	3 open
Money from wallet		X	
Fold paper		X	
Tear paper			X
String bead			X

(from Summary form)

Dynamic Positional Analysis				
Total Score		Percentage		
	/ 72			
Thumb	Finger	Wrist	Frarm	Elbow
10/12	/12	/24	/12	/12

- Sum the segment scores to determine the total score
- Divide the total score by the highest possible score
- Multiply by 100
- Express score as percentage of normal or optimal score

Dynamic Positional Analysis				
Total Score		Percentage		
	44 / 72		61%	
Thumb	Finger	Wrist	Frarm	Elbow
10/12	12 /12	6/24	4/12	12/12

Grasp and Release Analysis

- Two hand functions analyzed in 3 wrist positions
- Score: 0 to 3 (pathological alignment to normal or optimal alignment)
- Highest possible score = 6 (normal or optimal function)

Calculation

- Convert N/Y scores to numerical values by assigning a single point to the yes marks and a 0 to the no marks
- Sum the scores for each wrist position
- Sum the 3 wrist position scores to determine the total score
- Divide the score by highest possible score
- Multiply by 100
- Express score as percentage of normal or optimal score

(from SHUEE scoring form)

Grasp / Release Analysis				
Position	Grasp		Release	
Wrist Flexion	Y	N	Y	N
Wrist Neutral	Y	N	Y	N
Wrist Extended	Y	N	Y	N

(from Summary form)

Grasp / Release		
Total Score		%
	4 / 6	67
Flex	Neut	Ext
2/ 2	2/ 2	0/ 2

Note: If the client has previously had a wrist fusion and is able to grasp and release in neutral, the client would receive a score of 2/2 in the Neutral column. For this special case, the final percentage should be calculated as 100% as it is not possible for the client to perform grasp and release in flexion and extension.

INTERPRETATION OF RESULTS

When reviewing the score sheet and results of the SHUEE, each client and their family dynamics should be considered individually. General guidelines for interpretation of results are as follows.

With respect to the SFA, if a client demonstrates neglect of their hand (score of 0) or uses their hand as a gross weight bearing surface (score of 1) for the majority of their scores then the trend would favor more definitive intervention such as fusion (arthrodesis). Typically, due to neglect, the client would have a difficult time with a prolonged rehabilitation. Likewise if the client scores in the 3, 4, and 5 range, they are actively engaging the affected hand in activities. This would favor transfer strategies or Botox intervention. The rehabilitation participation would be favored.

The DPA scores allow a documented reference to the position of the hand during activities. The lowest score correlates with the greatest amount of positional misalignment. If four of the four wrist tasks were graded as a 0 or 1, a fusion (arthrodesis) would be considered. However if the client is able to come to a neutral position or even attain correct alignment for at least two of the four tasks, then the transfer or Botox strategies could be entertained.

In the grasp and release section, if the client is unable to grasp and release in any position then a fusion (arthrodesis) with a release for positioning may be indicated. If the client is able to grasp and release in flexion and neutral but not in extension, then release with tendon transfers may be indicated.

The SHUEE does not conclude with a cumulative score thus a specific score does not equal a particular intervention. The SHUEE is a documentation of the client's spontaneous and dynamic positional analysis so that an individualized treatment plan of care can be obtained and recorded in an objective manner.

© 2005 a work by Shriners Hospitals for Children

REFERENCES

1. Trombly CA. Evaluation of biomechanical and physiological aspects of motor performance. Occupational Therapy for Physical Dysfunction, 4th Ed., Williams & Wilkins, Baltimore, Maryland; 1995, pp 126-130.
2. Bohannon RW, Smith MB. Interrater reliability of a modified Ashworth scale of muscle spasticity. *Phys Therapy* 1986; 67:206-207.
3. House J, et al. A dynamic approach to the thumb-in-palm deformity in cerebral palsy. J *Pediatr Orthop*; 63-A:216-225.
4. Barr NR. The Hand: Principles and techniques of simple splint making in rehabilitation, Butterworth & Co., Woburn, Massachusetts.; 1979, pp 61-62.

© 2005 a work by Shriners Hospitals for Children

Click on each item to open the corresponding form.
You must have Acrobat Reader installed to view these forms.

SHUEE Evaluation Form

SHUEE Scoring Summary Form

Scoring Percentages Form

Printable Version of this Online Manual

© 2005 a work by Shriners Hospitals for Children

CASE STUDIES I

The following section includes 3 case studies for viewing and scoring. The key gives explanation to the scores and will refer you to the section of the manual which explains the correct score. You can print out blank scoring forms by clicking the Forms link above. Score each case on your own and then view the provided scores by clicking the appropriate link. Questions in regards to scoring can be directed to the authors.

Case Study 1: Video Scores

Tearing Paper: Note how she manipulates right upper extremity against left upper extremity by pulling the paper towards her body.

Wrist Extension: Note the wrist extension on the final toss of the ball. Refer to the Wrist Segment Alignment scoring explanation. To receive a wrist extension classification, the wrist does not need to maintain extension throughout the entire task.

Case Study 2: Video Scores

Donning Sock: Note that the sock is held weakly by the subject.

Wrist Extension: At no time during the ball toss does the wrist extend beyond flexion. Refer to the Wrist Segment Alignment scoring explanation.

Case Study 3: Video Scores

String Beads: The physical cue by the therapist indicates a score of 0. Refer to the House Scale example video for a score of 0.

Thumb Segment: While tearing the paper, the web space is closed with no visible light within the web space. Refer to the Thumb Segmental Alignment scoring explanation.

Score Summary for all 3 case studies

CASE STUDIES II

The following case studies are provided for more practice. However, explanations of the provided scores are omitted.

Case Study 1: Video Scores

Case Study 2: Video Scores

Case Study 3: Video Scores

Case Study 4: Video Scores

Case Study 5: Video Scores

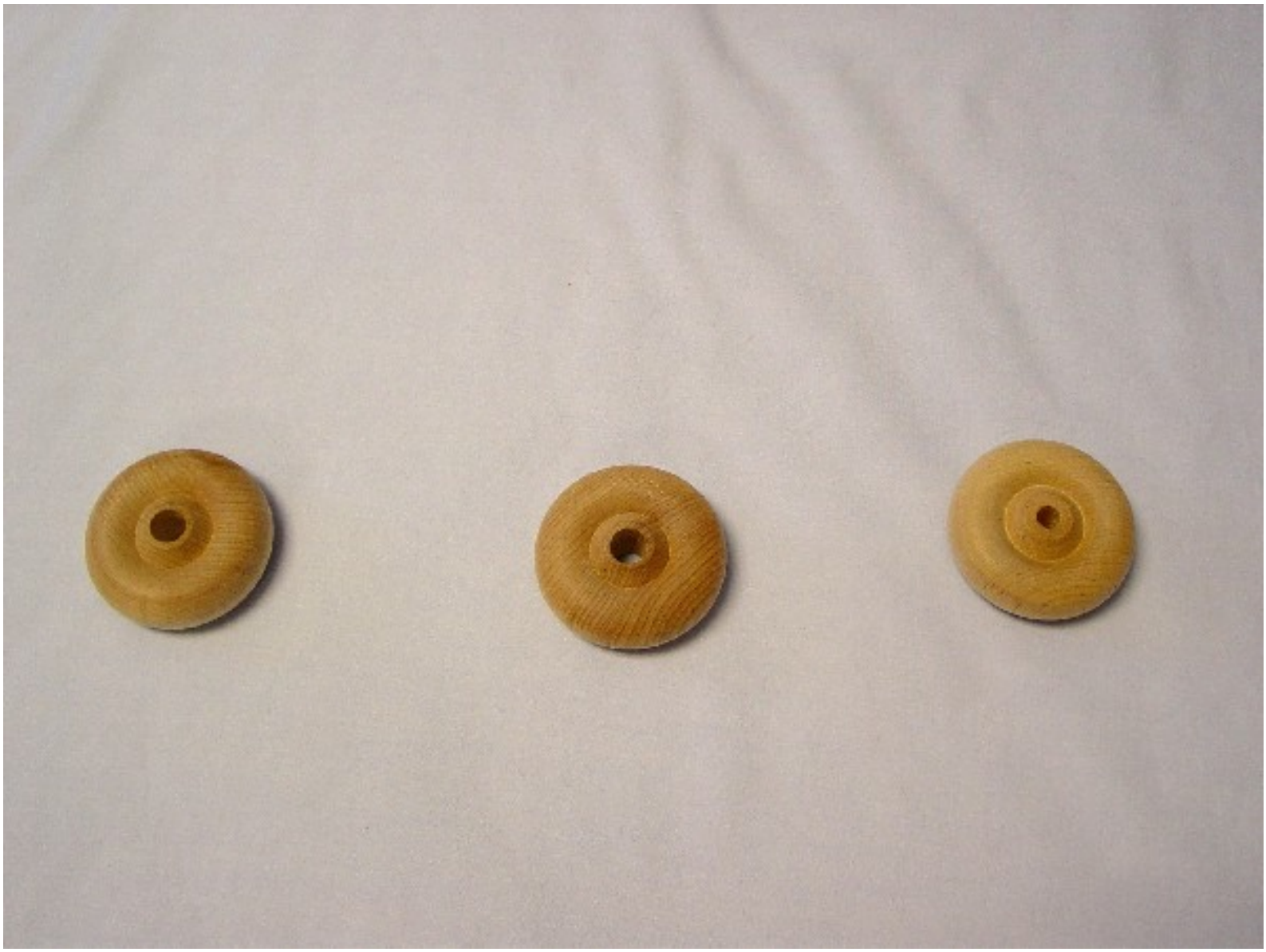
Score Summary for all 5 case studies

© 2005 a work by Shriners Hospitals for Children

To install the MPEG4 codec to your system:

1. Copy the MPEG4x folder from the CD to a folder on your hard drive (e.g. C:\Temp)
2. Open the MPEG4x folder and right-click on the mpeg4fix.inf file.
3. Click "Install" in the drop-down menu.
4. Click "Ok" in all the dialogs that follow to install the codec.
   If you are running Windows XP or 2000, you may get messages that the program has not passed certain Microsoft testing. Just disregard these messages and click OK.

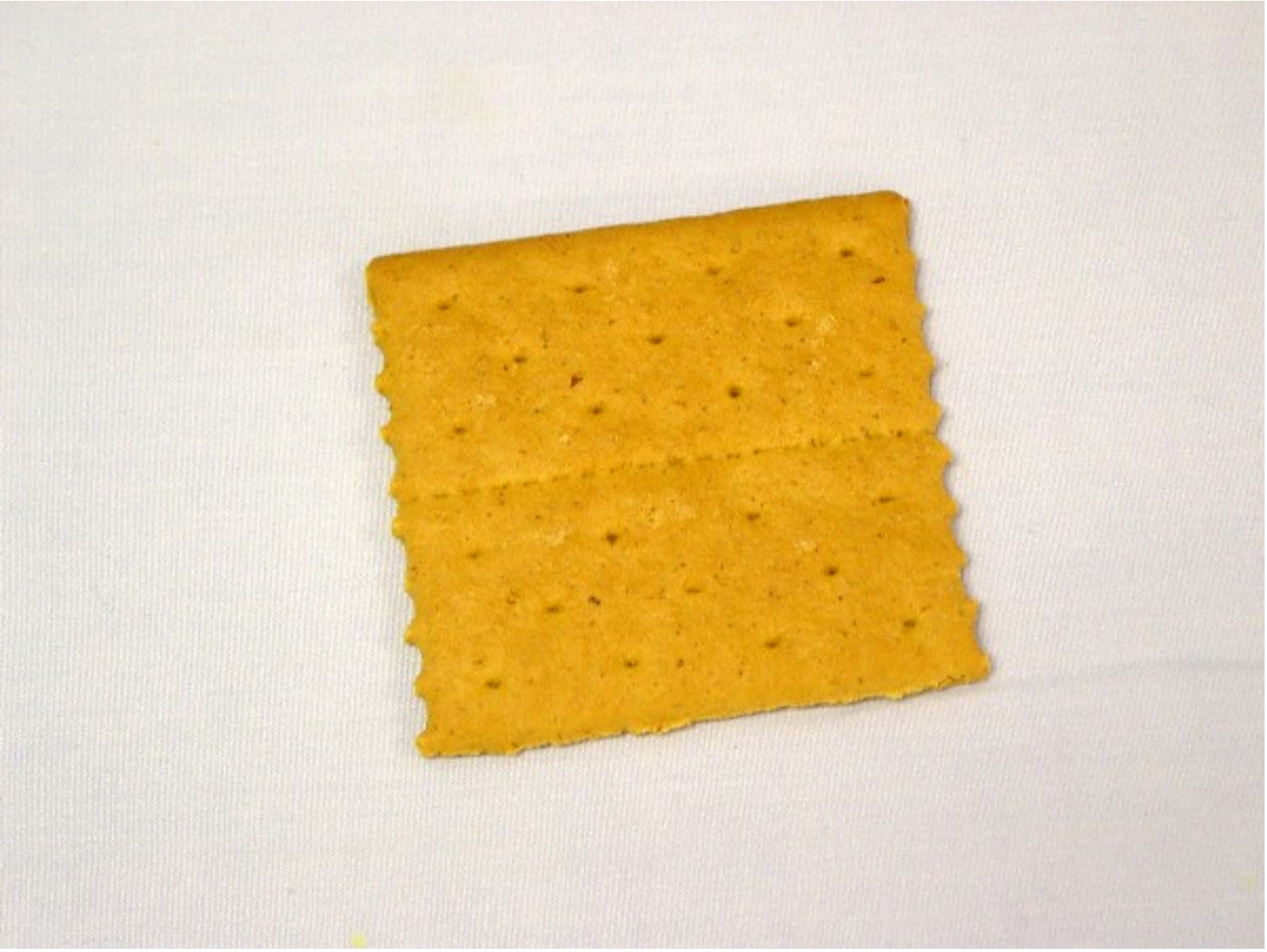
This codec allows you to play .avi movie files that were created using Microsoft MPEG4 v1, v2, or v3 compression



THE UNITED STATES OF AMERICA
THE UNITED STATES OF AMERICA
TWENTY DOLLARS

COPY
COPY
COPY

Play-Doh
MODELING COMPOUND
INSTRUCTIONS:



Great Job!
Fantastic!
WOW!
Well Done!
Great Job!
Fantastic!
WOW!
Well Done!
Great Job!
Fantastic!
WOW!
Well Done!
Great Job!
Fantastic!
WOW!

Shriners Hospital Upper Extremity Evaluation

Date

Therapist Signature

Name Age Diagnosis

History

Subjective - Goals of patient & family; functional limitations

RIGHT		WNL With Following Exceptions	LEFT	
A	P	**RANGE OF MOTION**	A	P
		Shoulder Abduction		
		Shoulder Flexion		
		Shoulder Internal Rotation		
		Shoulder External Rotation		
		Elbow Flexion		
		Elbow Extension		
		Forearm Supination		
		Forearm Pronation		
		Wrist Flexion		
		Wrist Extension		
		Ulnar Deviation		
		Radial Deviation		
		Finger Flexion		
		Finger Extension		
		Thumb CMC Palmar Abd.		
		Thumb CMC Radial Abd.		
		Thumb MCP		

Tone

Modified Ashworth Scale

0 No increase in muscle tone.	2 More marked increase in muscle tone through most of the ROM, but the part is easily moved.
1 Slight increase in tone, manifested by a catch & release, or by minimal resistance at the end of the ROM when the affected part is moved into flexion or extension.	3 Considerable increase in tone, passive movement is difficult.
	4 Affected part is rigid in flexion or extension.

ADL's

	Independent	Dependent	Assist	Comments
UE dressing				
LE dressing				
Orthotic				
Shoes				
Socks				
Fasteners				
Hygiene				

addressograph

Shriners Hospitals for Children
Greenville Hospital
Shriners Hospital Upper Extremity Evaluation

Form # 15280-19

Dynamic Positional Analysis

Spontaneous Functional Analysis	Activity	Thumb Segment			Finger Segment			Wrist Segment						Forearm Segment				Elbow Segment		
		0 palm	1 close	3 open	0 flexion	3 neutral	0 extension	1 flexion	2 neutral	3 extension	0 ulnar deviation	3 neutral	radial deviation 0	0 extreme pronation	1 pronation	2 neutral	3 supination	1 extreme flexion	2 flexion	3 extension
0 1 2 3 4 5	Money from wallet																			
0 1 2 3 4 5	Fold paper																			
0 1 2 3 4 5	Tear paper																			
0 1 2 3 4 5	String bead																			
0 1 2 3 4 5	Unscrew bottle cap																			
0 1 2 3 4 5	Pull playdough apart																			
0 1 2 3 4 5	Cut playdough with knife																			
	Throw large ball																			
	Accept coins/change																			
	Receive 5																			
	Take hand to mouth																			
	Touch opp. ear with palm																			
	Place sticker on ball																			
0 1 2 3 4 5	Put socks on																			
0 1 2 3 4 5	Fasten shoe																			
	Crawl																			

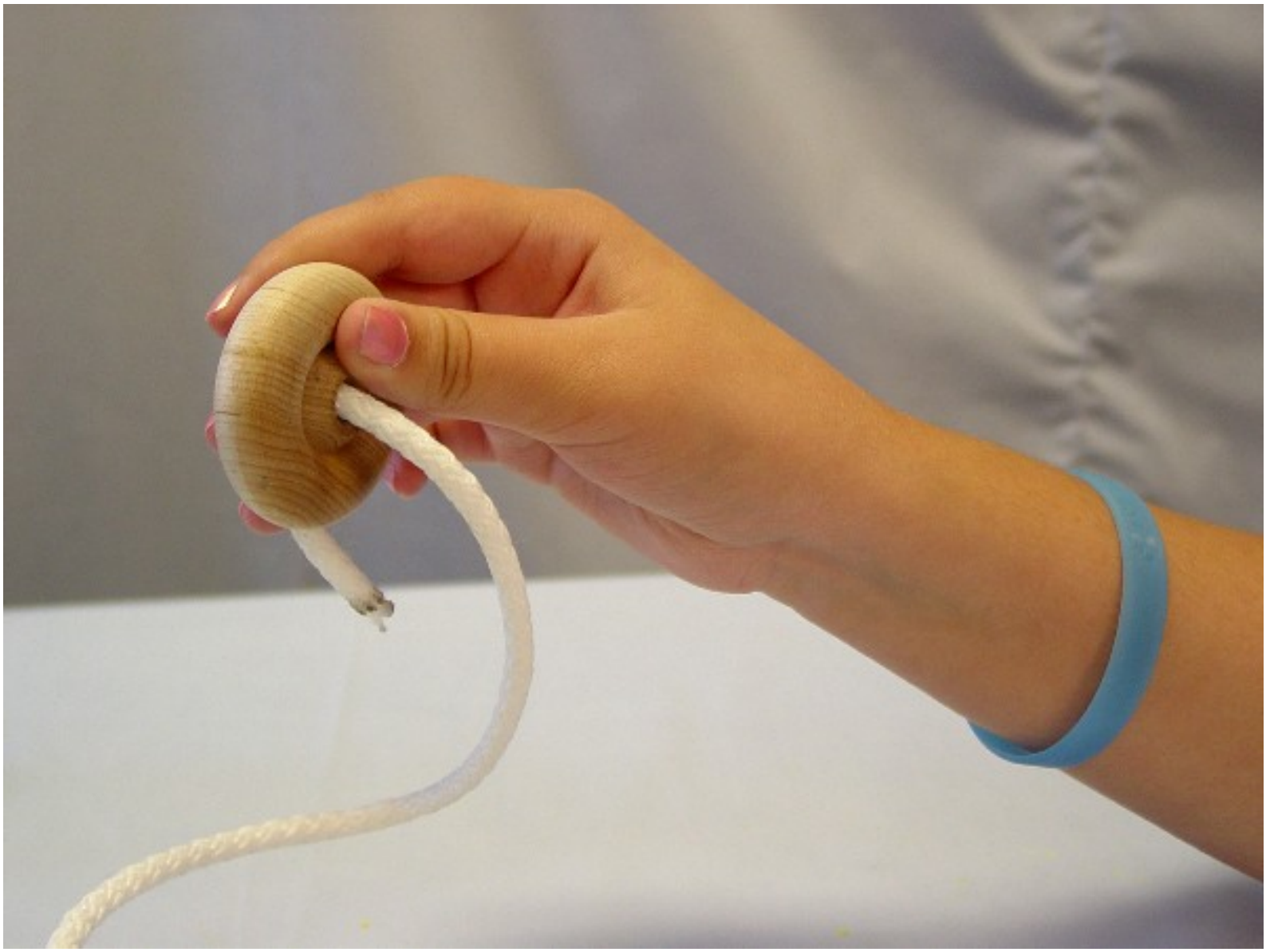
Functional Classification System

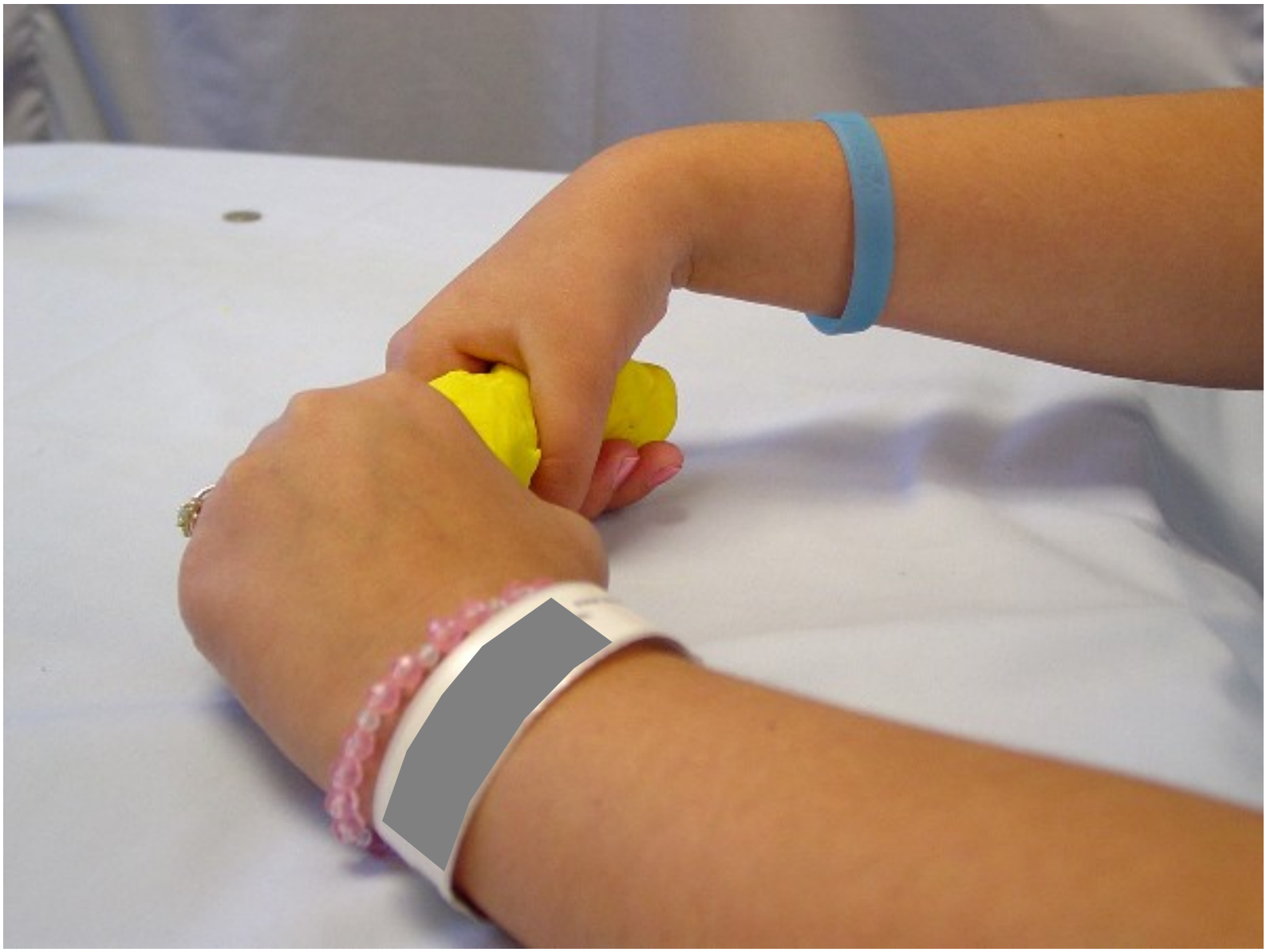
0 Does not use-Extremity not utilized in any capacity for completion of task.
1 Poor passive assist-Uses as stabilizing weight only
2 Passive assist-Can hold onto object placed in hand & may stabilize it for use by other hand
3 Poor active assist-Can actively grasp object & hold it weakly
4 Active assist-Can actively grasp object, stabilize it well, & may manipulate it against other hand
5 Spontaneous use, partial to complete-Performs bimanual activities easily; may use hand spontaneously or without reference to other hand

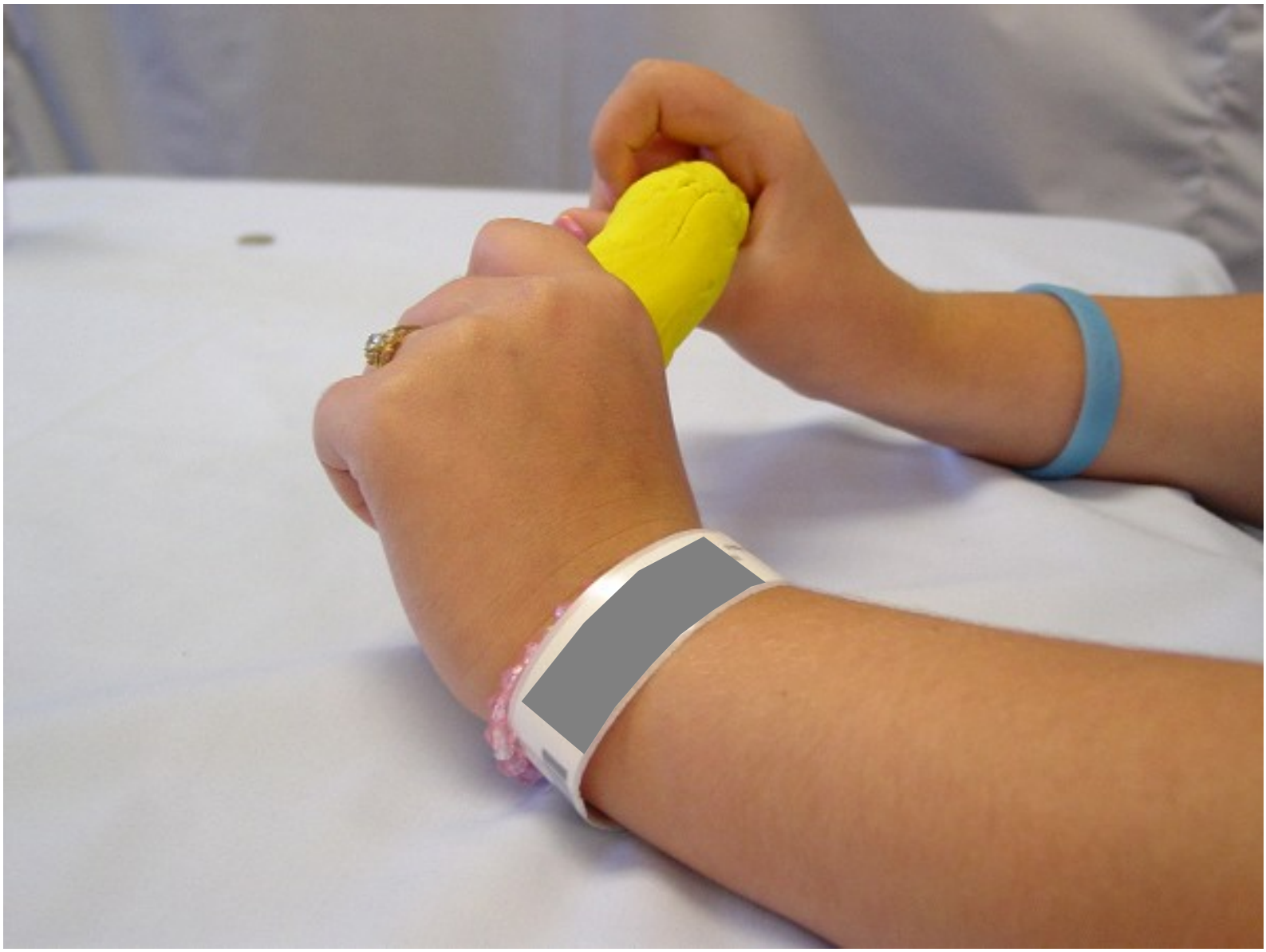
Grasp / Release Analysis

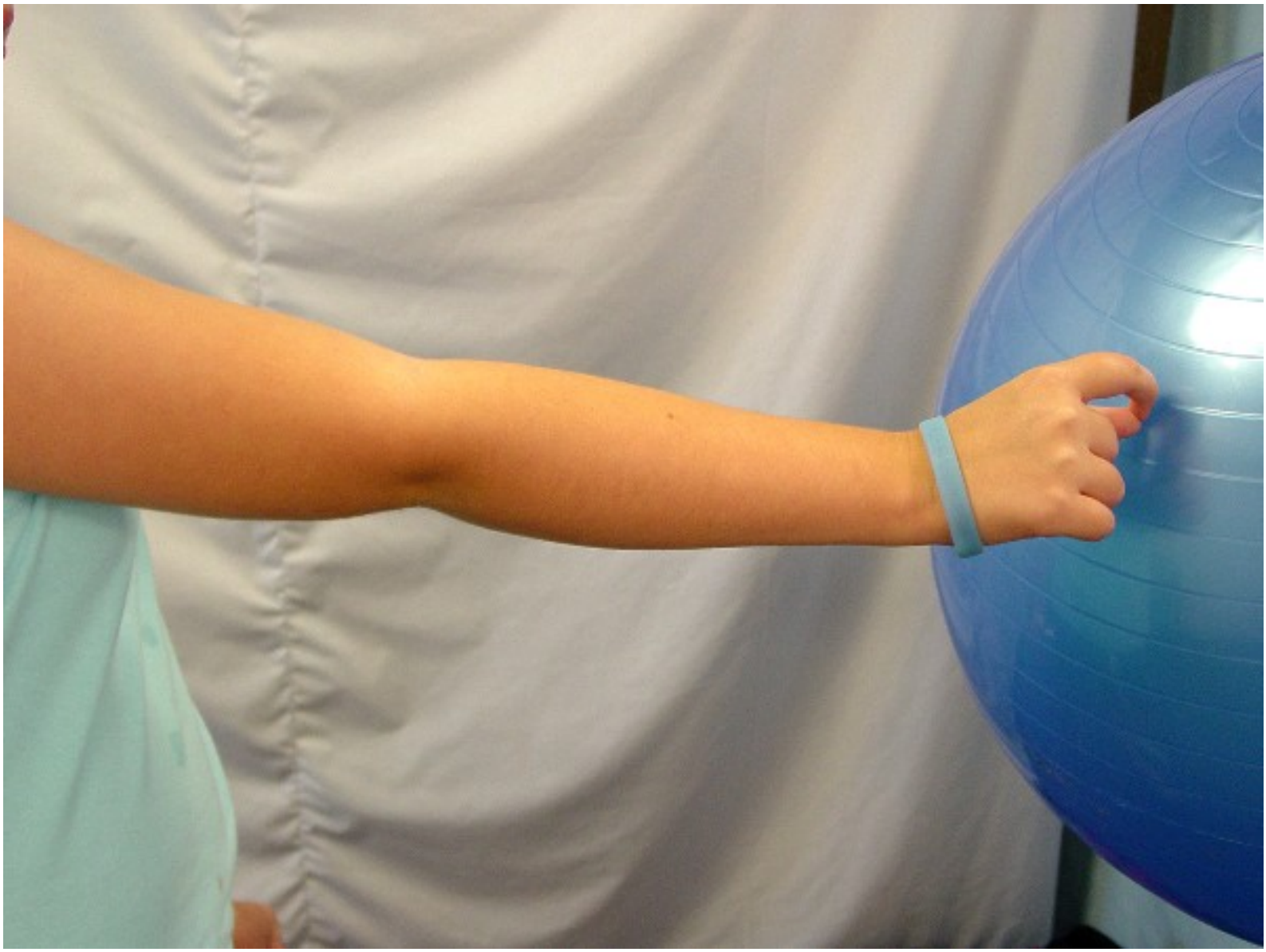
Position	Grasp		Release	
Wrist Flexion	Y	N	Y	N
Wrist Neutral	Y	N	Y	N
Wrist Extended	Y	N	Y	N

Comments: (Web space, MCP instability)









FLEXION GRASP

FLEXION RELEASE

NEUTRAL GRASP

NEUTRAL RELEASE

EXTENSION GRASP

EXTENSION RELEASE

SHUEE Scoring Form

Patient Name _____ Patient # _____

Date	Initials	Spontaneous Functional Analysis						Dynamic Positional Analysis					Grasp / Release		
		Total Score			Percentage			Total Score		Percentage			Total Score		%
		/ 45			%			/ 72		%			/ 6		
		/ 0	/ 1	/ 2	/ 3	/ 4	/ 5	Thumb	Finger	Wrist	Frarm	Elbow	Flex	Neut	Ext
								/12	/12	/24	/12	/12	/ 2	/ 2	/ 2

Comments, e.g. intervention & date, score changes, etc. _____

Date	Initials	Spontaneous Functional Analysis						Dynamic Positional Analysis					Grasp / Release		
		Total Score			Percentage			Total Score		Percentage			Total Score		%
		/ 45						/ 72					/ 6		
		/ 0	/ 1	/ 2	/ 3	/ 4	/ 5	Thumb	Finger	Wrist	Frarm	Elbow	Flex	Neut	Ext
								/12	/12	/24	/12	/12	/ 2	/ 2	/ 2

Comments, e.g. intervention & date, score changes, etc. _____

Date	Initials	Spontaneous Functional Analysis						Dynamic Positional Analysis					Grasp / Release		
		Total Score			Percentage			Total Score		Percentage			Total Score		%
		/ 45						/ 72					/ 6		
		/ 0	/ 1	/ 2	/ 3	/ 4	/ 5	Thumb	Finger	Wrist	Frarm	Elbow	Flex	Neut	Ext
								/12	/12	/24	/12	/12	/ 2	/ 2	/ 2

Comments, e.g. intervention & date, score changes, etc. _____

Date	Initials	Spontaneous Functional Analysis						Dynamic Positional Analysis					Grasp / Release		
		Total Score			Percentage			Total Score		Percentage			Total Score		%
		/ 45						/ 72					/ 6		
		/ 0	/ 1	/ 2	/ 3	/ 4	/ 5	Thumb	Finger	Wrist	Frarm	Elbow	Flex	Neut	Ext
								/12	/12	/24	/12	/12	/ 2	/ 2	/ 2

Comments, e.g. intervention & date, score changes, etc. _____

Shriners Hospital Upper Extremity Evaluation

Date

Therapist Signature

Name Age Diagnosis

History

Subjective - Goals of patient & family; functional limitations

RIGHT		WNL With Following Exceptions	LEFT	
A	P	**RANGE OF MOTION**	A	P
		Shoulder Abduction		
		Shoulder Flexion		
		Shoulder Internal Rotation		
		Shoulder External Rotation		
		Elbow Flexion		
		Elbow Extension		
		Forearm Supination		
		Forearm Pronation		
		Wrist Flexion		
		Wrist Extension		
		Ulnar Deviation		
		Radial Deviation		
		Finger Flexion		
		Finger Extension		
		Thumb CMC Palmar Abd.		
		Thumb CMC Radial Abd.		
		Thumb MCP		

Tone

Modified Ashworth Scale

0 No increase in muscle tone.	2 More marked increase in muscle tone through most of the ROM, but the part is easily moved.
1 Slight increase in tone, manifested by a catch & release, or by minimal resistance at the end of the ROM when the affected part is moved into flexion or extension.	3 Considerable increase in tone, passive movement is difficult.
	4 Affected part is rigid in flexion or extension.

ADL's

	Independent	Dependent	Assist	Comments
UE dressing				
LE dressing				
Orthotic				
Shoes				
Socks				
Fasteners				
Hygiene				

addressograph

Shriners Hospitals for Children
Greenville Hospital
Shriners Hospital Upper Extremity Evaluation

Form # 15280-19

Dynamic Positional Analysis

Spontaneous Functional Analysis	Activity	Thumb Segment			Finger Segment			Wrist Segment						Forearm Segment				Elbow Segment		
		0 palm	1 close	3 open	0 flexion	3 neutral	0 extension	1 flexion	2 neutral	3 extension	0 ulnar deviation	3 neutral	radial deviation 0	0 extreme pronation	1 pronation	2 neutral	3 supination	1 extreme flexion	2 flexion	3 extension
0 1 2 3 4 5	Money from wallet																			
0 1 2 3 4 5	Fold paper																			
0 1 2 3 4 5	Tear paper																			
0 1 2 3 4 5	String bead																			
0 1 2 3 4 5	Unscrew bottle cap																			
0 1 2 3 4 5	Pull playdough apart																			
0 1 2 3 4 5	Cut playdough with knife																			
	Throw large ball																			
	Accept coins/change																			
	Receive 5																			
	Take hand to mouth																			
	Touch opp. ear with palm																			
	Place sticker on ball																			
0 1 2 3 4 5	Put socks on																			
0 1 2 3 4 5	Fasten shoe																			
	Crawl																			

Functional Classification System

0 Does not use-Extremity not utilized in any capacity for completion of task.
1 Poor passive assist-Uses as stabilizing weight only
2 Passive assist-Can hold onto object placed in hand & may stabilize it for use by other hand
3 Poor active assist-Can actively grasp object & hold it weakly
4 Active assist-Can actively grasp object, stabilize it well, & may manipulate it against other hand
5 Spontaneous use, partial to complete-Performs bimanual activities easily; may use hand spontaneously or without reference to other hand

Grasp / Release Analysis

Position	Grasp		Release	
Wrist Flexion	Y	N	Y	N
Wrist Neutral	Y	N	Y	N
Wrist Extended	Y	N	Y	N

Comments: (Web space, MCP instability)

Shriners Hospital Upper Extremity Evaluation Place an X in appropriate observation

new

Dynamic Positional Analysis (D.P.A.) KEY: * PREFERRED POSITION FOR TASK and TOP SCORE

S.F.A. Instructions: Add columns for subtotals. Add subtotals for Total score. Divide Total (Patient) Score by Top Score of 45 = %

D.P.A. Instructions: Multiply score × number of tasks and make subtotal for each section. Add all subtotals for total score divided by top score = %.

Spontaneous Functional Analysis (S.F.A.)						Activity	Thumb Segment (4 tasks×3) *			Finger Segment (4×3) *			Wrist Segment (8×3) *						Forearm Segment (4×3) *				Elbow Segment (4×3) *		
							1	2	3	0	3	0	1	2	3	0	3	0	0	1	2	3	1	2	3
							palm	close	open	flexion	neutral	extension	flexion	neutral	extension	ulnar deviation	neutral	radial deviation	extreme pronation	pronation	neutral	supination	extreme flexion	flexion	extension
0	1	2	3	4	5	Money from wallet			X																
0	1	2	3	4	5	Fold paper			X																
0	1	2	3	4	5	Tear paper		X																	
0	1	2	3	4	5	String bead		X																	
0	1	2	3	4	5	Unscrew bottle cap																			
0	1	2	3	4	5	Pull playdough apart																			
0	1	2	3	4	5	Cut playdough with knife																			
						Throw large ball																			
						Accept coins/change																			
						Receive 5																			
						Take hand to mouth																			
						Touch opp. ear with palm																			
						Place sticker on ball																			
0	1	2	3	4	5	Put socks on																			
0↓	1↓	2↓	3↓	4↓	5↓	Fasten shoe																			
Sub-total						Crawl																			
S.F.A. TOTAL SCORE: /45						(column)																			
S.F.A. PERCENTAGE: %						Functional Classification System (section subtotal)	Thumb: /(12) *			Fingers: /(12) *			Wrist: /(24) *						Forearm: /(12) *				Elbow: /(12) *		

D.P.A. Sub-total

D.P.A. Total: /72 * D.P.A. Percentage

0 Does not use-Extremity not utilized in any capacity for completion of task.
1 Poor passive assist-Uses as stabilizing weight only
2 Passive assist-Can hold onto object placed in hand & may stabilize it for use by other hand
3 Poor active assist-can actively grasp object & hold it weakly
4 Active assist-Can actively grasp object, stabilize it well, & may manipulate it against other hand
5 Spontaneous use, partial to complete-Performs bimanual activities easily; may use hand spontaneously or without reference to other hand

G.R.A. Grasp / Release Analysis

Position	Grasp	Release
Wrist Flexion	1 Y N	1 Y N
Wrist Neutral	1 Y N	1 Y N
Wrist Extended	1 Y N	1 Y N
	G.R.A. Total	/(6*) top score

Comments: (Web space, MCP instability) G.R.A. %

G.R.A. Instructions: Add total responses (score). Divide by top score = %

SHUEE PERCENTAGE SCORE

SPONTANEOUS FUNCTIONAL ANALYSIS (SFA)

1/45 = 02 %	11/45 = 24 %	21/45 = 47 %	31/45 = 69 %	41/45 = 91 %
2/45 = 04 %	12/45 = 27 %	22/45 = 49 %	32/45 = 71 %	42/45 = 93 %
3/45 = 07 %	13/45 = 29 %	23/45 = 51 %	33/45 = 73 %	43/45 = 96 %
4/45 = 09 %	14/45 = 31 %	24/45 = 53 %	34/45 = 76 %	44/45 = 98 %
5/45 = 11 %	15/45 = 33 %	25/45 = 56 %	35/45 = 78 %	45/45 = 100 %
6/45 = 13 %	16/45 = 36 %	26/45 = 58 %	36/45 = 80 %	
7/45 = 16 %	17/45 = 38 %	27/45 = 60 %	37/45 = 82 %	
8/45 = 18 %	18/45 = 40 %	28/45 = 62 %	38/45 = 84 %	
9/45 = 20 %	19/45 = 42 %	29/45 = 64 %	39/45 = 87 %	
10/45 = 22 %	20/45 = 44 %	30/45 = 67 %	40/45 = 89 %	

new

DYNAMIC POSITIONAL ANALYSIS (DPA)

1/72 = 01 %	13/72 = 18 %	25/72 = 35 %	37/72 = 51 %	49/72 = 68 %	61/72 = 85 %
2/72 = 03 %	14/72 = 19 %	26/72 = 36 %	38/72 = 53 %	50/72 = 69 %	62/72 = 86 %
3/72 = 04 %	15/72 = 21 %	27/72 = 38 %	39/72 = 54 %	51/72 = 71 %	63/72 = 88 %
4/72 = 06 %	16/72 = 22 %	28/72 = 39 %	40/72 = 56 %	52/72 = 72 %	64/72 = 89 %
5/72 = 07 %	17/72 = 24 %	29/72 = 40 %	41/72 = 57 %	53/72 = 74 %	65/72 = 90 %
6/72 = 08 %	18/72 = 25 %	30/72 = 42 %	42/72 = 58 %	54/72 = 75 %	66/72 = 92 %
7/72 = 10 %	19/72 = 26 %	31/72 = 43 %	43/72 = 60 %	55/72 = 76 %	67/72 = 93 %
8/72 = 11 %	20/72 = 28 %	32/72 = 44 %	44/72 = 61 %	56/72 = 78 %	68/72 = 94 %
9/72 = 13 %	21/72 = 29 %	33/72 = 46 %	45/72 = 63 %	57/72 = 79 %	69/72 = 96 %
10/72 = 14 %	22/72 = 31 %	34/72 = 47 %	46/72 = 64 %	58/72 = 81 %	70/72 = 97 %
11/72 = 15 %	23/72 = 32 %	35/72 = 49 %	47/72 = 65 %	59/72 = 82 %	71/72 = 99 %
12/72 = 17 %	24/72 = 33 %	36/72 = 50 %	48/72 = 67 %	60/72 = 83 %	72/72 = 100 %

GRASP/RELEASE ANALYSIS (GRA)

1/6 = 17 %
2/6 = 33 %
3/6 = 50 %
4/6 = 67 %
5/6 = 83 %
6/6 = 100 %

SHRINERS HOSPITAL UPPER EXTREMITY EVALUATION (SHUEE)

Developed at Shriners Hospitals for Children
Greenville, South Carolina

© 2005 a work by Shriners Hospitals for Children
All rights reserved. This material contains valuable proprietary products and trade secrets of the Shriners Hospitals for Children, embodying substantial creative efforts and confidential information, ideas and expressions. No part of this material may be disclosed, used, reproduced or transmitted in any form or by any me ans, electronic, optical, me chanical, satellite, radio wave or otherwise, including photocopying, recording, duplicating, or in connection with any information, image or object, storage, retrieval or transmission system of any kind, without permission in writing from the Shriners Hospitals for Children.

Disclaimer
Certain sections of this CD deal with health and medical related issues. Please note that such CD is not intended to supplant any in-person medical consultation or examination. Always seek the advice of a trained health professional with any questions you may have regarding this CD. Never disregard professional medical advice or delay in seeking medical treatment due to information obtained from this CD. Any information received from this CD is not intended to diagnose, treat, or cure. This CD is for information purposes only. The information on this CD is not intended to replace proper medical care.

This manual is intended to instruct on the correct administration of the SHUEE. After reading through the Introduction, Test Administration, and Test Scoring and Interpretation sections, proceed to the Case Studies section to view example SHUEE videos. Blank scoring forms are provided under the Forms section for practice. Correct scores for each case study are provided with the videos.

Note about videos: Videos are in MPEG-4 .avi format. If you have on older PC that cannot play these files, you may need to install the appropriate codec to play this format. Click here for instructions on how to install these files.

Note about PDF documents: Some documents contained in this manual are in .pdf format. The Adobe Acrobat reader needs to be installed to view these files. This application can downloaded from the internet at the following address - www.adobe.com.

Table of Contents

Click on each item to go directly to that information

Introduction

Objectives

Historical Background

Description of the Test

Clinical and Research Applications

Test Administration

Testing Materials

Videotaping

Subject Preparation

Evaluator Guidelines

Evaluation Form

General Information

Demographic Info

Subjective

Range of Motion

Tone

Activities of Daily Living

Analyses: Spontaneous Functional / Dynamic Positional / Grasp and Release

Overview

Activities

Test Scoring and Interpretation

Scoring

Spontaneous Functional Analysis

Dynamic Positional Analysis

Grasp and Release Analysis

Scoring Form

Spontaneous Functional Analysis

Dynamic Positional Analysis

Grasp and Release Analysis

Interpretation of Results

References

Forms

Case Studies

OBJECTIVES

This manual provides the examiner with an overview of the administration and interpretation of the Shriners Hospital Upper Extremity Evaluation (SHUEE). Evaluator training prior to clinical application of the SHUEE should include:

- Reading this manual
- Viewing the Key Interpretation video
- Completing the Video Proficiency test

Information regarding the assembly of a test kit has also been provided in this manual.

HISTORICAL BACKGROUND

The SHUEE was developed in November 1996 to assess the segmental, dynamic alignment of the involved upper extremity in clients with hemiplegic cerebral palsy when performing functional tasks. Review of the literature revealed evaluation tools that measured those tasks that could be completed, but no standardized methods for documenting the manner in which the functional tasks were performed. Such information is essential in designing interventions and documenting outcome.

The SHUEE was initially developed as a screening test to determine which clients were appropriate candidates for BOTOX injections to the involved upper extremity. It has subsequently been used to trend upper extremity function, select surgical interventions, and document the effects of such interventions.

Because the shoulder is rarely addressed surgically in clients with cerebral palsy, the SHUEE focuses on segmental analysis of elbow, forearm, wrist, thumb and fingers. Observation of shoulder girdle is recommended, but not currently included in the SHUEE.

DESCRIPTION OF THE TEST

The SHUEE is a video-based evaluation that was designed for use with clients with hemiplegic type cerebral palsy. The SHUEE presents a descriptive profile for comparing dynamic segmental alignment of the upper extremity, pre-and post intervention. The SHUEE has a numerical score for comparing a clients own scores to one another.

The test consists of two pages. The first page evaluates the client through standard measurements of active and passive range of motion (ROM), tone, and a history-based assessment of the performance of activities of daily living. The second page evaluates the spontaneous use of the involved extremity and the segmental alignment of the extremity while performing tasks on demand. The SHUEE is designed to evaluate both functional and spontaneous abilities, as well as to document dynamic segmental alignment when performing tasks.

The SHUEE is video-based for several reasons. This allows it to be viewed at a later date. During administration of the test, the client can complete all tasks in a dynamic fashion without starting and stopping for the evaluator to record data. The SHUEE may be evaluated by a multi-disciplinary team consisting of occupational/physical therapists, physicians, and family, resulting in a more comprehensive treatment plan. The videotaped SHUEE becomes an invaluable part of the medical record, documenting functional alignment and pre/post intervention for comparative study.

CLINICAL AND RESEARCH APPLICATIONS

Although to date the SHUEE has only been evaluated for use with clients with hemiplegic cerebral palsy between the ages of 3 and 18 years, other potential applications exist. Further clinical testing is necessary before these other applications can be recommended.

TESTING MATERIALS

The SHUEE utilizes the following testing materials. Click on each image to see a larger image.

Billfold style wallet to hold paper money

8 x 10 sheet of standard weight paper

Two 2” in diameter and approximately ½” thick, flat sided, wooden beads

Stiff cord for stringing beads

Three dollar sized bills made of standard weight paper

Four plastic coins of any size

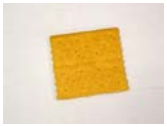
One wide-mouth 2-2 ½” screw cap clear 16 oz. bottle

One can Play-Doh®

Standard fork and knife (not child size)

Shoe with tie fastener

Sock



Cracker

Stickers of any size or type

One 30” ball

VIDEOTAPING

Any standard video recorder, with a tripod, can be used for the taping evaluation. Sound recording is not needed. The taping area should be spacious enough for the client to toss the large ball and crawl towards camera. An 8’ x 8’ area is adequate.

The videographer should be aware of which body segment is being analyzed. Table I can be provided to videographer as a reference. This allows the videographer to adjust camera angles as needed. If a second person is not available, the SHUEE can be performed by one person with the camera stationary. In this situation, it is helpful to have a video monitor to ensure proper camera angles. The activities section of this manual describes camera angle specifics for each

task.

SUBJECT PREPARATION

For best observation of client's extremity, remove all caps/hats, restrain long hair, and roll up sleeve of involved extremity above the elbow. Optimal position of the camera relative to client is important during video recording. The camera needs to be focused only on client's upper body and the table top. It is not necessary to have evaluator in camera angle. Position client sideways to the camera with uninvolved side closest to the camera and involved side furthest from the camera. This position allows best visibility of the involved hand and thumb during video. Repositioning of the client and/or camera is occasionally necessary to optimize subsequent visual analysis of the appropriate planes of motion at each joint. For best postural control, client should be seated at a table. A table with wheels is optimal to allow it to be rolled out of the way for certain tasks. For clarity for later viewing, a clutter-free background with light blue background is suggested. To reduce clutter during filming, the test bag should be on the floor at the evaulator's feet. Items should be removed from the bag prior to the test. Click here for a photo of a typical test area.

EVALUATOR GUIDELINES

With experience, the evaluator can perform the test in 15 minutes. While the SHUEE does provide specific verbal instructions, the SHUEE does not limit verbal interactions between evaluator and client. For example, the evaluator is encouraged to provide positive feedback. The optimum sequence for administration of the SHUEE can be found on Table I. Modification of sequence to suit the client or evaluator needs or preferences is acceptable.

SHUEE TEST ITEM SEQUENCE (SEGMENT ANALYZED)	
MONEY FROM WALLET	(THUMB/FINGER)
FOLD PAPER	(THUMB/FINGER)
TEAR PAPER	(THUMB/FINGER)
STRING BEAD	(THUMB/FINGER)
UNSCREW BOTTLE CAP	(WRIST)
PULL PLAY-DOH® APART	(WRIST)
CUT PLAY-DOH® WITH KNIFE	(WRIST)
ACCEPT COINS/CHANGE	(FOREARM)
RECEIVE "5"	(FOREARM)
TAKE HAND TO MOUTH	(FOREARM)
TOUCH OPPOSITE EAR WITH PALM	(FOREARM)
PUT SOCK ON	(ELBOW)
TIE SHOE	(ELBOW)
PLACE STICKER ON BALL	(ELBOW)
THROW LARGE BALL	(WRIST)
CRAWL	(ELBOW)

Table 1: SHUEE Test Item Sequence (table can be printed and laminated to aid in completion of the test)

EVALUATION FORM

GENERAL INFORMATION

(See Page 1 of SHUEE)

- **Demographic Information**
  - Client Name
  - Age – current year and month
  - Client's Diagnosis
  - History – include any significant birth history or previous surgery

- **Subjective (may be asked of client or parent/guardian)**
  - Functional limitations – what movements prevent the client from being able to accomplish tasks?
  - What task would the client like to be able to perform?
  - What "new" movement would help the most?
  - What are the goals of the client and family?

- **Range of Motion**
  - Standard passive and active range of motion assessments are completed with the limb segments in anatomical positions. For brevity, record only those areas that are not within normal limits. "Within normal limits" is defined as being within 10 degrees of normal range. [1]

- **Tone**
  - Circle the number corresponding to the client's degree of tone as noted by the Modified Ashworth Scale. [2]

- **Activities of Daily Living (may be asked of client or parent/guardian)**
  - Domains
    - Upper extremity dressing
    - Lower extremity dressing
    - Orthotics
    - Shoes
    - Fasteners
    - Hygiene
  - Scoring of Independence Level
    - Independent – with no assistance needed by caregiver
    - Assistance – client is able to perform task with minimum assistance
    - Dependent – maximum assistance needed for task or completely dependent on

caregiver for task

- Comments
    - Specific clarification of the performance of the task

SPONTANEOUS FUNCTIONAL ANALYSIS (SFA), DYNAMIC POSITIONAL ANALYSIS (DPA), AND GRASP/RELEASE ANALYSIS (GRA)

(See Page 2 of SHUEE)

Overview

The second page consists of the analysis sheet for Spontaneous Functional Analysis (SFA), Dynamic Positional Analysis (DPA), and Grasp/Release Analysis (GRA). The examiner will present 16 tasks to the client. These activities have been grouped together to evaluate specific joint movement. These tasks are developmentally age appropriate tasks addressing the areas of Activities of Daily Living, Fine Motor and Gross Motor Skills. The GRA is done after the tasks related to the SFA and DPA have been completed. A DPA score will be given to all 16 tasks while a SFA score will only be given to 9 of the 16 tasks.

Activities

All items must be placed on table, presented at midline, without reference to which hand should be used unless otherwise noted. Suggested sequence of tasks can be found on Table 1. Prior to starting test, state the reason for the test. Example: “I am going to ask you to do some things, like string beads, things like that. Show me how you normally would do it. Go ahead and take off one of your socks and shoes. It doesn’t matter which one.”

Click each task to watch an example video clip. All video examples, with exception of sock donning and shoe tying, are simulated to illicit a zero on the SFA scale to allow demonstration of the therapist physically cueing the child.

1. **Money From Wallet**

   Action: Present client with billfold style wallet and ask client to remove paper bills while observing the thumb/finger position.

   Verbiage: “Take the paper money out of the wallet like you normally would.”

   If client doesn’t use involved extremity, physically cue by touching involved upper extremity and say, “Now do it again, letting this hand help.” Replace money in wallet and repeat task.

   Camera: Focus on webspace of thumb, making certain it is visible.

2. **Fold Pieces of Paper**

Action: Hand client sheet of plain paper to fold in any fashion and observe thumb/finger position. Roll table out of way to elicit two-handed use.

Verbiage: "Now fold this paper in ½ in any fashion."

If involved hand isn't used, physically cue by touch and say, "Now let this hand help."

Camera: Focus on web space of thumb, making certain it is visible.

3. **Tear Piece of Paper**

Action: Once paper is folded, ask client to tear paper. Evaluator may initiate three tears. Paper does not have to be torn on fold. This task demonstrates thumb/finger position.

Verbiage: "I'm going to start tearing this paper and I want you to finish it."

Camera: Focus on web space of thumb, making certain it is visible.

4. **String Large Bead**

Action: Client will be given string and 3 large beads and asked to string beads. This task demonstrates thumb/finger position.

Verbiage: "Now I want you to string these beads."

If involved upper extremity isn't used, remove bead and say, "Let's do it again and let this hand help." Physically cue by touching involved upper extremity.

Camera: Focus on web space of thumb, making certain it is visible.

5. **Unscrew Bottle Cap**

Action: Client is handed a bottle with a screw cap and asked to remove cap. Client should hold bottle with involved upper extremity. Cap may be loosened by examiner and does not have to be replaced by the client. Wrist position is observed in this task.

Verbiage: "Please take the top off of this bottle."

After client completes task, ask them to repeat it. Place cap back onto bottle and state, "Now, I want you to do that one more time." This is simply for ease of scoring.

If client doesn't include involved extremity, physically cue client by touching involved extremity and saying, "Now do it again, letting the other hand help." Replace cap and repeat task.

Camera: Focus on wrist angle, view should be radial (thumb side) of wrist.

6. **Pull Play-Doh® Apart**

Action: Examiner molds Play-Doh® into cylindrical shape and client is asked to pull Play-Doh® apart at least three times while wrist position is observed.

Verbiage: "Now tear this Play-Doh® into three pieces." If client doesn't include involved extremity, physically cue client by touching involved extremity and saying, "Now do it again, letting the other hand help."

Camera: Focus on wrist angle, view should be radial (thumb side) of wrist.

7. **Cut Play-Doh® With Knife**

Action: Examiner molds Play-Doh® into a flat circle for cutting and presents client with knife and fork. It is understood that client uses dominant hand for cutting, however, for evaluation purposes, client must hold knife in involved hand while wrist position is observed.

Verbiage: "Pretend this is something good to eat and show me how you would cut it."

If the client states he cannot cut, state, "Just do the best you can." Typically clients will use dominant side for holding knife. If this is the case, say to client, "I know this sounds crazy, but I want you to put the knife in this hand." At that time, physically cue client by touching involved extremity.

Camera: Focus on wrist angle, view should be radial (thumb side) of wrist.

8. **Throw Large Ball**

Action: Examiner gives client large ball and asks client to throw ball back. The ball can be tossed or bounced. This task is usually performed twice, videotaping from both sides, observing wrist position.

Verbiage: "Now let's stand up. I want you to stand over here."

(Move table out of way and guide client to approximately four feet across from therapist with involved extremity furthest from camera.) "I want you to toss this ball to me and I'll toss it back." After two tosses, state, "Now, let's switch places." Guide client to where you were standing, placing involved extremity closest to camera. The ball is then tossed again two times.

Camera: Focus on wrist angle, view should be radial (thumb side) of wrist.

9. **Accept Change**

Action: Examiner gives three coins to client, placing each into open palm of involved side to demonstrate supination. Remove table so subject does not use table to facilitate supination.

Verbiage: "Let me give you these coins."

If client uses non-involved hand physically cue client by touching involved extremity and state, "Now let's try it with this hand".

Camera: Camera should be focusing on forearm and angle may need to be looking along length of forearm from hand to get best view of supination.

10. **Receives "5"**

Action: Examiner asks client to receive low "5" with involved extremity demonstrating supination. Remove table so client does not use table to facilitate supination.

Verbiage: "Let me give you 5."

If client uses non-involved hand, physically cue client to use involved extremity and state, "Let's do it with this hand". If child then attempts to give you 5, reiterate, "No, I want to give you five". "Can you turn your hand up towards the ceiling like this?" and demonstrate supination.

Camera: Camera should be focusing on forearm and angle may need to be looking along length of forearm from hand to get best view of supination.

11. **Take Object to Mouth**

Action: Examiner provides client with a cracker to eat and observes client taking cracker to his/her mouth with involved side to demonstrate supination. If client doesn't demonstrate supination, ask them to place palm to mouth to facilitate this.

Verbiage: "Now I want you to show me how you would eat this. You don't have to eat it if you don't want to. Just take it to your mouth."

If client uses non-involved hand, physically touch involved hand and state, "Now use this hand". If client does not supinate state, "Now can you place your palm on your mouth, like this?" Evaluator then demonstrates palm to mouth.

Camera: Camera should be focusing on forearm and angle may need to be looking along length of forearm from hand to get best view of supination.

12. **Touch Opposite Ear**

Action: Examiner asks client to touch contralateral ear with the palm of the involved upper extremity to demonstrate supination.

Verbiage: "Can you touch this palm to this ear? Like this?" Evaluator then touches involved hand and contralateral ear. Evaluator then demonstrates palm to contralateral ear. If client states he cannot, state, "Just do your best."

Camera: Camera should be focusing on forearm and angle may need to be looking along length of forearm from hand to get best view of supination.

13. **Place Sticker on Ball**

Action: Examiner asks client to place sticker on ball, using involved side, with ball placed at arm's length from client. Client may need physical cues to remain at arm's length distance from ball to demonstrate elbow extension.

Verbiage: "Put this sticker on this ball."

Camera: Focus on elbow directly from side to note elbow extension.

14. **Put Socks On**

Action: Client should have one sock and shoe removed. Client demonstrates sock donning, assisting with involved extremity to demonstrate elbow extension.

Verbiage: "Go ahead and put your sock back on for me."

If client doesn't assist with involved extremity, physically cue client by touching involved extremity and say, "Now let this arm help". If child flexes lower extremity which prevents upper extremity elbow extension, instruct the child to, "Put your leg on the floor and let me see you do it again".

Camera: Focus on elbow directly from side to note elbow extension.

15. **Fastening Shoes**

Action: Client demonstrates fastening shoes with involved upper extremity. Clients who are too young or refuse to fasten shoes may be evaluated as they assist with this activity. The objective is to look at elbow extension in reaching to the shoe, not their ability to complete the task.

Verbiage: "Now tie your shoe." If client states he cannot, state, "Just pretend you are tying". If he doesn't use involved upper extremity in task, physically cue by touching involved upper extremity, and state, "Let this hand help". If child keeps lower extremity flexed or crossed, ask client, "Put your leg down and reach for your

shoe".

Camera: Focus on elbow directly from side to note elbow extension.

16. Crawl

Action: Client is asked to crawl towards camera in quadruped position demonstrating elbow extension on the involved side. Client only needs to crawl approximately four or five feet.

Verbiage: "I know this is silly, but I want you to get down and crawl towards the camera." If client commando crawls or creeps, ask child, "Can you come up on your hands and knees?"

Camera: Focus on elbow directly from side to note elbow extension.

Grasp/Release Analysis

Action: Once the client performs the 16 tasks, the therapist or client then positions the wrist in: flexion, neutral, extension.

The therapist asks client to take bead from therapist. Bead should be held by side, not flat, and not stuffed into client's hand. A comment section is available to document if the client is able to perform with difficulty or ease.

Verbiage: "Now I want you to stand over here." Move client in front of background positioning the client between the therapist and camera. Support the forearm with the radial (thumb) side towards camera. If the wrist is not already held in a flexed position, flex wrist and ask, "Can you take this bead from me?" " Now can you straighten your wrist and still pick up the bead?" Then, therapist must position wrist and then once again ask client to grasp bead while therapist holds in neutral. "Now can you bring your wrist all the way up and pick up the bead?" Then, therapist must position wrist and then once again ask client to grasp bead while therapist holds in extension. For some clients, placing them into wrist extension will take maximum physical effort on therapist's part. Reposition client to allow ulnar side of hand to be closest to camera and repeat all three tasks with same directions.

Camera: Focus on wrist angle; view should be radial and then ulnar side of wrist

SCORING

The SHUEE data collection form consists of 2 pages. The first page is primarily descriptive and requires no scoring. The second page is utilized during the video taped portion and requires scoring of the Spontaneous Functional Analysis (SFA), the Dynamic Positional Analysis(DPA), and the Grasp/Release(GRA) segments on the actual SHUEE form. The SFA score is circled and the DPA score is marked in the grid with a check mark.

SPONTANEOUS FUNCTIONAL ANALYSIS (SFA)

In order to assess the client's actual function of the affected extremity, a spontaneous use score is recorded. For this portion of the scoring, a modified House scale is used. The scale is shown in Table II. The SFA is recorded for 9 of the 16 tasks. During these nine tasks, the examiner will first evaluate the client for spontaneity of use. The Spontaneous use score should always be comleted first. Optimal score would be to achieve a score of 5, spontaneous use partial to complete. It is important to remember during administration that the client is presented with the task but no verbal reference is made to use of the affected limb. After observation, the evaluator will circle the number that correlates with the House definition of spontaneous use. It is important to note that for task #7, cutting PLAY doh® with knife task, the SFA is determined by the initial grasp of either fork or knife, whereas the DPA requires grasp of knife with involved extremity. For video examples of each activity level, click on the Example identifiers in Table II.

TABLE II

MODIFIED HOUSE SCALE [3]			
CLASS	DESIGNATION	ACTIVITY LEVEL	EXAMPLES
0	Does not use	Extremity not utilized in any capacity for completion of task.	Example 1 Example 2
1	Poor Passive Assist	Uses as stabilizing weight only.	Example 1 Example 2
2	Passive Assist	Can hold onto object placed in hand; may stabilize the object for use by other hand.	Example 1 Example 2
3	Poor Active Assist	Can actively grasp object and stabilize object for use by other hand.	Example 1 Example 2
4	Active Assist	Can actively grasp and stabilize object for use by other hand; may manipulate object with affected hand.	Example 1 Example 2
5	Spontaneous use, partial to complete	Performs bimanual activities easily; may use the hands spontaneously or without reference to the other hand.	Example 1 Example 2

DYNAMIC POSITIONAL ANALYSIS (DPA)

Once the SFA is completed for a task, the evaluator will then record the second score, DPA. If the client did not use the affected limb for initial task completion, then the limb is touched and encouraged to be used. The second score for each of the 16 activities is related to joint and limb segment movement. The DPA documents the dynamic, segmental alignment of the extremity when performing the task. Clients who perform tasks on demand (i.e. not spontaneously) can still be effectively evaluated using this portion of the evaluation. The DPA assesses five functional/anatomical segments.

Thumb Segment Alignment

- **Thumb In Palm** – Any combination of metacarpophalangeal joint (MCP) flexion or interphalangeal joint (IP) flexion resulting in the thumb being placed beneath the fingers, in the palm. No visible web space is seen, from any angle at the first web

space.

- **Thumb Web Space Closed** – No visible space at the first web space. Thumb is adducted and may have a hyperextended IP joint, but does not cross index metacarpal into palm. No visible web space is seen, from any angle at the first web space.

- **Thumb Web Space Open** – Thumb MCP in abduction. Any visible web space constitutes an "open" score. Client able to extend or abduct thumb to grasp object. Client does not have to maintain abducted posture to be given this score.

Finger Segment Alignment

Fingers are graded as a group because they frequently move in composite flexion or extension. The tasks used for thumb evaluation are used for finger evaluation.

- **Flexion** - MCP maintained in greater than 45° flexion. Fingers are held in palm, in variable flexion pattern at DIP joints.

- **Neutral** – Fingers are held in midrange with adequate alignment for task. Fingers easily fluctuate between flexion and extension patterns with no joint aberrations.

- **Extension** – Fingers are held in hyperextension at MCP or IP joints. Associated swan neck deformities or extensor splaying may also be present.

Wrist Segment Alignment

- **Flexion** – Wrist is held in flexed position throughout task; with or without ulnar deviation; any measurement between 0° - 80° of flexion.[4]

- **Anatomical neutral** – Wrist in anatomical neutral position of 0º for all or portion of task; with or without ulnar deviation.

- **Extension** – Wrist extends past anatomical neutral position for all or portion of the task; any measurement between 0° - 70° of extension.

- **Ulnar deviation** – Wrist is held in an ulnarly deviated position throughout task; any measurement between 0° - 30°.

- **Neutral** – Wrist is in the neutral plane; within 5° of neutral.

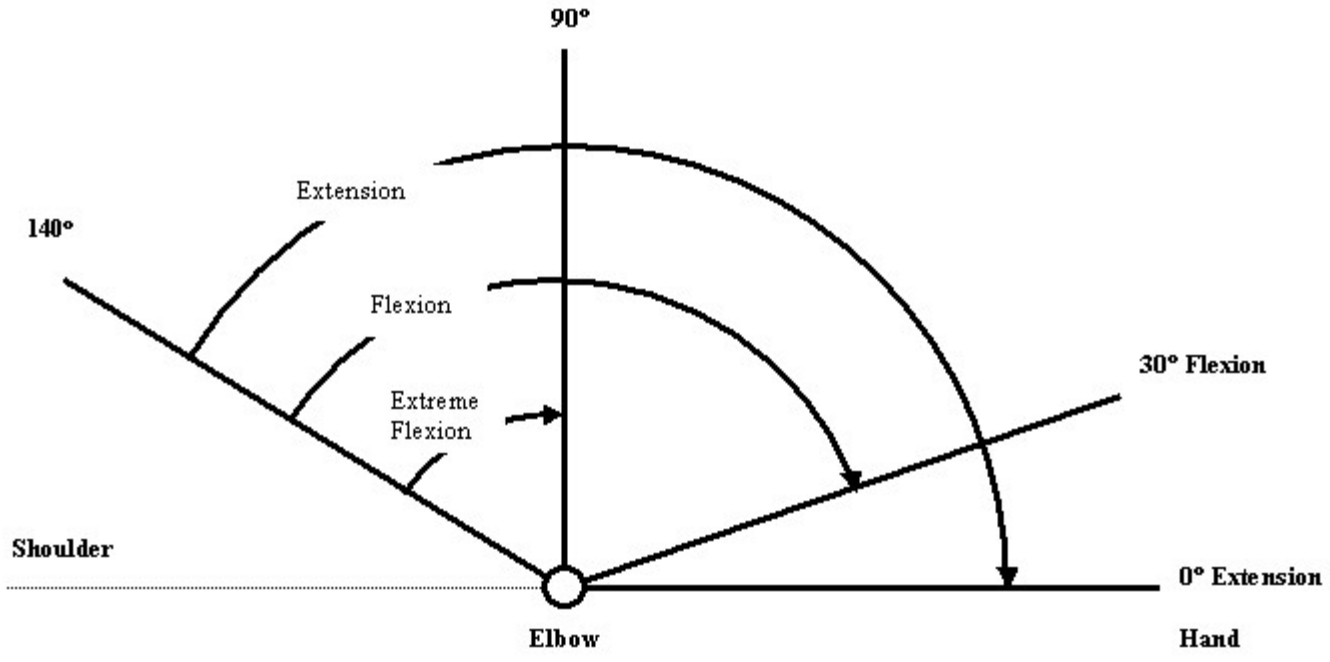
- **Radial deviation** – Wrist is held in a radial deviated position throughout task; any measurement between 0° - 20°.

Forearm Segment Alignment

- **Extreme pronation** – Excessive pronation, no active supination, resulting in palm away from body; any measurement 91° or greater.
- **Pronation** – Pronated at rest with no active supination during task, resulting in palm to floor; any measurement 0° - 90°.
- **Neutral** – Active movement from pronated position to neutral, resulting in 0° palm towards body.
- **Supination** – Active movement beyond neutral to supination with palm open to face. Anything 0° - 90°.

Elbow Segment Alignment

- **Extreme flexion** – Client is unable to actively extend past 90º.
- **Flexion** – Client is unable to extend past 30º.
- **Extension** – Client is able to extend between 30º and 0º.



The thumb/finger tasks were chosen to elicit thumb abduction and the use of the fingers with in a neutral range. The wrist tasks encourage wrist extension with no ulnar or radial deviation. The forearm tasks elicit supination. The elbow tasks require elbow

extension. An “x” is placed on the grid that corresponds to the segmental alignment of the extremity.

GRASP AND RELEASE ANALYSIS (GRA)

The GRA records if the client can or cannot grasp and release the object with the wrist in the three different positions. A yes (Y) or no (N) for grasp and release is provided contingent on clients ability to close and open fingers with the wrist maintained in each position. The optimal outcome would be for the client to open and close the fingers grasping the bead with the wrist in all three positions.

Click here for examples of optimal grasp and release for each position.

Comments

This space is available to document the quality of the grasp and release, the tightness of the web space, the MCP instability, or any other factor that the evaluating therapist deems necessary for complete evaluation.

SHUEE SCORING FORM

Since the SHUEE was created to present a descriptive profile for comparing the dynamic segmental alignment of the upper extremity, pre and post intervention, a SHUEE scoring form summary sheet was designed so the evaluator could review numerous SHUEE scores. This form provides a total score and a percentage for each of the scoring sections.

The following describes the manner in which the marks on the second page of the SHUEE form are converted to a numerical fashion and documented on the SHUEE Scoring form.

SPONTANEOUS FUNCTIONAL ANALYSIS

- Nine tasks are scored
- Modified House Scale 0 to 5 (less to more spontaneous) is used
- Highest possible score equals 45 (normal spontaneous use)

Calculation

- Sum numbers of tasks scored at each house level (0-5)

(from SHUEE form)

Spontaneous Functional Analysis						Activity
0	1	2	3	4	5	Money from wallet
0	1	2	3	4	5	Fold paper
0	1	2	3	4	5	Tear paper
0	1	2	3	4	5	String bead
0	1	2	3	4	5	Unscrew bottle cap
0	1	2	3	4	5	Pull playdough apart
0	1	2	3	4	5	Cut playdough with knife
						Throw large ball
						Accept coins/change
						Receive 5
						Take hand to mouth
						Touch opp. ear with palm
						Place sticker on ball
0	1	2	3	4	5	Put socks on
0	1	2	3	4	5	Fasten shoe
						Crawl

(from Summary Form)

Spontaneous Functional Analysis					
Total Score			Percentage		
	/ 45				
1/ 0	1/ 1	2/ 2	4/ 3	1/ 4	0/ 5

- Multiply sum number of tasks at each house level by the numerical value of each House level

Spontaneous Functional Analysis					
Total Score			Percentage		
	/ 45				
1/ 0	1/ 1	2/ 2	4/ 3	1/ 4	0/ 5
0	1	4	12	4	0

- Sum these values to determine the total score

  0+1+4+12+4=21

- Divide total score by highest possible score
- Multiply by 100
- Express score as percentage of normal or optimal score

Spontaneous Functional Analysis					
Total Score			Percentage		
	21/ 45			47%	
1/ 0	1/ 1	2/ 2	4/ 3	1/ 4	0/ 5
0	1	4	12	4	0

DYNAMIC POSITIONAL ANALYSIS

- 5 segments analyzed
- 4 tasks for each segment
- score: 0 to3(pathological alignment to normal or optimal alignment)
- Highest possible score equals 72 (normal or optimal alignment)

Calculation

- Convert positional scores to numerical values

Thumb Segment			Finger Segment			Wrist Segment						Forearm Segment					Elbow Segment		
0	1	3	0	3	0	1	2	3	0	3	0	0	1	2	3	1	2	3
palm	close	open	flexion	neutral	extension	flexion	neutral	extension	ulnar deviation	neutral	radial deviation	extreme pronation	pronation	neutral	supination	extreme flexion	flexion	extension

- Sum the scores for each anatomical segment

(from SHUEE scoring form)

	Thumb Segment		
Activity	0 palm	1 close	3 open
Money from wallet		X	
Fold paper		X	
Tear paper			X
String bead			X

(from Summary form)

Dynamic Positional Analysis				
Total Score		Percentage		
	/ 72			
Thumb	Finger	Wrist	Frarm	Elbow
10/12	/12	/24	/12	/12

- Sum the segment scores to determine the total score
- Divide the total score by the highest possible score
- Multiply by 100
- Express score as percentage of normal or optimal score

Dynamic Positional Analysis				
Total Score		Percentage		
	44 / 72		61%	
Thumb	Finger	Wrist	Frarm	Elbow
10/12	12 /12	6/24	4/12	12/12

GRASP AND RELEASE ANALYSIS

- Two hand functions analyzed in 3 wrist positions
- Score: 0 to 3 (pathological alignment to normal or optimal alignment)
- Highest possible score = 6 (normal or optimal function)

Calculation

- Convert N/Y scores to numerical values by assigning a single point to the yes marks and a 0 to the no marks
- Sum the scores for each wrist position
- Sum the 3 wrist position scores to determine the total score
- Divide the score by highest possible score
- Multiply by 100
- Express score as percentage of normal or optimal score

(from SHUEE scoring form)

Grasp / Release Analysis				
Position	Grasp		Release	
Wrist Flexion	Y	N	Y	N
Wrist Neutral	Y	N	Y	N
Wrist Extended	Y	N	Y	N

(from Summary form)

Grasp / Release		
Total Score		%
	4 / 6	67
Flex	Neut	Ext
2/ 2	2/ 2	0/ 2

INTERPRETATION OF RESULTS

When reviewing the score sheet and results of the SHUEE, each client and their family dynamics should be considered individually. General guidelines for interpretation of results are as follows.

With respect to the SFA, if a client demonstrates neglect of their hand (score of 0) or uses their hand as a gross weight bearing surface (score of 1) for the majority of their scores then the trend would favor more definitive intervention such as fusion (arthrodesis). Typically, due to neglect, the client would have a difficult time with a prolonged rehabilitation. Likewise if the client scores in the 3, 4, and 5 range, they are actively engaging the affected hand in activities. This would favor transfer strategies or Botox intervention. The rehabilitation participation would be favored.

The DPA scores allow a documented reference to the position of the hand during activities. The lowest score correlates with the greatest amount of positional misalignment. If four of the four wrist tasks were graded as a 0 or 1, a fusion (arthrodesis) would be considered. However if the client is able to come to a neutral position or even attain correct alignment for at least two of the four tasks, then the transfer or Botox strategies could be entertained.

In the grasp and release section, if the client is unable to grasp and release in any position then a fusion (arthrodesis) with a release for positioning may be indicated. If the client is able to grasp and release in flexion and neutral but not in extension, then release with tendon transfers may be indicated.

The SHUEE does not conclude with a cumulative score thus a specific score does not equal a particular intervention. The SHUEE is a documentation of the client's spontaneous and dynamic positional analysis so that an individualized treatment plan of care can be obtained and recorded in an objective manner.

REFERENCES

1. Trombly CA. Evaluation of biomechanical and physiological aspects of motor performance. Occupational Therapy for Physical Dysfunction, 4th Ed., Williams & Wilkins, Baltimore, Maryland; 1995, pp 126-130.

2. Bohannon RW, Smith MB. Interrater reliability of a modified Ashworth scale of muscle spasticity. *Phys Therapy* 1986; 67:206-207.

3. House J, et al. A dynamic approach to the thumb-in-palm deformity in cerebral palsy. J *Pediatr Orthop*; 63-A:216-225.

4. Barr NR. The Hand: Principles and techniques of simple splint making in rehabilitation, Butterworth & Co., Woburn, Massachusetts.; 1979, pp 61-62.

Case Study 1

Spontaneous Functional Analysis	Activity	Thumb Segment			Finger Segment			Wrist Segment						Forearm Segment				Elbow Segment		
		0 palm	1 close	3 open	0 flexion	3 neutral	0 extension	1 flexion	2 neutral	3 extension	0 ulnar deviation	3 neutral	0 radial deviation	0 extreme pronation	1 pronation	2 neutral	3 supination	1 extreme flexion	2 flexion	3 extension
0 1 2 (3) 4 5	Money from wallet			X		X														
0 1 2 3 (4) 5	Fold paper			X		X														
0 1 2 3 (4) 5	Tear paper			X		X														
0 1 2 3 (4) 5	String bead			X		X														
0 1 2 (3) 4 5	Unscrew bottle cap							X				X								
0 1 2 3 (4) 5	Pull playdough apart									X		X								
0 1 2 (3) 4 5	Cut playdough with knife							X				X								
	Throw large ball									X		X								
	Accept coins/change																X			
	Receive 5																X			
	Take hand to mouth																X			
	Touch opp. ear with palm																X			
	Place sticker on ball																			X
0 1 2 3 (4) 5	Put socks on																			X
0 1 2 3 (4) 5	Fasten shoe																			X
	Crawl																			X

Functional Classification System

0 Does not use-Extremity not utilized in any capacity for completion of task.
1 Poor passive assist-Uses as stabilizing weight only
2 Passive assist-Can hold onto object placed in hand & may stabilize it for use by other hand
3 Poor active assist-Can actively grasp object & hold it weakly
4 Active assist-Can actively grasp object, stabilize it well, & may manipulate it against other hand
5 Spontaneous use, partial to complete-Performs bimanual activities easily; may use hand spontaneously or without reference to other hand

Grasp / Release Analysis

Position	Grasp		Release	
Wrist Flexion	(Y)	N	(Y)	N
Wrist Neutral	(Y)	N	(Y)	N
Wrist Extended	(Y)	N	(Y)	N

Comments: (Web space, MCP instability)

very lax MCP

Case Study 2

Spontaneous Functional Analysis	Activity	Thumb Segment			Finger Segment			Wrist Segment						Forearm Segment				Elbow Segment		
		0 palm	1 close	3 open	0 flexion	3 neutral	0 extension	1 flexion	2 neutral	3 extension	0 ulnar deviation	3 neutral	0 radial deviation	0 extreme pronation	1 pronation	2 neutral	3 supination	1 extreme flexion	2 flexion	3 extension
0 1 2 3 (4) 5	Money from wallet			X		X														
0 1 2 3 (4) 5	Fold paper			X		X														
0 1 2 3 (4) 5	Tear paper			X		X														
0 1 2 3 (4) 5	String bead			X		X														
0 1 2 (3) 4 5	Unscrew bottle cap							X				X								
0 1 2 (3) 4 5	Pull playdough apart							X				X								
0 1 2 (3) 4 5	Cut playdough with knife							X				X								
	Throw large ball							X				X								
	Accept coins/change															X				
	Receive 5															X				
	Take hand to mouth															X				
	Touch opp. ear with palm															X				
	Place sticker on ball																			X
0 1 2 (3) 4 5	Put socks on																			X
0 1 2 3 (4) 5	Fasten shoe																			X
	Crawl																			X

Functional Classification System

0 Does not use-Extremity not utilized in any capacity for completion of task.
1 Poor passive assist-Uses as stabilizing weight only
2 Passive assist-Can hold onto object placed in hand & may stabilize it for use by other hand
3 Poor active assist-Can actively grasp object & hold it weakly
4 Active assist-Can actively grasp object, stabilize it well, & may manipulate it against other hand
5 Spontaneous use, partial to complete-Performs bimanual activities easily; may use hand spontaneously or without reference to other hand

Grasp / Release Analysis

Position	Grasp		Release	
Wrist Flexion	(Y)	N	(Y)	N
Wrist Neutral	(Y)	N	(Y)	N
Wrist Extended	(Y)	N	(Y)	N

Comments: (Web space, MCP instability)

minimal MCP

Case Study 3

Spontaneous Functional Analysis	Activity	Thumb Segment			Finger Segment			Wrist Segment						Forearm Segment				Elbow Segment		
		0 palm	1 close	3 open	0 flexion	3 neutral	0 extension	1 flexion	2 neutral	3 extension	0 ulnar deviation	3 neutral	radial deviation 0	0 extreme pronation	1 pronation	2 neutral	3 supination	1 extreme flexion	2 flexion	3 extension
(0) 1 2 3 4 5	Money from wallet		X				X													
0 (1) 2 3 4 5	Fold paper		X				X													
0 (1) 2 3 4 5	Tear paper		X				X													
(0) 1 2 3 4 5	String bead		X				X													
0 (1) 2 3 4 5	Unscrew bottle cap							X				X								
(0) 1 2 3 4 5	Pull playdough apart							X				X								
(0) 1 2 3 4 5	Cut playdough with knife							X				X								
	Throw large ball							X				X								
	Accept coins/change													X						
	Receive 5													X						
	Take hand to mouth													X						
	Touch opp. ear with palm														X					
	Place sticker on ball																			X
0 (1) 2 3 4 5	Put socks on																			X
(0) 1 2 3 4 5	Fasten shoe																			X
	Crawl																			X

Functional Classification System

0 Does not use-Extremity not utilized in any capacity for completion of task.
1 Poor passive assist-Uses as stabilizing weight only
2 Passive assist-Can hold onto object placed in hand & may stabilize it for use by other hand
3 Poor active assist-Can actively grasp object & hold it weakly
4 Active assist-Can actively grasp object, stabilize it well, & may manipulate it against other hand
5 Spontaneous use, partial to complete-Performs bimanual activities easily; may use hand spontaneously or without reference to other hand

Grasp / Release Analysis

Position	Grasp	Release
Wrist Flexion	Y (N)	Y (N)
Wrist Neutral	Y (N)	Y (N)
Wrist Extended	Y (N)	Y (N)

Comments: (Web space, MCP instability)

SHUEE Scoring Form

Patient Name _____ Patient # _____

Date	Initials	Spontaneous Functional Analysis						Dynamic Positional Analysis					Grasp / Release		
	CS 1	Total Score			Percentage			Total Score		Percentage			Total Score		%
		33 / 45			73%			68/ 72		94%			6/ 6		100
		0 / 0	0/ 1	0 / 2	3/ 3	6/ 4	0/ 5	Thumb	Finger	Wrist	Frarm	Elbow	Flex	Neut	Ext
		0	0	0	9	24	0	12/12	12/12	20/24	12/12	12/12	2/ 2	2/ 2	2/ 2

Comments, e.g. intervention & date, score changes, etc. _____

Date	Initials	Spontaneous Functional Analysis						Dynamic Positional Analysis					Grasp / Release		
	CS 2	Total Score			Percentage			Total Score		Percentage			Total Score		%
		32/ 45			71%			64 / 72		89%			6 / 6		100
		0/ 0	0/ 1	0/ 2	4/ 3	5/ 4	0/ 5	Thumb	Finger	Wrist	Frarm	Elbow	Flex	Neut	Ext
		0	0	0	12	20	0	12/12	12/12	16/24	12/12	12/12	2/ 2	2/ 2	2/ 2

Comments, e.g. intervention & date, score changes, etc. _____

Date	Initials	Spontaneous Functional Analysis						Dynamic Positional Analysis					Grasp / Release		
	CS3	Total Score			Percentage			Total Score		Percentage			Total Score		%
		4/ 45			9%			37/ 72		51%			0/ 6		0
		5/ 0	4/ 1	0/ 2	0/ 3	0/ 4	0/ 5	Thumb	Finger	Wrist	Frarm	Elbow	Flex	Neut	Ext
		0	4	0	0	0	0	8/12	0/12	16/24	1/12	12/12	0/ 2	0/ 2	0/ 2

Comments, e.g. intervention & date, score changes, etc. _____

Case Study II - 1

Spontaneous Functional Analysis	Activity	Thumb Segment			Finger Segment			Wrist Segment						Forearm Segment				Elbow Segment		
		0 palm	1 close	3 open	0 flexion	3 neutral	0 extension	1 flexion	2 neutral	3 extension	0 ulnar deviation	3 neutral	0 radial deviation	0 extreme pronation	1 pronation	2 neutral	3 supination	1 extreme flexion	2 flexion	3 extension
0 1 2 3 (4) 5	Money from wallet			X		X														
0 1 2 3 (4) 5	Fold paper			X		X														
0 1 2 3 (4) 5	Tear paper			X		X														
0 1 2 3 (4) 5	String bead			X		X														
0 1 2 (3) 4 5	Unscrew bottle cap							X				X								
0 1 2 (3) 4 5	Pull playdough apart							X				X								
0 1 2 (3) 4 5	Cut playdough with knife							X				X								
	Throw large ball							X				X								
	Accept coins/change															X				
	Receive 5															X				
	Take hand to mouth															X				
	Touch opp. ear with palm															X				
	Place sticker on ball																			X
0 1 2 (3) 4 5	Put socks on																			X
0 1 2 3 (4) 5	Fasten shoe																			X
	Crawl																			X

Functional Classification System

0 Does not use-Extremity not utilized in any capacity for completion of task.
1 Poor passive assist-Uses as stabilizing weight only
2 Passive assist-Can hold onto object placed in hand & may stabilize it for use by other hand
3 Poor active assist-Can actively grasp object & hold it weakly
4 Active assist-Can actively grasp object, stabilize it well, & may manipulate it against other hand
5 Spontaneous use, partial to complete-Performs bimanual activities easily; may use hand spontaneously or without reference to other hand

Grasp / Release Analysis

Position	Grasp		Release	
Wrist Flexion	(Y)	N	(Y)	N
Wrist Neutral	(Y)	N	(Y)	N
Wrist Extended	(Y)	N	(Y)	N

Comments: (Web space, MCP instability)

Case Study II - 2

Spontaneous Functional Analysis	Activity	Thumb Segment			Finger Segment			Wrist Segment						Forearm Segment				Elbow Segment		
		0 palm	1 close	3 open	0 flexion	3 neutral	0 extension	1 flexion	2 neutral	3 extension	0 ulnar deviation	3 neutral	0 radial deviation	0 extreme pronation	1 pronation	2 neutral	3 supination	1 extreme flexion	2 flexion	3 extension
0 1 2 (3) 4 5	Money from wallet			X		X														
0 1 2 (3) 4 5	Fold paper			X		X														
0 1 2 (3) 4 5	Tear paper			X		X														
0 1 2 (3) 4 5	String bead			X		X														
0 1 2 (3) 4 5	Unscrew bottle cap									X		X								
0 1 2 (3) 4 5	Pull playdough apart									X		X								
0 1 2 (3) 4 5	Cut playdough with knife									X	X									
	Throw large ball									X	X									
	Accept coins/change															X				
	Receive 5															X				
	Take hand to mouth																X			
	Touch opp. ear with palm															X				
	Place sticker on ball																			X
0 1 2 (3) 4 5	Put socks on																			X
0 1 2 (3) 4 5	Fasten shoe																			X
	Crawl																			X

Functional Classification System

0 Does not use-Extremity not utilized in any capacity for completion of task.
1 Poor passive assist-Uses as stabilizing weight only
2 Passive assist-Can hold onto object placed in hand & may stabilize it for use by other hand
3 Poor active assist-Can actively grasp object & hold it weakly
4 Active assist-Can actively grasp object, stabilize it well, & may manipulate it against other hand
5 Spontaneous use, partial to complete-Performs bimanual activities easily; may use hand spontaneously or without reference to other hand

Grasp / Release Analysis

Position	Grasp		Release	
Wrist Flexion	(Y)	N	(Y)	N
Wrist Neutral	(Y)	N	(Y)	N
Wrist Extended	Y	(N)	Y	(N)

Comments: (Web space, MCP instability)

Case Study II - 3

Spontaneous Functional Analysis	Activity	Thumb Segment			Finger Segment			Wrist Segment						Forearm Segment				Elbow Segment		
		0 palm	1 close	3 open	0 flexion	3 neutral	0 extension	1 flexion	2 neutral	3 extension	0 ulnar deviation	3 neutral	0 radial deviation	0 extreme pronation	1 pronation	2 neutral	3 supination	1 extreme flexion	2 flexion	3 extension
0 (1) 2 3 4 5	Money from wallet			X		X														
0 (1) 2 3 4 5	Fold paper		X			X														
0 1 2 (3) 4 5	Tear paper			X		X														
0 1 2 (3) 4 5	String bead			X		X														
0 1 2 (3) 4 5	Unscrew bottle cap							X			X									
0 1 2 (3) 4 5	Pull playdough apart							X			X									
0 1 (2) 3 4 5	Cut playdough with knife							X			X									
	Throw large ball							X				X								
	Accept coins/change														X					
	Receive 5														X					
	Take hand to mouth													X						
	Touch opp. ear with palm													X						
	Place sticker on ball																			X
0 1 2 (3) 4 5	Put socks on																			X
0 1 2 (3) 4 5	Fasten shoe																			X
	Crawl																			X

Functional Classification System

0 Does not use-Extremity not utilized in any capacity for completion of task.
1 Poor passive assist-Uses as stabilizing weight only
2 Passive assist-Can hold onto object placed in hand & may stabilize it for use by other hand
3 Poor active assist-Can actively grasp object & hold it weakly
4 Active assist-Can actively grasp object, stabilize it well, & may manipulate it against other hand
5 Spontaneous use, partial to complete-Performs bimanual activities easily; may use hand spontaneously or without reference to other hand

Grasp / Release Analysis

Position	Grasp		Release	
Wrist Flexion	(Y)	N	(Y)	N
Wrist Neutral	(Y)	N	(Y)	N
Wrist Extended	Y	(N)	Y	(N)

Comments: (Web space, MCP instability)

Case Study II - 4

Spontaneous Functional Analysis	Activity	Thumb Segment			Finger Segment			Wrist Segment						Forearm Segment				Elbow Segment		
		0 palm	1 close	3 open	0 flexion	3 neutral	0 extension	1 flexion	2 neutral	3 extension	0 ulnar deviation	3 neutral	0 radial deviation	0 extreme pronation	1 pronation	2 neutral	3 supination	1 extreme flexion	2 flexion	3 extension
0 1 2 3 (4) 5	Money from wallet			X		X														
0 1 2 3 (4) 5	Fold paper			X		X														
0 1 2 3 (4) 5	Tear paper			X		X														
0 1 2 3 (4) 5	String bead			X		X														
0 1 2 3 (4) 5	Unscrew bottle cap									X		X								
0 1 2 3 (4) 5	Pull playdough apart									X		X								
0 1 2 3 (4) 5	Cut playdough with knife									X		X								
	Throw large ball									X		X								
	Accept coins/change																X			
	Receive 5																X			
	Take hand to mouth																X			
	Touch opp. ear with palm																X			
	Place sticker on ball																			X
0 1 2 (3) 4 5	Put socks on																			X
0 1 2 3 (4) 5	Fasten shoe																			X
	Crawl																			X

Functional Classification System

0 Does not use-Extremity not utilized in any capacity for completion of task.
1 Poor passive assist-Uses as stabilizing weight only
2 Passive assist-Can hold onto object placed in hand & may stabilize it for use by other hand
3 Poor active assist-Can actively grasp object & hold it weakly
4 Active assist-Can actively grasp object, stabilize it well, & may manipulate it against other hand
5 Spontaneous use, partial to complete-Performs bimanual activities easily; may use hand spontaneously or without reference to other hand

Grasp / Release Analysis

Position	Grasp		Release	
Wrist Flexion	(Y)	N	(Y)	N
Wrist Neutral	(Y)	N	(Y)	N
Wrist Extended	(Y)	N	(Y)	N

Comments: (Web space, MCP instability)

Case Study II - 5

Spontaneous Functional Analysis	Activity	Thumb Segment			Finger Segment			Wrist Segment						Forearm Segment				Elbow Segment		
		0 palm	1 close	3 open	0 flexion	3 neutral	0 extension	1 flexion	2 neutral	3 extension	0 ulnar deviation	3 neutral	0 radial deviation	0 extreme pronation	1 pronation	2 neutral	3 supination	1 extreme flexion	2 flexion	3 extension
0 1 2 3 (4) 5	Money from wallet			X		X														
0 1 2 3 (4) 5	Fold paper			X		X														
0 1 2 3 (4) 5	Tear paper			X		X														
0 1 2 3 4 (5)	String bead			X		X														
0 1 2 3 (4) 5	Unscrew bottle cap							X				X								
0 1 2 3 (4) 5	Pull playdough apart							X				X								
0 1 2 3 (4) 5	Cut playdough with knife							X				X								
	Throw large ball							X				X								
	Accept coins/change																X			
	Receive 5																X			
	Take hand to mouth																X			
	Touch opp. ear with palm																X			
	Place sticker on ball																			X
0 1 2 3 (4) 5	Put socks on																			X
0 1 2 3 (4) 5	Fasten shoe																			X
	Crawl																			X

Functional Classification System

0 Does not use-Extremity not utilized in any capacity for completion of task.
1 Poor passive assist-Uses as stabilizing weight only
2 Passive assist-Can hold onto object placed in hand & may stabilize it for use by other hand
3 Poor active assist-Can actively grasp object & hold it weakly
4 Active assist-Can actively grasp object, stabilize it well, & may manipulate it against other hand
5 Spontaneous use, partial to complete-Performs bimanual activities easily; may use hand spontaneously or without reference to other hand

Grasp / Release Analysis

Position	Grasp		Release	
Wrist Flexion	(Y)	N	(Y)	N
Wrist Neutral	(Y)	N	(Y)	N
Wrist Extended	(Y)	N	(Y)	N

Comments: (Web space, MCP instability)

SHUEE Scoring Form

Patient Name _____ Patient # _____

Date	Initials	Spontaneous Functional Analysis						Dynamic Positional Analysis					Grasp / Release		
	CS II -1	Total Score			Percentage			Total Score		Percentage			Total Score		%
		41/ 45			91%			64/ 72		89%			6/ 6		100%
		0/ 0	0/ 1	0/ 2	0/ 3	4/ 4	5/ 5	Thumb	Finger	Wrist	Frarm	Elbow	Flex	Neut	Ext
		0	0	0	0	16	25	12/12	12 /12	16/24	12/12	12/12	2/ 2	2/ 2	2/ 2

Comments, e.g. intervention & date, score changes, etc. _____

Date	Initials	Spontaneous Functional Analysis						Dynamic Positional Analysis					Grasp / Release		
	CS II -2	Total Score			Percentage			Total Score		Percentage			Total Score		%
		27/ 45			60%			63/ 72		88%			4/ 6		67%
		0/ 0	0/ 1	0/ 2	9/ 3	0/ 4	0/ 5	Thumb	Finger	Wrist	Frarm	Elbow	Flex	Neut	Ext
		0	0	0	27	0	0	12/12	12/12	18/24	9/12	12/12	2/ 2	2/ 2	0/ 2

Comments, e.g. intervention & date, score changes, etc. _____

Date	Initials	Spontaneous Functional Analysis						Dynamic Positional Analysis					Grasp / Release		
	CS II -3	Total Score			Percentage			Total Score		Percentage			Total Score		%
		22/ 45			49%			44/ 72		61%			4/ 6		67%
		0/ 0	2/ 1	1/ 2	6/ 3	0/ 4	0/ 5	Thumb	Finger	Wrist	Frarm	Elbow	Flex	Neut	Ext
		0	2	2	18	0	0	11/12	12/12	7/24	2/12	12/12	2/ 2	2/ 2	0/ 2

Comments, e.g. intervention & date, score changes, etc. _____

Date	Initials	Spontaneous Functional Analysis						Dynamic Positional Analysis					Grasp / Release		
	CS II -4	Total Score			Percentage			Total Score		Percentage			Total Score		%
		35/ 45			78%			72/ 72		100%			6/ 6		100%
		0/ 0	0/ 1	0/ 2	1/ 3	8/ 4	0/ 5	Thumb	Finger	Wrist	Frarm	Elbow	Flex	Neut	Ext
		0	0	0	3	32	0	12/12	12/12	24/24	12/12	12/12	2/ 2	2/ 2	2/ 2

Comments, e.g. intervention & date, score changes, etc. _____

Date	Initials	Spontaneous Functional Analysis						Dynamic Positional Analysis					Grasp / Release		
	CS II -5	Total Score			Percentage			Total Score		Percentage			Total Score		%
		37/ 45			78%			72/ 72		100%			6/ 6		100%
		0/ 0	0/ 1	0/ 2	0/ 3	8/ 4	1/ 5	Thumb	Finger	Wrist	Frarm	Elbow	Flex	Neut	Ext
		0	0	0	0	32	5	12/12	12/12	16/24	12/12	12/12	2/ 2	2/ 2	2/ 2

Comments, e.g. intervention & date, score changes, etc. _____