



SHAP

Southampton Hand
Assessment Procedure

Assessor's

SHAP

Protocol

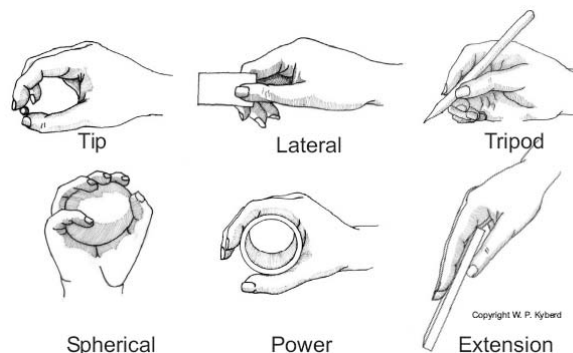
General Information

The Southampton Hand Assessment Procedure (SHAP) has been formed based on the analysis of grip patterns, and their frequency of use in Activities of Daily Living (ADL) tasks. Therefore it is considered to cover the wide range of prehensile tasks the hand usually undertakes (with the omission of specific occupational or recreational requirements).

The test consists of the manipulation of a series of both lightweight and heavyweight abstract objects. These are intended to directly reflect specific grip patterns, whilst also assessing the strength and compliance of the grip. This is followed by 14 ADL tasks. To ensure standardisation, the assessor's test procedure must be followed, whilst objectivity is maintained by participant self-timing. A complete assessment is expected to take around 20 minutes to complete (including all of the relevant explanations to the subject).

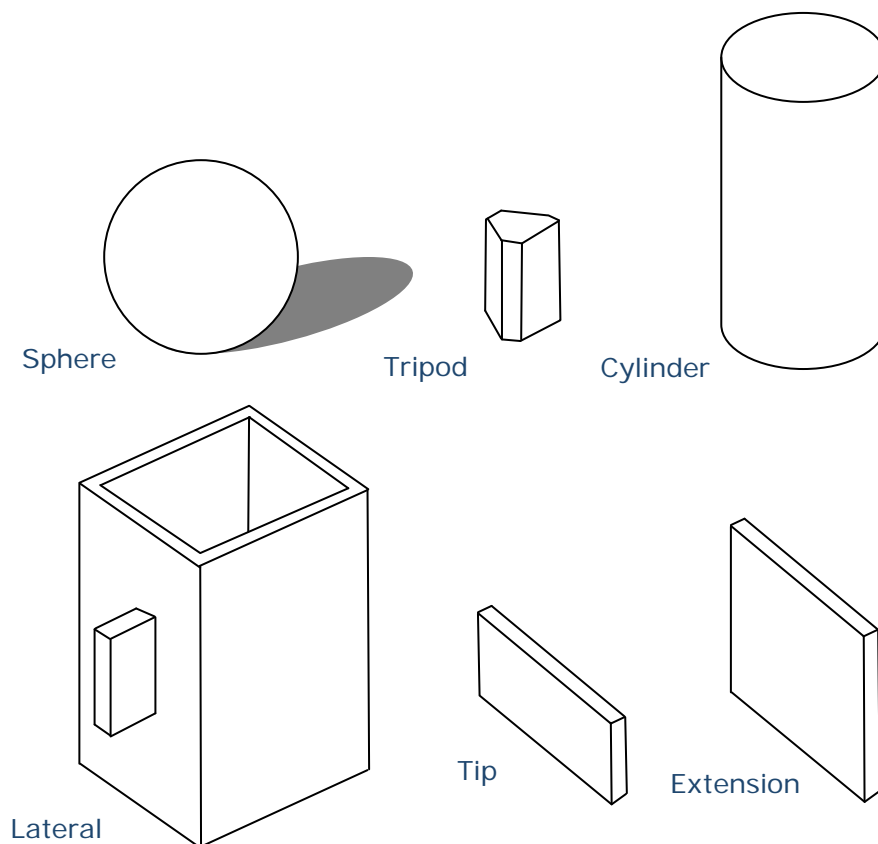
The procedure is designed to provide a score of functionality, which can be equated with a percentage; hence on completion of the test a score of optimum hand function is obtained. This score provides a tangible result describing the level of hand impairment, e.g. the participant has 75% of optimum hand function. As the procedure has been designed to be standardised and objective, this score cannot only be used for comparative assessments of a participant's performance throughout a course of treatment, but also provides information on their level of function (this is with respect to the benchmark of an unimpaired participant).

The protocol outlined in the following pages provides details for the assessor concerning the setup and execution of the test. The assessor is required to demonstrate each task to the descriptions given. The following diagram may help identify the appropriate grip patterns.



Contents of SHAP Test

Quantity	Item
1	Test case containing all SHAP equipment
1	Backboard mounted in case with lock & key, door handle and zip
1	SHAP form-board
1	Foam insert containing all objects
1	Timer unit
6	Lightweight abstract objects (see figure below)
6	Heavyweight abstract objects (see figure below)
1	Lock and key mounted on backboard
1	Zip mounted on backboard
4	Coins (2 x 1p and 2 x 2p)
1	Button board with 4 buttons attached
1	Plasticine block
1	Knife
1	Note card
1	Glass jar with lid
1	Glass jug
1	Cardboard juice carton
1	Empty tin with plastic lid
1	Door handle mounted on backboard
1	Metal arrow unit
1	Screwdriver



SHAP Abstract Object Tasks

Assessor's SHAP Protocol

Setting up the SHAP

The participant should be seated at a table with arms resting on the table. The participant's elbows should be at a 90° angle.

Place the SHAP form-board in front of the participant blue side facing upward, approximately 8cm from the front edge of the table. Fit the timer unit into the space provided in the front of the board. For each of the SHAP abstract object tasks, the board should be moved from left to right so that each task is directly in front of the participant, thereby ensuring no bias toward either hand dominance. The SHAP case and all ADL objects can be removed from the table during this first phase of the assessment.

Procedural Notes

Each task should be demonstrated to the participant using slow, clear movements, ensuring that the participant is aware of the appropriate grip for completion of the abstract object tasks.

It is important to note that the demonstration should be carried out using the corresponding hand under assessment, to avoid any confusion for the participant.

Prosthesis users should be encouraged to practice each task, prior to timing it, in order to determine the most appropriate technique as many users usually carry out tasks with the natural hand alone. Due to the difficulties associated with myoelectric prostheses, if it is apparent that the device has failed to respond to user demand, then a note should be made, and a retest allowed. If the device is similarly unresponsive during the second task, a note should be made of the difficulties encountered.

In other circumstances, the participant should be given only one chance to carry out the timed task. The time taken to complete each task, the appropriate grip pattern if identifiable should be recorded, as well as any relevant notes.

When establishing any form of normative data, it is imperative that the task is carried out fully. Due to the need to complete a task in the minimum amount of time there is often a temptation to 'rush' the task without actually fulfilling the exact requirements. Under these circumstances the task should be repeated.

Completing the SHAP Test

In the forthcoming document, normal text denotes instructions for assessors. *Text in italic text denotes instructions to be read to participants.* The SHAP website contains video demonstrations to help with accurate placement of the ADL tasks on the form board (please refer to <http://www.shap.ecs.soton.ac.uk/about-usage.php> for further guidance on completing the SHAP tasks).

SHAP Abstract Object Tasks

The 6 lightweight objects are to be completed first. If a participant cannot complete a task, this could be recorded as C/C (Cannot Complete) on the supplied SHAP test data sheet. All lightweight abstract objects are completed, followed by all heavyweight abstract objects.

“A series of objects will be placed on the board. The task involves moving the object from the rear slot on the board to the front slot. Only the hand under assessment (dominant hand) should be used for any of these tasks, including the starting and stopping of the timer.”

Spherical Place the ‘spherical object’ in the appropriate rear slot. Place the ‘tip object’ in the slot between the rear and front ‘spherical object’ slots to create a small barrier. Move the board so that these slots are directly in front of the participant whilst maintaining the approximate 8cm distance from the front of the table. Using the spherical grip move the object over the barrier and place it in the front slot.

“Start the timer, pick up and move the object as demonstrated with as few mistakes as possible, and as quickly as possible, to the front slot. Complete the task by depressing the blue button on the timer again.”

Tripod Place the ‘tripod object’ in the appropriate rear slot. Using a tripod grip, move the object to the front slot.

“Start the timer, move the object as demonstrated and as quickly as possible to the front slot and then stop the timer.”

Power Place the ‘power object’ in the appropriate rear slot. Move the board so that these slots are directly in front of the participant whilst maintaining the approximate 8cm distance of the board from the front of the table. Using the power grip, pick up the object and move it to the front slot.

“Start the timer, move the object as demonstrated and as quickly as possible to the front slot and then stop the timer.”

Lateral Place the ‘lateral object’ in the appropriate rear slot with the handle facing toward the participant. Move the board so that these slots are directly in front of the participant whilst maintaining the approximate 8cm distance from the front of the table. Using the lateral grip, pick up the object by the handle and move it to the front slot.

“Start the timer, move the object as demonstrated and as quickly as possible to the front slot and then stop the timer.”

Tip Place the ‘tip object’ in the appropriate rear slot. Using a tip grip, move the object to the front slot.

“Start the timer, move the object as demonstrated and as quickly as possible to the front slot and then stop the timer.”

Extension Place the ‘extension object’ in the appropriate rear slot. Using an extension grip, move the object to the front slot.

“Start the timer, move the object as demonstrated and as quickly as possible to the front slot and then stop the timer.”

The procedure above should now be repeated, in the same order using the heavyweight abstract objects.

Once completed, remove all the abstract objects from the table and turn over the form-board. Place the board directly in front of the participant for all ADL tasks at approximately 8cm from the front of the table.

Activities of Daily Living

As before, each task should be demonstrated to the participant using slow, clear movements, ensuring that the participant is aware of the appropriate procedure.

The 'Optional' instructions should be used when the assessor feels that the participant would be unable, is uncomfortable, or unnatural in using the demonstrated grip.

To avoid repetitive filling/emptying of objects with water for the pouring tasks (jug, carton and full jar tasks), it is advisable to fill a separate container with approximately 1 litre of water. It may also be advisable to have a towel nearby to clear any spillage.

"The second stage of this assessment consists of 14 everyday activities, which should be timed in the same manner by pressing the blue button to start and stop the timer. Again tasks should be completed as quickly as possible, with as few mistakes as possible, using only the appropriate hand unless otherwise stated."

Pick Up Coins Arrange the two 2p and two 1p coins in the designated areas on the board. Place the glass jar in the designated spot for this task with the lid removed. Pick up each coin in turn by sliding the coin to the edge of the board using a tip or tripod grip and drop each coin into the glass jar. Move from right to left. Reset the task for the participant.

"Start the timer, lift each coin in turn as quickly as possible, and drop it in the jar as demonstrated. Repeat that for all the coins and then stop the timer."

[OPTIONAL: If you feel unable to pick up the coins as demonstrated, you may use any method you wish, whilst only using one hand.]

Button Board Place the button board to the right of the timer unit if assessing the right hand, and to the left if assessing the left hand. The buttons should be farthest from the timer unit. Undo each button in turn, using only the assessed hand in a tripod grip. The other hand may be used to steady the board, but may not assist in the task. The button board should remain on the form-board at all times. Reset the task for the participant.

“Start the timer and using only the appropriate hand, undo all four buttons in any order as demonstrated and as quickly as possible. You may steady the button board with your other hand so that it remains on the form-board throughout the task. Then stop the timer using only the appropriate hand.”

Simulated Food Cutting Place the knife to the side of the timer unit (right side for right-handed assessments, left side for left-handed assessments). Place the plasticine ‘food item’ in the designated area on the form board (mould to look like a sausage and fit approximately the area on the form board). Pick up the knife, using the other hand to steady the plasticine. Cut it clearly into two sections. Then replace the knife on the form board. Reset the task by remoulding the plasticine for the participant.

“Start the timer, use the knife provided to cut the plasticine clearly into two pieces, as demonstrated and as quickly as possible. You may use the other hand to steady the plasticine. Return the knife to its starting position on the board and the stop the timer.”

Page Turning Place the piece of card in the designated area on the opposite side of the platform to the hand under assessment. Using an extension or tripod grip, pick up the card, turn it over as if turning the pages of a book and place it on the opposite side of the form board (on the side under assessment). Reset the task for the participant.

“Start the timer lift and turn over the card as if you were turning the pages of a book and place the card on the opposite side of the board as demonstrated and as quickly as possible. Then stop the timer.”

Jar Lid The lid should be placed on the empty glass jar and tightened only with sufficient force as would be expected for everyday use/self storage. The jar should be placed in the designated area on the form board. Both hands should be used for this task. Pick up the jar using a power grip with the non-dominant hand, undo the lid and return both the jar and the lid to the designated areas on the platform. Reset the task for the participant.

“Start the timer, pick up the jar and undo the lid with the hand under assessment as demonstrated and as quickly as possible. Return the jar and lid to the platform as demonstrated and stop the timer.”

Glass Jug Pouring Fill the glass jug with 100ml of water (100ml is marked on the jug). Place the jug in the designated area of the form board with the handle of the glass jug pointing the right for right-handed participants, and to the left for left-handed participants. Place the glass jar (without the lid) on the designated left area for right-handed participants and the right for left-handed participants. Lift the glass jug by the handle using a lateral grip and show how to pour the water into the glass jar. Reset the task for the participant.

“Start the timer and whilst ensuring as little spillage as possible, pour the water from the jug into the jar as demonstrated and as quickly as possible. Replace the jug on the board and then stop the timer.”

Carton Pouring Empty the glass jar from the previous task and replace the jar in the same position on the form board. Fill the carton with 200ml of water (measured out in the glass jug). Place the carton in the designated area on the form board with the spout of the carton pointing toward to glass jar (according to the handedness defined for the previous task). Pick up the carton using a power grip and show how to pour the water into the glass jar. Reset the task for the participant.

“Start the timer and whilst ensuring as little spillage as possible, pour the water from the carton into the jar as demonstrated and as quickly as possible. Replace the carton on the board and then stop the timer.”

Lifting a Heavy Object Fill the glass jar with water to the top of the label and tighten the lid. Place the jar in the designated area on the form board, on the left side of the board for right-handed participants and the right side of the board for left-handed participants. Place the empty carton lengthways along the middle of the form board (without obstructing the timer unit) to create a barrier. Lift the jar over the carton using a power grip and place on the opposite side of the form board in the designated area. Reset the task for the participant.

“Start the timer, move the jar over the carton to the other side of the board as demonstrated and as quickly as possible. Then stop the timer.”

[THE WATER CAN NOW BE DISPOSED OF AND WILL FORM NO FURTHER PART IN THE ASSESSMENT.]

Lifting a Light Object Place the empty tin (with the plastic lid on) in the same position on the board as defined for the jar in the previous task and keep the carton in the same position on the form board creating a barrier. Lift the tin over the carton using the power grip and place on the opposite side of the form board in the designated area. Reset the task for the participant.

“Start the timer, move the tin over the carton to the other side of the board as demonstrated and as quickly as possible. Then stop the timer.”

[PLACE THE SHAP CASE ON THE TABLE DIRECTLY IN FRONT OF THE PARTICIPANT AND APPROXIMATELY 8cm FROM THE FRONT EDGE OF THE TABLE. PUT THE FOAM INSIDE THE CASE AND KEEP THE LID OF THE CASE OPEN. PLACE THE TIMER UNIT IN THE CASE ON THE FOAM INSERT IN THE APPROPRIATE POSITION. THE FINAL 5 TASKS WILL INVOLVE THE USE OF THE CASE.]

Lifting a Tray Place the form board ADL side up, on the table to the left of the case for right-handed participants and to the right for left-handed participants. Place the form board slightly overhanging the edge of the table with the long edge facing forwards. The timer unit should remain in the case. Both hands should be used to pick up the form board using a lateral or extension grip. Assuming a right-handed participant: lift the form board from the left side, over the case whilst remaining seated and place it on the table to the right side of the case. Reset the task for the participant.

“Start the timer, move the tray from the left/right to the right/left hand side of the case as demonstrated and as quickly as possible. Then stop the timer.”

Rotate Key Return the form board to the case ADL side up, placing in on top of the foam insert (the timer unit should fit neatly in its original position on the board without moving it from the foam). Turn the key to the white mark using the lateral grip.

“Start the timer, rotate the key as demonstrated and as quickly as possible to the white mark and release the key (at which time the key will spring back to its start position) and then stop the timer.”

Open/Close Zip Ensure the zip is closed. Open and close the zip using a lateral or tip grip.

“Start the timer, open and close the zip as demonstrated and as quickly as possible and then stop the timer.”

Rotate a Screw Place the screwdriver in the designated area on the form board on the right side for right-handed participants and the left for left-handed participants. The arrow unit is mounted on a clip, which should be attached to the front of the case (again, the right side for right-handed participants and the left for left-handed participants). Use the area directly in front of the screwdriver between the lock and the handle on the case. Ensure the arrow is pointing upward. Use two hands to guide the screwdriver to the screw and rotate it 90° clockwise to the mark on the clip using one hand only. Hold the screwdriver in a power grip. You may hold the clip on the top of the case to keep it stable with your other hand. Reset the task for the participant.

“Start the timer and use the screwdriver to rotate the screw a quarter turn clockwise to, or beyond the white mark as demonstrated and as quickly as possible. Once completed, the screwdriver should be replaced on the platform and the timer stopped. Two hands may be used to guide the screwdriver to the screw, but only the appropriate hand should be used for turning the screw. Your other hand can be used to steady the top of the arrow unit.”

Door Handle Rotate the door handle using a power grip until it is fully open, then release the handle.

“Start the timer, rotate the door handle until it is fully open and then release it as demonstrated and as quickly as possible. Then stop the timer.”