CHEDOKE-McMASTER STROKE ASSESSMENT

INCLUDES:

- Administering the Chedoke Assessment
- Scoring and Interpreting the Chedoke Assessment
- Chedoke-McMaster Stroke Assessment Score Forms
  - Impairment Inventory
  - Activity Inventory

Taken from:

CHEDOKE-McMASTER STROKE ASSESSMENT

Development, Validation and Administration Manual

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regional tertiary care program provided intensive rehabilitation lasting on average 10 weeks. Adults varying in age from 18 to 90 years were admitted to this unit. The time from onset of stroke to the admission to the unit varied from one week to several years, with a mean of 9 weeks.

Although the Chedoke Assessment was developed for the assessment of clients with stroke in a rehabilitation setting, its application has been more widely demonstrated. The Activity Inventory (formerly the Disability Inventory) has been shown to be a valid measure of functional change in clients in an acute neurological setting[4] and for those with acquired brain injury[5]. The Chedoke Assessment has been shown to function as discriminative, predictive, and evaluative measure. The minimal clinically important difference (MCID) of the Activity Inventory for neurological clients, including those with stroke, is 7 points when determined a physiotherapist, [4, 6, 7] and the MCID of the Activity Inventory is 8 points when determined by clients with stroke and their caregivers.[6,7] In addition, predictive equations have been developed for both the Impairment Inventory and the Activity Inventory for use with patients with acute stroke[8] or patients with stroke in the rehabilitation setting.[9] The predictive equations are found Chapter 8 of the manual. The potential for using the Impairment Inventory scores as a predictor of independent ambulation has also been reported.[10]

Limitations to Use

This measure had not been validated for use on clients who are less than one week post stroke.

ADMINISTRATION PROCEDURES

Physical setting, environment and clothing

Every effort should be made to ensure that the client feels comfortable and at ease during the administration of the assessment. The testing room should be comfortable warm, and large enough to accommodate a low plinth, a floor mat and a wheelchair. The plinth should be wide enough for a client to roll from supine to side lying without feeling apprehensive. Distractions should be kept to a minimum. Clients should wear comfortable clothing (e.g. shorts or a jogging suit) which allows the therapist to observe knees and elbows. During the testing of shoulder pain, the shoulder region should be free of clothing. Halter tops are suggested for female clients. Access to a full flight of stairs and the outdoors is required for the Activity Inventory. Shoes and orthoses are not worn during the testing of the Impairment Inventory stages, but should be worn for the administration of the Activity Inventory.

Equipment

All equipment should be assembled ahead of time.

- foot stool
- pillows
- 2 meter line marked on the floor
- chair with armrests
- adjustable table
- plastic measuring cup (250 ml)
- wide, low plinth
- stop watch
- floor mat
- ball, 6.5 cm (2.5 in) in diameter
- 1 liter plastic pitcher with water

Testing Time

Approximately 45 to 60 minutes is required to complete the assessment, depending on the client's level of endurance and concentration. It may not be feasible to complete the entire test in one session. Every effort should be made to complete the assessment within 2 days in order to minimize changes in the client's physical condition.

Client Safety

A therapist should always exercise sound judgement to ensure a client's safety. Prior to testing, check on the client's medical history and identify any conditions which could put the client at risk. The presence of pain should be considered as sufficient reason to not complete a task, which is then scored accordingly. If, during testing, the therapist thinks it is neither safe nor prudent to ask the client to attempt an activity that could worsen the client's condition (e.g., roll onto a very painful shoulder) the activity should be avoided. If a client becomes excessively fatigued or apprehensive it is advisable to end the assessment.

Client Comprehension of Instructions

A therapist's instruction, whether words or gestures, should be clear and concise. Every effort should be made to ensure that a client understands what is being asked of him or her. To ensure that a client understands what is being asked, a movement task may be demonstrated, a client's limb may be moved passively through a task, or the client may be asked to perform a task on the uninvolved side. A treatment session aimed at teaching a client how to perform a task should not precede testing. Once the client understands what is required, the test instructions are given, and the performance observed. Once a client understands what is requested, a task should only be attempted twice in the Impairment Inventory and only once in the Activity Inventory.

The administration and scoring guidelines are available in a Canadian French version as well.

THE CHEDOKE ASSESSMENT SCORE FORM

The Score Form for the Chedoke Assessment is reproduced at the end of this Chapter. Although copyrighted, we invite you to "COPY FREELY – DO NOT CHANGE." Detailed instructions for administration and scoring are provided in Chapter 7.

References:

1. Johnston MV, Keith RA, Hinderer SR. Measurement standards in interdisciplinary medical rehabilitation. Arch Phys Med Rehabil. 1992;73:s3-s23.

2. Gowland C, Stratford P, Ward M, et al. Measuring physical impairment and disability with the Chedoke-McMaster Stroke Assessment. Stroke 1993; 24 (1):58-63.

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4. Barclay-Goddard R. Physical function outcome measurement in acute neurology. Physiother Can 2000; 52(2):138-145.

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9. Gowland C, Van Hullenaar S, Torresin W, et al. Chedoke-McMaster Stroke Assessment - Development, validation, and administration manual. Hamilton, Ontario, Canada: School of Occupational Therapy and Physiotherapy, McMaster University, Hamilton, Ontario; 1995.

10. Stevenson TJ. Using Impairment Inventory Scores to determine ambulation status in individuals with stroke. Physiother Can Summer 1999; 168-174.

7
SCORING AND INTERPRETING THE CHEDOKE ASSESSMENT **Revised**

OVERVIEW

This Chapter continues with the guidelines for administration, scoring and interpretation.

IMPAIRMENT INVENTORY: SHOULDER PAIN
Score Form

STAGE 5: Shoulder pain is noted during testing, but the functional activities that the client normally performs are not affected by the pain

Shoulder pain is elicited only during active or passive movement of the shoulder. Pain does not limit the client's regular activities of daily living or other functions.

STAGE 6: No shoulder pain, but at least one prognostic indicator is present

No shoulder pain is noted during passive range of motion or with functional activities. One or more of the following adverse prognostic indicators are present:

- The arm is in a low stage of recovery, Stage 1 or 2.
- The scapula is malaligned. It can be elevated, depressed, abducted or adducted.
- Loss of range of shoulder movement with flexion or abduction less than 90°, or external rotation less than 60°.

STAGE 7: Shoulder pain and prognostic indicators are absent

The client does not complain of shoulder pain. No adverse prognostic indicators are noted.

MOTOR RECOVERY

Motor recovery following stroke was first described by Twitchell in a cardinal paper on "The restoration of motor function following hemiplegia in man", written in 1951.[1] In this paper, he introduced the notion of recovery occurring in a predictable manner with movement occurring first in stereotyped patterns of movement called limb synergies. Brunnstrom expanded on Twitchell's concepts, defined six discrete stages of motor recovery and described these limb synergies. The therapists on the stroke team at the Chedoke Rehabilitation Centre further expanded on this knowledge during the many years spent on the development of the Chedoke Assessment (see Chapter 2).

Knowledge of motor recovery should assist the individual therapist in precise staging and in linking the meaning of the assessment items and findings to both an understanding of the current state of the client's nervous system and the recovery taking place. As well, this knowledge should assist in the correct interpretation of the significance of the impairment and potential for change. Although some of this information was given in Chapter 2, it is repeated here to reinforce its importance when administering, scoring and interpreting the assessment results and planning treatment. This knowledge is summarized here under the headings: (i) definitions of the Stages of Motor Recovery, (ii) sequence of motor recovery, (iii) description of the limb synergies, and (iv) principles of motor recovery.

Definitions of the Stages of Motor Recovery

The definitions of the Stages of Motor Recovery are given in Table 7.1, on the following page. It is these definitions that form the conceptual context for the selection of items throughout the Impairment Inventory (with the exception of Shoulder Pain).

Sequence of Motor Recovery

In *Stage 1* the part (limb or trunk) is *flaccid* and the nervous system is in a state of inhibition. The muscle stretch reflexes (i.e., biceps, pronator, pectoralis major, triceps, quadriceps and tendo-achilles) are absent or hypoactive, the limb feels heavy and does not respond to facilitation. During the transition from Stage 1 to 2, tone increases. This increase in tone with the onset of hyperactive muscle stretch reflexes is obvious before active movement can be facilitated.

In *Stage 2* active movement can be facilitated or occurs spontaneously as an *associated reaction.* Arm movement may result from facilitation of the tonic neck reflexes. Resistance given to the contra lateral limb may also produce movement through facilitation of an associated reaction. Movement can be in any range. For scoring purposes, do *not* consider an increase in tone alone to qualify as movement. Movement results from the facilitation of spinal reflexes (e.g., input via cutaneous or proprioceptive receptors), brainstem (or tonic neck) reflexes (input via proprioceptive vestibular receptors or receptors in the neck), or associated reactions (irradiation from antagonists, synergists or muscles from the opposite side of the body).

Table 7.1 Definitions of the Stages of Motor Recovery

Stage	Description
1	Flaccid paralysis is present. Phasic stretch reflexes are absent or hypoactive. Active movement cannot be elicited reflexly with a facititory stimulus, or volitionally.
2	Spasticity is present and is felt as a resistance to passive movement. No voluntary movement is present but a faciftory stimulus will elicit the limb synergies reflexly. These limb synergies consist of stereotypical flexor and extensor movements.
3	Spasticity is marked. The synergistic movements can be elicited voluntarily, but are obligatory. In most cases, the flexion synergy dominates the arm, the extension synergy the leg. There are strong and weak components within each synergy.
4	Spasticity decreases. Synergy patterns can be reversed if movement takes place in the weaker synergy first. Movements combining antagonistic synergies can be performed when the prime movers are the strong components of the synergy.
5	Spasticity wanes, but is evident with rapid movement and at the extremes of range. Synergy

Synergy patterns and simple movements out of synergy are possible at *Stage 4*.

By *Stage 5*, full range synergy movements and complex combinations of synergies are possible. Ankle eversion, hip abduction with internal rotation, and finger and thumb extension are movements that are not part of either the flexion or extension synergies. Thus, they are slower to recover than other movements, and are not present through full range at this stage.

Stage 6 differs from normal only when the nervous system is stressed. This is tested by requesting more complex or faster movement than would normally be needed in daily activities.

By *Stage 7* there is no evidence of functional impairment. Activities and skill are at a pre-stroke level. There is a "normal" sensory-perceptual-motor system. Arms and legs do not feel heavier than the contralateral side nor do they fatigue more rapidly.

Description of the Limb Synergies

Brunnstrom[2] described four limb synergies:

- the flexion synergy of the arm and hand
- the extension synergy of the arm and hand
- the flexion synergy of the leg and foot
- the extension synergy of the leg and foot

She noted that the flexion synergy often dominates in the arm, while the extension synergy usually dominates in the leg. Any deviation from these usual states should be noted during assessment. She also identified what are usually the strongest and weakest components of each synergy. The components of the flexion and extension `of` the limb synergies `of` the arm, hand, leg and foot are identified in Table 7.2 on the following page.

Table 7.2 Flexion and Extension Limb Synergies of the Arm, Hand, Leg and Foot

ARM & HAND		LEG & FOOT	
Flexion	**Synergy**	**Flexion**	**Synergy**
Shoulder girdle	- elevation	Hip	- <u>flexion</u>
	- retraction		- abduction
Shoulder joint	- hyperextension		- external rotation
	- *abduction***	Knee	*-flexion*
	- *external rotation*	Ankle	- dorsi flexion
Elbow	- <u>flexion</u>*		- inversion
Forearm	- supination	Great Toe	- extension
Wrist	- flexion	Toes	- flexion
Finger	- flexion		
	- adduction		
Thumb	- flexion		
	- adduction		
Extension	**Synergy**	**Extension**	**Synergy**
Shoulder	- <u>adduction</u>	Hip	- *extension*
	- <u>internal rotation</u>		- adduction
Elbow	- *extension*		- internal rotation
Forearm	- pronation	Knee	- <u>extension</u>
Wrist	- flexion or extension	Ankle	- plantar flexion
Finger	- flexion		- inversion
	- adduction	Toes	- flexion or extension
Thumb	- flexion		
	- adduction		

* strong components underlined
** weak components italicized

IMPAIRMENT INVENTORY - STAGING MOTOR RECOVERY
Score Form Page 1

Principles of Motor Recovery

- Motor recovery from hemiplegia follows a stereotyped sequence of events.

- The performance of selected motor tasks, requiring increasingly more complex motor control, indicates recovery of the central nervous system.

- Movement first occurs in patterns (limb synergies), and, in the early stages, it is these patterns of movement that are assessed. As the stages progress, movement patterns become more complex and dependence on the stereotypical synergies decreases.

- Postural control, the arm, hand, leg and foot may recover at different rates (e.g., commonly the leg is in Stage 3 while the arm is in Stage 2). The stage of recovery of the proximal part of the limbs is often in a higher stage than the distal part (i.e., the arm is frequently in a higher stage than the hand). Also, movements involving flexion are often at a different stage of recovery than movements involving extension.

- Elements of pathology consistent with a lower stage of recovery may persist even when the client performs at a more advanced stage. For example, a single task within Stage 3 may not be possible when the client can perform two tasks at Stage 4.

- The Stages of Motor Recovery measure the amount of neurological impairment

ADMINISTRATION GUIDELINES

Refer to Chapter 6 (Administering the Chedoke Assessment) for administration procedures and score forms.

Starting position

Testing begins at Stage 4 for postural control and the leg, and at Stage 3 for the arm, hand and foot. Standard starting positions ar

Testing Procedures

When instructing the client, use simple commands. Examples of specific instructions are included for your use. You may modify the instructions, if necessary, to be sure that your client understands the required movements.

When Stage 2 tasks involve facilitated active movement, the movement may be in any range. Visible muscle contraction qualifies as movement, but an increase in muscle tone alone does not. When applying a facilitory stimulus only manual stimuli are permitted. Neither ice nor mechanical devices are allowed during testing. A facilitory stimulus cannot be applied more than twice. When testing Stage 2 tasks involving a change in tone, the part is passively put through the available range of movement briskly with two repetitions.

In Stages 3 to 7, voluntary movement is tested. Facilitation techniques are not permitted. Stage 6 tasks require full range of motion with near normal timing and coordination. Stage 7 tasks require fill range of motion and rapid complex movements with normal timing. For any task requiring either greater than half or full range of motion, compare with the range on the uninvolved side. At Stage 7, timing and coordination of the task must be comparable to the uninvolved side.

Once familiar with the assessment, you can increase your efficiency in test administration by minimizing the amount of repositioning that the client is asked to do. For example, test all postural control, arm, hand, leg and foot tasks that use the same starting position. In Stages 2 and 3 of the arm, hand, leg and foot, however, tasks within each stage must be done in the order presented. The weaker synergy should always be tested first.

Scoring

The client may attempt each task twice. Additional attempts which serve to train the client to achieve a task are not permitted. To receive credit for completing a task, the client must be able to perform it correctly at least once. Place an "X" in the appropriate box for tasks that are accomplished. If the client fails to complete two of the three tasks in the stage where testing began, move to a lower stage until two tasks are accomplished in a single stage. If two tasks are accomplished at the stage where testing began, assess the third task, but regardless of the result, move up to the next stage. In order to achieve a Stage 7, all, three tasks in Stage 6 as well as two

IMPAIRMENT INVENTORY – STAGE OF POSTURAL CONTROL
Score Form Page 1

Standard Starting Position: No shoes and socks. No standard position**.** Encourage good sitting posture (ie. with hips and knees at 90°) during testing when indicated. Start the assessment at Stage 4.

STAGE 1

Unable to demonstrate at least two of the Stage 2 tasks

STAGE 2

Task 1: **Facilitated log roll to side lying**
Position: Supine.
Instruction: "Roll onto your strong side."
Method: Facilitate rolling at head, shoulders or pelvis.
Required: Some active movement (either log or segmental rolling is acceptable).

Task 2: **Resistance to trunk rotation**
Position: Side lying on the strong side.
Instruction: "Let me move your trunk."
Method: Place one hand on the shoulder girdle and the other over the hip. Passively move shoulder girdle and hip in opposite directions with sufficient speed of passive movement to elicit a stretch reflex. Feel for resistance to trunk rotation.

Task 3: **Static righting with facilitation**
Position: Sitting unsupported on the side of the bed, hands on lap, feet on floor
Instruction: "Sit without holding on."
Method: Facilitate static righting in sitting.
Required: Some active response, without falling.
Don't accept: Holding on for support.

STAGE 3

Task 1: **Log roll to side lying**
Position: Supine.
Instruction: "Roll onto your strong side without pulling on the bed."
Required: Unassisted rolling onto side. Segmental rolling is acceptable.
Don't accept: Using hands to pull self over.

IMPAIRMENT INVENTORY – STAGE OF POSTURAL CONTROL
Score Form Page 1

Task 2: **Move forward and backward**
Position: Sitting unsupported on the side of the bed, hands on lap, feet on floor
Instruction: "Lean forwards and backwards, and return to the centre."
Required: Independent righting forward and backward within base of support. Head and

IMPAIRMENT INVENTORY – STAGE OF POSTURAL CONTROL
Score Form Page 1

Task 2:	**On weak leg 5 seconds**
Position:	Standing unsupported, arms at side.
Instruction:	"Stand only on your weak leg as long as you can."
Method:	Time unipedal stance and record results in box provided.
Required:	Independent unipedal stance for at least 5 seconds.
Allowed:	Arm, leg, and trunk movements that permit the person to accomplish the task.

Task 3:	**Sideways braiding for 2 meters**
Position:	Standing unsupported.
Instruction:	"Walk sideways to the left, keep crossing your right foot in front of the left foot for a distance of 2 meters, then reverse for 2 meters with your left foot crossing in front of your right foot. Keep your hips and feet facing forward and keep your feet on the line."
Method:	Use a 2 meter (2 yard) line on the floor. The client may stop to change directions.
Required:	The trunk, pelvis, and feet must remain facing forward, and the feet must stay on the line.

STAGE 7

Task 1:	**Abduction of strong leg**
Position:	Standing unsupported.
Instruction:	"Lift your strong leg out to the side while keeping your weak leg straight.
Required:	Abduction of strong leg beyond neutral, maintaining pelvic alignment.
Don't accept:	Trendelenburg.

Task 2:	**Tandem walking 2 meters in 5 seconds**
Position:	Standing unsupported.
Instruction:	"Touching heel to toe, walk along this straight line as quickly as possible."
Method:	Time 2 meters (2 yards) tandem walking. Record the number of seconds in the box provided. Use tape to make a 2 meter (2 yard) line on the floor.
Don't Accept:	Any loss of balance. (ie: falling off the line) or not touching heels to toes.

Task 3:	**Walk on toes 2 meters**
Position:	Standing unsupported.
Instructions:	"Walk on your tip toes without stopping."
Method:	Use tape to make a 2 meter (2 yard) line on the floor.
Required:	Bilateral equal plantar flexion and weight bearing.

Position: Standard starting position.
Instruction: "Touch your chin with your hand."
Required: Sufficient elbow flexion for any part of the hand to touch the chin. Movement in synergy is permissible.
Not permitted: Flexion of head

Task 3: Shoulder shrugging greater than half range
Position: Standard starting position.
Instruction: "Shrug both shoulders up towards your ears."
Required: Active scapular elevation greater than half range. Movement in synergy is permissible.

STAGE 4

Task 1: Extension synergy, then flexion synergy
Position: Standard starting position.
Instruction: "Reach across and touch your opposite knee with your elbow straight, then without stopping, touch the ear on your weak side, keeping your elbow up."
Required: Shoulder adduction and full elbow extension to touch or pass the top of the opposite knee with full internal rotation of the shoulder and pronation of the forearm. Then without stopping the shoulder should attain at least 90° of abduction with 0° horizontal flexion and some external rotation when the hand touches the ear. The forearm may be either pronated or supinated.
Don't accept: Prolonged pause between synergies.

Task 2: Shoulder flexion to 90°
Position: Standard starting position
Instruction: "Keep your elbow straight throughout movement, and lift your arm up to shoulder height."
Required: Shoulder flexion to 90ûwith full elbow extension. Forearm may be pronated.
Don't accept: Shoulder abduction, scapular elevation or elbow flexion.

Task 3: Supination then pronation
Position: Elbow at side with 90ûelbow flexion.
Instruction: "Keep your elbow at your side, and turn your palm up and then down."
Required: Full supination and full pronation. Elbow remains at side of trunk.
Don't accept: Compensatory movement of trunk.

STAGE 5

Task 1: **Flexion synergy, then extension synergy**

Position: Standard starting position.

Instruction: "Touch the ear on your weak side, keeping your elbow up, and then without stopping reach towards your opposite knee, finishing with your elbow straight."

Method: Watch for 90ûof shoulder abduction with 0ûhorizontal flexion and external rotation to touch the ear with any part of the hand. The elbow may be flexed with either pronation or supination. Touch the opposite knee while fully extending the elbow and adducting and internally rotating the shoulder with pronation of the forearm so that the palm faces down.

Task 2: **Trace a vertical figure 8**
Position: Shoulder flexion to 90°.
Instruction: "Draw a large "figure 8" keeping your elbow straight."

IMPAIRMENT INVENTORY: STAGE OF HAND

Task 3: **Finger flexion with lateral prehension**
Position: Standard starting position.
Instruction: "Make a tight fist and bring your thumb down to your index finger. Don't let me move your thumb."
Method: Test for active lateral prehension (key grip) by trying to move the thumb away from the index finger.
Required: Sufficient finger flexion to bring tips of all fingers to the palm of the hand. Active thumb flexion, and ability to maintain the prehension position.

STAGE 5

Task 1: **Finger flexion then extension**
Position: Standard starting position.
Instruction: "Make a tight fist and then straighten your fingers out."
Required: Smooth reversal from flexion to extension. Full flexion and full extension of fingers.
Don't accept: To bend or straighten fingers unevenly.

Task 2: **Finger abduction**
Position: Forearm pronated with fingers extended.
Instruction: "Spread your fingers apart as far as you can."
Required: Full range finger abduction
Don't accept: Wrist and finger flexion during movement.

Task 3: **Opposition of thumb to little finger**
Position: Hand unsupported (forearm may be supported).
Instruction: "Touch the tip of your little finger with the tip of your thumb."
Required: Some flexion of MCP, PIP, and DIP joints of the thumb and 5th finger.
Don't accept: Wrist flexion.

STAGE 6
Task 1: **Tap index finger 10 times in 5 seconds**
Position: Standard starting position with forearm pronated.
Instruction: "Keeping your finger straight, tap your index finger as quickly as you can."
Required: Active flexion and extension at MCP joint with IP joints in extension, with smooth movements of equal amplitude.
Don't accept: Movement taking place at wrist, or flexion of the IP joints.

Task 2: **Pull trigger, then return**
Position: Pistol grip, wrist in neutral position, thumb and index finger extended, 3 other fingers flexed.
Instruction: "Bend and straighten your index finger without moving anything else."
Required: Full range flexion and extension of PIP and DIP joints with no movement at the MCP joint of the index finger. No movement of thumb and other fingers.
Don't accept: Any change from the starting position.

Task 3: **Wrist and finger extension with finger abduction**
Position: Hand resting on lap or support, forearm pronated.
Instruction: "Lift your wrist as far as you can and then stretch your fingers apart."
Required: Full range wrist and finger extension with full range of abduction.

STAGE 7

Task 1: **Thumb to finger tips, then reverse 3 times in 12 seconds**
Position: Standard starting position with thumb touching the little finger.
Instruction: "Starting with the little finger, touch the tip of each finger with your thumb and then go back to the little finger. Make sure the index and little fingers are touched twice. Do this 3 times."
Required: Smooth, coordinated movement repeated 3 times in 12 seconds.

Task 2: **Bounce a ball 4 times in succession, then catch it**
Position: Sitting, holding onto a ball 6.5 centimeters (2.5 inches) in diameter (e.g. a tennis ball).
Instruction: "Bounce the ball 4 times and then catch it."
Required: The activity is controlled and the height of the ball (around knee height) is consistent. It is permissible to bounce ball between the knees or to the outside of weak side.
Don't accept: Catch and release of the ball.

Task 3: **Pour 250 ml. from 1 liter pitcher, then reverse**
Position: Sitting at a table with 250 ml. (1 cup) plastic measuring cup with handle and a 1 liter (1 quart) plastic pitcher on the table. The 1 liter pitcher is three-quarters full. The measuring cup is medial to the pitcher.
Instruction: "With your weak hand, pour the water from the pitcher to the cup. Pick up the cup and pour the water back into the pitcher by turning the palm of your hand up."
Required: The client must pour the water to fill the measuring cup. Task is accomplished without spilling the liquid.
Don't accept: Pitcher and cup touching, compensatory movements of the trunk or upper limbs or jerky movements.

Standard starting position: Lying on back with knees bent and feet flat, with hands resting on stomach, shoes and socks off, and pants rolled up. Start assessment at Stage 4.

STAGE 1

Unable to demonstrate at least two of the Stage 2 tasks.

STAGE 2

Task 1: **Resistance to passive hip or knee flexion**
Position: Standard starting position, with limb supported as necessary.
Instruction: "Let me move your leg."
Method: Choose either a) or b):

a) flex and extend hip 5 times with sufficient speed of passive movement to elicit stretch reflex. Feel for resistance to passive movement and watch for an active contraction of hip flexors.
b) flex and extend knee 5 times with sufficient speed of passive movement to elicit stretch reflex. Feel for resistance to passive movement and watch for an active contraction of the quadriceps.

Task 2: **Facilitated hip flexion**
Position: Standard starting position.
Instruction: "Bend your leg towards your chest."
Method: Facilitate a contraction of the hip flexors.
Required: Some active hip flexion.

Task 3: **Facilitated extension**
Position: Standard starting position.
Instruction: "Straighten your leg out."
Method: Facilitate a contraction of hip and knee extensors.
Required: Some active contraction of hip or knee extensors.

STAGE 3

Task 1: **Adduction to neutral**
Position: Standard starting position with weak leg abducted (30-45°).
Instruction: "Bring your weak knee into the middle."
Method: Adduction of weak leg to neutral. Foot may be stabilized.

Task 2: **Hip flexion to 90°**
Position: Standard starting position.
Instruction: "Bend your leg up towards your chest."
Required: Hip flexion to 90° (hip abduction and/or pelvic tilt are permitted).

Task 3: **Full extension**
Position: Standard starting position. Leg may be stabilized.
Instruction: "Straighten your leg out."
Method: Full active hip and knee extension. Gravity may assist with the movement. Adduction and internal rotation are not required, but are permitted.

STAGE 4

Task 1: **Hip flexion to 90° then extension synergy**
Position: Standard starting position. The unaffected leg remains in flexion during this task.
Instruction: "Bend your leg up towards your chest, and out to the side. Then without stopping, straighten your leg out, crossing your weak leg over the mid-line."
Required: Hip and knee flexion to 90°, hip abduction to 45°, and external rotation at least to neutral during the flexion component. Full extension of hip and knee with sufficient hip internal rotation and adduction to cross the weak foot over the midline. No stopping between synergies.
Don't accept: Prolonged pause between synergies.

Task 2: **Bridging hips with equal weight bearing**
Position: Standard starting position.
Instruction: "Lift your hips off the bed pushing equally with both feet."
Method: Test for equal weight bearing by trying to displace the weak foot.
Required: Hip extension and weight bearing equal bilaterally. Pelvis aligned.
Don't accept: The use of a non-slip material under the weak foot.

Task 3: **Knee flexion beyond 100°**
Position: Sitting, hips and knees flexed to 90° and feet supported.
Instruction: "Bend your knee back as far as you can."
Required: Knee flexion greater than $100^{o.}$
Acceptable: Part of the foot can remain in contact with the floor.
Don't accept: Excessive trunk movement.

Task 3:	**Trace a pattern: forward, side, back, return**
Position:	Standing on strong leg with light support.
Instruction:	"Trace the shape of a triangle on the floor: forward, side, back, return. Keep your forefoot on the floor and keep your knee straight."
Method:	Therapist may provide light support for balance.
Required:	Smooth, coordinated hip flexion, abduction and extension while keeping the knee extended.

Standard Starting Position: No standard position. Test all tasks in one position before the client moves to another position, i.e., in lying before sitting. Encourage good sitting posture (ie. with hips and knees at 90°) during testing when indicated. Remove socks and shoes. Start at Stage 3 with the client supine.

STAGE 1

Unable to demonstrate at least two of the Stage 2 tasks.

STAGE 2

Task 1: Resistance to passive dorsiflexion

Task 2: **Some dorsiflexion**

STAGE 5

Task 1: **Toe extension with ankle plantarflexion**
Position: Sitting with the weak leg crossed over the strong leg at the knee.
Instruction: "Push your foot down. Keep it there and then lift your toes up."
Method: Leg may be stabilized.
Required: Maintained ankle plantar flexion with full toe extension for all toes.

Task 2: **Ankle plantarflexion, then dorsiflexion**
Position: Sitting with the weak knee extended.
Instruction: "Push your foot down, then pull it up."
Method: Leg is fully extended. Support can be provided above the knee.
Required: Full plantarflexion and full dorsiflexion with knee extension.
Don't accept: Any knee flexion.

Task 3: **Eversion**
Position: Standing with involved foot slightly forward and light hand support.
Instruction: "Keeping your heel on the ground, lift your foot up and out."
Method: Do not stabilize the leg.
Required: Full eversion with heel on floor, with no internal or external rotation of hip.

STAGE 6

Task 1: **Tap the foot 5 times in 5 seconds**
Position: Standing with involved foot slightly forward and light hand support.
Instruction: "Heel on the floor, tap your foot as quickly as possible."
Required: At least 5 taps of the foot in 5 seconds. Smooth movements with consistent dorsiflexion range with each repetition while maintaining the heel on the floor.
Don't accept: Compensation with flexion synergy or trunk movement.

Task 2: **Foot circumduction**
Position: Standing with knee extended, weak foot off floor, and light hand support.
Instruction: "Make 4 large circles with your foot only."
Required: Smooth coordinated circular movement using full available range.
Don't accept: Movement at hip or knee.

Task 3: **Eversion**
Position: Standing with knee extended, weak foot off floor, and light hand support.
Instruction: "Keep your knee straight and then turn only your foot out."
Required: Full range eversion while maintaining full knee extension.
Don't accept: External rotation of hip.

STAGE 7

Task 1:	**Heel touching forward, then toe touching behind, 5 times in 10 seconds**
Position:	Standing with light hand support.
Instruction:	"Touch the floor in front of you with your heel and then behind you with your toes. Do this as quickly as you can."
Method:	The task consists of full dorsiflexion in front and full plantarflexion behind. Count the number of movements performed in 10 seconds.
Required:	Smooth, coordinated, full range dorsiflexion and full plantarflexion with hip extension.
Don't accept:	Weight bearing through support.

Task 2:	**Circumduction quickly, reverse**
Position:	Standing with weak foot off the floor and light hand support.
Instruction:	"Make 4 large circles with your foot in one direction and then reverse."
Required:	Smooth, coordinated, circular movement quickly in the full available range and at a constant speed.
Don't accept:	Weight bearing through support.

Task 3:	**Up on toes then back on heels 5 times**
Position:	Standing with light hand support.
Instruction:	"Stand on your toes, then back on your heels raising your toes up. Repeat as quickly as possible 5 times.”
Method:	Knees remain extended.
Required:	Weight bearing and range equal bilaterally for all 5 repetitions.
Don't accept:	Weight bearing through support
Permissible:	Slight hip flexion for balance

ACTIVITY INVENTORY

The purpose of the Activity Inventory is to assess the client's functional level, not the precise

COMPLETE DEPENDENCE - The client expends less than half (less than 50%) of the effort. Maximal or total assistance is required, or the activity is not performed. The levels of assistance required are:

2 **Maximal assistance -** The client expends less that 50% of the effort, but at least 25%.

1 **Total assistance -** The client expends less than 25% of the effort, 2 persons are required for assistance, or the task is not tested for safety reasons.

Note: Even though the overall scoring of the Activity Inventory is based on the FIM scoring principles, we have developed specific scoring criteria for the individual tasks of the Activity Inventory. For example, arms on the wheelchair or armchair, are not considered assistive devices.

You are expected to score each task, do not leave any item blank. If you decide not to test a task because of your concerns for the client's safety, assign a score of 1.

Task 1:	**Supine to side lying on strong side**
Position:	Supine lying, head on pillow, legs extended, arms by each side.
Instruction:	"Roll over towards your strong side."
Method:	Assist if necessary and judge the amount of assistance given. For use of the bedrail, score 6.
Permissible:	To use the bed or mattress to push on or pull up

Task 2:	**Supine to side lying on weak side**
Position:	Supine lying, head on pillow, legs extended, arms by each side.
Instruction:	"Roll over towards your weak side."
Method:	Assist if necessary and judge the amount of assistance given. For use of the bedrail, score 6.
Permissible:	To use the bed or mattress to push on or pull up

Task 3:	**Side lying to long sitting through strong side**
Position:	Side lying on the strong side, head on pillow, arms forward, legs slightly flexed.
Instruction:	"Come up into sitting with your legs out in front of you."
Method:	May flex, abduct and externally rotate hips, and flex knees. Assist if necessary and judge the amount of assistance given.
Permissible:	To use the bed or mattress to push on or pull up

Task 4:	**Side lying to sitting on side of the bed through strong side**
Position:	Side lying on the strong side, head on pillow, arms forward, legs slightly flexed.
Instruction:	"Come up into sitting with your legs over the side of the bed."
Method:	Assist if necessary and judge amount of assistance given and aids used. For use of the bedrail, score 6.
Permissible:	To use the bed or mattress to push up or pull up

Task 5:	**Side lying to sitting on side of the bed through weak side**
Position:	Side lying on the weak side, head on pillow, arms forward, legs slightly flexed.
Instruction:	"Come up into sitting with your legs over the side of the bed."
Method:	Assist if necessary and judge amount of assistance given and aids used. For use of bedrail, score 6.
Permissible:	To use the bed or mattress to push up or pull up

Task 6:	**Remain standing**
Position:	Standing.
Instruction:	"Stay standing for 30 seconds."
Method:	Time for 30 seconds. Assist if necessary and judge assistance given. If they use an aid to remain standing, score 6. Score a 1 if the client cannot stand for 30 seconds with assistance.
Permissible:	To assist the client to rise

Task 7:	**Transfer to and from bed towards strong side.**
Position:	a) Sitting in bed. b) Sitting in wheelchair or chair with arms.
Instruction:	Bed to chair: "Come and sit in this chair." Chair to bed: "Come and sit on the side of the bed." Client is permitted to use the arm of a chair to turn.
Method:	Assist if necessary and judge assistance given.
Required:	Safe performance of all aspects of task (including putting on brake, removal of foot pedal if necessary). Score 4 or lower if the client requires help with the brakes/pedals.

Task 8:	**Transfer to and from bed towards weak side**
Position:	a) Sitting in bed. b) Sitting in wheelchair or chair with arms.
Instruction:	Bed to chair: "Come and sit in this chair." Chair to bed: "Come and sit on the side of the bed."
Method:	Client is permitted to use the arm of a chair to turn. Assist if necessary and judge assistance given.
Required:	Safe performance of all aspects of task (including putting on brake, removal of foot pedal if necessary). Score 4 or lower if the client requires help with the brakes/pedals.

Task 9:	**Transfer up and down from floor and chair**
Position:	a) Sitting in the wheelchair or a regular chair with arms. b) Long sitting in the middle of the mat, facing the wheelchair or a regular chair.
Instruction:	a) "Go down onto the mat." b) "Come up and sit in the chair."
Method:	The client attempts both a) and b). The client is permitted to use arms of chair. Assist if necessary, judge amount of assistance given.
Required:	Safe performance of all aspects of task (including putting on brakes, removal of foot pedal if necessary).

Task 10:	**Transfer up and down from floor and standing**
Position:	a) Standing facing the floor mat. b) Long sitting in the middle of the mat.
Instruction:	a) "Get down onto the floor mat." b) "Stand up."
Method:	The clients attempts both a) and b). Assist if necessary, judge amount of assistance given. Furniture, such as chairs, is not allowed.
Required:	Safe performance of task.

WALKING INDEX

A device is any type of walking aid. The highest score that a client can reach with a walking aid or orthoses is 6. To receive 7, the client must walk independently without aids.

Task 11: **Walking indoors 25 meters**
Position: Standing**.**
Instruction: "Walk up and down the hall."
Method: Measure distance walked. Assist if necessary and judge amount of assistance given. (25 meters equals 27 yards.)
Modified scoring: Assign a score of 5 if client walks 15 meters (16 yards) (but not 25) indoors independently with or without an aid.

Task 12: **Walking outdoors, over rough ground, ramps, and curbs (150 meters)**
Position: Standing.
Instruction: "Walk outside on a lawn, a side walk, across a street, and up and down a hill."
Method: Walk a minimum of 150 meters outdoors. Assist if necessary, judge amount of assistance given. If the client cannot walk 150 meters with assistance, score a 1. (150 meters equals 164 yards.)
Required: Safe performance of the task.
Note: If necessary, you can simulate outdoor walking indoors using ramps, varied surfaces, curbs, etc.

Task 13: **Walking outdoors 6 blocks (900 meters**)
Position: Standing.
Instruction: "Walk 6 city blocks." (a distance of 900 meters, with one block approximately equal to 150 meters)
Method: Assist if necessary, judge amount of assistance given. (900 meters equals 984 yards)
Required: Safe performance of the task.
Modified scoring: Assign a score of 5 if client walks 300 meters (324 yards) independently with or without an aid.
Note: If necessary, you can simulate outdoor walking indoors using ramps, varied surfaces, curbs, etc.

Task 14: **Walk up and down stairs**
Position: Standing.
Instruction: "Go up and down 10 to 14 steps (one flight)."
Method: Assist if necessary, judge amount of assistance given. The railing is considered a device.
Required: Safe performance of the task.
Modified scoring: Assign a score of 5 if the client goes up and down 4 to 6 steps independently, with or without an assistive device, and/or takes more than reasonable time or there are safety considerations.

SHOULDER PAIN

1 ☐ constant, severe arm and shoulder pain with pain pathology in more than just the shoulder

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IMPAIRMENT INVENTORY: STAGE OF RECOVERY OF ARM AND HAND

ARM and HAND: Start at Stage 3. Starting position: sitting with forearms in lap or supported on a pillow in a neutral position, wrist at 0° and fingers slightly flexed. Changes from this position are indicated by underlining. Place an X in the box for each task

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SCORE FORM Page 3 of 4
IMPAIRMENT INVENTORY: STAGE OF RECOVERY OF LEG AND FOOT

LEG: Start at Stage 4 with the client in lying on back with knees bent and feet flat. FOOT: Start at Stage 3 with client in supine. Test position is beside the item or underlined. If not indicated, the position has not changed. Place an X in box of each task accomplished. Score the highest stage in which the client achieves at least two Xs. For "standing" test items, light support may be provided but weight bearing through the hand is not allowed. Shoes and socks off.

	LEG	
1		not yet Stage 2
2	Crook lying	resistance to passive hip or knee flexion
		facilitated hip flexion
		facilitated extension
3		abduction, adduction to neutral
		hip flexion to 90°
		full extension
4		hip flexion to 90° then extension synergy
		bridging hips with equal weightbearing
	Sit	knee flexion beyond 100°
5	Crook lying	extension synergy, then flexion synergy
	Sit	raise thigh off bed
	Stand	
	5	hip extension with knee flexion