

17th March

Revised Hammersmith Scale for SMA (RHS)

2015

The Revised Hammersmith Scale for SMA (RHS) is a revision and extension of the original and expanded versions of the Hammersmith Functional Motor Scale with the inclusion of new items for the assessment of motor function in Type 2 and 3 Spinal Muscular Atrophy. The items for this scale were finalised on 17th March 2015. This is the manual of testing procedures accompanying this scale.

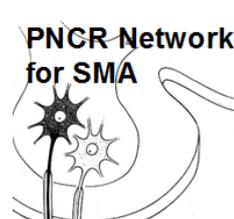
This scale is presented by SMA REACH UK, the Italian SMA Network and the Pediatric Neuromuscular Clinical Research Network (PNCN) for SMA (USA).

Manual Version 1.2

Date 30.06.2021

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RHS Manual Revisions

Manual Version Number	Effective Date	Reason for Change	Author
1.0	21.04.2015	Original manual to accompany 17.03.2015 finalised scale items.	Danielle Ramsey
1.1	15.05.2015	Photographs added to items: 3, 4, 14, 17, 21, 22, 23 & 24, 28 & 29, 30, 31, 32 & 34, 33 & 35, 36	Danielle Ramsey
		Scale item and scoring unchanged from 17.03.2015 finalised scale items. Further wording clarification added to scoring detail section for items: 5 & 6, 8, 10, 14, 31, 36 Further wording clarification added to starting position to item: 11	Danielle Ramsey
1.2	30.06.2021	Inclusion of original research paper in introduction, and original scale papers. Update on notes of testing procedure (removal of reference to pilot following publication in 2017) updated sections 1, 2, 4, 5. Addition of copyright reference to manual and proformas.	Danielle Ramsey

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*item includes reference to WHO developmental milestones

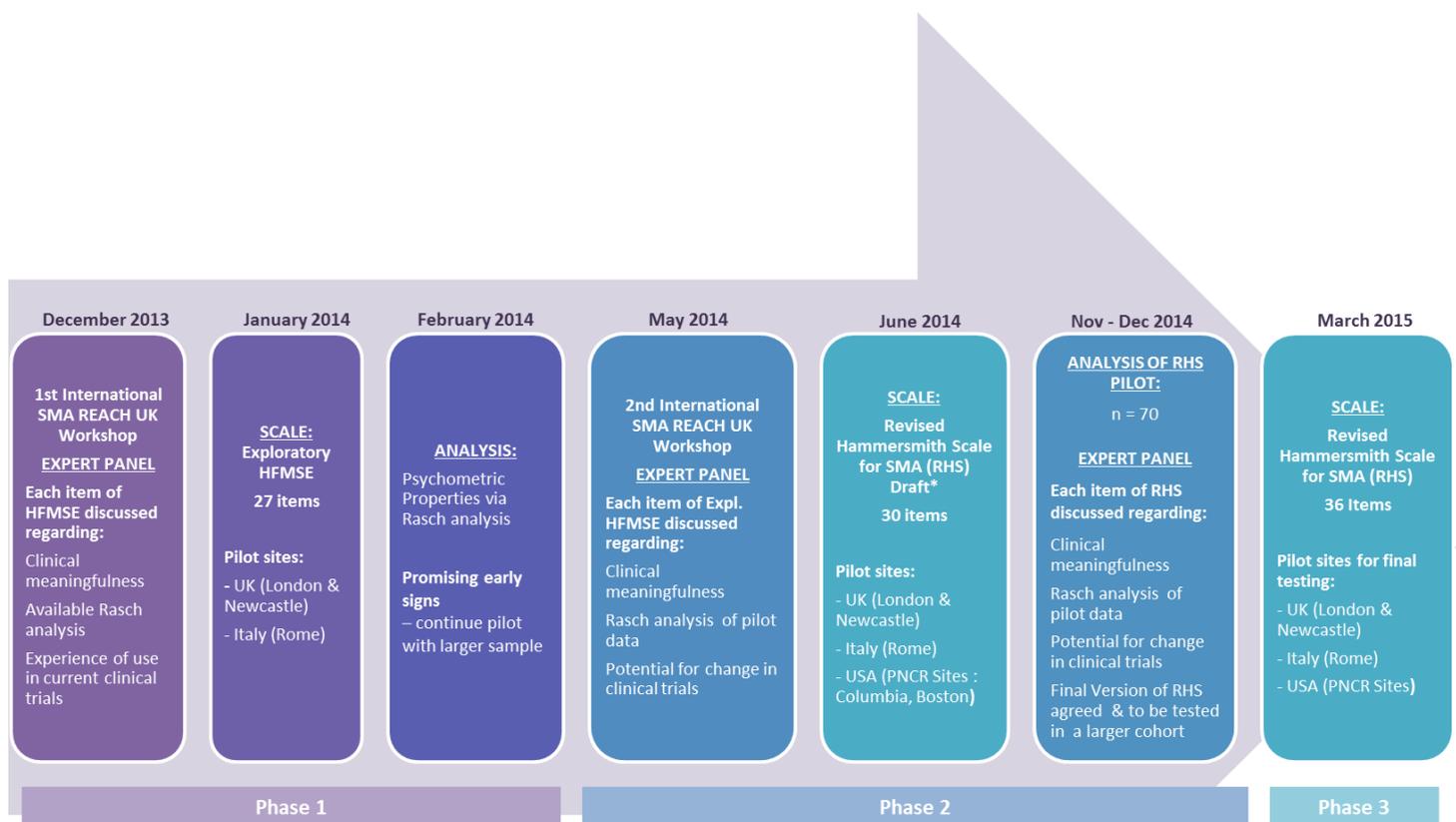
Revised Hammersmith Scale for SMA (RHS)

Introduction to this collaboration

The development of the Revised Hammersmith Scale for SMA (RHS) is part of an international collaborative effort by SMA REACH UK, the Italian SMA Network and PNCr to improve functional outcome measures in Spinal Muscular Atrophy.

Two workshops (December 2013 & May 2014) and numerous teleconferences have been held by SMA REACH UK with expert Physiotherapists and Physicians from the UK, Italy and USA to address current bottlenecks with the existing functional scales used in SMA types 2 & 3. The RHS (17.03.2015) has been developed following these workshops to improve clinical meaningfulness, statistical robustness, sensitivity and specificity of the Hammersmith Functional Motor Scale Expanded (HFMSSE) in the light of advancement in the field of SMA, and the need for robust measures for clinical trials involving novel therapeutics.

Method of Development



*RHS (Draft) new name for Expl. HFMSSE version 2

This manual provides both the proformas and the detailed operating procedures for the Revised Hammersmith Scale for SMA (RHS) (17.03.2015). Original article:

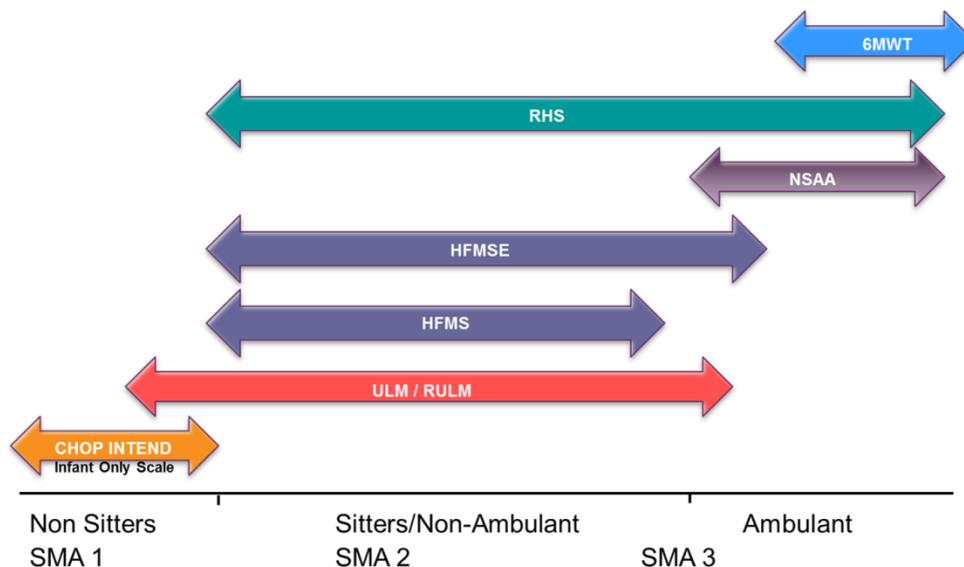
[Revised Hammersmith Scale for spinal muscular atrophy: A SMA specific clinical outcome assessment tool](#)

Ramsey D, Scoto M, Mayhew A, Main M, Mazzone ES, et al. (2017) Revised Hammersmith Scale for spinal muscular atrophy: A SMA specific clinical outcome assessment tool. PLOS ONE 12(2):

eo172346. <https://doi.org/10.1371/journal.pone.0172346>

The RHS can be conducted alongside the original Hammersmith Functional Motor Scale Expanded (HFMS). For reference purposes where the item links to original scales this will be indicated in the manual, for clarification of scoring for original scales please see their respective manuals.

Figure 1: How the RHS fits in the continuum of outcome measures in SMA



The RHS (17.03.2015) includes references to the WHO Multicentre Growth Reference Study (MGRS) developmental milestone indicators (Wijnhoven et al, 2004). These can be completed alongside the RHS items but must be formally administered.

Acknowledgements

This manual is the result of international collaboration between Danielle Ramsey, Anna Mayhew, Marion Main, Elena Mazzone, Jackie Montes and PNCR evaluators (Sally Dunaway, Amy Pasternak & Rachel Salazar).

We are also grateful to Marion Main for the creation of the original Hammersmith Functional Motor Scale (HFMS) and her support for its use worldwide. We also would like to acknowledge Jessica O'Hagen and colleagues for their work developing the Expanded version of the HFMS (HFMSE) and Anna Mayhew and colleagues (Michelle Eagle, Jessica O'Hagen, and the PNCR evaluators - Allan Glanzman, Jackie Montes, Susan Riley, Janet Quigley, Sally Dunaway, and Shree Pandya) for the HFMSE manual upon which this manual is based. We also thank the previous authors of the manuals for their permission to reproduce their original photographs for this manual.

Additional items have been adapted from the North Star Ambulatory Assessment for SMA to remove any ceiling effect. Therefore we also acknowledge the developers of the NSAA – Elaine Scott, Michelle Eagle, Anna Mayhew and the Physiotherapy Assessment and Evaluation Group of the North Star Clinical Network. We also thank them for permission to reproduce their original photographs for this manual.

We would like to thank the generous support of The SMA Trust (UK) who has funded SMA REACH UK and the support of the SMA Foundation (USA) and Spinal Muscular Atrophy Support UK (formerly The Jennifer Trust for SMA) for the development of previous scales.

We are grateful to all of the clinicians and investigators that have provided feedback and their ongoing input regarding the development of this scale.

Finally, we thank the patients and their families who have participated in the scale's pilot and who have given us their time and their permission to use their photographs to illustrate this assessment tool successfully.

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Notes on Testing Procedure

1. Intended Population

The RHS is intended for use in assessing the functional motor abilities of people with SMA type 2 and 3, the ambulant and non-ambulant population. This manual clarifies the procedures and scoring. Where transitioning from routine use of the HFMSE to the RHS we recommend that the RHS is done in conjunction with the original HFMSE (using the combined proforma, page 43) for at least one assessment to enable comparison with previous scores/assessments.

2. Motor Scale Evaluators

RHS assessments should be performed by individuals who have experience in the handling of children and adults with SMA, such as physical or occupational therapists. Some quantifiers or additional items in the comments section are for exploratory purposes, for example with item 5 & 6 documentation of contractures in the comments section may be a potential confounder.

Any use of this scale for research purposes should be predicated by the understanding of the scales' starting positions, operational definitions and scoring criteria. If the scale is utilised for clinical research, evaluators are encouraged to undergo training to establish reliability prior to beginning data collection.

3. Instructions to the subject & coaching parameters

This gross motor measure should reflect the subject's best ability and best performance on the day. If after verbal instructions are given, the subject does not understand the command, or if clarification is needed, the evaluator may demonstrate the item. To make the demonstration uniform, the highest scoring item (most difficult) should be demonstrated. When the item is to be tested, the item instructions are given verbally then followed by an optional demonstration. Any subject especially younger ones may require encouragement to complete the task. Use what is appropriate and works for the individual in order to demonstrate their best abilities.

4. Order of tests

The RHS has been ordered to limit positional changes and fatigue; items become progressively harder according to that position. Ideally all centres would follow the same test order and for research purposes this would be **essential** as fatigue can be an issue with these children. In the clinic setting it may be appropriate to alter the order to suit the needs of the patient.

Using the RHS in combination with the HFMSE (page 43)

RHS Proforma includes the RHS in addition to the original scoring of the HFMSE, whereby 2 scales can be tested using a single proforma. The HFMSE items appear below the corresponding RHS item and should be tested in the order dictated by the RHS. This may cause the test to be a little longer than usual but in reality this should have little impact on the subject as it is mainly a concern for the examiner to test one item and score it 2 different ways. In some instances it may require some items being repeated, however this should be minimal. Any evidence of increased fatigue as a result of the test should be noted in the comments section of the proforma.

WHO Developmental Milestones

RHS Items 1, 12, 16, 17 and 18 contain references to the WHO developmental milestone indicators, these items are marked with a *. The corresponding WHO item is referenced in the comments section and the scoring criteria is found at the end of the proforma. These items may be an extension of what is required to score on the RHS. These can be scored alongside the corresponding RHS item (so to avoid repetition later in the test), however to score the item they should be formally administered. Scoring criteria of the WHO developmental milestones can be found on page 38.

5. Clinical evaluation

It is recommended that when using the test for clinical use that **all** the items should be attempted, even though you may have seen the child you are assessing before and think you know their level of motor ability, we request that you test all the items. At subsequent assessments you may feel it is clearly unnecessary to test the child on some items but they should be attempted once or twice.

For some items there are additional quantifiers or boxes to tick in the scoring category or additional notes in the comments section. Please complete where possible as this will help identify potential confounders related to the scoring.

Contractures

The impact of contractures on some items needs to be established, for example in items 5 & 6. Therefore, please detail where prompted, or provide extra information if you perceive it to be a confounding factor. Where there is not additional detail on the proforma contractures can also be noted by ticking the limited by contractures column LBC.

Documentation of Right, Left and/or Asymmetry

For many items of the RHS, after discussion by the expert panel, it was decided that recording both sides is not always required; therefore some items from the original scale have been combined and rescored. Conversely there are some instances where it is clinically useful to note the asymmetry, where this is the case separate right and left items are included. The proforma has been designed to enable clinicians to document asymmetry when observed regardless of whether it is being scored.

A box for R/L indicates notation of whether the task is achieved with each side (tick both) or to note asymmetry (tick one box if completed). If asymmetry is noted the best achievable score is taken for the most able side, this is noted by ticking that box, or described in the comments section.

For example –

Item 8 Supine to Side Lying

- *subject is only able to half roll to the left, L*
- *subject is able to half roll to both sides R L*

If there are no boxes to document the asymmetry in the scoring criteria record the highest score for the most able side and note in the comments section any additional information useful for your clinical records.

For example

- *Item 25 Rise from Floor – subject's best ability is to rise from floor leading via right half kneel, but they cannot do this with the left – they score 2 and R ½ kneel in the comments section.*

This process is explained in detail throughout the manual. For repeated tests the side scored previously should always be repeated and scored again to ensure consistency.

6. Trials/number of attempts to achieve items

The subject is allowed three trials for each item. The best-performed trial will be scored.

7. Orthotic use

During the testing, **no orthoses are to be used**. This includes scoliosis jackets, AFOs, Lycra suits/garments, socks and shoes. If the subject cannot perform the item without the use of orthotics, the score should be recorded as a zero.

8. Attaining /maintaining starting position

Ideally the subject should get into the starting position themselves. If they are unable to do so they may be placed into the starting position by the therapist where indicated. This is often due to the fact that many children with SMA are prone to soft tissue contracture, specifically of the tendoachilles, hamstrings, and hip flexors. In order to score an item the correct starting position must be achieved either by the individual or with the assistance of the therapist. If placed by the therapist, they must be able to maintain the position independently.

9. Clothing

Testing should be done with as minimal amount of clothing as is comfortable. This will allow the evaluator to assess posture and compensations. T-shirts and shorts are recommended. No socks or shoes.

10. Previous assessments

Please do not examine previous results prior to reassessing a patient as this is likely to bias your current assessment. Do, however, note where relevant any R / L preference from previous tests in order to replicate the test reliably.

11. Compliance issues

Where gaining and maintaining compliance is an issue, therapists are asked to make a value judgment whether the test results give a true value of the patient's ability. If it is felt that data is poor this should be clearly noted at the end of the proforma. Distractions should be kept to a minimum wherever possible during testing.

12. Rest breaks

Rest breaks are allowed if required but should be included in the overall timing of the test.

13. Clinical environment

Ideally the clinical environment should be kept as free from distractions as possible.

14. Time taken to complete

Timing of administration should begin after the test is explained to the subject and parents, and the subject is in the starting position for item 1. The subject should not be informed of the timed aspect of the test as it may result in a sped up effort and unnecessary fatigue. Once the final task is attempted, timing should cease. The time taken should be recorded in whole minutes (round up half minutes).

15. Timing tasks

Several tasks depend on being able to hold a position for 3 seconds. In the text this is called "for the count of 3". It is unnecessary to use a stopwatch for this amount of time when involved in a clinical assessment. When counting to 3, time for 3 seconds by saying: "and 1 - and 2 - and 3" so that three seconds is achieved on the word of 3. "For the count of 10" also utilises this approach.

In addition to noting technique, items 19 and 25 are also timed using a stopwatch. The timing aspect is separate to the scoring of the item and is detailed further in the scoring criteria section of this manual on pages 25 and 30.

16. Safety

For some tests having the evaluator available to guard the subject whilst attempting the task will be a necessary safety precaution. For some items, such as "standing", "single leg stand" or "stand to sitting on the floor", it may be advisable to have a bench/plinth nearby as well.

17. Equipment

- Plinth (Mat table)
- Floor-mat
- Stop watch
- Chair
- Bench/Height adjustable plinth (mat table)
- Stairs, at least 4 (6 inches/15cm in height) with a railing (or standard therapy stairs)
- Tape and ruler (see item 36)
- 12 metre space for run/walk item
- Box step 15cm (6 inches) in height

Scoring Criteria

Test item 1*: Sitting

Starting Position

Best attainable independent sitting position with back unsupported on floor/plinth



Ring sitting – ‘frog’ sitting with hips abducted and externally rotated, or cross-legged sitting

90/90 sitting – hips and knees at 90° on the edge of the plinth, feet unsupported (not in wheelchair)

Preferred sitting position ring or 90/90, if also able to do this in long sitting as in original HFMSE item 2 (score 2) tick long sitting box in the comments section.



Long sit – with legs straight = knees maybe flexed, knee caps pointing upwards, ankles <10cm apart.

Instruction

Can you sit on the plinth/chair without using your hands for support for a count of 3?

Scoring detail/diagram

For a score of 1

- Needs hand/s to prop in any seated position – long, ring or 90/90
- Propping with hand/s – includes 1 or 2 hands, these may be in contact with surface or their body

Score

2

1

0

Activity: Sitting

Sitting unsupported:

Maintains seated position via propping with hand/s:

Unable to sit

Ring or 90/90

Ring or 90/90

Photographs / Notes



Figure 1a Score 2

Subject able to maintain ring or 90/90 sitting, as described, without hand for support for a count of 3. Arms need to be clear of floor and body for more than a count of 3. This degree of shoulder flexion is not required.



Figure 1b & c Score 1

Subject uses any sitting position –Ring or 90/90 but requires use of their hand/s to prop maintain position. Able to hold position for a count of 3. Hand support may be in contact with the surface or their body.

Subject unable to sit without support externally, or unable to maintain a sitting position for a count of 3.

Corresponding item(s)

HFMSE 1, 2

*WHO 1 Sitting without support (page 38)

Test item 2: Hands to head in sitting

Starting Position

Not tested in wheelchair. The sitting position used should be their best unsupported sitting position for use of their arms. Can be tested in floor sitting or 90/90 over edge of plinth (not 'w' sitting).

Floor sitting = long sit, ring sitting, cross-legged sitting.

90/90 sitting = hips and knees at 90° on the edge of the plinth, feet unsupported (not in wheelchair)

Specify sitting position in comments section

Instruction

Can you show me how you get your hand/hands to your head? (hands touch head above level of ears/eyebrows)

Scoring detail/diagram

Fingertips must touch head above ear level. Ear level is an imaginary line made around the circumference of the head from the superior tip of the left ear, across the face to the eyebrow line, to the superior tip of the right ear and behind their head back to the starting point.

Arms free from side = visible space between arms and body, may be using abduction or a combination of abduction and flexion.

For a score of 1, tick which arm they are able to use to complete the task, if they can do it with each arm but only one at a time tick both R & L.

If they use any neck flexion or if you observe minimal head flexion, ask them to repeat the test to see if they can score 1 or above.

Record their sitting position using the boxes in the comments section: 90/90, ring, long or describe other position if required.

Score

2

1

0

Activity:
Hands to head in sitting

Able to bring both hands to head at same time – arms free from side without flexing head or trunk

Able to bring one hand to head – arms free from side without flexing head or trunk

Using compensations – flexing head & trunk or “crawling” hand/s

Unable to bring hand to head

R L

Photographs / Notes

Subject can touch both hands to head above the ear/eyebrow line whilst maintaining stable trunk and head position, arms are free from side.



Figure 2 Score 1

Using only 1 hand subject is able to touch head above ear/eyebrow level whilst maintaining stable trunk and head position, reaching arm is free from side.

Using compensatory movements

- Able to get hands above ear/eyebrow line but uses head/trunk flexion or by using “crawling” movements of hand/s.

Unable

- Subject attempts to reach the head above level of ear but is unable to reach to ear/eyebrow line.

Corresponding item(s)

HFMSE 3, 4

Test item 3: Sitting to lying

Starting Position	Long sitting or nearest equivalent on the plinth/mat. Not 90/90 sitting over edge of bed.		
Instruction	<i>Can you lie down in a controlled/safe way from sitting?</i>		
Scoring detail/diagram	Scores 2: Controlled way can mean through side-lying or by lowering themselves using their arms and legs Scores 1: May use one of the techniques above but lacks some control or flops forward / rolls sideways. However remains safe – does not risk injury. Evaluator can demonstrate technique.		
Score	2	1	0
Activity: Sitting to lying	Able to lie down through side lying or using clothes in a controlled/safe way	Able to lie down by going forwards and rolling sideways, or through prone in a controlled/safe way	Unable or completes in uncontrolled/ unsafe way
Photographs / Notes	 <p>Figure 3a Score 2 Subject moves from sitting to lying, through side-lying, or with use of hands in a controlled/safe way without collapsing.</p>	<p>Movement is controlled/safe.</p>  <p>Figure 3c Score 1 Subject moves from sitting to prone by going forwards/collapsing (controlled/safe) and rolling sideways to get to supine.</p>	
	 <p>Figure 3b Score 2 Subject completes through sagittal plane (reverse sit-up), does not use hands.</p>		
Corresponding item(s)	HF MSE 10		

Test item 4: Adduction from crook (hook) lying

Starting Position

Supine on mat/plinth with hips at 45° and knees at 90° with feet hip width apart, knees not touching.



Evaluator passively positions one leg in the abducted position and asks child to bring the leg back to the starting position – adducting and internally rotating the leg. The goal of this item is to focus on the child's ability to adduct the legs from the abducted position.

Evaluator must not stabilise non-tested leg.

Instruction

Can you bring your leg back to the middle and hold this position for a count of 3?

Scoring detail/diagram

If the subject is only able to achieve adduction utilising compensatory movements or if their movements lack control, their highest achievable score is 1 if they are able to attain the starting position.

To score 2 they must return from their full available range and have control throughout movement. If they are only able to complete part of the movement, or lack control the maximum available score is 1.

For a score of 2 mark which leg they are able to use to complete the task, if they can do it with each leg mark R & L.

Score

2

1

0

Activity:
Adduction from
Crook (Hook) Lying

Able to adduct to bring 1 leg back to neutral

Holds crook lying position for a count of 3

Unable to maintain/ achieve starting position.

Photographs / Notes



Figure 4a Score 2

Full available range is achieved.

If they can only complete with one leg mark right or left, tick both if able to do both sides in isolation, full available range required.



Figure 4b Score 1

Only able to attain and hold the starting position for a count of 3.

If able to adduct but lacks control and can maintain starting position score is 1.

If they are able to adduct but not through full available range score is 1.

Corresponding item(s)

CHOP INTEND 5

Test item 5 & 6: Hip flexion in supine Right & Left

Starting Position	<p>In supine on mat/plinth with knees and hips in the maximal available extension.</p> <p>Note level of contracture in comments section if a flexion contracture at hip/knee of $> 15^\circ$ is present as it may place them at an increased mechanical advantage.</p>		
Demonstration	<p>Passively move the limb through the maximal available range of motion that you would like the child to complete</p>		
Instruction	<p><i>Can you bring your right knee to your chest? Try to go as far as you can</i></p> <p><i>Now can you bring your left knee to your chest? Try to go as far as you can</i></p>		
Scoring detail/diagram	<p>Ideally the leg must remain in neutral alignment line with kneecaps facing up and hips in neutral rotation and ab/adduction to ensure measurement of flexion, however any strategy to gain hip flexion is permitted (i.e. hip in external rotation).</p> <p>For a score of 1 and 2 the subject is permitted to use "creeping" motions (ideally in alignment described above).</p>		
Score	2	1	0
Activity: Right & Left hip flexion in supine	Full hip flexion achieved	Initiates right hip and knee flexion ($>10\%$ of available range of motion)	Unable
Photographs / Notes	<p>Full range is defined as $>110^\circ$ or full available range.</p>  <p>Figure 5 & 6a Score 2 The subject is able to perform full flexion of hip and knee (i.e. beyond 110°). The thigh should approximate the subject's chest and the posterior calf should touch/approximate the thigh.</p>	<p>Subject is able to initiate flexion $>10\%$ but does not achieve full range ($<110^\circ$)</p>  <p>Figure 5 & 6b Score 1 The subject initiates hip and knee flexion or flexes through partial range – visible knee <u>and</u> hip flexion $>10\%$ from starting position. The foot does may/may not leave the surface of the bed.</p>	The subject is unable to initiate hip and knee flexion.
Corresponding item(s)	<p>HFMSE 21 & 22</p>		

Test item 7: Lifts head from supine

Starting Position	Supine on mat/plinth with arms crossed over chest		
Instruction	<i>Can you lift your head to look at your toes keeping your arms folded for a count of 3?</i>		
Scoring detail/diagram	If subject is unable cross their arms over their chest due to arm weakness you can help them fold their arms across their chest.		
Score	2	1	0
Activity: Lifts head from supine	Can lift head up through neck flexion and holds for a count of 3	<input type="checkbox"/> Can lift head with compensatory movements for a count of 3 <input type="checkbox"/> Can lift head up momentarily through neck flexion (< a count of 3)	Unable
Photographs / Notes	<p>Achieves neck flexion purely in the sagittal plane, no compensations</p>  <p>Figure 7a Score 2 Subject able to flex his neck and break contact with the mat, holding the position for a count of 3.</p>	<p>With compensatory movements: Head is lifted but through side flexion, using protraction or with no neck flexion.</p>  <p>Figure 7b Score 1 Subject able to flex head, breaking contact with the mat for a count of 3 by side flexing.</p> <p>Lifting momentarily: Subject breaks contact with the surface but for less than a count of 3</p>	Head remains in contact with the plinth.
Corresponding item(s)	HFMSE 17 NSAA 12		

Test item 8: Supine to side lying

Starting Position

Supine on mat/plinth with arms by side or in mid-position



Instruction

Can you roll onto your side?

Scoring detail/diagram

Side lying is defined as shoulders perpendicular to floor, and trunk and hips in line with body. The end position the leading leg ends up on top of the other.

This item is scored either able or unable to do. The subject will achieve a score of 1 as long as they are able to roll in one direction regardless of whether they need to use their own arms to help push/pull.

Document in the comments section whether they are able to go to R and/or L, if able to do both ways tick both boxes. If subject can roll to one side but not the other, right or left the best achievable side should be ticked.

Score

1

0

Activity:

Supine to side-lying

Able to roll onto side

Unable to roll onto side in any direction

Photographs / Notes



Figure 8a Score 1

Hips roll enough to be in line with shoulders and perpendicular to the mat.

Unable to complete or initiate roll.



Figure 8b Score 0

Subject rolls upper trunk but is unable to bring hips in line with shoulders and perpendicular to the mat.

Corresponding item(s)

HFMSE 5

Test item 9: Rolls supine to prone

Starting Position

Supine on mat/plinth with arms in mid position or by side.



Instruction

Can you roll from your back to your tummy? Try not to use your arms

Scoring detail/diagram

Please note any asymmetry if able to only complete to one side by ticking R/L in the comments section, scoring on the proforma the performance of the best side. If able to do it to both sides tick both boxes.

R
 L

Final prone position = prone with arms out from underneath body, hips and shoulders parallel to plinth.

Scores 0 – if unable to bring hips **and** shoulders into prone, or if one shoulder/hip is raised. This may be due to limitations as a result of contractures, mark as 0 but if due to contractures note this in the LBC column.

Score

2

1

0

Activity:

Rolls supine to prone

Rolls fully into prone without pulling/pushing on arms

Rolls fully into prone by pulling/pushing on arms

Unable to roll into prone in any direction. Does not initiate or complete

Photographs / Notes



Figure 9a Score 2

Subject is able to roll from supine to prone over any side without pulling/pushing on his hands.



Figure 9b&c Score 1

Subject able to achieve the task but uses arms (hands 9b, elbows 9c)



Scores 0 if there is an attempt to transition from supine towards, but not achieving full prone.

Unable to achieve final prone position

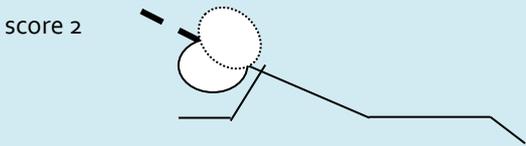
Corresponding item(s)

HFMSE 8, 9

Test item 10: Lifting head from prone

Starting Position	Prone with forehead resting on mat/plinth arms down by side or forwards. If subject cannot achieve prone independently the evaluator may position them in prone.		
Instruction	<i>Can you lift your head up keeping your arms by your side for a count of 3?</i>		
Scoring detail/diagram	Scores 2 or 1: Chin needs to be clear of floor and held for a count of 3. Arm position for a score of 1: positioned between 70° and 110° shoulder abduction. If unable to maintain prone position due to contractures score 0 and mark LBC.		
Score	2	1	0
Activity: Lifting head from prone	Lifts straight up, arms down by sides for a count of 3	Lifts straight up, arms forward for a count of 3 	Unable or lifts less than a count of 3
Photographs / Notes	 Figure 10a Score 2 Subject able to lift head and break contact with the mat for a count of 3 with arms resting by sides.	 Figure 10b Score 1 The subject can only lift his head off the mat when his arms are in the mid position but can do this for a count of 3.	 Figure 10c Score 0 Subject is unable to lift head to break contact with the mat with arms by the side or in the mid position. Or Can lift head up momentarily but not sustain it for a count of 3.
Corresponding item(s)	HFMSE 12		

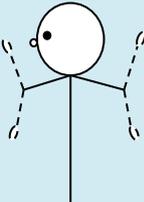
Test item 11: Prone; prop on forearms

Starting Position	<p>Prone with forehead resting on mat/plinth, arms down by side.</p> <p>If subject cannot achieve prone independently the evaluator may position them in prone.</p>		
Instruction	<p><i>Can you prop yourself on your forearms with your head up (not holding your head) for a count of 3</i></p>		
Scoring detail/diagram	<p>If unable to achieve position due to contractures mark this in the limited by contractures column (LBC) and give details if necessary.</p> <p>Scores 2: If head is level with trunk or above it</p> <div style="text-align: center;">  </div>		
Score	2	1	0
Activity: Prone; prop on forearms	<p>Achieves position and holds head up independently for a count of 3</p>	<p>Maintains position with head supported on hands for a count of 3</p>	<p>Unable or holds for less than a count of 3</p>
Photographs / Notes	<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;">  <p>Figure 11 a Score 2 Subject able to independently transition from prone to prop on forearms and maintain this position with head up for a count of 3.</p> </div> <div style="width: 45%;"> <p>Requires support to be placed into the position but when placed is able to hold their own head up for a count of 3.</p> <p>Or</p> <p>Able to achieve position independently but requires use of their hands to hold their head up for a count of 3.</p> </div> </div>		 <p>Figure 11b Score 0 Subject is unable to prop on forearms and maintain head up without assistance (therapists hands still in contact)</p>
Corresponding item(s)	<p>HFMSE 11</p>		

Test item 12*: Four point kneeling/crawling

Starting Position	<p>Prone on mat/plinth, arms in mid position or by side.</p> 		
Instruction	<p><i>Can you get onto your hands and knees and then crawl?</i></p>		
Scoring detail/diagram	<p><u>Head Position:</u></p> <p>Score 2: Ideally head extended, looking forwards, however if they are able to crawl with head down this would also achieve a score of 2 as they have achieved functional ambulation.</p> <p>Score 1: Head may be in line with body or extended beyond neutral.</p> <p>Score 0: Head falls below the line of the body when asked to maintain four-point kneel.</p>		
Score	2	1	0
Activity: Four point kneeling/ crawling	Crawls moving all 4 limbs at least 2 times in a row	Achieves four-point kneeling	Unable
Photographs / Notes	<div style="display: flex; justify-content: space-around;"> <div data-bbox="359 981 670 1214">  <p>Figure 12a Score 2 Clear movement of all 4 limbs at least 2 times in a row (any pattern).</p> <p>Achieves ambulation via crawling with head down or up.</p> <p>May use a strategy of sliding their knees, this is permitted as long as they are gaining functional ambulation.</p> </div> <div data-bbox="774 981 1069 1214">  <p>Figure 12b Score 1 Subject is shown in independent transition from prone to four point kneeling, able to maintain this position, with head up for a count of 3.</p> </div> <div data-bbox="1197 981 1444 1214">  <p>Figure 12c Score 0 Subject was unable to maintain the required alignment, head falls below the line of the body</p> <p>Or</p> <p>Cannot obtain position independently</p> </div> </div>		
Corresponding item(s)	<p>HFMSE 15, 16 *WHO 2 Hands and knees crawling (page 38)</p>		

Test item 13: Rolls prone to supine

Starting Position	Prone arms in mid position (see diagram) or by side 		
Instruction	<i>Can you roll from your tummy to your back? Try not to use your arms</i>		
Scoring detail/diagram	Please note any asymmetry if able to only complete to one side by ticking R/L in the comments section, scoring on the proforma the performance of the best side. If able to do it to both sides tick both boxes. <input type="checkbox"/> R <input type="checkbox"/> L Final supine position = supine with arms out from underneath body, hips and shoulders parallel to plinth. Scores 2: Momentum is allowed as long as not pushing or pulling with arms. Scores 0: If unable to bring hips and shoulders into supine. This may be due to limitations as a result of contractures, mark as 0 but if due to contractures note this in the LBC column.		
Score	2	1	0
Activity:	Rolls fully into supine without	Rolls fully into supine by	Unable to roll into supine in any
Rolls prone to supine	pulling/pushing on arms	pulling/pushing on arms	direction. Does not initiate or complete
Photographs / Notes	 <p>Figure 13a Score 2 Subject rolls from prone to supine over his side without using his arms to help.</p>	 <p>Figures 13b Score 1 Subject moves from prone to supine independently using one arm to push them through the movement.</p>	Unable to achieve final supine position  <p>Figure 13c Score 0 Movement to full supine is attempted but not achieved. If due to contractures mark 0 and note this in the LBC column.</p>
Corresponding item(s)	HMFSE 6, 7		

Test item 14: Lying to sitting

Starting Position	Supine arms by side		
Instruction	<i>Can you get from lying (supine) to sitting?</i>		
Scoring detail/diagram	<p>Score 2: Able to get into sitting by using side-lying or supine – not turning into prone or towards floor.</p> <p>Using clothing counts as using hands. If the patient does not have clothing on during the assessment but states they can complete lie to sit when they pull on their clothes, re-assess this item with their clothes on.</p> <p>Final sitting position: must <u>not</u> be 90/90 over the edge of the bed, any other upright sitting position on the plinth/mat (with/without propping) is acceptable.</p>		
Score	2	1	0
Activity: Lying to sitting	<p>Able by using supine / side lying using</p> <p><input type="checkbox"/> 1 hand</p> <p><input type="checkbox"/> 2 hands</p>	<p>Able by using strategies:</p> <p><input type="checkbox"/> Turns into prone or towards floor</p> <p><input type="checkbox"/> Able by utilising momentum / pulls on legs</p>	<p>Unable</p>
Photographs / Notes	<p>Supine: Utilises flexion in the sagittal plane with no compensatory movements (full sit-up), may use one arm to assist.</p>  <p>Figure 14a Score 2 Subject does not use hands, and moves through sagittal plane.</p> <p>Side: Able by using side lying / pushing up through side.</p>  <p>Figure 14b Score 2 Subject moves from lying to sitting through side lying pushing up through side.</p>	 <p>Figure 14c Score 1 Subject can independently move from lying to sitting by turning into prone and pushing up into sitting.</p> <p>Or</p> <p>Utilises momentum by rocking forwards and pulling on legs.</p> <p>Or any other strategy, please note in comments.</p>	<p>Subject is unable to transition from lying to sitting independently.</p>
Corresponding item(s)	<p>HFMSE 14</p> <p>NSAA 10</p>		

Test item 15: Sit to stand

Starting Position	Sitting on chair / plinth with arms crossed over chest 90° at hips and knees feet shoulder width apart feet supported on floor/ box/step		
Instruction	<i>Can you stand up from the chair/bench keeping your arms folded if you can?</i>		
Scoring detail/diagram	Feet should be supported on the floor or on a box step in starting position Any use of hands on body to assist to stand will lead to a score of 1		
Score	2	1	0
Activity: Sit to Stand	Able to stand up without using arms (keeping arms folded, feet do not move)	Stands by using strategies: (circle relevant) Uses hands on legs/chair / Turns Prone / Widens Base	Unable
Photographs / Notes	Goes from sitting to standing without using hands, with feet shoulder width apart Legs must not rest on the back of the chair.	Subject widens base of support > shoulder width and pushes on chair score = 1 Any use of hands on chair and/or body score = 1 Widening base of support > shoulder width without use of hands scores = 1 Turning prone (involves use of hands on the chair) score = 1	Unable to initiate or complete.
Corresponding item(s)	NSAA 3		

Test item 16*: Cruising/supported stand

Starting Position	Standing barefoot on the floor.		
	No use of orthotics.		
	The evaluator should be nearby to guard the subject in order to ensure safety.		
Instruction	<i>Can you walk holding on around furniture?</i>		
Scoring detail/diagram	<p>Definition of support</p> <ul style="list-style-type: none"> - Subject uses 2 hand support on plinth/stable surface. Plinth is at level of umbilicus. - Trunk, hip and knees must <u>not</u> be supported. - Subject must be able to control hip, knee and pelvis independently. - Can be placed in this position as long as they are able to maintain it. <p>If unable to stand supported using their hands on a surface score 0.</p> <p>If can stand momentarily note this in the comments section but this is not given a score.</p> <p>If they are able to cruise please note if they are able to do it to the right and the left or if there is any asymmetry by marking the R/L boxes, if they can do it to both sides mark both boxes.</p>		
Score	2	1	0
Activity: Cruising/ Supported Stand	Cruise at least 5 steps around furniture <input type="checkbox"/> R <input type="checkbox"/> L	Stands supported for a count of 3	Unable to stand supported
Photographs / Notes	Whilst holding on to the plinth/stable surface with both hands they are able to cruise (side-step) in one direction for at least 5 steps.	The subject is able to stand holding onto the surface with both hands and is able to stay in this position for at least a count of 3. If they are able to maintain for at least 10 seconds then they also meet the WHO developmental milestone for standing with assistance.	<p>Unable to stand supported</p> <p>Or</p> <p>Able to stand but only with the use of KAFOs, gaiters, standing frame.</p>
Corresponding item(s)	<p>HFMSE 18</p> <p>* WHO 3 Standing with Assistance (page 38)</p> <p>*WHO 4 Walking with Assistance (page 38)</p>		



Figure 16a Score 0
Subject unable to achieve standing without additional support at hip and trunk.

Test item 17*: Standing

Starting Position	Standing barefoot on the floor, feet should be approximately 10cm/hip width apart (place hand between feet to get approx. 10cm).		
	No use of orthotics.		
	The evaluator should be nearby to guard the subject in order to ensure safety.		
Instruction	<i>Can you stand without holding onto anything for a count of 3?</i>		
Scoring detail/diagram	Can be placed in this position as long as they are able to maintain it without support.		
	If can stand momentarily note this in the comments section but this is not given a score.		
Score	2	1	0
Activity: Standing	Stands <u>upright</u> and <u>symmetrically</u> , without compensation for a count of 3	Stands but with some degree of compensation for a count of 3	Cannot stand independently, needs support
Photographs / Notes	Subject is able to stand independently for a count of 3.	Lacks upright, symmetry. Using compensatory strategies eg: Adducting knees, unable to stand still on the spot, excessive calcaneal eversion.	Unable to stand independently Or Able to stand but only with the use of KAFOs, gaiters, standing frame.
			
	<p>Figure 17b Score 1 Compensations seen in standing, needs to adduct knees for stability.</p>	<p>Figure 17c Score 0 Subject unable to achieve standing without additional support at hip and trunk.</p>	
Corresponding item(s)	HFMSE 19 NSAA 1 *WHO 5 Standing Alone (page 38)		

Test item 18*: Walking

Starting Position	Standing barefoot on a level floor. Tested without orthotics, sock and shoes. Walking aids are not permitted.		
	The evaluator should be nearby to guard the subject in order to ensure safety.		
Instruction	<i>Can you walk without using any help or aids? Show me</i>		
Scoring detail/diagram	Score 0 if requires orthotics in order to stand or step and is unable to take steps without.		
Score	2	1	0
Activity: Walking	Takes at least 5 steps unaided	Able to takes < 5 steps unaided	Unable
Photographs / Notes	Independently walks 5 steps with good balance and upright posture.	Subject may require close supervision, able to keep balance for at least one step, may have limited movement. Must be a clear step – foot must leave contact with the floor.	Unable to stand independently and take any steps. Or Only able to complete the distance with a walking aid.
Corresponding item(s)	HFMSE 20 *WHO 6 Walking Alone (page 38)		

Test item 19: Runs 10m

Starting Position	<p>Standing barefoot. Tested without orthotics, socks or shoes. No walking aids are permitted. This item is also timed for additional information.</p>		
	<p>Timed Test: These items are preferentially tested without the use of shoes or orthoses. The use of any aids/orthoses/shoes should be marked on the assessment sheet and remain consistent for future tests wherever possible.</p> <p>A 10m measured walkway is marked in the physiotherapy department or hallway. The patient is shown start and finish lines and asked to traverse this as <i>quickly</i> as they safely can. They should not be asked to run – but rather to get there as quickly as they can, the choice is then theirs. 'Prime' them by saying '<i>ready, steady, GO</i>'. Time is recorded with a stopwatch from when their first foot crosses the start line to when the second foot crosses the finish line. If wall is touched, note how often.</p> <p>Note: Care needs to be taken to ensure that the patient is safe when completing this test. The assessor can walk nearby to provide 'emergency' help should it be needed, but must not support or provide manual assistance for the patient in any way.</p>		
Instruction	<p><i>Can you go as quickly and safely as you can to.....(give 10 m marker) "Ready steady GO"</i></p>		
Scoring detail/diagram	<p>This is also a timed test but may not necessarily be a run hence the instruction "Go as quickly and safely as you can"</p>		
	<p>Note the use of any walking aids and the timed test in the comments section, use of walking aids would be a score of 0. Time is recorded even if they walk and are unable to achieve a run.</p>		
Score	2	1	0
Activity: Runs 10m	<p>Can run – both feet off the ground</p>	<p>Speeds up walk but always maintains one foot on the floor</p>	<p><input type="checkbox"/> Walks with no extra speed</p> <p><input type="checkbox"/> Only with aids</p> <p><input type="checkbox"/> Unable</p>
Photographs / Notes	 <p>Figure 24a Score 2 Both feet off the floor, definite 'run'</p>	 <p>Figure 24b Score 1 Picks up speed but always maintains one foot is always in contact with the floor, no 'flight'.</p>	<p>Able to complete distance but walks with no extra speed.</p> <p>Or</p> <p>Would require use of a walking aid to complete the distance.</p> <p>Or</p> <p>Unable to complete the distance</p>
Corresponding item(s)	<p>NSAA 17</p>		

Test item 20: Squat down and up

Starting Position	<p>Standing barefoot independently on a level floor or mat.</p> <p>No orthotics used.</p>		
Instruction	<p>The evaluator should be nearby to guard the subject in order to ensure safety.</p> <p><i>Can you squat and stand up again?</i></p> <p><i>Pretend you are going to sit on a very low seat – only go as far down as you are able to get up from on your own.</i></p>		
Scoring detail/diagram	<p>Movement must be controlled to score 2, 1</p> <p>If subject requires hand support to complete the task this is defined as</p> <ul style="list-style-type: none"> - Ability to support themselves by using hands on their own body/floor - They are allowed to use their hands to get up for a score of 1 and 2 		
Score	2	1	0
Activity: Squat down and up	<p>Full squat down (without using hands) and up* (with/without using hands)</p> <p>At least 90° achieved at knees/ hips</p> <p>*must be able to get up from final range</p> <p style="text-align: center;"><input type="checkbox"/> Using hands</p>		
Photographs / Notes	 <p>Figure 20a Score 2</p> <p>Attains a full squat position – hips and knees flexed greater than 90° without arm support</p> <p>Can use their hands to help themselves up either by pushing on the floor or on their body.</p>	<p>Able to complete a mid-range squat with or without the use of hands.</p>  <p>Figure 20b Score 1</p> <p>Subject completes squat <90° with hands on self.</p>	<p>Unable to control movement or unable to initiate movement.</p>
Corresponding item(s)	HFMSE 28		

Test item 21: Stand to sit on floor

Starting Position	Standing barefoot on a level floor or mat. To attempt this item, the subject must be able to maintain independent standing without arm support.		
Instruction	<i>Can you sit on the floor in a controlled/safe way from standing? Try not to use your arms</i>		
Scoring detail/diagram	Sitting is any style of comfort on the floor/mat i.e. long, frog etc. (Not 'w' sit). Any use of furniture will score 0.		
Score	2	1	0
Activity: Stand to sit on floor	Able to sit down arms free in a controlled manner	Sits on floor using hands on floor/body	<input type="checkbox"/> Using furniture <input type="checkbox"/> Unable
Photographs / Notes	<p>The subject is able to lower themselves to sitting on the floor with control and without using their arms. "With control" implies that the movement is regulated or directed, no fast movements or collapse permitted.</p>	<p>The subject is able to lower to sitting on the floor with use of arms or lacks control during the transition ('crashes')</p> <p>They may use their arms on their own body i.e. hands on thighs is considered arm support.</p>	<p>Any use of furniture to assist transfer to floor.</p> <p>Unable to complete transition.</p>
			
	<p>Figure 21a Score 1 Subject is able to sit down using hands on floor.</p>		<p>Figure 21b Score 0 Subject requires furniture to transition to the floor.</p>
Corresponding item(s)	HF MSE 27		

Test item 22: High kneeling

Starting Position	<p>Sitting</p> <p>It is permitted to use a therapy bench/plinth/floor if required for support.</p> <p>The evaluator should be nearby to guard the subject in order to ensure safety. This item may require a few "test trials" to determine whether or not the subject will require a bench for support.</p>		
Demonstration	<p>Demonstrate the high kneeling position</p>		
Instruction	<p><i>Can you kneel like this (high kneeling) for a count of 10?</i></p>		
Scoring detail/diagram	<p>High kneeling is defined as weight taken on both knees. Trunk, hips and knees should all be in alignment to ensure symmetrical muscle activity is being used. Some degree of lumbar lordosis is permitted as a compensatory movement, however if they are only able to maintain high kneeling due to excessive lumbar lordosis and poor alignment relative to this, a score of 0, unable to achieve high kneeling, should be given.</p> <p>Arms can be used to assist with transition for a score of 1 and 2. However to maintain high kneeling arms free scores 2.</p> <p>If subject requires hand support to complete task this is defined as</p> <ul style="list-style-type: none"> - Ability to support themselves by using only hands on the plinth/bench or on their own body - Trunk and hips must not be in contact with the surface - Preferentially assess without support first 		
Score	2	1	0
Activity: High kneeling	Maintains high kneeling without holding on for a count of 10	Maintains high kneel with one arm support for a count of 10	Unable
Photographs / Notes	<p>May or may not use hands to attain high kneeling, but able to maintain a high kneel position without upper limb support.</p>  <p>Figure 22a Score 2 Subject able to maintain high kneeling without holding on for a count of 10.</p>	<p>One hand support only on the plinth/bench with upright posture maintained as described above</p>	<p>Unable to attain or maintain position.</p> <p>Does not achieve high kneeling alignment described above with or without one arm support i.e. only able to maintain position with excessive lumbar lordosis.</p>  <p>Figure 22c Score 0 Subject only able to achieve high kneeling with use of 2 hands to support.</p>
Corresponding item(s)			

Test item 23 & 24: High kneeling to half kneel Right & Left

Starting Position	<p>High kneeling, arms free.</p> <p>Arms can be used for a score of 1 to assist with transition or subject is able to use one arm on a bench to support themselves in this position. It is permitted to use a therapy bench/plinth/their own body for support.</p> <p>The evaluator should be nearby to guard the subject in order to ensure safety.</p>		
Instruction	<p><i>Can you bring your left leg up so that your foot is flat on the ground without using your arms and hold for a count of 10?</i></p> <p><i>Now can you bring your right leg up so that your foot is flat on the ground without using your arms and hold for a count of 10?</i></p>		
Scoring detail/diagram	<p>This item may require a few "test trials" to determine whether or not the subject will require a bench for support.</p> <p>Half kneeling is defined as weight taken on one knee and the opposite foot:</p> <ul style="list-style-type: none"> - RIGHT half kneel = left foot forwards, weight-bearing on right knee - LEFT half kneel = right foot forwards, weight-bearing on left knee <p>Alignment is not a consideration.</p> <p>If subject requires hand support to complete task this is defined as:</p> <ul style="list-style-type: none"> - Ability to support themselves by using only hands on the plinth/bench or on their own body - Trunk and hips must not be in contact with the surface - If achieved a score of 1 note as appropriate if their hands were used for support by checking the following boxes in the comments section <input type="checkbox"/> support <input type="checkbox"/> no support - Preferentially assess without support first 		
Score	2	1	0
Activity: High kneeling to half kneel (Right & Left)	<p>Able to achieve and maintain position without arm support for a count of 10</p>	<p>Maintains half kneel with one arm support for a count of 10</p> <p>With:</p> <p><input type="checkbox"/> support</p> <p><input type="checkbox"/> no support</p>	<p>Unable</p>
Photographs / Notes	 <p>Figure 23 & 24 a Score 2 Able to complete without need of arms for transition or to maintain half kneeling</p>	 <p>Figure 23 & 24b Score 1 Subject requires use of one hand on the bench to get into the position of half kneel or to maintain half kneeling.</p> <p>Subject should have good upright posture and half-kneel position but needs to support themselves with one hand on the bench.</p> <p>Subject can be placed into half kneel and maintain one arm support for a count of 10.</p>	 <p>Figure 23 & 24 c Score 0 Unable to get into half kneeling or maintain position.</p>
Corresponding item(s)	HF MSE 23, 24		

Test item 25: Rise from floor

Starting Position	Supine arms down by sides on floor/mat. This item is also timed for additional information.		
Instruction	<p>Timed Test: The subject starts in supine with their arms by their side. They are told to stand up as quickly as possible when the command "GO" is given. Time is recorded with a stopwatch from the initiation of movement until the assumption of upright standing. The area should be free from furniture and the patient should not be wearing orthoses or using any aids.</p> <p>Note the time in the comments section.</p> <p><i>Can you get up from the floor using as little support as possible and as fast as you can? Stand up as quickly as possible when the instruction "GO" is given</i></p>		
Scoring detail/diagram	Note further details of technique in comments section for clinical records.		
Score	2	1	0
Activity: Rise from floor	Achieves rise from floor without hands (any unsupported method)	Able to get up from floor using hands on floor and/or body	<input type="checkbox"/> Able to get up from floor using furniture/ assistance <input type="checkbox"/> Unable to get up from floor using any method
Photographs / Notes	<p>If achieves via ½ kneeling note which side they use in the comments section i.e. <input checked="" type="checkbox"/> L ½ kneel (R foot forwards)</p> <p>Subject moves from supine to standing using any modified technique (without using furniture) for example:</p> <ul style="list-style-type: none"> - Turns towards the floor (into a four-point kneeling position or rolls to prone) - Places hands on the floor to assist rising and walks hands up body until upright - Uses one or both arms to push up on legs to achieve upright standing - Large base of support by abducting hips and extending knees <p>Subject can independently move from supine to sitting and then requires furniture to push up on to stand.</p> <p>Unable to initiate / complete.</p> <p>Also scores 0 if unable to attain independent standing.</p> <div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div style="text-align: center;">  <p>Figure 25 b Score 1</p> </div> <div style="text-align: center;">  <p>Figure 25c Score 0 Subject needs to use furniture to get to standing</p> </div> </div>		
Corresponding item(s)	HFMSE 25,26 NSAA 11		

Test items 26 & 27: Stand on one leg Right & Left

Starting Position	Standing barefoot on the floor. Tested without orthotics, socks or shoes.		
	The evaluator should be nearby to guard the subject in order to ensure safety.		
Instruction	<i>Can you stand on your right leg for a count of 3?</i> <i>Now can you stand on your the left leg for a count of 3?</i>		
Scoring detail/diagram	It may be helpful to demonstrate this item. Hold your foot out in front of you to discourage compensatory wrapping of one leg around the other.		
Score	2	1	0
Activity: Stand on one leg Right & Left	Able to stand in a relaxed manner (no fixation) for a count of 3	Stands but either momentarily or needs a lot of fixation e.g. by knees tightly adducted or other trick	Unable
Photographs / Notes	Visible gap between knees required and minimal trunk compensatory movements. If excessive trunk sway/side flexion score is limited to 1.	Excessive postural sway. Fixation via adduction and hooking raised leg behind weight-bearing leg.	
Corresponding item(s)	NSAA 4, 5		

Test items 28 & 29: Hops Right & Left

Starting Position	<p>Standing barefoot on the floor. Tested without orthotics, socks or shoes.</p> <p>The evaluator should be nearby to guard the subject in order to ensure safety.</p>
Instruction	<p><i>Can you hop on your right leg?</i> <i>Now can you hop on your left leg?</i></p>
Scoring detail/diagram	<p>It may be helpful to demonstrate this item.</p> <p>This item is scored as either able or unable to hop</p>
Score	<p style="text-align: center;">1 0</p>
Activity: Hops Right & Left	<p>Distinct hop: clears forefoot and heel off floor Unable</p>
Photographs / Notes	<div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div style="text-align: center;">  <p>Figure 28 & 29a Score 1 Obvious foot clearance required.</p> </div> <div style="text-align: center;">  <p>Figure 28 & 29b Score 0 Foot does not leave the floor.</p> </div> </div>
Corresponding item(s)	<p>NSAA 15, 16</p>

Test item 30: Ascend 4 stairs

Starting Position	Standing independently, barefoot.		
Instruction	<p><i>Can you walk up the steps?</i></p> <p><i>If support is needed you may only use one rail (can use two hands to one rail)</i></p>		
Scoring detail/diagram	<p>Using a set of standard stairs (each step 15cm/6 inches in height, therapy stairs if possible), goal is to ascend 4 steps, must complete all 4 steps to score.</p> <p>Alternating pattern = Step-through pattern, one foot to a step, reciprocal movement with alternate leg on each step</p> <p>Marking time = Step-to pattern, two feet to a step</p> <p>If subject ascends and does not use rail but uses one hand on knee, or supporting themselves in an alternate way a score of 1 should be given.</p> <p>Using one rail means one hand on the rail or two hands on the same rail. If both rails are used a score of 0 is given.</p>		
Score	2	1	0
Activity: Ascend 4 stairs	<p>Independently (without support/rail) ascends using alternating pattern <input type="checkbox"/> Alternating pattern with one support (one rail/hand on body)</p> <p><input type="checkbox"/> Marking time with/without support</p> <p style="text-align: right;">Unable</p>		
Photographs / Notes	<p>If does not use rail but uses alternative technique of upper limb support on body a score of 1 is given.</p> <p>Widening base of support is a score of 1.</p> <p>Going up sideways is allowed for a score of 1, as is using two hands to one rail.</p> <p>If need to use 2 rails or unable</p>		
			
	<p>Figure 30a Score 2 Ascending stairs hands-free with alternating step-through pattern.</p>		
			
		<p>Figure 30b Score 1 Has to use rail with 1 hand in order to complete the task.</p>	
Corresponding item(s)	HF MSE 30, 32		

Test item 31: Descend 4 stairs

Starting Position	<p>Standing independently at the top of four stairs, barefoot.</p> <p>If the subject is unable to ascend the stairs (item 30) it may be difficult to test this item due to manual handling concerns. If after testing items 33 & 35 the subject is able to descend a box step re-attempt this item only if the subject is able to ascend the stairs by an alternative method, i.e. by crawling or bottom shuffling up the stairs.</p>		
Instruction	<p><i>Can you walk down the steps?</i></p> <p><i>If support is needed you may only use one rail (can use two hands to one rail)</i></p>		
Scoring detail/diagram	<p>Using a set of standard stairs (each step 15cm/6 inches in height, therapy stairs if possible), goal is to descend 4 steps, must complete all 4 steps to score.</p> <p>Alternating pattern = Step-through pattern, one foot to a step, reciprocal movement with alternate leg on each step</p> <p>Marking time = Step-to pattern, two feet to a step</p> <p>If subject descends and does not use rail but uses one hand on knee, or supporting themselves in an alternate way a score of 1 should be given.</p> <p>Using one rail means one hand on the rail or two hands on the same rail. If both rails are used a score of 0 is given</p>		
Score	2	1	0
Activity: Descend 4 stairs	<p>Independently (without support/rail) descends using alternating pattern <input type="checkbox"/> Alternating pattern with one support (one rail/hand on body) Unable</p> <p><input type="checkbox"/> Marking time with/without support</p>		
Photographs / Notes	<p>If does not use rail but uses alternative technique of upper limb support on body a score of 1 is given.</p> <p>Widening base of support is a score of 1.</p> <p>Going down sideways is allowed for a score of 1, as is using two hands to one rail.</p> <p>If need to use 2 rails or unable</p> <div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div data-bbox="406 1176 638 1433" style="text-align: center;">  <p>Figure 31a Score 2 Descends hands-free using alternating step through pattern.</p> </div> <div data-bbox="718 1500 957 1758" style="text-align: center;">  <p>Figure 31b Score 1 Descends hands-free using step-to, marking time pattern.</p> </div> <div data-bbox="997 1500 1212 1758" style="text-align: center;">  <p>Figure 31c Score 1 Has to use single rail with 1-2 hands in order to complete the task.</p> </div> <div data-bbox="1268 1332 1500 1680" style="text-align: center;">  <p>Figure 31d Score 0 Subject needs to use 2 rails to complete, cannot use two hands to one rail.</p> </div> </div>		
Corresponding item(s)	HFMSE 31, 33		

Test item 32 & 34: Climbs box step

Starting Position	<p>Standing on the floor, barefoot, in front of step.</p> <p>Using box step 15cm (6 inches) high wherever possible.</p>		
Instruction	<p><i>Can you step onto the top of the box with your right leg first? (followed by item 33 descends box step)</i></p> <p><i>Can you step onto the top of the box with your left leg first? (followed by item 35 descends box step)</i></p>		
Scoring detail/diagram	<p>Support may be provided by the use of a height adjustable plinth, or, if not available a 'neutral' hand from the therapist. Hand/Support should not be taking weight of subject and is there for balance only.</p> <p>If subject uses one hand on their leg/body this counts as support and would be a score of 1.</p>		
Score	2	1	0
Activity: Climbs Box Step	Faces forwards, climbs up – no support needed	Goes up sideways or needs support	Unable
Photographs / Notes	<p>Facing forwards ascends independently with no compensatory movements observed.</p>	<p>One hand support, required for stability but not taking weight of subject</p> <p>Uses compensatory movements such as one hand on leg, turning sideways, widening base of support but is able to ascend safely.</p> <div data-bbox="869 1097 1125 1433" data-label="Image"> </div> <p>Figure 34a Score 1 Subject able to ascend but uses compensatory strategies with one hand on leg. (Note - therapist hands are not in contact with subject but has hands nearby for safety)</p>	<p>Unable or requires increased support – hand/support taking weight of subject.</p> <div data-bbox="1260 974 1492 1288" data-label="Image"> </div> <p>Figure 32 a Score 0 Subject requires greater support than 'neutral hand' from therapist to ascend.</p>
Corresponding item(s)	NSAA 6 & 7		

Test item 33 & 35: Descends box step

Starting Position	<p>Standing, barefoot, on top of box step.</p> <p>Using box step 15cm (6 inches) high wherever possible.</p> <p>If subject is unable to ascend a step in previous item, descending a step can still be tested by positioning the step by a plinth, asking the subject to sit on the plinth, raise it up to a level whereby the subject can transfer to stand and then ask the subject to step down from the step.</p>		
Instruction	<p><i>Can you step down from the box with your right leg first? (completed following item 32)</i></p> <p><i>Can you step on down from the box with your left leg first? (completed following item 34)</i></p>		
Scoring detail/diagram	<p>Support may be provided by the use of a height adjustable plinth, or, if not available a 'neutral' hand from the therapist. Hand/Support should not be taking weight of subject and is there for balance only.</p> <p>If subject uses one hand on their leg/body this counts as support and would be a score of 1.</p>		
Score	2	1	0
Activity: Descends Box Step	Faces forward, climbs down controlling weight bearing leg. No support needed	Goes down sideways or skips down or needs support	Unable
Photographs / Notes	<p>Facing forwards, controlling movement, flexion of weight bearing leg to lower leg.</p>	<p>Subject descends by side stepping/turning sideways, placing one hand on their leg. Skips down in a fast movement, or uses any strategy that avoids flexion of the weight bearing leg.</p> <div data-bbox="869 1232 1093 1523" data-label="Image"> </div> <p>Figure 35 Score 1 Subject needs to turn sideways to step down. (Note - therapist hands are not in contact with subject but has hands nearby for safety)</p>	<p>Unable or requires increased support – hand/support taking weight of subject.</p> <div data-bbox="1252 1108 1460 1366" data-label="Image"> </div> <p>Figure 33 Score 0 Subject requires greater support than 'neutral hand' from therapist to descend step.</p>
Corresponding item(s)	NSAA 8 & 9		

Test item 36: Jump forwards 30cm (12")

Starting Position	<p>Standing barefoot on a level floor. Position the standing subject comfortably in front of two parallel lines (taped 30cm, 12", apart on the floor).</p>		
Instruction	<p><i>Can you jump as far as you can, with both feet, from this line all of the way to the other line?</i></p>		
Scoring detail/diagram	<p>The subject must jump and land without the use of upper extremity support and without falling to receive credit for any score.</p> <p><u>Scoring detail for Jumping forwards</u></p> <p>The distance jumped is from the starting line to the back of the heels. In the case that the distance travelled by two feet is uneven, the lesser distance should be considered.</p>		
	 <p>Figure 36a Starting Position. Subject is placed with toes touching the starting line.</p>	 <p>Figure 36b Subject jumping with both feet simultaneously leaving the floor.</p>	 <p>Figure 36c Shows how the distance of the jump is measured, from the starting line to the back of the heels.</p>
Score	2	1	0
Activity: Jump forwards 30cm (12")	<p>Jumps forward and lands with two feet simultaneously moving forward at least 30cm (12")</p>	<p><input type="checkbox"/> Jumps with two feet simultaneously but lands one at a time moving forward/up travelling < 30cm (12")</p> <p><input type="checkbox"/> Jumps and lands with two feet simultaneously moving forward < 30cm (12")</p>	<p>Unable to initiate jump</p>
Photographs / Notes	<p>Clears both feet from the ground and lands simultaneously and travels at least 30cm.</p>	<p>Takes off with two feet but lands one foot at a time <30cm</p> <p>Or</p> <p>Takes off and lands with both feet together but travels <30cm (12") achieved.</p>  <p>Figure 36d Score 1 Takes off with both feet but travels <30cm (12")</p>	 <p>Figure 36e Score 0 Attempts to jump but is unable to raise feet from floor.</p>
Corresponding item(s)	<p>HFMSE 29 NSAA 14</p>		

WHO Developmental Milestones

Multicentre Growth Reference Study WHO Gross Motor Milestones (Wijnhoven et al, 2004)

WHO Developmental Milestone	Scoring Criteria	Corresponding RHS item
<p>W1. Sitting without support:</p> 	<p>Child sits up straight with the head erect for at least 10 seconds. Child does not use arms or hands to balance body or support position.</p>	1
<p>W2. Hands-and-knees crawling:</p> 	<p>Child alternately moves forward or backward on hands and knees. The stomach does not touch the supporting surface. There are continuous and consecutive movements at least 3 in a row.</p>	12
<p>W3. Standing with Assistance:</p> 	<p>Child is in upright position on both feet. Child holds onto a stable object with both hands without leaning on it. Child's body does not touch the stable object. Child's legs support most of the child's body weight. Child thus stands with assistance for at least 10 seconds.</p>	16
<p>W4. Walking with Assistance:</p> 	<p>Child is in upright position with the back straight. Child makes sideways or forward steps by holding onto a stable object (e.g. furniture) with one or both hands. One leg moves forward while the other supports part of the body weight. Child takes at least five steps in this manner.</p>	16
<p>W5. Standing Alone:</p> 	<p>Child stands in upright position on both feet (not the toes) with back straight. The legs support 100% of the child's weight. There is no contact with a person or object. Child stands alone for at least 10 seconds</p>	17
<p>W6. Walking Alone:</p> 	<p>Child takes at least 5 steps independently in upright position with the back straight. One leg moves forward while the other supports most of the body weight. There is no contact with a person or object.</p>	18

RHS

Scoring Proformas

Notes on RHS Proforma:

- Proforma ordered to minimize positional changes therefore items become progressively harder in that position.
- At present one form for ambulant/non-ambulant.
- WHO motor milestone items are referenced with * and with item noted in comments, go to the end of the proforma for WHO scoring criteria.
- Ability to score RHS & WHO developmental milestones.

Notes on RHS & HFMSE combined Proforma:

- Proforma completed in order of RHS, WHO developmental indicators referenced as above.
- Corresponding HFMSE items can be scored at the same time as the RHS.
- Some HFMSE items not tested with the RHS have been included in the relevant position, ie in prone prop on extended arms.
- Scoring HFMSE & RHS: there are dedicated columns for inputting the scores, where a number is in the box a score should be written. If a HFMS score only is required these are HFMSE items 1-20.
- Ability to score RHS, HFMS & HFMSE, and WHO developmental milestones.

Name		SMA Type		DOB		Assessor	
Date of assessment		Albuterol/Salbutamol		Y / N		Date of spinal surgery	
Please circle highest current level of independent mobility: None Rolls Bottom shuffles Crawls Walks with KAFO's / AFO's Walks with crutches / frame Independent walking							
Comment..... LBC = Limited by contracture *WHO separate scoring at end of RHS							
Test	Instruction	2	1	0	L B C	Comments	RHS Score
SITTING	1* Sitting Using plinth / floor. (Back / feet unsupported)	Can you sit on the plinth/chair without using your hands for support for a count of 3?	Sitting unsupported: Ring or 90/90	Maintains seated position via propping with hand/s: Ring or 90/90	Unable to sit	WHO 1* <input type="checkbox"/> Long sitting	
	2 Hands to head in sitting	Can you show me how you get your hand/hands to your head? (hands touch head above level of ears/eyebrows)	Able to bring both hands to head at same time – arms free from side without flexing head or trunk	Able to bring one hand to head – arms free from side without flexing head or trunk <input type="checkbox"/> R <input type="checkbox"/> L	<input type="checkbox"/> Using compensations – flexing head & trunk or “crawling” hand/s <input type="checkbox"/> Unable to bring hand to head	Sitting position described: <input type="checkbox"/> 90/90 <input type="checkbox"/> Ring <input type="checkbox"/> Long	
	3 Sitting to lying	Can you lie down in a controlled/safe way from sitting?	Able to lie down through side lying or using clothes in a controlled/safe way	Able to lie down by going forwards and rolling sideways, or through prone in a controlled/safe way	Unable or completes in uncontrolled/unsafe way		
SUPINE	4 Adduction from crook (hook) lying – supine hips @ 45°, knees @ 90°, feet hip width apart. Passively abduct leg	Can you bring your leg back to the middle and hold this position for a count of 3?	Able to adduct to bring 1 leg back to neutral	Holds crook lying position for a count of 3	Unable to maintain/achieve starting position.	<input type="checkbox"/> R <input type="checkbox"/> L	
	5 Right hip flexion in supine	Can you bring your right knee to your chest? Try to go as far as you can	Full hip flexion achieved	Initiates right hip and knee flexion (>10% of available range of motion)	Unable	Flexion contracture > 15 ° present? Hip Y <input type="checkbox"/> N <input type="checkbox"/> Knee Y <input type="checkbox"/> N <input type="checkbox"/>	
	6 Left hip flexion in supine	Can you bring your left knee to your chest? Try to go as far as you can	Full hip flexion achieved	Initiates left hip and knee flexion (>10% of available range of motion)	Unable	Flexion contracture > 15 ° present? Hip Y <input type="checkbox"/> N <input type="checkbox"/> Knee Y <input type="checkbox"/> N <input type="checkbox"/>	
	7 Lifts head from supine	Can you lift your head to look at your toes keeping your arms folded for a count of 3?	Can lift head up through neck flexion and holds for a count of 3	<input type="checkbox"/> Can lift head with compensatory movements for a count of 3 <input type="checkbox"/> Can lift head up momentarily through neck flexion (< a count of 3)	Unable		
ROLLING	8 Supine to side-lying (end position leading leg ends up on top of other)	Can you roll onto your side? Note: Onto side = shoulders perpendicular to floor, trunk and hips in line with body		Able to roll onto side	Unable to roll onto side in any direction	<input type="checkbox"/> R <input type="checkbox"/> L	
	9 Rolls supine to prone	Can you roll from your back to your tummy? Try not to use your arms	Rolls fully into prone without pulling/pushing on arms	Rolls fully into prone by pulling/pushing on arms	Unable to roll into prone in any direction. Does not initiate or complete	<input type="checkbox"/> R <input type="checkbox"/> L	
PRONE	10 Lifting head from prone	Can you lift your head up keeping your arms by your side for a count of 3	Lifts straight up, arms down by sides for a count of 3	Lifts straight up arms forward for a count of 3 	Unable or lifts less than a count of 3		
	11 Prone; prop on forearms	Can you prop yourself on your forearms with your head up (not holding your head) For a count of 3	Achieves position and holds head up independently for a count of 3	Maintains position with head supported on hands for a count of 3	Unable or holds for less than a count of 3		
	12* Four-point kneeling/crawling	Can you get onto your hands and knees and then crawl?	Crawls moving all 4 limbs at least 2 times in a row	Achieves four-point kneeling	Unable	WHO 2*	
ROLLING	13 Rolls prone to supine	Can you roll from your tummy to your back? Try not to use your arms	Rolls fully into supine without pulling/pushing on arms	Rolls fully into supine by pulling/pushing on arms	Unable to roll into supine in any direction. Does not initiate or complete	<input type="checkbox"/> R <input type="checkbox"/> L	
Test	Instruction	2	1	0	L B C	Comments	RHS Score

SITTING	14 Lying to sitting	Can you get from lying (supine) to sitting?	Able via supine / side lying using: <input type="checkbox"/> 1 hand <input type="checkbox"/> 2 hands	Able by using strategies: <input type="checkbox"/> Turns into prone or towards floor <input type="checkbox"/> Utilises momentum/pulls on both legs	Unable		
	15 Sit to Stand (Starting in a 90/90 position using a Plinth / Bench / Chair)	Can you stand up from the chair / bench keeping your arms folded if you can?	Able to stand up without using arms (keeping arms folded, feet do not move)	Stands by using strategies: (circle relevant) Uses hands on legs/chair Turns Prone / Widens Base	Unable		
STANDING	16* Cruising/ supported stand	Can you walk holding on around furniture?	Cruise at least 5 steps around furniture <input type="checkbox"/> R <input type="checkbox"/> L	Stands supported for a count of 3	Unable to stand supported	WHO 3 & 4*	
	17* Standing	Can you stand without holding onto anything for a count of 3?	Stands upright and symmetrically, without compensation for a count of 3	Stands but with some degree of compensation for a count of 3	Cannot stand independently, needs support	WHO 5*	
RUN / WALK	18* Walking	Can you walk without using any help or aids? Show me	Takes at least 5 steps unaided	Able to take < 5 steps unaided	Unable	WHO 6*	
	19 Runs 10m	Can you go as quickly and safely as you can to.....(give 10 m marker) "Ready steady GO"	Can run - both feet off the ground	Speeds up walk but always maintains one foot on the floor	<input type="checkbox"/> Walks with no extra speed <input type="checkbox"/> Only with aids <input type="checkbox"/> Unable	TIME:.....seconds	
STANDING	20 Squat down and up	Can you squat down and stand up again? Pretend you are going to sit on a very low seat - only go as far down as you are able to get up from on your own	Full squat down (without using hands) and up* (with/without using hands) At least 90° achieved at knees/ hips *must be able to get up from final range	Initiates squat in both knees (10° to <90°) with controlled movement +/- using hands on self <input type="checkbox"/> Using hands	Unable		
	21 Stand to sit on floor	Can you sit on the floor in a controlled/ safe way from standing? Try not to use your arms	Able to sit down arms free in a controlled manner	Sits on floor using hands on floor/body	<input type="checkbox"/> Uses furniture <input type="checkbox"/> Unable		
MAT	22 High kneeling	Can you kneel like this (high kneeling) for a count of 10?	Maintains high kneeling without holding on for a count of 10	Maintains high kneel with one arm support for a count of 10	Unable		
	23 High Kneeling to Right half kneel  (Left foot forward)	Can you bring your LEFT leg up so that your foot is flat on the ground without using your arms and hold for a count of 10?	Able to achieve and maintain position without arm support for a count of 10	Maintains half kneel with one arm support for a count of 10 With: <input type="checkbox"/> support <input type="checkbox"/> no support	Unable		
	24 High Kneeling to Left half kneel  (Right foot forward)	Can you bring your RIGHT leg up so that your foot is flat on the ground without using your arms and hold for a count of 10?	Able to achieve and maintain position without arm support for a count of 10	Maintains half kneel with one arm support for a count of 10 With: <input type="checkbox"/> support <input type="checkbox"/> no support	Unable		
MAT / FLOOR	25 Rise from floor	Can you get up from the floor using as little support as possible and as fast as you can? Stand up as quickly as possible when the instruction "GO" is given	Achieves rise from floor without hands (any unsupported method)	Able to get up from floor using hands on floor and/or body	<input type="checkbox"/> Able to get up from floor using furniture/ assistance <input type="checkbox"/> Unable to get up from floor using any method	If uses 1/2 kneel: <input type="checkbox"/> R (L foot forwards) <input type="checkbox"/> L (R foot forwards) Further detail: TIME:.....seconds	
SINGLE LEG STAND	26 Stand on one leg – Right	Can you stand on your right leg for a count of 3?	Able to stand in a relaxed manner (no fixation) for a count of 3	Stands but either momentarily or needs a lot of fixation e.g. by knees tightly adducted or other trick	Unable		
	27 Stand on one leg – Left	Can you stand on your left leg for a count of 3?	Able to stand in a relaxed manner (no fixation) for a count of 3	Stands but either momentarily or needs a lot of fixation e.g. by knees tightly adducted or other trick	Unable		
	28 Hops – Right	Can you hop on your right leg?		Distinct hop: clears forefoot and heel off floor	Unable		
	29 Hops – Left	Can you hop on your left leg?		Distinct hop: clears forefoot and heel off floor	Unable		
Test	Instruction	2	1	0	L B C	Comments	RHS Score

STAIRS	30 Ascend stairs 4 standard stairs	Can you walk up the steps? If support is needed you may only use one rail (can use two hands to one rail)	Independently (without support/rail) ascends using alternating pattern	<input type="checkbox"/> Alternating pattern with one support (one rail/hand on body) <input type="checkbox"/> Marking time with/without support	Unable		
	31 Descend stairs 4 standard stairs	Can you walk down the steps? If support is needed you may only use one rail (can use two hands to one rail)	Independently (without support/rail) descends using alternating pattern	<input type="checkbox"/> Alternating pattern with one support (one rail/hand on body) <input type="checkbox"/> Marking time with/without support	Unable		
STEP	32 Climbs box step – Right	Can you step onto the top of the box using your right leg first?	Faces forwards, climbs up – no support needed	Goes up sideways or needs support	Unable		
	33 Descends box step – Right	Can you step down from the box using your right leg first?	Faces forward, climbs down controlling weight bearing leg. No support needed	Goes down sideways or skips down or needs support	Unable		
	34 Climbs box step – Left	Can you step onto the top of the box using your left leg first?	Faces forwards, climbs up – no support needed	Goes up sideways or needs support	Unable		
	35 Descends box step - Left	Can you step down from the box using your left leg first?	Faces forward, climbs down controlling weight bearing leg. No support needed	Goes down sideways or skips down or needs support	Unable		
JUMP	36 Jump forwards 30cm (12")	Can you jump as far as you can, with both feet, from this line all of the way to the other line?	Jumps forward and lands with two feet simultaneously moving forward at least 30cm (12")	<input type="checkbox"/> Jumps with two feet simultaneously but lands one at a time moving forward/up travelling < 30cm (12") <input type="checkbox"/> Jumps and lands with two feet simultaneously moving forward < 30cm (12")	Unable to initiate jump		
			2's =	1's =	0's =	Total =	/69

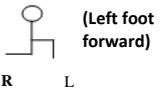
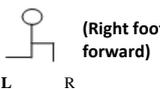
*WHO DEVELOPMENTAL MILESTONES		Qualifier met:
W1. Sitting without support: Child sits upright with head erect for at least 10 seconds. Child does not use arms or hands to balance body or support position.		Y <input type="checkbox"/> N <input type="checkbox"/>
W2. Hands and knees crawling: Child alternately moves forward or backward on hands and knees. The stomach does not touch the supporting surface. There are continuous and consecutive movement, at least 3 in a row.		Y <input type="checkbox"/> N <input type="checkbox"/>
W3. Standing with Assistance: Child stands in upright position on both feet, holding onto a stable object (e.g. furniture) with both hands without leaning on it. The body does not touch the stable object, and the legs support most of the body weight. Child thus stands with assistance for at least 10 seconds.		Y <input type="checkbox"/> N <input type="checkbox"/>
W4. Walking with Assistance: Child is in upright position with the back straight. Child makes sideways or forward steps by holding onto a stable object (e.g. furniture) with one or both hands. One leg moves forward while the other supports part of the body weight. Child takes at least 5 steps in this manner.		Y <input type="checkbox"/> N <input type="checkbox"/>
W5. Standing Alone: Child stands in upright position on both feet (not the toes) with the back straight. The legs support 100% of the child's weight. There is no contact with a person or object. Child stands alone for at least 10 seconds.		Y <input type="checkbox"/> N <input type="checkbox"/>
W6. Walking Alone: Child takes at least 5 steps independently in upright position with the back straight. One leg moves forward while the other supports most of the body weight. There is no contact with the person or object.		Y <input type="checkbox"/> N <input type="checkbox"/>
Total WHO Milestones Achieved:		/ 6

Revised Hammersmith Scale for SMA (RHS)	17.03.2015
Is this test a true reflection of the subjects ability Y <input type="checkbox"/> N <input type="checkbox"/> If no please detail why	
Comments on Assessment	

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Name		SMA Type		DOB		Assessor			
Date of assessment		Albuterol/Salbutamol Y / N		Date of spinal surgery					
Please circle highest current level of independent mobility: None Rolls Bottom shuffles Crawls Walks with KAFO's / AFO's Walks with crutches / frame Independent walking									
Comment..... LBC = Limited by contracture *WHO separate scoring at end of RHS									
Test	Instruction	2	1	0	L B C	Comments	RHS Score	HFMS Score	
SITTING	1* Sitting Using plinth / floor. (Back / feet unsupported)	Can you sit on the plinth/chair without using your hands for support for a count of 3?	Sitting unsupported: Ring or 90/90	Maintains seated position via propping with hand/s: Ring or 90/90	Unable to sit		WHO 1* <input type="checkbox"/> Long sitting	1*	
	HFMS 1 Plinth/ chair sitting Can be over the edge of plinth or on plinth / floor. Record the best you see	Can you sit on the plinth / chair without using your hands for support for a count of 3? (Back unsupported / feet +/- support)	Able to sit using no hand support for a count of 3 or more	Needs one hand support to maintain balance for a count of 3	Needs two hand support to maintain balance Unable to sit				1.
	HFMS 2 Long Sitting Legs straight = knees maybe flexed, knee caps pointing upwards, ankles <10cm apart	Can you sit on the floor / plinth without using your hands for support and with your legs straight for a count of 3	Able to sit on floor / plinth with legs straight without hand support for a count of 3	Able to sit on floor / plinth with legs straight propping with one hand support for a count of 3	Able to long sit using two hands for a count of 3 Or unable to sit with straight legs				2.
	2 Hands to head in sitting	Can you show me how you get your hand/hands to your head? (hands touch head above level of ears/eyebrows)	Able to bring both hands to head at same time – arms free from side without flexing head or trunk	Able to bring one hand to head – arms free from side without flexing head or trunk <input type="checkbox"/> R <input type="checkbox"/> L	<input type="checkbox"/> Using compensations – flexing head & trunk or “crawling” hand/s <input type="checkbox"/> Unable to bring hand to head		Sitting position described: <input type="checkbox"/> 90/90 <input type="checkbox"/> Ring <input type="checkbox"/> Long	2.	
	HFMS 3 One hand to head in sitting Hand touch head above level of ears	Can you get one hand to your head without bending your neck	Able to bring one hand to head. Head and trunk remain stable	Can only bring hand to head by flexing head	Unable to bring hand to head even using head and trunk movement				3.
	HFMS 4 Two hands to head in sitting Hands touch level above ear	Can you lift both hands up at the same time, to your head, without bending your neck?	Able to place both hands on head arms free from side. Head and trunk remain stable	Able to place hands on head but only using head flexion or side tilt or crawling hands up or one at a time	Unable to place both hands on head				4.
	3 Sitting to lying	Can you lie down in a controlled/safe way from sitting?	Able to lie down through side lying or using clothes in a controlled/safe way	Able to lie down by going forwards and rolling sideways, or through prone in a controlled/safe way	Unable or completes in uncontrolled/unsafe way			3.	
	HFMS 10 Sitting to Lying	Can you lie down in a controlled way from sitting?	Able to lie down in a controlled fashion through side lying or using clothes	Able to lie down by flopping forwards and rolling sideways	Unable or falls over				10.
	4 Adduction from crook (hook) lying – supine hips @ 45°, knees @ 90°, feet hip width apart. Passively abduct leg	Can you bring your leg back to the middle and hold this position for a count of 3?	Able to adduct to bring 1 leg back to neutral	Holds crook lying position for a count of 3	Unable to maintain/ achieve starting position. <input type="checkbox"/> R <input type="checkbox"/> L			4.	
	5 Right hip flexion in supine	Can you bring your right knee to your chest? Try to go as far as you can	Full hip flexion achieved	Initiates right hip and knee flexion (>10% of available range of motion)	Unable		Flexion contracture > 15 ° present? Hip Y <input type="checkbox"/> N <input type="checkbox"/> Knee Y <input type="checkbox"/> N <input type="checkbox"/>	5.	
SUPINE	HFMS 21 Right hip flexion in supine	SAME AS ABOVE							21.
	6 Left hip flexion in supine	Can you bring your left knee to your chest? Try to go as far as you can	Full hip flexion achieved	Initiates left hip and knee flexion (>10% of available range of motion)	Unable		Flexion contracture > 15 ° present? Hip Y <input type="checkbox"/> N <input type="checkbox"/> Knee Y <input type="checkbox"/> N <input type="checkbox"/>	6.	
	HFMS 22 Left hip flexion in supine	SAME AS ABOVE							22.
	7 Lifts head from supine	Can you lift your head to look at your toes keeping your arms folded for a count of 3?	Can lift head up through neck flexion and holds for a count of 3	<input type="checkbox"/> Can lift head with compensatory movements for a count of 3 <input type="checkbox"/> Can lift head up momentarily through neck flexion (< a count of 3)	Unable			7.	
SUP	Test	Instruction	2	1	0	L B C	Comments	RHS Score	HFMS Score

	HFMSE 17 Lifts head from supine	<i>SAME AS ABOVE</i>	Head lifted off the surface in mid-line towards chest	Head is lifted but through side flexion or with no neck flexion	Unable				17.
ROLLING	8 Supine to side-lying (end position leading leg ends up on top of other)	<i>Can you roll onto your side? Note: Onto side = shoulders perpendicular to floor, trunk and hips in line with body</i>		Able to roll onto side	Unable to roll onto side in any direction	<input type="checkbox"/> R <input type="checkbox"/> L			8.
	HFMSE 5 Supine to side-lying	<i>SAME AS ABOVE</i>	Able to ½ roll from supine both ways	Can ½ roll only one way <input type="checkbox"/> R <input type="checkbox"/> L	Unable to half roll either way				5.
	9 Rolls supine to prone	<i>Can you roll from your back to your tummy? Try not to use your arms</i>	Rolls fully into prone without pulling/pushing on arms	Rolls fully into prone by pulling/pushing on arms	Unable to roll into prone in any direction. Does not initiate or complete	<input type="checkbox"/> R <input type="checkbox"/> L			9.
	HFMSE 8 Rolls supine to prone over R	<i>Can you roll from your back to your front in both directions?</i>	Turns to prone with free arms to the right	Turns to prone by pulling/pushing on arms	Unable to turn into prone				8.
HFMSE 9 Rolls supine to prone over L	Turns to prone with free arms to the left		Turns to prone by pulling/pushing on arms	Unable to turn into prone				9.	
PRONE	10 Lifting head from prone	<i>Can you lift your head up keeping your arms by your side for a count of 3</i>	Lifts straight up, arms down by sides for a count of 3	Lifts straight up arms forward for a count of 3 	Unable or lifts less than a count of 3				10.
	HFMSE 12 Lifts head from prone	<i>SAME AS ABOVE</i>	<i>SAME AS ABOVE</i>						12.
	11 Prone; prop on forearms	<i>Can you prop yourself on your forearms with your head up (not holding your head) For a count of 3</i>	Achieves position and holds head up independently for a count of 3	Maintains position with head supported on hands for a count of 3	Unable or holds for less than a count of 3				11.
	HFMSE 11 Props on forearms	<i>Can you prop yourself on your forearms and hold for a count of 3?</i>	Able to achieve prop on forearms with head up for a count of 3	Holds position for a count of 3 when placed	Unable				11.
	HFMSE 13 Prop on extended arms	<i>Can you prop yourself up with straight arms for a count of 3?</i>	Able to prop on extended arms, head up for a count of 3	Holds position when placed for a count of 3	Unable				13.
	12* Four-point kneeling/crawling	<i>Can you get onto your hands and knees and then crawl?</i>	Crawls moving all 4 limbs at least 2 times in a row	Achieves four-point kneeling	Unable		WHO 2*		12.
	HFMSE 15 Four-point kneeling	<i>Can you get onto your hands and knees with your head up and hold for a count of 3?</i>	Achieves four-point kneeling. Head up for a count of 3	Holds position when placed for a count of 3	Unable				15.
HFMSE 16 Crawling	<i>Can you crawl forwards?</i>	Able to crawl forwards Moves all four points twice or more	Moves all four points only once	Unable				16.	
ROLLING	13 Rolls prone to supine	<i>Can you roll from your tummy to your back? Try not to use your arms</i>	Rolls fully into supine without pulling/pushing on arms	Rolls fully into supine by pulling/pushing on arms	Unable to roll into supine in any direction. Does not initiate or complete	<input type="checkbox"/> R <input type="checkbox"/> L			13.
	HFMSE 6 Rolls prone to supine over R	<i>Can you roll from your tummy to your back in both directions?</i>	Turns to supine with free arms to the right	Turns to supine using arms to push / pull with	Unable to turn to supine				6.
	HFMSE 7 Rolls prone to supine over L	<i>Can you roll from your tummy to your back in both directions?</i>	Turns to supine with free arms to the left	Turns to supine using arms to push / pull with	Unable to turn to supine				7.
SITTING	14 Lying to sitting	<i>Can you get from lying (supine) to sitting?</i>	Able via supine / side lying using: <input type="checkbox"/> 1 hand <input type="checkbox"/> 2 hands	Able by using strategies: <input type="checkbox"/> Turns into prone or towards floor <input type="checkbox"/> Utilises momentum/pulls on both legs	Unable				14.
	HFMSE 14 Lying to sitting	<i>Can you get from lying to sitting without rolling to your tummy?</i>	Able by using side lying	Turns into prone or towards floor	Unable				14.
	15 Sit to Stand (Starting in a 90/90 position using a Plinth / Bench / Chair)	<i>Can you stand up from the chair / bench keeping your arms folded if you can?</i>	Able to stand up without using arms (keeping arms folded, feet do not move)	Stands by using strategies: (circle relevant) Uses hands on legs/chair Turns Prone / Widens Base	Unable				15.
Test	Instruction	2	1	0	L B C	Comments	RHS Score	HFMSE Score	

Test	Instruction	2	1	0	L B C	Comments	RHS Score	HFMSE Score
STANDING	16* Cruising/ supported stand	Can you walk holding on around furniture?	Cruise at least 5 steps around furniture <input type="checkbox"/> R <input type="checkbox"/> L	Stands supported for a count of 3	Unable to stand supported	WHO 3 & 4*	16*	
	HFMSE 18 Supported standing	Can you stand using one hand for support for a count of 3?	Can stand using one hand support for a count of 3.	Able to stand with minimal trunk support (not hip) for a count of 3.	Can stand with hand support but needs knee/hip support in addition for a count of 3. Or unable			18.
	17* Standing	Can you stand without holding onto anything for the count of 3?	Stands <u>upright</u> and <u>symmetrically</u> , without compensation for a count of 3	Stands but with some degree of compensation for a count of 3	Cannot stand independently, needs support	WHO 5*	17*	
	HFMSE 19 Stand unsupported	Can you stand without holding on to anything for a count of 3?	Can stand independently for more than a count of 3	Stands independently for a count of 3	Stands only momentarily (less than a count of 3) Or unable			19.
WALK / RUN	18* Walking	Can you walk without using any help or aids? Show me	Takes at least 5 steps unaided	Able to take < 5 steps unaided	Unable	WHO 6*	18*	
	HFMSE 20 Stepping	Can you walk without using any help or aids? Show me	Able to take more than 4 steps unaided	Able to take 2 – 4 steps unaided	Unable			20.
	19 Runs 10m	Can you go as quickly and safely as you can to(give 10 m marker) "Ready steady GO"	Can run - both feet off the ground	Speeds up walk but always maintains one foot on the floor	<input type="checkbox"/> Walks with no extra speed <input type="checkbox"/> Only with aids <input type="checkbox"/> Unable	TIME:.....seconds	19.	
STANDING	20 Squat down and up	Can you squat down and stand up again? Pretend you are going to sit on a very low seat - only go as far down as you are able to get up from on your own	Full squat down (without using hands) and up* (with/without using hands) At least 90° achieved at knees/ hips *must be able to get up from final range	Initiates squat in both knees (10° to <90°) with controlled movement +/- using hands on self <input type="checkbox"/> Using hands	Unable		20.	
	HFMSE 28 Squat	Can you squat? Pretend you are going to sit in a very low seat	Squats with arms free	Initiates squat (more than 10%) , uses arm support	Unable to initiate			28.
	21 Stand to sit on floor	Can you sit on the floor in a controlled/ safe way from standing? Try not to use your arms	Able to sit down arms free in a controlled manner	Sits on floor using hands on floor/body	<input type="checkbox"/> Uses furniture <input type="checkbox"/> Unable		21.	
	HFMSE 27 Stand to sit	Can you sit on the floor in a controlled way? Try not to use your arms.	Able to sit down with arms free and no collapse	Sits on floor but uses arms or crashes	Unable			27.
MAT/FLOOR	22 High kneeling	Can you kneel like this (high kneeling) for a count of 10?	Maintains high kneeling without holding on for a count of 10	Maintains high kneel with one arm support for a count of 10	Unable		22.	
	23 High Kneeling to <u>Right</u> half kneel  R L	Can you bring your <u>LEFT</u> leg up so that your foot is flat on the ground without using your arms and hold for a count of 10?	Able to achieve and maintain position without arm support for a count of 10	Maintains half kneel with one arm support for a count of 10 With: <input type="checkbox"/> support <input type="checkbox"/> no support	Unable		23.	
	HFMSE 23 High kneeling to <u>Right</u> half kneel	Can you bring your <u>left</u> leg up so that your foot is flat on the ground without using your arms and hold for a count of 10?	Arms used for transition, maintains arms free in half kneel for a count of 10	Maintains half kneel with arm support for a count of 10	Unable			25.
	24 High Kneeling to <u>Left</u> half kneel  L R	Can you bring your <u>RIGHT</u> leg up so that your foot is flat on the ground without using your arms and hold for a count of 10?	Able to achieve and maintain position without arm support for a count of 10	Maintains half kneel with one arm support for a count of 10 With: <input type="checkbox"/> support <input type="checkbox"/> no support	Unable		24.	
HFMSE 24 High kneeling to <u>Left</u> half kneel	Can you bring your <u>right</u> leg up so that your foot is flat on the ground without using your arms and hold for a count of 10?	Arms used for transition, maintains arms free in half kneel for a count of 10	Maintains half kneel with arm support for a count of 10	Unable			24.	

MAT/FLOOR	25 Rise from floor	Can you get up from the floor using as little support as possible and as fast as you can? Stand up as quickly as possible when the instruction "GO" is given	Achieves rise from floor without hands (any unsupported method)	Able to get up from floor using hands on floor and/or body	<input type="checkbox"/> Able to get up from floor using furniture/ assistance <input type="checkbox"/> Unable to get up from floor using any method	If uses 1/2 kneel: <input type="checkbox"/> R (L foot forwards) <input type="checkbox"/> L (R foot forwards) Further detail: TIME:.....seconds		25.	
	HFMSE 25 High kneeling to stand leading with Left leg (through right half kneel)	Can you stand up from this position starting with your <u>left</u> leg without using your hands? May need demonstration	Able with arms free	Able to shift weight off both knees (with or without arm support)	Unable			25.	
	HFMSE 26 High kneeling to stand leading with Right leg (through left half kneel)	Can you stand up from this position starting with your <u>right</u> leg without using your hands? May need demonstration	Able with arms free	Able to shift weight off both knees (with or without arm support)	Unable			26.	
SINGLE LEG STAND	26 Stand on one leg – Right	Can you stand on your right leg for a count of 3?	Able to stand in a relaxed manner (no fixation) for a count of 3	Stands but either momentarily or needs a lot of fixation e.g. by knees tightly adducted or other trick	Unable			26.	
	27 Stand on one leg – Left	Can you stand on your left leg for a count of 3?	Able to stand in a relaxed manner (no fixation) for a count of 3	Stands but either momentarily or needs a lot of fixation e.g. by knees tightly adducted or other trick	Unable			27.	
	28 Hops – Right	Can you hop on your right leg?		Distinct hop: clears forefoot and heel off floor	Unable			28.	
	29 Hops – Left	Can you hop on your left leg?		Distinct hop: clears forefoot and heel off floor	Unable			29.	
STAIRS	30 Ascend stairs 4 standard stairs	Can you walk up the steps? If support is needed you may only use one rail (can use two hands to one rail)	Independently (without support/rail) ascends using alternating pattern	<input type="checkbox"/> Alternating pattern with one support (one rail/hand on body) <input type="checkbox"/> Marking time with/without support	Unable			30.	
	HFMSE 30 Ascends 4 stairs with rail	Can you walk up the steps? You can use one railing	Ascends 4 stairs with railing, alternating feet	Ascends 2-4 stairs, one rail, any pattern	Unable to ascend 2 stairs using one rail			30.	
	HFMSE 32 Ascends 4 stairs without rail	Can you walk up the steps? This time try not to use the railing	Ascends 4 stairs, arms free, alternating feet	Ascends 2-4 stairs, arms free, any pattern	Unable to ascend 2 stairs arms free			32.	
	31 Descend stairs 4 standard stairs	Can you walk down the steps? If support is needed you may only use one rail (can use two hands to one rail)	Independently (without support/rail) descends using alternating pattern	<input type="checkbox"/> Alternating pattern with one support (one rail/hand on body) <input type="checkbox"/> Marking time with/without support	Unable			31.	
	HFMSE 31 Descends 4 stairs with rail	Can you walk down the steps? You can use one railing	Descends 4 stairs, with railing, alternating feet	Descends 2-4 stairs, one rail, any pattern	Unable to descend 2 stairs with one rail			31.	
	HFMSE 33 Descends 4 stairs without rail	Can you walk down the steps? This time try not to use the railing	Descends 4 stairs, arms free, alternating feet	Descends 2-4 stairs, arms free, any pattern	Unable to descend 2 stairs arms free			33.	
STEP	32 Climbs box step – Right	Can you step onto the top of the box using your right leg first?	Faces forwards, climbs up – no support needed	Goes up sideways or needs support	Unable			32.	
	33 Descends box step – Right	Can you step down from the box using your right leg first?	Faces forward, climbs down controlling weight bearing leg. No support needed	Goes down sideways or skips down or needs support	Unable			33.	
	34 Climbs box step – Left	Can you step onto the top of the box using your left leg first?	Faces forwards, climbs up – no support needed	Goes up sideways or needs support	Unable			34.	
	35 Descends box step – Left	Can you step down from the box using your left leg first?	Faces forward, climbs down controlling weight bearing leg. No support needed	Goes down sideways or skips down or needs support	Unable			35.	
Test	Instruction	2	1	0	L B C	Comments	RHS Score	HFMSE Score	

JUMP	36 Jump forwards 30cm (12")	Can you jump as far as you can, with both feet, from this line all of the way to the other line?	Jumps forward and lands with two feet simultaneously moving forward at least 30cm (12")	<input type="checkbox"/> Jumps with two feet simultaneously but lands one at a time moving forward/up travelling < 30cm (12") <input type="checkbox"/> Jumps and lands with two feet simultaneously moving forward < 30cm (12")	Unable to initiate jump		36.	
	HFMSE 29 Jump 12" (30cm) forward	Can you jump as far as you can, with both feet, from this line all of the way to the other line?	Jumps at least 12", both feet simultaneously	Jumps between 2- 11", both feet simultaneously	Unable to initiate jump with both feet simultaneously		29.	
Total							/69	HFMSE* /40 HFMSE /66

**HFMS score calculated with HFMSE items 1 to 20 only

*WHO DEVELOPMENTAL MILESTONES	Qualifier met:
W1. Sitting without support: Child sits upright with head erect for at least 10 seconds. Child does not use arms or hands to balance body or support position.	Y <input type="checkbox"/> N <input type="checkbox"/>
W2. Hands and knees crawling: Child alternately moves forward or backward on hands and knees. The stomach does not touch the supporting surface. There are continuous and consecutive movement, at least 3 in a row.	Y <input type="checkbox"/> N <input type="checkbox"/>
W3. Standing with Assistance: Child stands in upright position on both feet, holding onto a stable object (e.g. furniture) with both hands without leaning on it. The body does not touch the stable object, and the legs support most of the body weight. Child thus stands with assistance for at least 10 seconds.	Y <input type="checkbox"/> N <input type="checkbox"/>
W4. Walking with Assistance: Child is in upright position with the back straight. Child makes sideways or forward steps by holding onto a stable object (e.g. furniture) with one or both hands. One leg moves forward while the other supports part of the body weight. Child takes at least 5 steps in this manner.	Y <input type="checkbox"/> N <input type="checkbox"/>
W5. Standing Alone: Child stands in upright position on both feet (not the toes) with the back straight. The legs support 100% of the child's weight. There is no contact with a person or object. Child stands alone for at least 10 seconds.	Y <input type="checkbox"/> N <input type="checkbox"/>
W6. Walking Alone: Child takes at least 5 steps independently in upright position with the back straight. One leg moves forward while the other supports most of the body weight. There is no contact with the person or object.	Y <input type="checkbox"/> N <input type="checkbox"/>
Total WHO Milestones Achieved:	/ 6

Revised Hammersmith for SMA (RHS) 17.03.2015

Is this test a true reflection of the subjects ability Y N If no please detail why

Comments

Original Scale Reference Papers

Revised Hammersmith Scale (RHS)

[Revised Hammersmith Scale for spinal muscular atrophy: A SMA specific clinical outcome assessment tool](#)

Ramsey D, Scoto M, Mayhew A, Main M, Mazzone ES, et al. (2017) Revised Hammersmith Scale for spinal muscular atrophy: A SMA specific clinical outcome assessment tool. PLOS ONE 12(2): e0172346. <https://doi.org/10.1371/journal.pone.0172346>

Hammersmith Functional Motor Scale (HFMS)

Main, M., Kairon, H., Mercuri, E. & Muntoni, F. (2003) The Hammersmith Functional Motor Scale for Children with Spinal Muscular Atrophy: A Scale to Test Ability and Monitor Progress in Children with Limited Ambulation. European Journal of Paediatric Neurology, 7, 155-159.

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World Health Organisation (WHO) Developmental Milestones

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