

HAMMERSMITH INFANT NEUROLOGICAL EXAMINATION (v 20.12.23)

Name

Date of birth

Gestational age

Date of examination

Chronological age / Corrected age

Head circumference

SUMMARY OF EXAMINATION
Global score (max 78)
Number of asymmetries
Behavioural score (not part of the optimality score)

Cranial nerve function	score	(max 15)
Posture	score	(max 18)
Movements	score	(max 6)
Tone	score	(max 24)
Reflexes and reactions	score	(max 15)
COMMENTS		

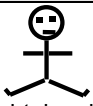
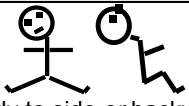
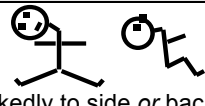
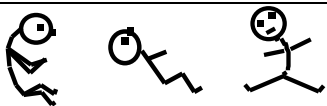
(Throughout the exam, if a response is not optimal but not poor enough to score 1, give a score of 2)

NEUROLOGICAL EXAMINATION

ASSESSMENT OF CRANIAL NERVE FUNCTION

	score 3	2	score 1	score 0	score	Asymmetry / Comments
Facial appearance (at rest and when crying or stimulated)	Smiles or reacts to stimuli by closing eyes and grimacing		Closes eyes but not tightly, poor facial expression	Expressionless, does not react to stimuli		
Eye movements	Normal conjugate eye movements		Intermittent Deviation of eyes or abnormal movements	Continuous Deviation of eyes or abnormal movements		
Visual response Test ability to follow a black/white target	Follows the target in a complete arc		Follows target in an incomplete or asymmetrical arc	Does not follow the target		
Auditory response Test the response to a rattle. Test each side separately making sure the rattle is not seen by the child	Reacts to stimuli from both sides		Doubtful reaction to stimuli or asymmetry of response	No response		
Sucking/swallowing Watch infant suck on breast or bottle. If older, ask about feeding, assoc. cough, excessive dribbling	Good suck and swallowing		Poor suck and/or swallow	No sucking reflex, no swallowing		

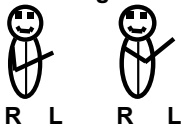
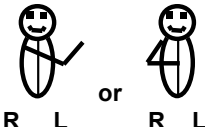
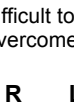
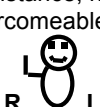
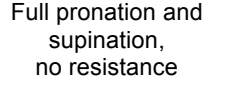
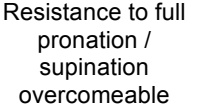
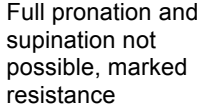
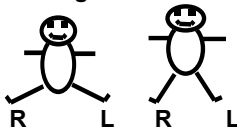
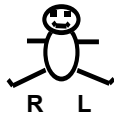
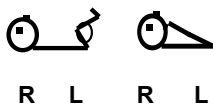
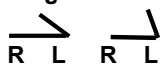
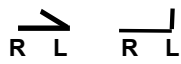
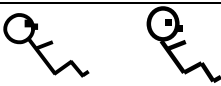
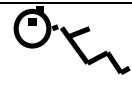
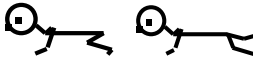
ASSESSMENT OF POSTURE (note any asymmetries)

	score 3	score 2	score 1	score 0	sc	Asymmetry / comments
Head in sitting (supported if needed)	 Straight; in midline		 Slightly to side <i>or</i> backward <i>or</i> forward	 Markedly to side <i>or</i> backward <i>or</i> forward		
Trunk in sitting (supported at the hips if needed)	 Straight		 Slightly curved or bent to side	 Very rounded rocketing back bent sideways		
Arms at rest	In a neutral position, central straight or slightly bent		Slight internal rotation <i>or</i> external rotation Intermittent dystonic posture	Marked internal rotation <i>or</i> external rotation <i>or</i> dystonic posture hemiplegic posture		
Hands	Hands open		Intermittent adducted thumb <i>or</i> fisting	Persistent adducted thumb <i>or</i> fisting		
Legs in sitting in supine and in standing	Able to sit with a straight back and legs straight or slightly bent (long sitting)  Legs in neutral position straight <i>or</i> slightly bent	Slight internal rotation <i>or</i> external rotation	Sit with straight back but knees bent at 15-20 °  Internal rotation <i>or</i> external rotation at the hips	Unable to sit straight unless knees markedly bent (no long sitting)  Marked internal rotation <i>or</i> external rotation <i>or</i> fixed extension or flexion or contractures at hips and knees		
Feet in supine and in standing	Central in neutral position Toes straight midway between flexion and extension		Slight internal rotation <i>or</i> external rotation Intermittent Tendency to stand on tiptoes or toes up or curling under	Marked internal rotation <i>or</i> external rotation at the ankle Persistent Tendency to stand on tiptoes <i>or</i> toes up or curling under		

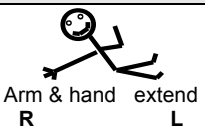
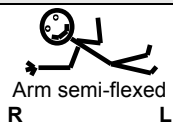
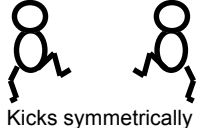
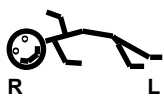
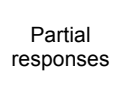
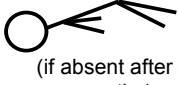
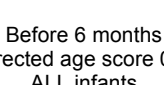
ASSESSMENT OF MOVEMENTS

	Score 3	Score 2	Score 1	Score 0	score	Asymmetry / comments
Quantity Watch infant lying in supine	Normal		Excessive or sluggish	Minimal or none		
Quality Observe infant's spontaneous voluntary motor activity during the course of the assessment	Free, alternating, and smooth		Jerky Slight tremor	• Cramped & synchronous • Extensor spasms • Athetoid • Ataxic • Very tremulous • Myoclonic spasm • Dystonic movement		

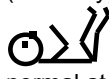
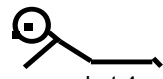
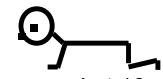
ASSESSMENT OF TONE

	Score 3	Score 2	Score 1	Score 0	sc	Asym/Co
Scarf sign Take the infant's wrist and pull the arm across the chest until there is resistance. Note the position of the elbow in relation to the midline.	Range: 					
Passive shoulder elevation Lift arm up alongside infant's head. Note resistance at shoulder and elbow.	Resistance overcomeable 	Resistance difficult to overcome 	No resistance 	Resistance, not overcomeable 		
Pronation/supination Steady the upper arm while pronating and supinating forearm, note resistance	Full pronation and supination, no resistance 		Resistance to full pronation / supination overcomeable 	Full pronation and supination not possible, marked resistance 		
Hip adductors With both the infant's legs extended, abduct them as far as possible. The angle formed by the legs is noted.	Range: 150-80° 	150-160° 	>170° 	<80° 		
Popliteal angle Keeping the infant's bottom on the bed, flex both hips onto the abdomen, then extend the knees until there is resistance. Note the angle between upper and lower leg.	Range: 150°-100° 	150-160° 	~90° or > 170° 	<80° 		
Ankle dorsiflexion With knee extended, dorsiflex the ankle. Note the angle between foot and leg.	Range: 30°-85° 	20-30° 	<20° or 90° 	> 90° 		
Pull to sit Pull infant to sit by the wrists. (support head if necessary)						
Ventral suspension Hold infant horizontally around trunk in ventral suspension; note position of back, limbs and head.						

REFLEXES AND REACTIONS

	Score 3	Score 2	Score 1	Score 0	sc	Asym / Co
Arm protection Pull the infant by one arm from the supine position (steady the contralateral hip) and note the reaction of arm on opposite side.						
Vertical suspension hold infant under axilla making sure legs do not touch any surface – you may "tickle" feet to stimulate kicking.						
Lateral tilting (describe side up). Hold infant up vertically near to hips and tilt sideways towards the horizontal. Note response of trunk, spine, limbs and head.						
Forward parachute Hold infant up vertically and quickly tilt forwards. Note reaction /symmetry of arm responses,		Partial responses 		Before 6 months corrected age score 0 for ALL infants 		
Tendon Reflexes Have child relaxed, sitting or lying – use small hammer	Easily elicitable biceps knee ankle	Mildly brisk bicep knee ankle	Brisk biceps knee ankle	Clonus or absent biceps knee ankle		

SECTION 2 MOTOR MILESTONES (not scored; note asymmetries)

Head control	Unable to maintain head upright normal to 3m	Wobbles normal up to 4m	Maintained upright all the time normal from 5m			Please note age at which maximum skill is achieved
Sitting	Cannot sit	With support at hips  normal at 4m	Props  normal at 6m	Stable sit  normal at 7-8m	Pivots (rotates)  normal at 9m	Observed: Reported (age):
Voluntary grasp – note side	No grasp	Uses whole hand	Index finger and thumb but immature grasp	Pincer grasp		Observed: Reported (age):
Ability to kick in supine	No kicking	Kicks horizontally but legs do not lift	Upward (vertically)  normal at 3m	Touches leg  normal at 4-5m	Touches toes  normal at 5-6m	Observed: Reported (age):
Rolling - note through which side(s)	No rolling	Rolling to side normal at 4m	Prone to supine normal at 6 m	Supine to prone normal at 6 m		Observed: Reported (age):
Crawling - note if bottom shuffling	Does not lift head	On elbows  normal at 3m	On outstretched hands  normal at 4m	Crawling flat on abdomen  normal at 8m	Crawling on hands and knees  normal at 10m	Observed: Reported (age):
Standing	Does not support weight	Supports weight normal at 4m	Stands with support normal at 7m	Stands unaided normal at 12m		Observed: Reported (age):
Walking		Bouncing normal at 6m	Cruising (walks holding on) normal at 12m	Walking independently normal by 15m		Observed: Reported (age):

SECTION 3 BEHAVIOUR (not scored)

	1	2	3	4	5	6	Comment
Conscious state	Unrousable	Drowsy	Sleep but wakes easily	Awake but no interest	Loses interest	Maintains interest	
Emotional state	Irritable, not consolable	Irritable, carer can console	Irritable when approached	Neither happy or unhappy	Happy and smiling		
Social orientation	Avoiding, withdrawn	Hesitant	Accepts approach	Friendly			

This is the official form for use with the Hammersmith Infant Neurological Examination.

Its content and scoring system are not to be changed. Main reference Haataja L et al J Peds 1999;135:153-61

For enquiries about the examination, please contact Prof Frances Cowan f.cowan@imperial.ac.uk,

Prof Leena Haataja leena.haataja@hus.fi or Prof Eugenio Mercuri eumercuri@gmail.com

Website <https://www.mackeith.co.uk/hammersmith-neurological-examinations/>