

## Hammersmith Infant Neurological Examination

Name:

Date of Birth:

Gestational Age:

Date of examination:

<b>Summary of examination</b>
<b>No. of asymmetries in section 1:</b>
<b>Milestones section 2:</b>
<b>Behavioural score section 3:</b>

<b>COMMENTS:</b>
<p><b>Cranial nerve function:</b></p> <p><b>Posture:</b></p> <p><b>Movements</b></p> <p><b>Tone</b></p> <p><b>Reflexes and reactions:</b></p>

### Section 1: Neurological items

#### Assessment of cranial nerve function

<i>column</i>	<i>1 (score 3)</i>	<i>2 (sc.2)</i>	<i>3 (score 1)</i>	<i>4 (score 0)</i>
<b>Facial appearance</b> (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
12 months	100			
18 months	100			



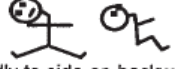
<b>Eye appearance</b>	normal conjugated eye movements		<b>intermittent</b> deviation of eyes or abnormal movements	<b>continuous</b> deviation of eyes or abnormal movements
12 months (%)	98		1	1
18 months (%)	100			






<b>Auditory response</b> Test the response to rattle or bell	reacts to stimuli on both sides		doubtful reaction to stimuli or asymmetrical	does not react to stimuli
12 months (%)	100			
18 months (%)	98		2	

<b>Visual response</b> Test the ability to follow a red ball or a moving object.	follows the object for a complete arc		follows the object for an incomplete arc or asymmetry	does not follow the object
12 months (%)	100			
18 months (%)	100			

<b>Sucking/swallowing</b> Watch the infant suck on breast or bottle.	good suck and swallowing		poor suck and/or swallowing	no sucking reflex no swallowing
12 months (%)	100			
18 months (%)	100			




## Posture

column	1 (score 3)	2 (sc.2)	3 (score 1)	4 (score 0)
<b>Head in sitting</b>	 straight; in midline		 slightly to side or backward or forward	 markedly to side or backward or forward
12 months (%)	100			
18 months (%)	100			

<b>Trunk in sitting (hold at hips if unstable)</b>	 straight		 slightly curved or bent to side	   very rounded    rocketing back    bent sideways
12 months (%)	100			
18 months (%)	100			

<b>Arms (at rest)</b>	in neutral position central straight or slightly bent		<b>slight</b> internal rotation or external rotation	<b>marked</b> internal rotation or external rotation or dystonic posture hemiplegic posture
12 months (%)	98		2	
18 months (%)	95		5	

<b>Hands</b>	hands open		<b>intermittent</b> adducted thumb or fisting	<b>persistent</b> adducted thumb or fisting
12 months (%)	100			
18 months (%)	100			

<b>Legs in sitting</b>	able to sit with straight back and legs straight or slightly bent (long sitting) 		sit with straight back but knees bent at 15-20 ° 	unable to sit straight unless knees markedly bent 
<b>in supine and in standing</b>	legs in a central position straight or slightly bent	<b>slight</b> external rotation	<b>marked</b> internal rotation or external rotation at hips	fixed extension or flexion or contractures at hips and knees
12 months (%)	64	25	10	1
18 months (%)	92		8	













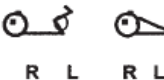











<b>Feet in supine and in standing</b>	central in neutral position toes straight midway between flexion and extension	<b>slight</b> internal rotation or external rotation	<b>intermittent</b> tendency to stand on tiptoes or toes up or curling under	<b>marked</b> internal rotation or external rotation at the ankle <b>persistent</b> tendency to stand on tiptoes or toes up or curling under
12 months (%)	90		10	
18 months (%)	90		10	

## Movements

column	1 (score 3)	2 (sc.2)	3 (score 1)	4 (score 0)
<b>Quantity</b> Watch infant lying in the supine	normal		excessive or sluggish	minimal or none
12 months (%)	97		3	
18 months (%)	100			




<b>Quality</b>	free, alternating, smooth		jerky, slight tremor	<ul style="list-style-type: none"> <li>• cramped &amp; synchronous</li> <li>• extensor spasms</li> <li>• athetoid</li> <li>• ataxic</li> <li>• very tremulous</li> <li>• myoclonic spasm</li> <li>• dystonic</li> </ul>
12 months (%)	99		1	
18 months (%)	98		2	




# Tone





column	1 (score 3)	2 (sc.2)	3 (score 1)	4 (score 0)
<b>Scarf sign</b> Take the infant's hand and pull the arm across the chest until there is resistance. Note the position of the elbow.	Range: 			
12 months (%)	98		2	
18 months (%)	95		5	
<b>Passive shoulder elevation</b> Lift arm next to the infant's head. Note resistance at shoulder and elbow.	resistance but overcome 		no resistance 	resistance not overcome 
12 months (%)	84		16	
18 months (%)	75		25	
<b>Pronation/supination</b> Steady upper arm while pronating and supinating forearm, note resistance	full pronation and supination, no resistance		full pronation and supination but resistance to be overcome	full pronation and supination not possible, marked resistance
12 months (%)	100			
18 months (%)	100			
<b>Adductors</b> With the infant's legs extended, open them as far as possible. The angle formed by the legs is noted.	150-80° 	150-160° 	>170° 	<80° 
12 months (%)	75	25		
18 months (%)	88	12		
<b>Popliteal angle</b> Legs are flexed at the hip simultaneously, then extended at the knee until there is resistance. Note angle between lower and upper leg.	Range: 170°-110° 	150-160° 	~90° or > 170° 	<80° 
12 months (%)	75	25		
18 months (%)	90	10		
<b>Ankle dorsiflexion</b> With knee extended, dorsiflex ankle. Note the angle between foot and leg.	Range: 30°-85° 	20-30° 	<20° or 90° 	> 90° 
12 months (%)	84	13	3	
18 months (%)	88	12		
<b>Pulled to sit</b> Pull infant to sit by wrists.				
12 months (%)	100			
18 months (%)	100			
<b>Ventral suspension</b>				
12 months (%)	99		1	
18 months (%)	98		2	



## Reflexes and reactions

column	1 (score 3)	2 (sc.2)	3 (score 1)	4 (score 0)
<b>Tendon Reflexes</b>	easily elicitable	mildly brisk	brisk	clonus or absent
	biceps knee ankle	bic knee ank	biceps knee ankle	biceps knee ankle
12 months (%)	82	18		
18 months (%)	88	12		












<b>Arm protection</b> Pull the infant by one arm from the supine position and note the reaction of the opposite side.				
	arm & hand extend R L		arm semi-flexed R L	arm fully flexed R L
12 months (%)	99		1	
18 months (%)	100			

<b>Vertical suspension</b> Hold infant under axilla, make sure legs do not touch any surface.				
	kicks symmetrically		kicks one leg more or poor kicking	no kicking even if stimulated or scissoring
12 months (%)	100			
18 months (%)	98		2	

<b>Lateral tilting</b> (describe side up). Infant held vertically, tilt quickly to horizontal. Note spine, limbs and head.				
	R L	R L	R L	R L
12 months (%)	75	16	9	
18 months (%)	79	19	2	

<b>Forward parachute</b> Infant held vertically and suddenly tilted forwards. Note reaction of the arms.			
	(after 6 months)		(after 6 months)
12 months (%)	100		
18 months (%)	100		

## Section 2: Motor milestones

Column	1	2	3	4	5	6
Head control	unable to maintain head upright (normal < 3 mo)	wobbles (normal at 4 mo)	all the time maintained upright (normal at 5 mo)			Observed:  Reported (age):
12 m (%)			100			
18 m (%)			100			
Sitting	Cannot sit	With support  (normal at 4 mo)	Props  (normal at 6 mo)	Stable sit  (normal at 7 mo)	Pivots  (normal at 10 mo)	Observed:  Reported (age):
12 m (%)				1	99	
18 m (%)					100	
Voluntary grasp	no grasp	uses whole hand	index finger and thumb but immature grasp	pincer grasp		Observed:  Reported (age):
12 m (%)			3	97		
18 m (%)			2	98		
Ability to kick: (in supine)	no kicking	horizontally legs do not lift	upward (vertically)  (normal at 3 mo)	touches leg  (normal at 4-5 mo)	touches toes  (normal at 5-6 mo)	Observed:  Reported (age):
12 m (%)					100	
18 m (%)					100	
Rolling	no rolling	rolling to side (normal at 4 mo)	prone to supine or supine to prone (normal at 6 mo)	supine to prone and prone to supine (normal at 7 mo)		Observed:  Reported (age):
12 m (%)		1	1	98		
18 m (%)				100		
Crawling	Does not lift head	On elbow  (normal at 3 mo)	On outstretched hand  (normal at 4-5 mo)	Crawling flat on abdomen  (normal at 8 mo)	Crawling on hands and knees  (normal at 10 mo)	Observed:  Reported (age):
			2	4	94	
					100	
Standing	Does not support weight	Supports weight (normal at 4-5 mo)	Stands with support (normal at 8 mo)	Stands unaided (normal at 12 mo)		Observed:  Reported (age):
12 m (%)		3	18	79		
18 m (%)			2	98		
Walking		Bouncing (normal at 6 mo)	Cruising (walks holding on) (normal at 11 mo)	Walking (normal at 15 mo)		Observed:  Reported (age):
12 m (%)		4	45	51		
18 m (%)			2	98		

## Section 3: Behaviour

	1	2	3	4	5	6	Comment
<b>A. State of consciousness</b>	unrousable	drowsy	sleepy but wakes easily	awake but no interest	loses interest	maintains interest	
<b>B. Emotional state</b>	irritable, not consolable	irritable, mother can console	irritable when approached	neither happy nor unhappy	happy, smiling		
<b>C. Social orientation</b>	avoiding, withdrawn	hesitant	accepts approach	friendly			