

Hammersmith Infant Neurological Examination

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Hammersmith Infant Neurological Examination (HINE) Training

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The Hammersmith Infant Neurological Examination (HINE) is a standardised and scoreable clinical neurological examination that can be used to assess infants from 2-24 months of age. The HINE contains 26 items across 5 domains and summing of scores in each domain provide a global score. More than ten studies of high risk newborns (preterm and term) have demonstrated that this assessment can be used in the diagnosis of cerebral palsy (CP).

Hi MinYoung,

AusCP-CTN is using Eventbrite to manage registration for [20190605 HINE Training - Vic - Royal Children's Hospital](#).

Since this is the first time you've bought a ticket or registered for an event on Eventbrite using kmin@cha.ac.kr, here's a quick guide to help you find what you need.

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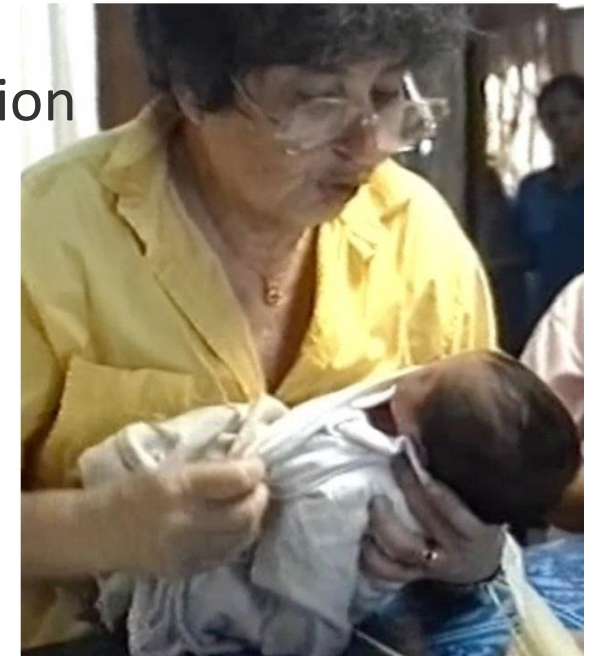
Scoring guideline

Introduction of HINE

<http://hammersmith-neuro-exam.com>

- **Hammersmith Infant Neurological Examination (HINE)**

- Based on the same principles as the neonatal exam
- Consists of 26 items that assess different neurological function
 - cranial nerve function
 - movements
 - reflexes and protective reactions
 - behaviour
 - some age-dependent items: gross and fine motor function
- To be used for infants between 3 and 24 months of age
- For clinic use and research
- Enable detection of high risk of cerebral palsy (CP) at an early age & prediction of independent sitting and walking in children with CP



Hammersmith Infant Neurological Examination

Name:

Date of Birth:

Gestational Age:

Date of examination:

Summary of examination

No. of asymmetries in section 1:

Milestones section 2:

Behavioural score section 3:

COMMENTS:

Cranial nerve function:

Posture:

Movements

Tone

Reflexes and reactions:

Section 1: Neurological items

Assessment of cranial nerve function (5 항목)

column	1 (score 3)	2 (sc.2)	3 (score 1)	4 (score 0)
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
12 months (%)	100			
18 months (%)	100			

column	1 (score 3)	2 (sc.2)	3 (score 1)	4 (score 0)
Eye appearance	normal conjugated eye movements		intermittent deviation of eyes or abnormal movements	continuous deviation of eyes or abnormal movements
12 months (%)	98		1	1
18 months (%)	100			

column	1 (score 3)	2 (sc.2)	3 (score 1)	4 (score 0)
Auditory response 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	

column	1 (score 3)	2 (sc.2)	3 (score 1)	4 (score 0)
Visual response 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			

column	1 (score 3)	2 (sc.2)	3 (score 1)	4 (score 0)
Sucking/swallowing 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 (6 항목)

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

column	1 (score 3)	2 (sc.2)	3 (score 1)	4 (score 0)
Trunk in sitting (hold at hips if unstable)	straight		slightly curved or bent to side	very rounded rocking back bent sideways
12 months (%)	100			
18 months (%)	100			

column	1 (score 3)	2 (sc.2)	3 (score 1)	4 (score 0)
Arms (at rest)	in neutral position central straight or slightly bent		slight internal rotation or external rotation	marked internal rotation or external rotation or dystonic posture hemiplegic posture
12 months (%)	98		2	
18 months (%)	95		5	

column	1 (score 3)	2 (sc.2)	3 (score 1)	4 (score 0)
Hands	hands open		intermittent adducted thumb or fisting	persistent adducted thumb or fisting
12 months (%)	100			
18 months (%)	100			

column	1 (score 3)	2 (sc.2)	3 (score 1)	4 (score 0)
Legs in sitting	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
in supine and in standing	legs in a central position straight or slightly bent	slight external rotation	marked 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	



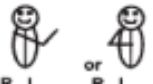
column	1 (score 3)	2 (sc.2)	3 (score 1)	4 (score 0)
Feet in supine and in standing	central in neutral position toes straight midway between flexion and extension	slight internal rotation or external rotation	intermittent tendency to stand on tiptoes or toes up or curling under	marked internal rotation or external rotation at the ankle persistent tendency to stand on tiptoes or toes up or curling under
12 months (%)	90		10	
18 months (%)	90		10	




Movements (2 항목)

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

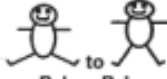



column	1 (score 3)	2 (sc.2)	3 (score 1)	4 (score 0)
Quality	free, alternating, smooth		jerky, slight tremor	<ul style="list-style-type: none"> cramped & synchronous extensor spasms athetoid ataxic very tremulous myoclonic spasm dystonic
12 months (%)	99		1	
18 months (%)	98		2	





Tone (8 항목)



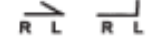

column	1 (score 3) Range:	2 (sc.2)	3 (score 1)	4 (score 0)
Scarf sign Take the infant's hand and pull the arm across the chest until there is resistance. Note the position of the elbow.	 R L R L		 R L	 R L or R L
12 months (%)	98		2	
18 months (%)	95		5	

Passive shoulder elevation Lift arm next to the infant's head. Note resistance at shoulder and elbow.	resistance but overcome  R L	no resistance  R L	resistance not overcome  R L
12 months (%)	84	16	
18 months (%)	75	25	

Pronation/supination 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		

Adductors With the infant's legs extended, open them as far as possible. The angle formed by the legs is noted.	150-80°  R L to R L	150-160°  R L	>170°  R L	<80°  R L
12 months (%)	75	25		
18 months (%)	88	12		

Popliteal angle 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°  R L R L	150-160°  R L	~90° or > 170°  R L R L	<80°  R L
12 months (%)	75	25		
18 months (%)	90	10		




Ankle dorsiflexion With knee extended, dorsiflex ankle. Note the angle between foot and leg.	Range: 30°-85°  R L R L	20-30°  R L	<20° or 90°  R L R L	> 90°  R L
12 months (%)	84	13	3	
18 months (%)	88	12		

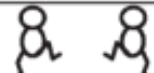
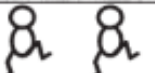

Pulled to sit Pull infant to sit by wrists.				
12 months (%)	100			
18 months (%)	100			





Ventral suspension				
12 months (%)	99		1	
18 months (%)	98		2	



Reflexes and reactions (5 항목)

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









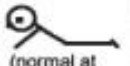

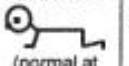
Arm protection Pull the infant by one arm from the supine position and note the reaction of the opposite side.	 arm & hand extend R L	 arm semi-flexed R L	 arm fully flexed R L
12 months (%)	99	1	
18 months (%)	100		

Vertical suspension 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	

Lateral tilting (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	

Forward parachute 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

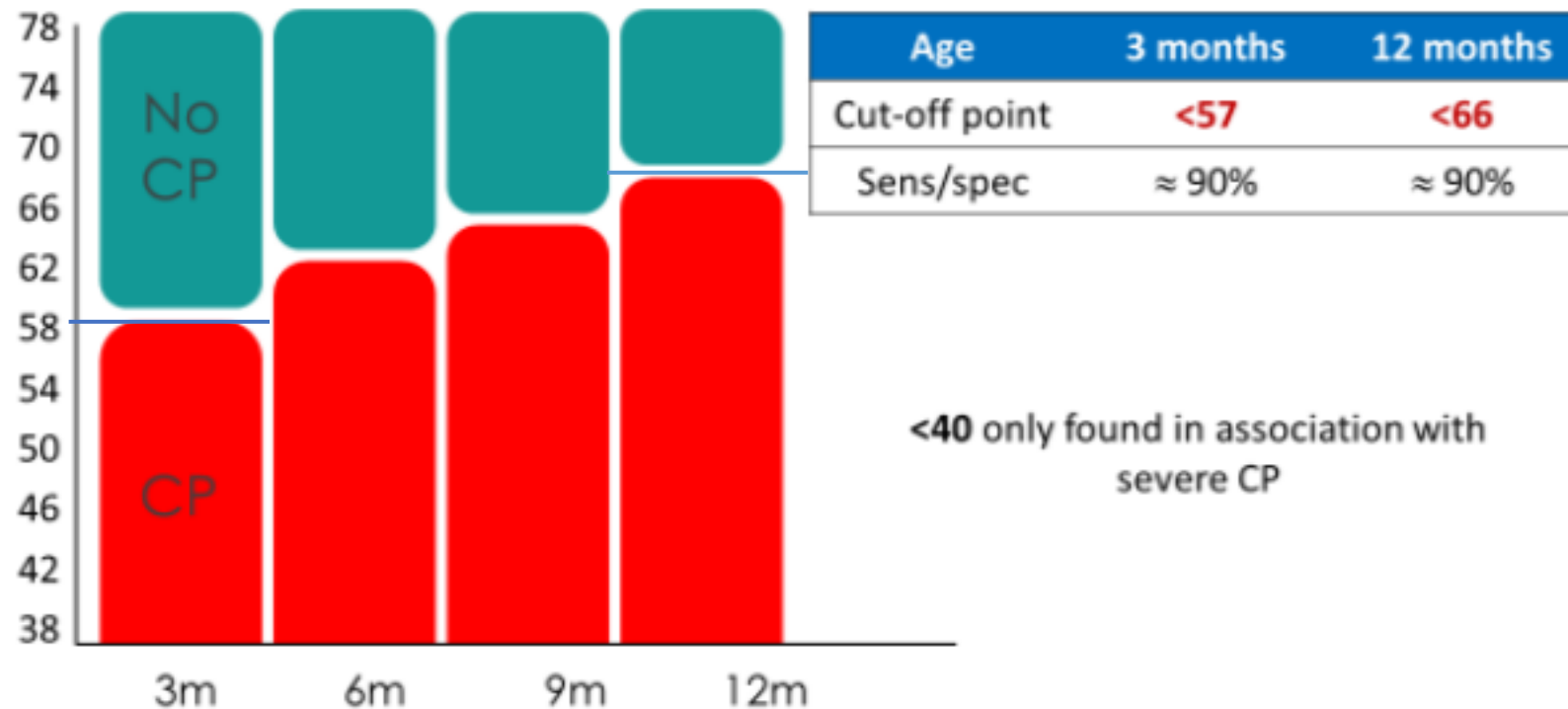
	1	2	3	4	5	6	Comment
A. State of consciousness	unroutable	drowsy	sleepy but wakes easily	awake but no interest	loses interest	maintains interest	
B. Emotional state	irritable, not consolable	irritable, mother can console	irritable when approached	neither happy nor unhappy	happy, smiling		
C. Social orientation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

Summary of examination in Section 1

- Global score (max 78)
 1. Cranial nerve function score (max 15)
 2. Posture score (max 18)
 3. Movement score (max 6)
 4. Tone score (max 24)
 5. Reflexes and reactions score (max 15)
- Number of asymmetries
- Behavioral score (Not part of the optimality score)
- COMMENTS

Significance of HINE use as an evaluation tool

Prediction of Cerebral Palsy



Hammersmith Infant Neurological Examination (HINE)

How long does the HINE take?

The examination takes 10–15 minutes to perform.

Do I need certified training to use the HINE in clinical practice?

No you do not need certified training to use the HINE in clinical practice.

HINE is predictive of cerebral palsy

HINE scores at 3 months:

- **<57** is 96% predictive of cerebral palsy
- <40 never occurs in children with normal outcomes^{3,4}

HINE scores at (6, 9, 12 months):

- 90% predictive of cerebral palsy
- **<73** predictive of cerebral palsy
- <40 almost always indicates cerebral palsy^{3,4}

HINE is predictive of severity and topography of cerebral palsy

- Motor severity of cerebral palsy under years of age is most accurately predicted using the HINE

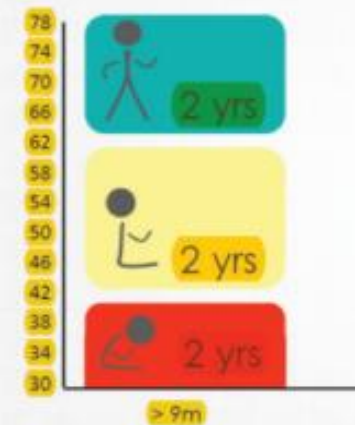
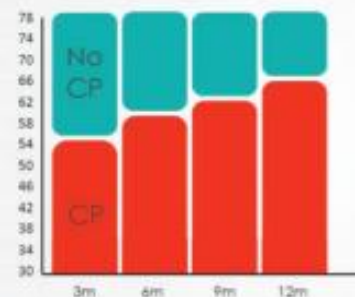
HINE scores at 3, 6, 9 or 12 months:

- **50-73** indicates likely unilateral cerebral palsy (i.e. 95-99% will walk)
- <50 indicates likely bilateral cerebral palsy

HINE scores at 3-6 months:

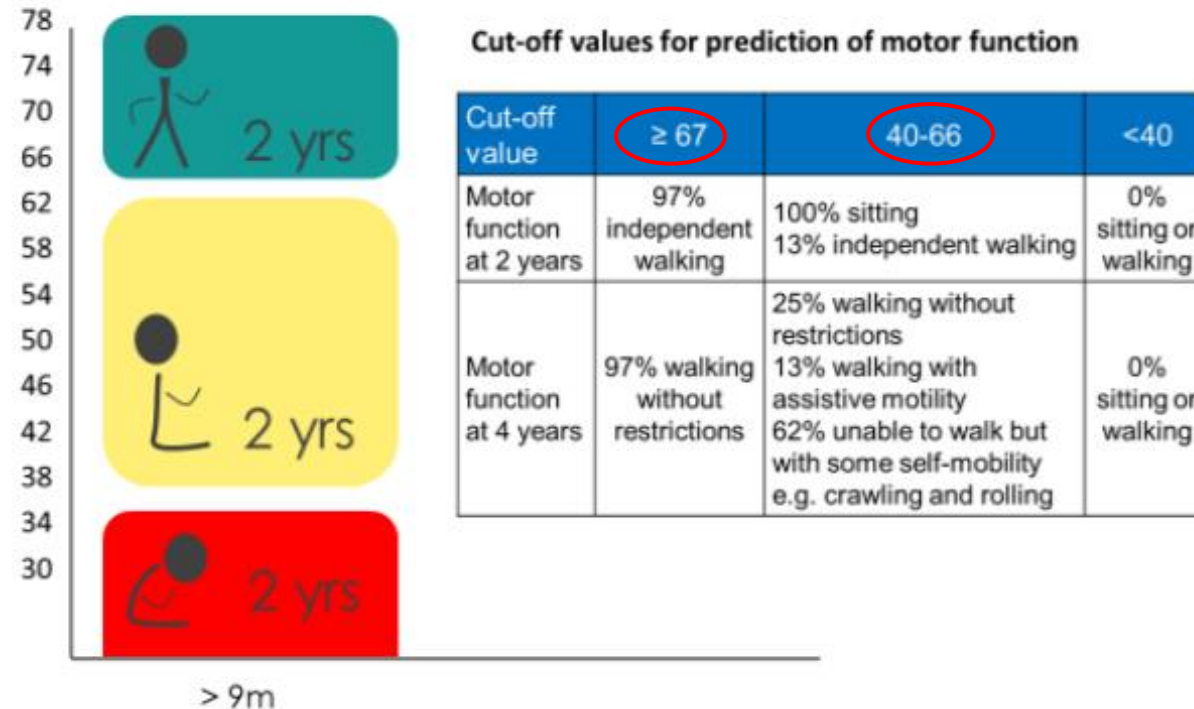
- **40-60** indicates likely GMFCS I-II
- <40 indicates likely GMFCS III-V

STANDARDISED
NEURO
EXAM



Hammersmith Infant Neurological Examination (HINE) Cut-off point Summary

Term infants with HIE



* Optimality score **at 9 -14 months** and motor function at 2 & 4 years in term-born infants with hypoxic-ischaemic encephalopathy (Haataja et al, J Peds 2001)

Early, Accurate Diagnosis and Early Intervention in Cerebral Palsy

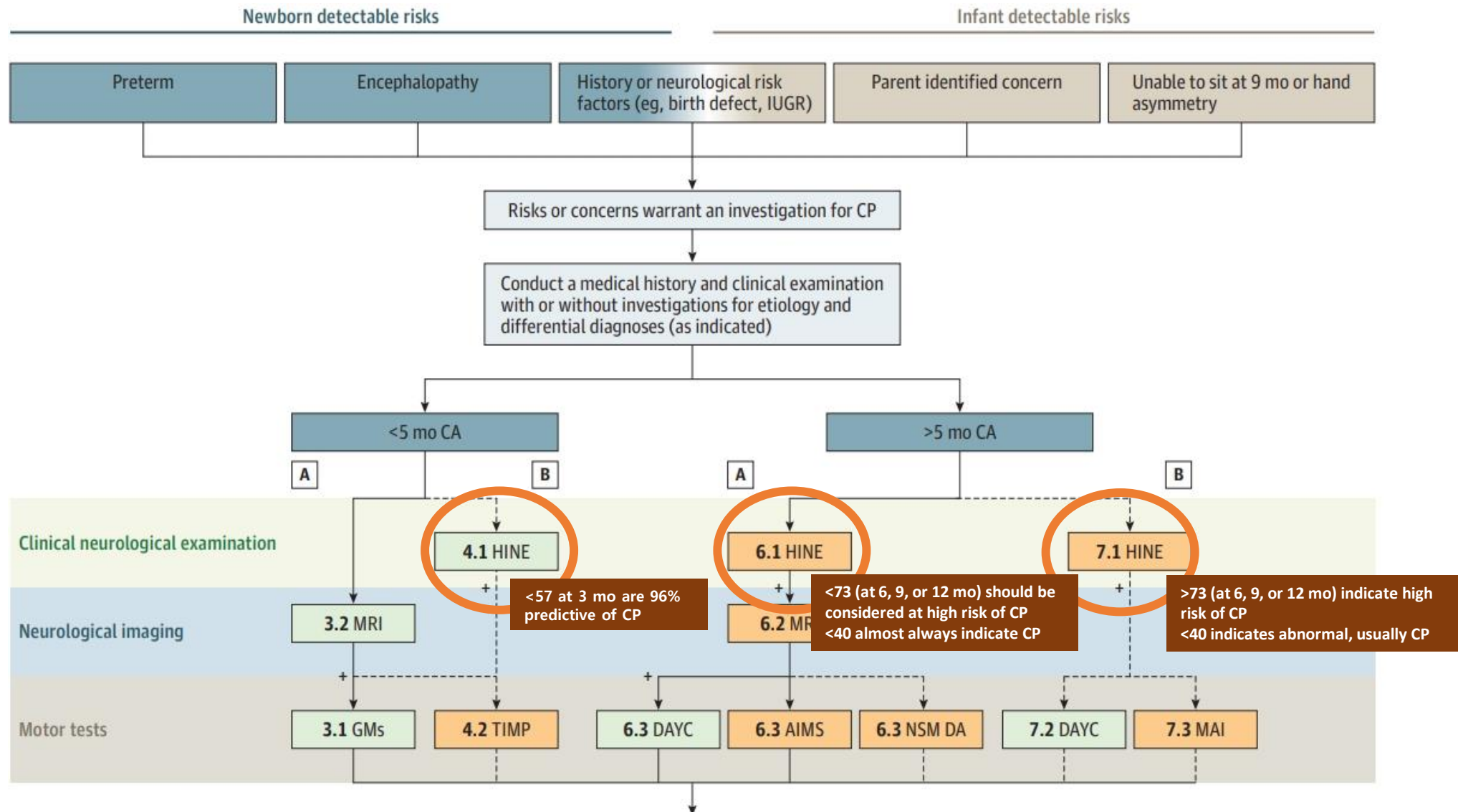
Advances in Diagnosis and Treatment

Iona Novak, PhD; Cathy Morgan, PhD; Lars Adde, PhD; James Blackman, PhD; Roslyn N. Boyd, PhD; Janice Brunstrom-Hernandez, MD;
Giovanni Cioni, MD; Diane Damiano, PhD; Johanna Darrah, PhD; Ann-Christin Eliasson, PhD; Linda S. de Vries, PhD; Christa Finsnieler, PhD


- To develop an international clinical practice guideline in accord with the World Health Organization's *Handbook for Guideline Development* and the Institute of Medicine's standards
- Followed Appraisal of Guidelines, Research and Evaluation (AGREE) II & Appraisal of Guidelines, Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA) statement
- The Grading of Recommendations Assessment, Development, and Evaluation (GRADE) framework
 - : strong for / conditional for / conditional against / strong against
- Six systematic reviews and 2 evidence-based clinical guidelines
- Before age 12 to 24 months – regarded as the latent or silent period → 6 months of C.A
- Three tools with best predictive validity for detecting CP
 - < 5 months C.A: Brain MRI (86-96% sensitivity), GM (98%), HINE (90%)
 - > 5 mo: MRI (86-89%), HINE (90%)

Combination of these!

Algorithm for early diagnosis of cerebral palsy or high risk of cerebral palsy



Hammersmith Infant Neurological Examination for infants born preterm: predicting outcomes other than cerebral palsy

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1 Pediatric Neurology Unit, Fondazione Policlinico Universitario A. Gemelli IRCCS, Rome; **2** Pediatric Neurology Unit, Università Cattolica del Sacro Cuore Roma, Rome, Italy. **3** Department of Paediatrics, Imperial College, London, UK. **4** Division of Pediatric Neurology, Children's Hospital, Pediatric Research Center, University of Helsinki, Helsinki, Finland. **5** National Centre of Services and Research for the Prevention of Blindness and Rehabilitation of Low Vision Patients, IAPB Italia Onlus.

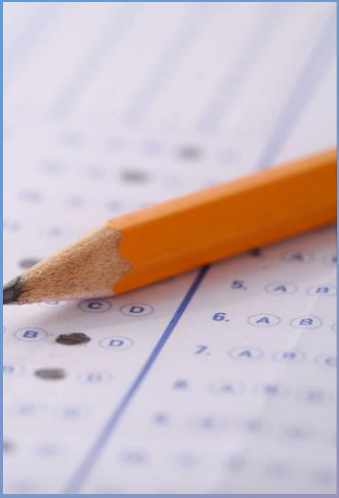
■ METHOD

- retrospective study of infants born preterm, who had repeated HINEs between 3 and 12 months
- At 2 years, cognition was assessed using the Mental Development Index (MDI) from Bayley Scales of Infant Development II
- All children were classified as cognitively typical/mildly delayed or significantly delayed (MDI <70) and CP.

■ RESULTS

- Of 1229 eligible infants (gestational age 25–36wks), 1108 did not develop CP, 891 had an MDI that was typical/mildly delayed, and 217 had an MDI less than 70.
- Of the 121 infants who developed CP, the MDI was typical in 28, mildly delayed in 27, and less than 70 in 66.
- **HINE scores showed a good sensitivity and specificity, for detecting significantly delayed cognitive performance in infants without CP.**
- In those who developed CP, the score was associated with their cognitive level.

➤ The HINE provides information about the risk of delayed cognitive performance in infants born preterm with and without CP.



Scoring guideline

■ Equipment



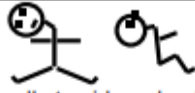






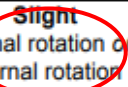
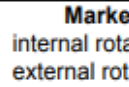

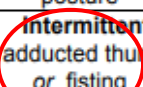
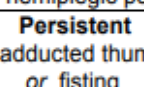




- Scoring proforma
- Visual targets
- Rattle
- Hammer
- Toys



Recording the examination

- Items do not need to be administered in order.
- Indicate the response by circling the appropriate picture. Draw variations on pictures.
- Finding falls between two options – mark across the vertical line
- Record any comments descriptively.
- If unsure, repeat item or make descriptive comment.

ASSESSMENT OF POSTURE (note any asymmetries)

	score 3	score 2	score 1	score 0	sc	Asymmetry / comments
Head in sitting	 Straight; in midline		 Slightly to side or backward or forward	 Markedly to side or backward or forward		
Trunk in sitting	 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 or external rotation Intermittent dystonic posture	 Marked internal rotation or external rotation or dystonic posture hemiplegic posture		 Dystonia, 우측 손에서 분명함
Hands	Hands open		 Intermittent adducted thumb or fisting	 Persistent adducted thumb or fisting		
Legs in sitting	Able to sit with a straight back and legs straight or slightly bent (long sitting) 		Sit with straight back but knees bent at 15-20 °  Internal rotation or external rotation at the hips	Unable to sit straight unless knees markedly bent (no long sitting)  Marked internal rotation or external rotation or fixed extension or flexion or contractures at hips and knees		
in supine and in standing	Legs in neutral position straight or slightly bent	Slight internal rotation or external rotation				
Feet	Central in neutral		Slight	Marked		

Scoring

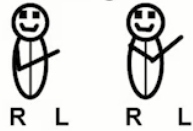

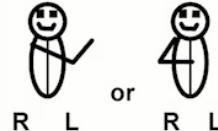




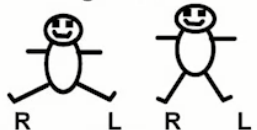
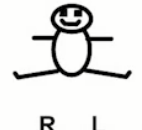

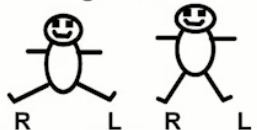

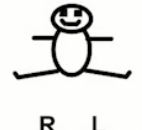



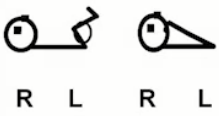

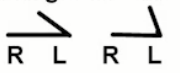

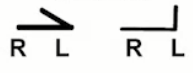

Score	Score the relevant ½ point if you mark across the vertical line.
Mean	If asymmetrical, add the two scores for that item and take the mean.
Predominant	Score predominant position/performance, not their best performance.

Ideally following items should be assessed with the child undressed down to vest and diapers. However, if undressing the child causes upset at least remove shoes and socks, trousers, and thick jumpers.



Asymmetric cases

ASSESSMENT OF TONE

	Score 3	Score 2	Score 1	Score 0	sc	Asym/Co
Scarf sign Take the infant's hand 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° 		

SUMMARY OF EXAMINATION

Global score (max 78)

Number of asymmetries

Behavioural score (not part of the optimality score)


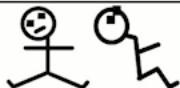
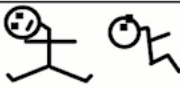






Cranial nerve function	score	(max 15)
Posture	score	(max 18)
Movements	score	(max 6)
Tone	score	(max 24)
Reflexes and reactions	score	(max 15)

COMMENTS

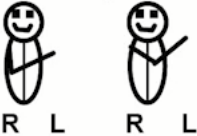






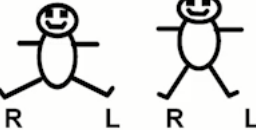


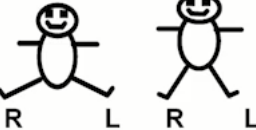







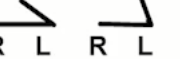

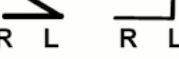

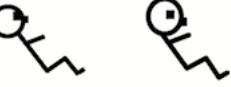


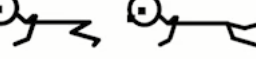


ASSESSMENT OF CRANIAL NERVE FUNCTION

	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	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		



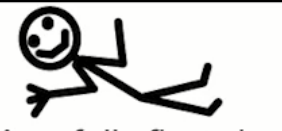
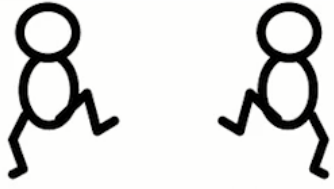

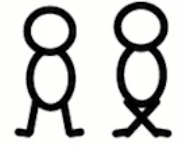



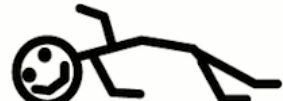


ASSESSMENT OF POSTURE (note any asymmetries)

	score 3	score 2	score 1	score 0	sc	Asymmetry / comments
Head in sitting	 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	 Straight		 Slightly curved <i>or</i> bent to side	 Very rounded rocketing back bent sideways		
Arms at rest	In a neutral position, central straight <i>or</i> 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	Able to sit with a straight back and legs straight <i>or</i> slightly bent (long sitting) 		Sit with straight back but knees bent at 15-20 ° 	Unable to sit straight unless knees markedly bent (no long sitting) 		
in supine and in standing	Legs in neutral position straight <i>or</i> slightly bent	Slight internal rotation <i>or</i> external rotation	Internal rotation <i>or</i> external rotation at the hips	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 <i>or</i> toes up <i>or</i> curling under	Marked internal rotation <i>or</i> external rotation at the ankle Persistent Tendency to stand on tiptoes <i>or</i> toes up <i>or</i> curling under		

ASSESSMENT OF TONE

	Score 3	Score 2	Score 1	Score 0	sc	Asym/Co
Scarf sign Take the infant's hand 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





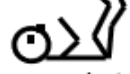

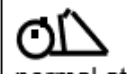
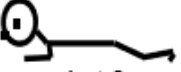
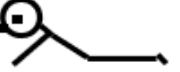
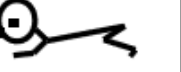
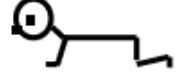
	Score 3	Score 2	Score 1	Score 0	sc	Asym / Co
Arm protection Pull the infant by one arm from the supine position (steady the contralateral hip) and note the reaction of arm on opposite side.	 Arm & hand extend R L		 Arm semi-flexed R L	 Arm fully flexed R L		
Vertical suspension hold infant under axilla making sure legs do not touch any surface – you may “tickle” feet to stimulate kicking.	 Kicks symmetrically		 Kicks one leg more or poor kicking	 No kicking even if stimulated or scissoring		
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.	 R L	 L R	 R L	 R L		
Forward parachute Hold infant up vertically and quickly tilt forwards. Note reaction /symmetry of arm responses,	 (after 6 months)		 (after 6 months)			
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		

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	<ul style="list-style-type: none"> • Cramped & synchronous • Extensor spasms • Athetoid • Ataxic • Very tremulous • Myoclonic spasm • Dystonic movement 		

Section 2 Motor milestones

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):

Thank you for your attention.