Hammersmith Neonatal Neurological Examination Term and preterms at term age Ricci D et al Early Hum Devel 2008

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Patient Name GΑ ID **Date** DOB

	arms & legs	legs slightly	leg well-flexed	leg well flexed	abnormal posture:	1 .5	2 .5	3	.5	4	.5	5	
	extended or very slightly flexed	flexed	but not adducted	& adducted near to	opisthotonus a) arms flexed,	3 0	9 6	60	9	12	0	1	25-27w
	siightly flexed			abdomen	b) legs extended	1 0	6 2	61	16	12	1	1	28-29w
æ			~2~~	->.	-,	2 0	4 2	65	17	8	0	2	30-31w
POSTURE	~~	~~~		(X)		0 0	0 2	81	4	9	0	4	32-34w
ĕ		\mathbb{Q}_{λ}	-25N	7		0 0	0 0	6	3	90	1	0	Full term
	(- 1	\\			<u> </u>		0 0	О	3	90	1	U	Full term
	arms do not flex	arms flex slowly	arms flex	arms flex	arms difficult to								
١.		not always; not completely	slowly; more complete	quickly and completely	extend; snap back forcefully	3 1	9 9	44	9	23	2	0	25-27w
₫				completely		1 1	3 4	42	15	33	0	1	28-29w
SE SE		æ	l 🗎	IΩ		1 0	8 3	42	10	36	0	0	30-31w
ARM RECOIL		\mathcal{A}	l vYv	l X		0 0	2 2	54	15	25	0	2	32-34w
AR	1 'U'	7()-	1 <i>11</i>	ΙIJ		0 0	5 2	22	3	67	1	0	Full term
_		- 1			ni								
_	arms remain straight;	arms flex slightly or some	arms flex well till shoulder	arms flex to approx. 100°	flexion of arms <100°:								
<u>S</u>	no resistance	resistance felt	lifts, then	& maintained	maintained when	3 0	17 5	51	10	14	0	0	25-27w
CT			straighten	as shoulder	body lifts up	7 1	14 7	45	8	18	0	0	28-29w
Σ	اللها	- ^T		lifts †	_ T	7 2	15 4	51	7	14	0	0	30-31w
ARM TRACTION	04-7-	\circ	\wedge	גשו.	עט	6 2	25 0	59	4	4	0	0	32-34w
AR	R L	R	٠٠ سيا	R	R L	0 0	1 0	22	8	69	0	0	Full term
			R L										
٠,	No flexion	incomplete or variable flexion	complete but slow flexion	complete fast flexion	legs difficult to extend; snap	3 0	14 4	18	5	52	0	4	25-27w
등	-	variable liexion	SIOW HEXION	IIGAIOH	back forcefully	0 0	5 2	24	5	62	0	2	28-29w
Ä	→			l <u> </u>		0 0	10 2	34	2	50	0	2	30-31w
LEG RECOIL	ا ما	٠ .	0.\$	0 4		0 0	9 0	38	2	49	0	2	32-34w
3	⊙~	O _~	<u> </u>	<u> – 2</u>		0 0	3 1	4	1	91	0	0	Full term
	lana stanisht	lana Anu aliabib.	lana flammali tili	lunes flavors 9	Acrica starra								
Z	legs straight - no resistance	legs flex slightly or some	legs flex well till bottom lifts up	knee flexes & remains	flexion stays when back &	1314	47 6	35		0.7			25 27
Ĕ		resistance felt		flexed when	bottom up	3 1 1 1	17 6 17 2	35 36	6	27 35	1	1	25-27w 28-29w
Σ¥C	<u> </u>	1	<u>†</u>	bottom up	1	2 0	21 8	38	5	25	0	1	30-31w
Ŧ		\circ	08	ام <i>د</i>	1 ~ ~	0 4	29 10	43	2	10	0	2	32-34w
LEG TRACTION	\sum_{R})	R CLA		0	0 0	0 1	12	12	72	0	3	Full term
1	κ Ε	R L	K L	R L	R L								
						3 0	22 8	46	6	14	0	0	25-27w
AL.			ا ما	١.,		5 1	16 5	48	7	17	1	0	28-29w
ШЩ	0	\mathcal{O}	\circ	104	I (O ()	2 0	15 10	53	5	15	0	0	30-31w
POPLITE AL ANGLE	180°	= 150°	=110°	=90°	<90°	2 0	26 4	49	4	13	0	2	32-34w
A A	R L	R L	R L	R L	R L	0 0	5 5	19	20	51	0	0	Full term
	no attempt to	infant tries:	rainas baad but	raises head:	<u> </u>								
_	raise head	effort better felt	raises head but drops forward	remains		3 0	17 4	46	9	21	0	0	25-27w
OL (1)		than seen	or back	vertical		0 0	13 5	46	12	24	0	0	28-29w
~	~ □	Ω	∞	(C)		3 0	14 2	48	13	20	0	0	30-31w
HEAD	I (W)	[P]	7~			4 0	15 4	55	4	18	0	0	32-34w
Ξö	IX.	\sim	~	~		0 0	0 6	26	12	56	0	0	Full term
	no attempt to	infant tries:	raises head but	raises head:	head upright or	! 							
9	raise head	effort better felt	drops forward	remains	extended; cannot	3 0	3 5	57	11	21	0	0	25-27w
Ĕ		than seen	or back	vertical; it	be passively	1 2	6 4	50	13	24	0	0	28-29w
ő	ایا	~	~	may wobble	flexed	1 0	2 2	63	11	21	0	0	30-31w
9	ly l	υ,	\mathcal{Q}	\mathbb{Q}		0 0	4 2	77	2	15	0	0	32-34w
HEAD CONTROL	 	<u>\</u>	ΙĹ	L		0 0	0 4	29	15	52	0	0	Full term
1		^	<u> </u>	ハ	<u> </u>								
	head drops &	tries to lift head	able to lift head	lifts head in	head in front of	3 3	27 13	36	3	15	0	0	25-27w
	stays back	but it drops	slightly	line with body	body	3 3	18 7	40	14	15	0	0	28-29w
AG.		back				7 3	16 5	46	7	16	0	0	30-31w
D.L.	0	\circ		\cap	\Box	4 0	21 4	56	o	15	0	0	32-34w
HEAD LAG	1 O K	Υ	\sim	14	*	0 0	9 4	44	12	31	0	0	Full term
Ξ		\sim	\sim	~	\sim					•	•		•
	back curved,	back curved,	back slightly	back straight,	back straight,	i ——							
		head ↓, limbs	curved, limbs	head in line,	limbs above body	0 0	21 11	38	11	15	4	0	25-27w
	head & limbs				•		25 8	44	. 0	1 40			
NO		slightly flexed	flexed	limbs flexed		3 0		44	8	10	0	2	28-29w
AL VSION			flexed	limbs flexed		3 0	22 8	47	5	14	1	0	30-31w
ENTRAL USPENSION			flexed OF &	imbs flexed						:		_	

2 6	arm flexion	arm flexion	arm flexion	arm flexion	1	.5	2	.5	3	.5	4	.5	5	
FLEXOR TONE compare arm and leg traction)	leg flexion	leg flexion	leg flexion;	leg flexion;	0	0	45	0 <1	27 40	<1 0	27	0 <1	0	25-27w 28-29w
FLEXOR TO (compare arm and leg tracti			difference	difference > 1	0	0	34	<1	47	<1	18	0	1	30-31w
EXC npa 1 leg			≤1 column	colum n	0	0	38	<1	36	<1	24	<1	2	32-34w
EL (COI					0	0	25	3	53	0	18	0	<1	Full term
		1 2											1 35	
ш		arms and	strong arm flexion with	strong arm flexion with	0	0	0	0	99	<1	0	0	1	25-27w
ON		legs generally	strong leg	strong leg	0	0	0	0	96	<1	3	0	1	28-29w
FLEXOR TONE (resting posture)		flexed	extension	extension	0	0	0	0	96	<1	2	0	2	30-31w
XXO			intermittent	continuous	0	0	0	0	94	<1	2	0	4	32-34w
FLF (res					0	0	0	0	99	0	<1	0	<1	Full term
		<u> </u>			ļ									
	leg traction	leg traction	leg traction	leg traction	0	0	43	<1	34	0	21	<1	1	25-27w
P (> popliteal	popliteal	< popliteal	< popliteal	0	0	41	0	39	<1	19	0	1	28-29w
E n an	angle	angle	angle;	angle;	0	0	38	0	36	<1	22	<1	4	30-31w
LEG TONE (leg traction and popliteal angle)			difference ≤1	difference > 1	0	0	19	<1	50	<1	29	<1	2	32-34w
G T Sitra			column	colum n	0	0	4	0	57	0	35	0	1	Full term
LE (leg														
ا ا	neck	neck	neck	neck	0	0	25	0	64	0	9	0	2	25-27w
180 H	extension <	extension =	extension >	extension >	0	0	17	0	70	0	13	0	0	28-29w
I K	neck flexion	Neck	neck flexion;	neck flexion;	0	0	18	0	76	0	6	0	0	30-31w
HEAD CONTROL (sitting)	C 1000 C	flexion	difference ≤	difference > 1	0	0	23	0	64	0	13	0	0	32-34w
HEAD (sitting)			1 column	colum n	0	0	3	0	94	0	3	0	<1	Full term
H is	VYV.DP-1-002417704	0.00001A000000000	ORD Section Control of											
	ventral suspension	ventral suspension	ventral suspension	ventral suspension	0	0	20	0	39	0	35	0	6	25-27w
NECK AND AXIAL TONE horizontal)	<	=	> suspension	> suspension	0	0	31	0	42	0	26	0	1	28-29w
NECK AND AXIAL TO! (horizontal)	head lag	head lag	head lag;	head lag;	0	0	24	0	49	0	26	0	1	30-31w
CK TIAI	9,55500		difference ≤1	difference > 1	0	0	17	0	51	0	28	0	4	32-34w
NE AX (hor			column	colum n	0	0	24	0	58	0	18	0	<1	Full term
				,				30						

Reflex items Page 3

03400	absent	felt, not	seen	'exaggerated'	clonus	1	.5	2	.5	3	.5	4	.5	5	46
TENDON REFLEX	aosene	seen	seen	chaggerated	cionas	0	0	9	0	55	7	13	3	13	25-27w
EFI						0	0	12	0	50	7	22	4	5	28-29w
28						0	0	24	1	52	1	13	0	9	30-31w
Į O						0	0	18	0	57	0	17	4	4	32-34w
ENI						<1	0	21	0	78	0	<1	0	<1	Full term
Ε							10	21	1 0	7.0				1	T un term
	no gag /	weak	weak regular	strong suck:	no suck										
	no suck	irregular	suck	(a) irregular	but strong	0	0	1	0	1	3	02	0	0	25 25
4G		suck only:		(b) regular	clenching	0	0	3	0	7	0	93	0	0	25-27w 28-29w
SUCK/GAG						0	0	0	0	6	2	90	0	0	30-31w
JCF						0	0	4	0	10	0	86	0	0	30-31W 32-34W
S		no				0	0	1	0	5	0	92	0	2	Full term
		stripping	some stripping	good stripping			10	1	0] 3	U	92	U		run term
	no	short,	strong flexion	strong finger	very strong										
	response	weak	of fingers	flexion,	grasp; infant	0	0	5	0	47	7	30	1	10	25-27w
AR P		flexion of	2009	shoulder ↑	can be lifted	0	0	3	1	40	8	43	1	4	28-29w
PALMAR GRASP		fingers			off couch	0	0	1	0	51	3	35	0	10	30-31w
PA GR	R L	R L	R L	R L	R L	0	0	7	0	53	3	30	0	7	32-34w
.,, .,,,,,,						<1	0	6	0	84	0	9	0	<1	Full term
							-	1							<i>ii</i>
	no	partial	toes curve around the			0	0	4	1	95	0	0	0	0	25-27w
AR	response	plantar flexion of	examiner's			0	1	5	2	92	0	0	0	0	28-29w
INT		toes	finger			0	0	2	1	97	0	0	0	0	30-31w
PLANTAR GRASP						0	0	2	2	96	0	0	0	0	32-34w
	R L	R L	R L			<1	0	2	0	98	0	0	0	0	Full term
						5	1 2	10		70	0	0	0	0	25.25
16.00%	no response	dorsi - flexion of	full placing response with			0	2	12	3	78 80	0	0	0	0	25-27w
PLACING	response	ankle onl y	flexion of hip,			0.00	0	8	8	83	0	0	0	0	28-29w
AC.			knee & placing			0	0	4	0	96	0	0	0	0	30-31w 32-34w
PL,			sole on surface			1	0	18	0	81	0	0	0	0	Full term
	R L	R L	R L			1	10	10	1 0	01	U	0	U	0	run term
	no	full	full abduction	partial abduction	• no		1 .							Ε.	
	response	abduction	but only	at shoulder and	abduction or	0	0	13	1	61	4	20	0	1	25-27w
	or opening of hands	at shoulder	delayed or partial	extension of arms followed by	adduction; • only	0	0	12	1	64	6	15	1	1	28-29w
6.5	only	and	adduction	smooth	forward	0	0	12	1	51	3	28	0	5	30-31w
EX	Palacase.	extension		adduction	extension of	0	0	23	0	46	2	27	0	2	32-34w
EFI		of the arms;			arms from the	0	0	1	0	20	0	79	0	0	Full term
R		no			shoulders • marked										
MORO REFLEX		adduction			adduction										
MC		•	A A		only										
		44													
		()	$() \rightarrow ()$	1 1 1 → 1	[() ()										

Movements Page 4

a

SPONTANEOUS MOVEMENT (quantity)	no movement	sporadic and short isolated movements	frequent isolated movements	frequent generalized movements	continuous exaggerated movements
SPONTANEOUS MOVEMENT (quality)	only stretches	stretches and random abrupt movements Some smooth movements	fluent movements but mono- tonous	fluent alternating movements of arms + legs; good variability	cramped synchr- onous mouthing jerky or other abnormal movement
HEAD RAISING	no movement	infant rolls head over, chin not raised	infant raises chin, rolls head over	infant brings head and chin up	infant brings head up and keeps it up

1	.5	2	.5	3	.5	4	.5	5	
0	0	15	3	28	3	51	0	0	25-27w
0	0	17	3	26	11	43	0	0	28-29w
0	0	13	0	31	8	48	0	0	30-31w
0	0	20	0	27	0	51	0	2	32-34w
<1	0	3	0	5	0	92	0	<1	Full term

0	0	16	4	42	11	23	1	3	25-27w
0	0	22	5	35	1	23	2	2	28-29w
0	0	20	6	34	2	36	0	2	30-31w
0	0	21	0	15	0	60	0	4	32-34w
2	0	5	0	<1	0	93	0	<1	Full term

0	0	36	6	34	6	14	1	3	25-27w
1	1	35	4	34	9	14	1	1	28-29w
1	1	40	5	28	1	21	1	2	30-31w
0	0	40	0	30	4	22	2	2	32-34w
<1	0	10	0	50	0	40	0	<1	Full term

Abnormal signs

ABN, HAND OR TOE POSTURES		hands open, toes straight most of the time	intermittent fisting or thumb adduction	continuous fisting or thumb adduction; index finger flexion, thumb opposition	continuous big toe extension or flexion of all toes
TREMOR		no trem or or trem or onl y when crying	tremor only after Moro or occasionally when awake	frequent tremors when awake	continuous tremors
STARTLE	no startle even to sudden noise	no spontan -eous startle but reacts to sudden noise	2-3 spontaneous startles	more than 3 spontaneous startles	continuous startles

1	.5	2	.5	3	.5	4	.5	5	
0	0	57	4	37	0	2	0	0	25-27w
0	0	64	6	28	0	2	0	0	28-29w
0	0	67	1	30	1	1	0	0	30-31w
0	0	75	2	21	0	2	0	0	32-34w
0	0	85	0	12	0	3	0	<1	Full term

0	0	43	1	29	8	16	0	3	25-27w
0	0	43	0	27	9	19	2	0	28-29w
0	0	54	0	24	3	19	0	0	30-31w
0	0	62	0	30	0	4	0	4	32-34w
0	0	88	0	12	0	<1	0	<1	Full term

22	0	40	7	20	1	10	0	0	25-27w
23	1	35	7	30	2	2	0	0	28-29w
37	1	32	1	25	1	3	0	0	30-31w
50	0	35	0	9	0	6	0	0	32-34w
<1	0	94	0	6	0	<1	0	<1	Full term

Behavioural signs, vision, hearing

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	does not		full	transient	persistent	1	.5	2	.5	3	.5	4	.5	5	ľ
	open		conjugated	35,311111111111111111111111111111111111	P	6	0	0	0	74	4	16	0	0	25-27w
CE	eyes		eye	nystagmus	nystagmus	2	0	0	0	80	2	15	1	0	28-29w
AN			mov	strabismus	strabismus	5	0	0	0	80	2	13	0	0	30-31w
AR					(H.X.) 75224 AVA AND SERV.	4	0	0	0	87	2	7	0	0	32-34w
PE				roving eye	roving eye	7	0	0	0	92	0	1	0	<1	Full term
Y Y				movemens	movements	-	10	10		12	U	_ 540	0	~1	1 an term
EYE APPEARANCE				sunsetting sign	dow nward deviation										
	no	auditory	shifting of	prolonged	turns head	T.E		1 20					0	0	25.25
7	reaction	startle;	eyes,	head turn	and eyes	5	1	28	0	57	1	8	0	0	25-27w
AUDITORY ORIENTATION		Brightens and	head might	to stimulus;	towards noise	2	0	23	10	50	6	9	0	0	28-29w
AUDITORY ORIENTATI		stills;	turn	N.S. (1997)	every time;	5	1	27	7	51	1	8	0	0	30-31w
E		TOTAL MACTICAL	towards	search	3	3	0	14	0	73	3	7	0	0	32-34w
		no true orientati	source	with eyes;	jerky abrupt	<1	0	30	0	50	0	20	0	<1	Full term
A 0		- on		smooth											
	does not	stills,	follows	follows	follows in a	6	0	7	2	25	3	26	9	22	25-27w
Z	follow or	focuses	horizontal	horizon	circle	0	0	7	1	33	7	21	15	16	28-29w
2	focus on	follows	-ly and	-tally and		1	0	9	0	27	5	25	10	23	30-31w
LY]	stimuli	briefly to the	vertically;	vertically;		0	0	10	0	42	10	38	0	0	32-34w
EN		side but	no head	turns head		<1	0	7	0	41	0	51	0	1	Full term
VISUAL ORIENTATION		loses stimuli	turn												1 011 (0111
ALERTNESS	will not respond to stimuli	when awake, looks only briefly	when awake, looks at stimuli but loses them	keeps interest in stimuli	does not tire (hyper- reactive)	6 1 0 0	0 0 0 0	22 17 21 7 2	1 4 1 3 0	48 60 43 54 48	3 3 2 0 0	20 14 33 36 49	0 1 0 0	0 0 0 0 <1	25-27w 28-29w 30-31w 32-34w Full term
										(4)					
	quiet all	awakes,	cries	cries	cries even	10	4	50	0	21		1	0		25.27
IRRITABILITY	the time, not	cries some	often when	always when	when not handled	12	1	52	0	31	0	3	0	1	25-27w
Ħ	irritable	-times	handled	handled	nancied	16	2	47	2	27	1	5 2	0	0	28-29w 30-31w
LAI	to any	when				27	0	47	0	22	0	5	0	0	30-31W 32-34W
R	stimuli	handled				<1	0	93	0	5	0	2	0	<1	Full term
Ħ							10	93	U] 3	[0		10	<1	run term
Y	not	cries	cries;	cries;	cries	10	0	29	0	29	3	29	0	0	25-27w
CONSOLABILITY	crying	briefly;	527	1,000	cannot be	17	1	19	2	29	7	22	1	2	28-29w
BB	consoling not	consol	becomes quiet	needs picking up	consoled	27	0	18	0	28	2	22	1	2	30-31w
77	needed	-ing not	when	to console		23	0	9	0	32	2	28	0	6	32-34w
NS		needed	talked to			1	0	41	0	45	0	12	0	<1	Full term
93							(Sec. 17)								L selection (Appendi
1	no cry at	whimpe	cries to		high pitched	11	0	11	0	78	0	0	0	0	25-27w
	all	-ring cry	stimuli		cry;	16	0	5	2	77	0	0	0	0	28-29w
ا 🖈		only	but		often	26	1	3	1	69	0	0	0	0	30-31w
CRY			normal pitch		continuous	23	0	6	2	69	0	0	0	0	30-31W 32-34W
			#			<1	0	7	0	92	0	0	0	1	Full z

Reference

Ricci D, Romeo DMM, Haataja L et al Neurological examination of preterm infants at term equivalent age. Early Human Development 2008:84;751–761