Neonatal neurological examination

Name Hospital number

Date of birth Date of examination

Gestation at birth Gestation now

Head circumference at birth: Head circumference now:

Centile Centile

Respiratory support: Ventilator / CPAP / oxygen / none

Current sedative / anti-convulsant / muscle rexant medication (specify drug, dose and time

last given):

Encephalopathic Yes / No If yes, describe

Cataracts / corneal clouding Yes / No

Dysmorphisms Yes / No If yes, describe

Cutaneous markers Yes / No If yes, describe

Skin dimples Yes / No

Excess fat folds Yes/ No

| Contractures | Description | Left | degree | Right | degree |
|--------------|---------------------|------|--------|-------|--------|
| | (flexion/extension) | | | | |
| Shoulders | | | | | |
| Elbows | | | | | |
| Wrists | | | | | |
| Fingers | | | | | |
| Hips | | | | | |
| Knees | | | | | |
| Ankles | | | _ | | _ |

Jaw jerk: present / absent / excessive

Mouth shape: normal / abnormal

Stridor: yes / no

Tongue: soft / hard / fasciculation / protruding

Dribbling, need for suction (how often), bubbly respiration

Gabella tap (for hyperekplexia)

Organomegaly: liver / spleen / kidneys

Genitalia: normal male / female

Pupillary assymetry: yes / no

Pupillary reflex to light: present / absent

Author: Dr James Boardman Neonatal Consultant, Implmentation date 19 10 15



| Ton | e and postu | | | Date | | at birth | GA now | |
|----------------|---|--|---|---|-------------------------------------|---|---|----------------------|
| | arms & legs extended | column 2 legs slightly flexed | column 3 leg well-flexed but not adducted | column 4 leg well flexed & adducted | abnormal posture: a) opistotonus | 1 .5 2 .5 5 0 19 19 0 10 19 | 3 .5 4 .5 5 46 8 0 0 3 | 25-27 w |
| Posture | | | 2V | near abdomen | b) | 3 0 10 11 0 0 0 | 62 6 5 1 78 10 3 | 28-30 w |
| <u> </u> | | | 9 | المحر | | 0 7 0 0 0 | 6 3 90 1 0 | 31-33 w full term |
| | arms do not flex | arms flex slowly; not always; | arms flex slowly; more complete | arms flex quickly and | arms difficult to extend; snap | 2 3 19 5 | 55 8 0 | 25-27 w |
| Arm recoil | ⊕ | not completely | Θ. | completely | back forcefully | 1 3 10 8 0 5 | 46 5 26 0 1 49 29 3 | 28-30 w |
| Arr | | O | \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ | | | 0 2 0 5 0 2 | 22 67 0 3 1 | 31-33 w full term |
| | arms remain | arms flex slightly | arms flex well till | arms flex well | flexion of arms | 0 0 24 5 | 47 13 0 | 25-27 w |
| action | straight; no resistance | or some resistance felt | shoulder lifts, then straighten | approx 100° & mantained as shoulder lifts | <100°; mantained when body lifts up | 10 25 8 | 41 6 9 0 | 28-30 w |
| Arm traction | $\stackrel{\uparrow}{\circ}$ | ↑ 6 0} ^ | | | Q) | 14 7 20 2 | 37 5 15 0 O | 31-33 w |
| | L R | L | <u> </u> | ٧ | <u>~</u> | 0 1 0 | 22 8 69 0 | full term |
| lic | No flexion | incomplete flexion; not every | complete but slow flexion | complete fast flexion | legs difficult to extend; | 0 0 13 5 0 1 | 21 8 48 0 5 36 48 4 | 25-27 w |
| Leg recoil | 6 | time | 0 & | 0 4 | snap back forcefully | 0 3 | 8 0 47 3 0 0 0 | 28-30 w 31-33 w |
| P | R D | L R | L R | L R | | 0 3 1 | 4 91 0 | full term |
| | legs straight - no resistance | legs flex slightly or some | legs flex well till bottom lifts up | knee flexes - well ; remains | flexion stays when | 0 3 5 3 | 45 32 4 5 3 3 | 25-27 w |
| Leg traction | ↑ <u> </u> | resistance felt | | flexed when bottom up | back+bottom up | 3 0 11 5 0 17 | 44 8 27 1 42 24 0 | 28-30 w |
| Leg 1 | | م ر | O_X | رصے R | LO_3 R | 5 12 0 0 | 0 0 0 12 72 3 | 31-33 w |
| H | L K | L R | L R | L O R | | 3 13 | 53 8 0 | full term |
| angle | 0 | (M) | ωb | ል እ | 0 2 | 0 10 1 7 3 19 | 56 8 0 6 0 | 25-27 w 28-30 w |
| Popliteal | 180° | ≈ 150° | ≈110° | ≈90° | <90° | 0 15 12 | 44 2 24 0 3 | 31-33 w |
| Pc | L R | L R | L R | L R | L R | 0 0 5 5 | 19 10 61 0 0 | full term |
| ol 1 | no attempt to raise head | infant tries: effort better felt than seen | raises head but drops forward or back | raises head: remains vertical it may wobble | | 6 0 16 0 3 9 | 32 16 30 0 0 47 28 0 | 25-27 w |
| Head control 1 | \sim | | | Q WODDIE | | 0 1 7 12 3 | 39 34 0 5 0 | 28-30 w 31-33 w |
| Hea | | | | Ŀ. | | 0 0 6 | 26 56 0 12 0 | full term |
| 2 | no attempt to raise head | infant tries: effort better felt than | raises head but drops forward or | raises head: remains vertical | head upright or extended; cannot | 0 6 6 | 44 30 0 | 25-27 w |
| Head control 2 | <u>^</u> | seen | back | it may wobble | be passively flexed | 0 1 1 | 59 14 25 0 0 | 28-30 w |
| Head c | 7 | \\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\ | | | | 0 0 5 0 0 | 58 5 32 0 0 29 52 0 | 31-33 w |
| Ë | head drops & | tries to lift head | able to lift head | lifts head in line | head in front of | 0 4 | 15 0 49 16 0 | full term |
| lag | stays back | but it drops back | slightly | with body | body | 0 11 0 14 0 5 | 5 0 0 52 20 0 9 0 | 25-27 w 28-30 w |
| Head lag | O. | 0. | 0 | O _C | & | 2 2 2 | 71 20 0 | 31-33 w |
| | haale sure | hank come ! | hank elleris | hadi atasi ti | ha ali atratisti | 0 9 | 31 0 0 39 23 0 | full term |
| susp. | back curved, head & limbs hang straight | back curved, head ↓, limbs slightly flexed | back slightly curved, limbs flexed | back straight, head in line, limbs flexed | back straight, head above body | 0 14 | 52 16 4 | 25-27 w |
| Ventral susp. | | S | 07 & | 97 & | 0,_ | 0 8 0 0 17 0 0 | 63 5 0 3 5 12 0 3 | 28-30 w 31-33 w |
| Ve | ار برب | 74 }; | | | | 0 4 5 | 47 28 0 16 0 | full term |

Tone patterns

| | | column 1 | column 2 | column 3 | column 4 | 1 | .5 | 2 | .5 | 3 | .5 | 4 | .5 | 5 | |
|----------------|--|--|--------------------------------------|---|--|-------------|-------------|--|-------------|---|-------------------|---|------------------|--------------------|--|
| Flexor tone 1 | On arm and leg traction | arm flexion < leg flexion | arm flexion = leg flexion | arm flexion> leg flexion but difference 1 column or < | arm flexion > leg flexion and difference > than 1 column | 0 0 0 | 0 0 0 | 58 47 39 25 | 3 5 0 | 21374663 | 3 0 5 | 18 9 0 12 | 0 1 2 | 0 3 2 <1 | 25-27 w 28-30 w 31-33 w full term |
| Flexor tone 2 | In supine | | arms and legs generally flexed | strong arm flexion with strong leg extension intermittent | strong arm flexion with strong leg extension continuous | 0 0 0 | 0 0 0 | 0 0 0 | 0 0 0 | 92 94 90 99 | 3 3 7 0 | 5 2 3 <1 | 0 0 0 | 0 1 0 <1 | 25-27 w 28-30 w 31-33 w full term |
| Leg ext. tone | Leg traction vs pop. angle | leg traction > than popliteal angle | leg traction = popliteal angle | leg traction < popliteal angle but difference 1 column < | leg traction < popliteal angle and difference > than 1 column | 0 0 0 | 0 0 0 | 40 27 15 4 | 3 0 0 | 26334257 | 0 3 12 0 | 24311935 | 2 0 7 0 | 5 6 5 | 25-27 w 28-30 w 31-33 w full term |
| Neck ext. tone | Neck in ext. vs neck in flexion | head extension < head flexion | head extension = head flexion | head extension > head flexion. but difference 1 column < | head extension > head flexion and difference > than 1 column | 0 0 0 | 0 0 0 | 2213203 | 0 0 0 | 70 82 72 94 | 0 0 0 | 8583 | 0 0 0 | 0 0 0 <1 | 25-27 w 28-30 w 31-33 w full term |
| Inc. ext. tone | Vent susp vs head lag | ventral suspension < head lag | ventral suspension = head lag | ventr suspension > head lag but difference 1 column < | ventr suspension> head lag and difference > than 1 column | 0 0 0 | 0 0 0 | 14 21 30 24 | 0 0 0 | 48 55 48 55 | 0 0 0 | 23 21 20 16 | 0 0 0 | 14 3 2 <1 | 25-27 w 28-30 w 31-33 w full term |

Reflexes

| | column 1 | column 2 | column 3 | column 4 | column 5 | 1 .5 2 .5 3 .5 4 .5 5 |
|---------------|-----------------------------|---|--|---|---|---|
| Tendon | Absent | felt, not seen | seen | Exaggerated | Clonus | 0 0 3 0 67 13 13 4 0 25-27 w 0 0 7 0 55 9 23 4 2 28-30 w 0 0 31 0 25 0 25 6 13 31-33 w |
| | L R | L R | L R | L R | L R | |
| Suck/Gag | no gag / no suck | weak irregular suck only No stripping | weak regular suck Some stripping | strong suck: irregular regular Good stripping | no suck but strong clenching | 0 0 3 0 6 6 85 0 0 25-27 w 0 0 2 0 11 3 84 0 0 28-30 w 0 0 5 0 9 0 86 0 0 31-33 w 0 0 1 0 5 0 92 0 2 full term |
| Palmar grasp | no response L R | short, weak flexion of fingers L R | strong flexion of fingers | strong finger flexion, shoulder ↑ | very strong grasp; infant can be lifted off couch L R | 0 0 11 0 57 3 26 3 0 25-27 w 0 0 4 2 61 9 20 2 2 28-30 w 0 0 5 0 67 6 22 0 0 31-33 w <1 |
| Plantar grasp | no response L R | partial plantar flexion of toes L R | toes curve around the examiner's finger L R | | | 0 0 8 3 89 0 0 0 0 25-27 w 0 1 7 1 91 0 0 0 0 28-30 w 0 0 5 2 93 0 0 0 0 31-33 w <1 |
| Moro reflex | response or a opening of co | at shoulder on | ly delayed or ritial adduction f | partial abduct. a shoulder and are extension ollowed by smooth adduction | | 0 0 6 0 64 5 25 0 0 25-27 w 0 0 20 0 56 1 20 0 3 28-30 w 0 0 27 0 34 2 32 0 5 31-33 w 0 0 1 0 20 0 79 0 0 full term |
| Placing | No response L R | dorsiflexion of ankle only | full placing response with flexion of hip, knee & placing sole on surface L R | | | 7 4 11 7 71 0 0 0 0 25-27 w 0 2 8 11 79 0 0 0 0 28-30 w 0 0 11 9 77 0 0 0 0 31-33 w 1 0 18 0 81 0 0 0 0 full term |

Spontaneous movements

| | column 1 | column 2 | column 3 | column 4 | column 5 | 1 | .5 | 2 | .5 | 3 | .5 | 4 | .5 | 5 | |
|------------------------|------------------------------------|---------------------------------------|-----------------------|----------------------------|--|----|----|----|----|----|----|----|------|------|------|
| t | no | sporadic and | frequent | frequent | continuous | 0 | 0 | 3 | 3 | 23 | 7 | 64 | 0 | 0 | 25- |
| men ntity) | movement | short isolated movements | isolated movements | generalised movements | exaggerated movements | 0 | 0 | 6 | 0 | 12 | 14 | 68 | 0 | 0 | 28- |
| Movement (Quantity) | | | | | | 0 | 0 | 2 | 0 | 24 | 0 | 74 | 0 | 0 | 31- |
| | | | | | | <1 | 0 | 3 | 0 | 5 | 0 | 92 | 0 | <1 | full |
| | only | frequent | fluent | fluent | cramped | 0 | 0 | 9 | 6 | 35 | 9 | 32 | 3 | 6 | 25-2 |
| ment ality) | stretches. stretches abrupt moveme | | movements but | movements | alternating synchronised; movements mouthing | 0 | 0 | 10 | 7 | 27 | 0 | 49 | 4 | 3 | 28-3 |
| Movement (Quality) | | movements; some smooth | monotonous | | jerky or other abn.mov. | 0 | 0 | 20 | 0 | 2 | 0 | 73 | 0 | 5 | 31- |
| _ | | movements | | | abii.iiiov. | 2 | 0 | 5 | 0 | <1 | 0 | 93 | 0 | <1 | full |
| D) | no | infant rolls head | infant rolls | infant brings | infant brings | 0 | 0 | 23 | 12 | 32 | 9 | 15 | 3 | 6 | 25-2 |
| raising one | response over, chin not raised | · · · · · · · · · · · · · · · · · · · | | head up and keeps it up | 1 | 0 | 25 | 10 | 29 | 3 | 30 | 1 | 1 | 28-3 | |
| Head rais prone | | | | 0 | 0 | 28 | 3 | 28 | 3 | 31 | 5 | 2 | 31-3 | | |
| Ĭ | | | | | | <1 | 0 | 10 | 0 | 50 | 0 | 40 | 0 | <1 | full |

| Abn | o <u>rmal sig</u> | , | | | | | | | | | | | | | |
|--------------------------|----------------------|-------------------------------|----------------------------|-----------------------------------|---------------------------------|-----|----|----|----|----|--------|----|--------|----|---------------------------------------|
| | col 1 | column 2 | column 3 | column 4 | column 5 | 1 | .5 | 2 | .5 | 3 | .5 | 4 | .5 | 5 | |
| 5 4 | | hands open, | intermittent | continuous | continuous big | 0 | 0 | 50 | 0 | 47 | 0 | 3 | 0 | 0 | 25-27 w |
| nd c | | toes straight most of the | fisting or thumb | fisting or thumb adduction; index | toe extension or flexion of all | 0 | 0 | 63 | 0 | 35 | 1 | 1 | 0 | 0 | 28-30 w |
| Abn. hand or toe posture | - | time | adduction | finger flexion, | toes | 0 | | 84 | | 13 | | 3 | | 0 | |
| Abn | | | | thumb opposition | | 0 | 0 | 85 | 0 | 12 | 0 | 3 | 0 | <1 | 31-33 w |
| | | | | оррозноп | | | 0 | | 0 | | 0 | | 0 | | full term |
| | | no tremor or | tremor only | frequent tremors | continuous | 0 | 0 | 61 | 0 | 17 | 8 | 11 | 0 | 3 | 25-27 w |
| o | | tremor only when crying | after Moro or occasionally | when awake | tremors | 0 | 0 | 65 | | 18 | 5 | 10 | 2 | 0 | 28-30 w |
| Tremor | | when crying | when awake | | | 0 | | 65 | | 20 | | 8 | | 5 | |
| - | | | | | | 0 | 0 | 88 | 0 | 12 | 2 0 | <1 | 0 0 | <1 | 31-33 w |
| | | | | | | | | | | | | | | | full term |
| | _ | no | 2-3 | more than 3 | continuous | 0 | 0 | 64 | 3 | 21 | 3 | 9 | 0 | 0 | 25-27 w |
| <u>e</u> | | spontaneous startle but | spontaneous startles | spontaneous startles | startles | 0 | 0 | 77 | | 18 | 1 | 0 | 0 | 0 | 28-30 w |
| Startle | | reacts to | Starties | Starties | | 0 | | 95 | | 3 | | 2 | | 0 | |
| 0, | noise | sudden noise | | | | <1 | 0 | 94 | 0 | 6 | 0 | <1 | 0 | <1 | 31-33 w |
| | | | | | | | | | | | | | | | full term |
| Reha | viour | | | | | | | | | | | | | | |
| | col 1 | column 2 | column 3 | column 4 | column 5 | 1 | .5 | 2 | .5 | 3 | .5 | 4 | .5 | 5 | |
| | does not | | full | transient | persistent | 3 | 0 | 0 | | 84 | 0 | 13 | 0 | 0 | 25-27 w |
| ents | open | | conjugated | -nystagmus | -nystagmus | 3 | | 0 | | 88 | | 9 | | 0 | |
| Eye movements | eyes | | eye movements | -strabismus -roving eye mov. | -strabismus -roving eye mov. | 5 | 0 | 0 | 0 | 81 | 0 | 8 | 0 | 0 | 28-30 w |
| ا رەر م | | | movemente | -sunset sign | -downward | | 0 | | 0 | | 6 | | 0 | | 31-33 w |
| | | | | - | deviation | 7 | 0 | 0 | 0 | 92 | 0 | 1 | 0 | <1 | full term |
| | | auditory | shifting of eye | es, prolonged head | turns head and | 6 | | 37 | | 51 | | 6 | | 0 | |
| > e | no | startle; | head might tu | rn turn to stimulus | ; eyes towards | 2 | 0 | 18 | 0 | 48 | 0 | 9 | 0 | 0 | 25-27 w |
| Auditory orientation | reaction | brightens and | towards source | | noise every | 0 | 0 | 6 | 19 | | 4 | 17 | 0 | 0 | 28-30 w |
| Au | | stills; no true orientation | | eyes; smooth | time; jerky abrupt | | 0 | | 11 | 61 | 5 | | 0 | | 31-33 w |
| | | | | | J. J. J. | <1 | 0 | 30 | 0 | 50 | 0 | 20 | 0 | <1 | full term |
| | | | | | | 12 | | 9 | | 12 | | 31 | | 30 | |
| _ G | does not | stills, focuses | , follows | follows | follows in a | 2 | 0 | 6 | 0 | 23 | 3 | 34 | 3 | 11 | 25-27 w |
| Visuaal rientatio | follow or | follows briefly | | nd horizontally and | d circle | | 0 | | 2 | | 9 | | 13 | 9 | 28-30 w |
| Visuaal orientation | focus on stimuli | to the side but loses stimuli | no head turn | vertically; turns head | | 0 | 0 | 14 | 0 | 18 | 9 | 46 | 4 | | 31-33 w |
| | • · · · · · · · · · | | The mean rain | | | <1 | 0 | 7 | 0 | 41 | 0 | 51 | 0 | 1 | full term |
| | will not | when awake, | when awake, | keeps interest | does not tire | 12 | | 18 | | 46 | | 18 | | 0 | |
| SS | respond | looks only | looks at stimu | | (hyper- | 0 | 0 | 22 | 3 | 53 | 3 | 21 | 0 | 0 | 25-27 w |
| Alertness | to stimuli | briefly | but loses ther | n | reactive) | | 0 | | 4 | | 0 | 39 | 0 | 0 | 28-30 w |
| Ale | | | | | | 0 | 0 | 0 | 6 | 50 | 5 | | 0 | | 31-33 w |
| | | | | | | 1 | 0 | 2 | 0 | 38 | 0 | 49 | 0 | <1 | full term |
| | quiet all th | e awakes, cri | es cries often | cries always | cries even | 8 | | 56 | | 31 | | 3 | | 2 | : |
| ₹ | time, not | sometimes | when handl | | when not | 24 | 0 | 41 | 0 | 29 | 0 | 4 | 0 | 0 | 25-27 w |
| rritability | irritable to | when handl | ed | | handled | 33 | 0 | | 1 | 12 | 1 | 0 | 0 | 0 | 28-30 w |
| Irit | any stimul | ' | | | | | 0 | 55 | 0 | | 0 | | 0 | | 31-33 w |
| | | | | | | <1 | 0 | 93 | 0 | 5 | 0 | 2 | 0 | <1 | full term |
| | | | | | | 8 | | 31 | | 36 | | 25 | | 0 | |
| ility | asleep; | awake; crie | s awake; crie | | awake; cries | 24 | 0 | 16 | 0 | 33 | 0 | 16 | 0 | 2 | 25-27 w |
| Consolability | awake, no | briefly; | becomes | needs picking | cannot be | | 0 | | 0 | | 5 | | 4 | ļ | 28-30 w |
| onsc | crying; consoling | consoling n needed | ot quiet when talked to | up to console | consoled | 32 | 0 | 10 | 0 | 30 | 5 | 23 | 0 | 0 | 31-33 w |
| Ö | not neede | | | | | 1 | 0 | 41 | 0 | 45 | 0 | 12 | 0 | <1 | full term |
| | | | <u> </u> | 1 | <u>.</u> I | 11 | | 18 | | 71 | | 0 | | 0 | · · · · · · · · · · · · · · · · · · · |
| | no cry at a | ıll whimpering | cries to | | High pitched | | 0 | | 0 | 07 | 0 | | 0 | | 25-27 w |
| Cry | .io ory at a | cry only | stimuli but | | cry; often | 24 | 0 | 7 | 4 | 65 | 0 | 0 | 0 | 0 | 28-30 w |
| Ō | | | normal pitch | n | continuous | 32 | 0 | 5 | 3 | 60 | 0 | 0 | 0 | 0 | 31-33 w |
| | | | | | | <1 | 0 | 7 | | 92 | 0 | 0 | 0 | 1 | full term |
| ш | | | | | | ı L | U | | U | | U | | U | | IUII LEIIII |

References

Mercuri et al. Neurologic examination of preterm infants at term age: comparison with term infants. *J Pediatr* 2003;142:647-55

Dubowitz et al. An optimality score for the neurologic examination of the term newborn. J Pediatr 1998;133:406-16

Author: Dr James Boardman Neonatal Consultant, Implmentation date 19 10 15