

Yorkshire and Humber Neonatal ODN Clinical Guideline (PAN)

Title: NEONATAL BRACHIAL PLEXUS INJURY

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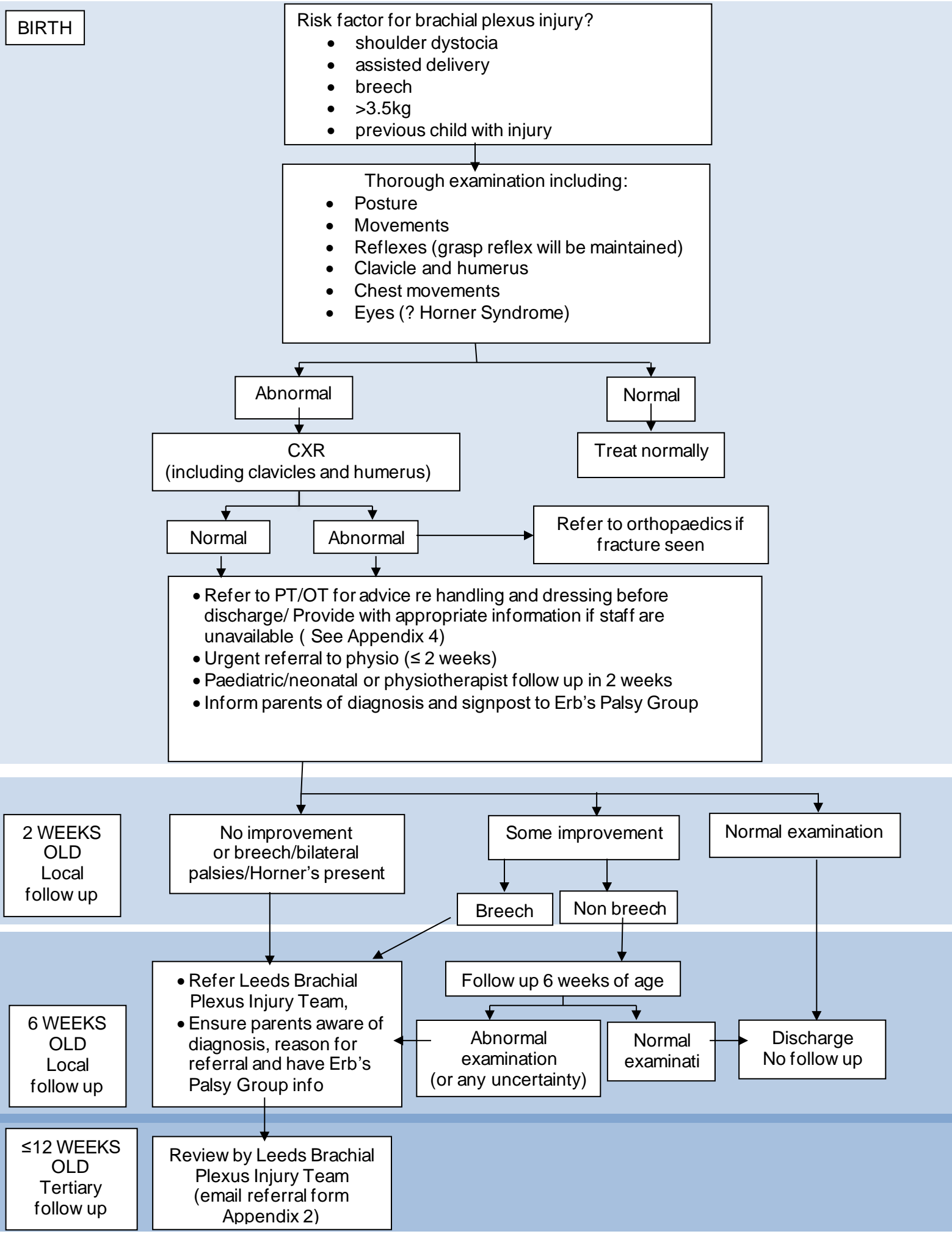
This clinical guideline has been developed to ensure appropriate evidence based standards of care throughout the Yorkshire and Humber Neonatal ODN. The appropriate use and interpretation of this guideline in providing clinical care remains the responsibility of the individual clinician. If there is any doubt discuss with a senior colleague.

Best practice recommendations represent widely used evidence-based practice and high quality standards that all Neonatal Units across the Network should implement. Subsequent suggested recommendations may be put into practice in local units. However, alternative appropriate local guidelines may also exist.

Contents:

- Summary of management of brachial plexus injury
- Background information
- Contact details/Parent information
- References
- Leeds Brachial Plexus Team referral form

Summary of Management of Neonatal Brachial Plexus Injury



BIRTH

Risk factor for brachial plexus injury?

- shoulder dystocia
- assisted delivery
- breech
- >3.5kg
- previous child with injury

Thorough examination including:

- Posture
- Movements
- Reflexes (grasp reflex will be maintained)
- Clavicle and humerus
- Chest movements
- Eyes (? Horner Syndrome)

Abnormal

Normal

Treat normally

CXR
(including clavicles and humerus)

Normal

Abnormal

Refer to orthopaedics if fracture seen

- Refer to PT/OT for advice re handling and dressing before discharge/ Provide with appropriate information if staff are unavailable (See Appendix 4)
- Urgent referral to physio (≤ 2 weeks)
- Paediatric/neonatal or physiotherapist follow up in 2 weeks
- Inform parents of diagnosis and signpost to Erb's Palsy Group

2 WEEKS OLD
Local follow up

No improvement or breech/bilateral palsies/Horner's present

Some improvement

Normal examination

6 WEEKS OLD
Local follow up

Refer Leeds Brachial Plexus Injury Team,
• Ensure parents aware of diagnosis, reason for referral and have Erb's Palsy Group info

Breech

Non breech

Follow up 6 weeks of age

Abnormal examination (or any uncertainty)

Normal examination

Discharge
No follow up

≤12 WEEKS OLD
Tertiary follow up

Review by Leeds Brachial Plexus Injury Team (email referral form Appendix 2)

Brachial Plexus Injury

Brachial plexus injury can be a devastating injury with serious consequences for the functional ability of the affected arm. It occurs at a highly emotive time.

It must be remembered that 'brachial plexus injury is a consequence of being born alive and often without brain injury, (S Kay)'

Definition

- Flaccid paralysis of upper limb/limbs immediately following birth.

Incidence

- BPSU 1998
 - 0.42/1000 live births UK (1 in 2300 live births UK)

Associations

- Shoulder dystocia
- Assisted delivery
- Higher birth weight
- Breech delivery
- Previous shoulder dystocia

Associated injuries

- Fractured clavicle
- Fractured humerus
- Subluxation C-spine
- Facial nerve palsy
- Phrenic nerve palsy
- Bruising/cephalhaematoma

Classification of injury

- Narakas Classification, examination at 3 weeks

Narakas Group	Name	Roots involved	Incidence	Site of weakness	Clinical findings	Complete recovery at 3/12	Complete recovery at 6/12
1	Upper Erb's	C5/6	75-91%	- Shoulder abduction - External rotation of shoulder - Elbow flexion	- Shoulder adduction - internal rotation - extended elbow	59%	56-65%
2	Extended Erb's	C5,6,7		As above + wrist extension	As above + wrist flexion		
3	Total Palsy	C5,6,7,8,T ₁	7-25%	Complete flaccid paralysis	No active movement in the upper limb+ sensory deficit	0%	0-14%
4	Total palsy with Horner Syndrome	C5,6,7,8,T ₁		As above + Horner syndrome			

Treatment

- The aim is to identify those babies whose injury will not spontaneously recover, in whom primary nerve surgery could be beneficial, *if carried out early enough*
- To identify these babies, the Toronto Scoring System is used, and the assessment will be carried out by the Leeds team
- Physiotherapy/ Occupational Therapy – to prevent contractures and optimise motor and sensory development
- Surgery

Management of suspected injury

- Document limb findings post-delivery and again at baby check
- Comment on:
 - posture
 - movements - active and passive
 - reflexes including Moro (expect the Grasp reflex to be maintained)
 - assess eyes for Horner's
 - assess breathing (phrenic nerve palsy)
 - assess clavicle and humerus for signs of fracture
- If examination abnormal:
 - X-ray clavicle, humerus and chest
 - Don't be overly reassuring
 - If possible ask the paediatric therapy team to speak with parents and advise on handling/dressing their baby. If not available ensure that this information is relayed by the medical/nursing team
 - Refer to paediatric physiotherapy department – as an urgent out-patient (within 2 weeks)
 - Arrange follow up for 2 weeks in neonatal/paediatric clinic
 - Explain diagnosis and importance of follow up to parents
 - if they miss follow up and recovery has not occurred the window for surgery is small and must be assessed by the Leeds team by 3 months (referral form in Appendix 2)
 - Supply them with Erb's Palsy Group information
- At 2 week review (paediatric or physiotherapist):
 - if there has been no improvement, Horner's Syndrome is present, (Narakas Type 4), or the baby delivered by breech, refer to Leeds Brachial Plexus Injury Team (complete referral form in Appendix 2 and email to Leeds)
 - if there has been some improvement and the baby was delivered by breech, refer to Leeds (referral form in Appendix 2)
 - if there has been some improvement and the baby was not breech, review again in 6 weeks
 - if there is complete resolution, discharge
- At 6 week review (paediatric or physiotherapy):
 - if the examination is still abnormal, refer to Leeds (referral form in Appendix 2). Referral can be made by a physiotherapist or a paediatrician.
 - if the examination is normal, discharge

- if there is any uncertainty as to whether the examination is completely normal, please refer to Leeds.
- It is important that infants are seen at Leeds by 12 weeks of age for optimal outcome

(There is a higher incidence of more severe injuries in breech babies, they tend to have less spontaneous recovery and generally do less well. These babies often need early surgery, hence early referral)

Outcome

- There is a tendency to be overly reassuring about the long-term prognosis of brachial plexus injury, which, at times, can lead to animosity at future clinic visits.
- At 3 months complete resolution
 - Narakas Type 1+2 injury – 59%
 - Narakas Type 3+4 injury – 0%
- At 6 months complete resolution
 - Narakas Type 1+2 injury – 56-65%
 - Narakas Type 3+4 injury – 0-14%

Useful resources

- Leeds Obstetrical Brachial Plexus Palsy Service
www.leedsth.nhs.uk/a-z-of-services/erbs-palsy
- A comprehensive guide for professionals and parents in the prognosis, treatment and support of Erb's Palsy: Erb's Palsy Group,
<http://www.erbspalsygroup.co.uk/>

References

- Congenital Brachial Palsy: Incidence, causes and outcome in UK and ROI, Evans-Jones et al, Arch Dis Child Fetal Neonatal Ed 2003;88:F185-189
- Prognosis following neonatal brachial plexus palsy: An evidence-based review. Susan L. Foad, J Child Orthop 2009 3:459–463

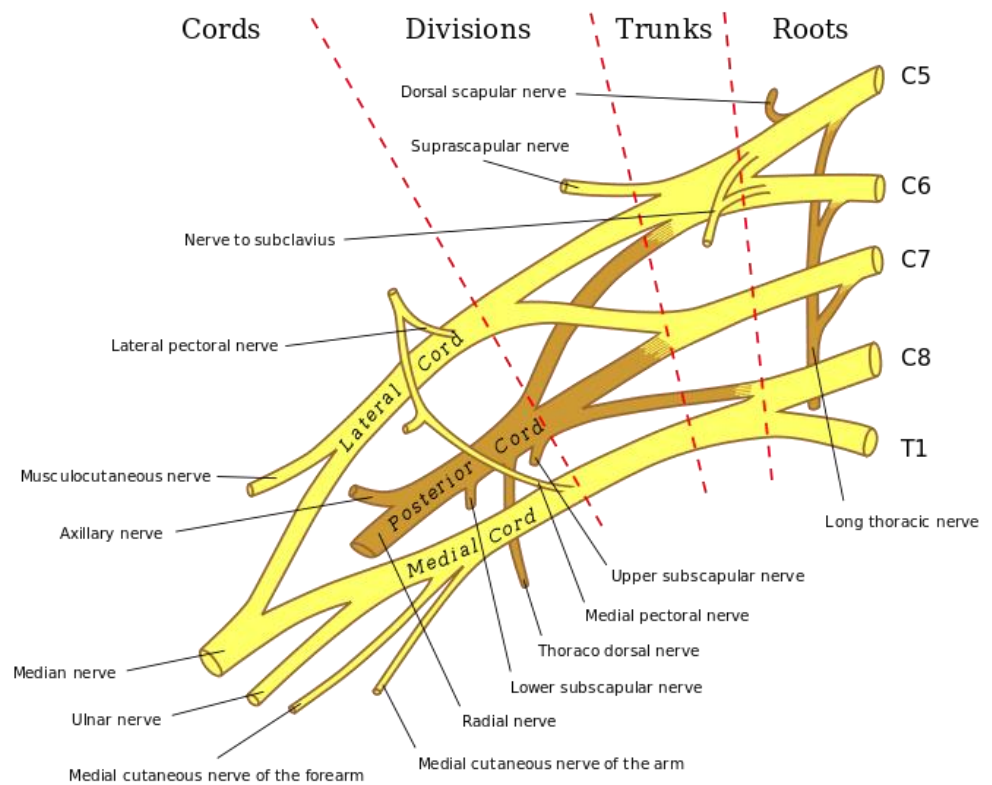
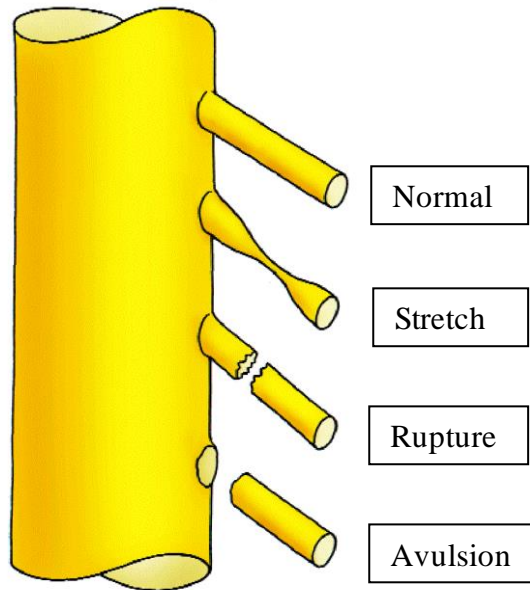
With thanks to S Taplin and G Bourke of the Leeds Teaching Hospitals Erbs Palsy Service.

APPENDICES

1. Pathophysiology
2. Link to Leeds referral form
3. Advice for parents
4. Grades of recommendation

Appendix 1: Pathophysiology

Pathophysiology: The brachial plexus is damaged by stretching forces placed on it, which can result in simple stretching of the nerve, rupture of the nerve, or avulsion of the nerve from its root



Appendix 2: Referral Form to Leeds Obstetrical Brachial Plexus Palsy Team

The email address for referral forms is included in the linked document.

<https://www.leedsth.nhs.uk/a-z-of-services/erbs-palsy/professionals/referral-form/>

Appendix 3: Advice for parents

PT/OT advice re handling: Ensure parents are aware that when carrying or handling the baby that they keep the affected arm supported.

- To ensure that when picking their baby up that they avoid lifting under the arms to do this and instead lift them by supporting the head/ body and affected arm
- To ensure that they place the affected arm into clothing first to prevent any further trauma and last when undressing so the clothes are loose around the trunk.
- To encourage parents to gently touch/stroke their baby's arm and hand
- When washing the baby to move the arm gently and pay particular attention to the arm/arm pit creases ensuring they are dried fully
- Reassurance that they will be seen usually within 2 weeks of birth to start any further exercises as appropriate
- For further advice and support: <http://www.erbspalsygroup.co.uk/>

Appendix 4: Grades of recommendation

Grade	
A	Requires at least one meta analysis, systematic review or RCT rated as 1++, and directly applicable to the target population, and demonstrating overall consistency of results
B	Requires a body of evidence including studies rated as 2++, directly applicable to the target population, and demonstrating overall consistency of results; or Extrapolated evidence from studies rated as 1++ or 1+
C	Requires a body of evidence including studies rated as 2+, directly applicable to the target population and demonstrating overall consistency of results; or extrapolated evidence from studies rated as 2++
D	Evidence level 3 or 4; or Extrapolated evidence from studies rated as 2+