Worcestershire Acute Hospitals NHS Trust

Anaesthetic management of Post-Partum Neurological Complications

This guidance does not override the individual responsibility of health professionals to make appropriate decision according to the circumstances of the individual patient in consultation with the patient and /or carer. Health care professionals must be prepared to justify any deviation from this guidance.

Introduction

Neuraxial analgesia/anaesthesia is widely used in the obstetric setting. Serious neurological complications are rare, but early detection is important to reduce or prevent permanent harm. This document has been produced to guide the neurological monitoring of obstetric patients who receive neuraxial analgesia or anaesthesia, in order to support earlier detection and minimise harm.

Lead Clinician(s)

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Approved by Maternity Governance Meeting on:	16th December 2022
Approved by Medicines Safety Committee on: *Where medicines included in guideline*	N/A
Review Date: This is the most current document and should be used until a revised version is in place	16th December 2025

Key amendments to this guideline

Date	Amendment	Approved by:
December 2022	New Guideline	MGM

Introduction

Neuraxial analgesia is widely available for pain-relief during labour, and neuraxial anaesthesia is the preferred choice for operative delivery and other obstetric procedures.

Although most complications are relatively minor, amongst the most feared are rare, serious neurological ones such as vertebral haematoma, infection and arachnoiditis. In particular, neurological impairment caused by an acute space- occupying lesion may become permanent if not detected and managed rapidly – within 8–12 h in the case of epidural haematoma.

Magnetic resonance imaging (MRI) of the spine is the preferred imaging modality for suspected cases, even though computerised tomography has been advocated as it may be more easily accessible, especially out of hours. Policies should therefore account for the ease of local access to MRI and the possible need for further referral.

Recommendations from Obstetric Anaesthesia Association

1. During labour, the anaesthetist should be alerted if a woman is unable to straight-leg raise (see separate Guideline for use of Regional Anaesthetic Alert Bracelets (RAAB).

2. If the woman is unable to straight-leg raise at 4 h from the last dose of epidural/spinal local anaesthetic, the anaesthetist should be called to assess whether the woman's care should be escalated to investigate the possibility of reversible causes of neurological injury.

3. Each maternity unit should have a guideline/policy in place to guide the escalation of care, depending on local resources/referral pathways. There should also be a guideline/policy for the assessment and management of postpartum women who present with neurological deficit after discharge from hospital.

Why was this guideline developed?

Neuraxial analgesia/anaesthesia is widely used in the obstetric setting. Serious neurological complications are rare, but early detection is important to reduce or prevent permanent harm. This document has been produced to guide the neurological monitoring of obstetric patients who receive neuraxial analgesia or anaesthesia, in order to support earlier detection and minimise harm.

Process:

1. Any patient who has undergone a Regional Anaesthetic procedure (Epidural, Spinal or peripheral nerve block) during their delivery will need review from an Anaesthetist if:

- **They have new central or peripheral Neurological symptoms during or after delivery**

- **They have neurological deficit which is not resolving within an expected timeframe (4 hours for lower limb motor function after spinal injection with heavy Bupivacaine, or last dose of epidural medication/removal of epidural catheter (whichever is later)**

2. Any patient who is referred to the Obstetric Anaesthetic team for review with Neurological deficit should assess the patient urgently using the Proforma below (appendix 1).

3. Once proforma completed and patient discharged from our care with appropriate action taken and discussion with patient documented, the document should be scanned to EZ notes for future reference.

4. The proformas will be kept in a drawer in the Maternity Theatre Anaesthetic room with any ongoing daily review documented in the usual way on the Anaesthetic follow up Database.

Monitoring

Page/ Section of Key Document	Key control:	Checks to be carried out to confirm compliance with the Policy:	How often the check will be carried out:	Responsible for carrying out the check:	Results of check reported to: *(Responsible for also ensuring actions are developed to address any areas of non-compliance)*	Frequency of reporting:
	WHAT?	**HOW?**	**WHEN?**	**WHO?**	**WHERE?**	**WHEN?**
	Neurological monitoring	Follow up	Case by Case	Anaesthetic team		
	Early MRI and referral to neurosurgery	Follow up	Case by Case	Anaesthetic Team		

References

1. OBSTETRICS ANAESTHESIA ASSOCIATION GUIDELINES- Safety guideline: neurological monitoring associated with obstetric neuraxial block 2020, A joint guideline by the Association of Anaesthetists and the Obstetric Anaesthetists' Association, S. M. Yentis,, D. N. Lucas, L. Brigante, R. Collis, P. Cowley, S. Denning, W. J. Fawcett, and A. Gibson

2. NAP 3 STUDY

3. Duncan A, Patel S. Neurological complications in obstetric regional anesthetic practice. J Obstet Anaesth Crit Care 2016;6:3-10

Contribution List

Contribution List

This key document has been circulated to the following individuals for consultation;

Designation
Dr Tom Heafield, Consultant Neurologist
Neurosurgical Dept, University Hospital Coventry
All Maternity Staff

This key document has been circulated to the chair(s) of the following committee's / groups for comments;

Committee
Radiology Department, Worcestershire Royal Hospital
Anaesthetics Clinical Governance committee
Maternity Guidelines group

Appendix 1

ASSESSMENT OF OBSTETRIC PATIENTS, POST NEURAXIAL PROCEDURE with ongoing NEUROLOGICAL symptoms

Patient home tel:	Patient mobile tel:

PRESENTATION

What symptoms did the patient experience? altered or absent sensation, motor deficits, bowel/bladder dysfunction. **PAIN** **NB:** **Radiation ?** **Mapping to a specific dermatome (e.g., nerve root or peripheral nerve) distribution?** **See appendix 1.**	

DETAILS OF PROCEDURE

SPINAL / EPIDURAL / CSE?	
DIFFICULTY LEVEL?	**EASY / DIFFICULT**
ANY COMPLICATIONS WHILE DOING THE PROCEDURE?	
ANY SYMPTOMS ELICITED ON: MOVEMENT OF THE NEEDLE, CATHETER INSERTION, INJECTION OF DRUG?	

PREDISPOSING RISK FACTORS

2nd stage prolonged?	**Y / N**
Prolonged duration of time in Lithotomy (>2hrs)	**Y / N**
Mode of delivery? (VD,FORCEPS,VENTOUSE,LSCS)	
Anticoagulation	**Y / N**
Bleeding diathesis	**Y / N**
Technically challenging epidural or spinal anaesthesia	**Y / N**
Diabetes	**Y / N**
Immunosuppression	**Y / N**
IVDU	**Y / N**
Alcoholism	**Y / N**
Trauma	**Y / N**
Prolonged duration of epidural catheter maintenance(>48HOURS)	**Y / N**
SEPSIS	**Y / N**

TIMELINE

	Date/time	Hours after:
Date/Time of insertion		**0**
Removal of Epidural catheter		
Document SLR		
Referral to Anaes.		

ANY SYMPTOMS OF CENTRAL NEURAXIAL PATHOLOGY?

EPIDURAL HAEMATOMA		**EPIDURAL ABSCESS**	
ACUTE ONSET BACK PAIN AND RADICULAR LEG PAIN	**Y/N**	**SEVERE BACKACHE, LOCALISED TENDERNESS**	**Y/N**
LOWER EXTREMITY WEAKNESS AND NUMBNESS	**Y/N**	**WCC AND CRP**	
LOSS OF BLADDER AND ANAL CONTROL	**Y/N**	**HEADACHE, NECK STIFFNESS**	**Y/N**
REFLEXES	**INCR/ DECR**	**LOSS OF LOWER LIMB AND SACRAL SENSATION**	**Y/N**

ASSESSMENT:

No evidence of Neurological deficit

Possible central canal pathology ☐

Possible Peripheral nerve injury ☐

Name of Consultant discussed with:

……..

ADDITIONAL NOTES AND DISCUSSION

MANAGEMENT

SUSPECTED CENTRAL PATHOLOGY

- INFORM **CONSULTANT ANAESTHETIST URGENTLY**
- URGENT DISCUSSION WITH **ON CALL RADIOLOGIST** AND MRI SCANNER, **IF 8AM -8 PM (weekends 8am – 5pm)** LIKELY TO ABLE TO FACILITATE AT WRH
- EARLY LIASON WITH **NEUROSURGICAL TEAM IN COVENTRY.**
- IF **OUT OF HOURS** OR NO WAY TO SCAN THEY WILL MAKE DECISION TO TRANSFER AND SCAN THERE ON CLINICAL GROUNDS.
- **INFECTION**-INITIATE SEPSIS SIX CARE BUNDLE
- DOCUMENT ALL FINDINGS & DISCUSSIONS
- COMPLETE DATIX FORM

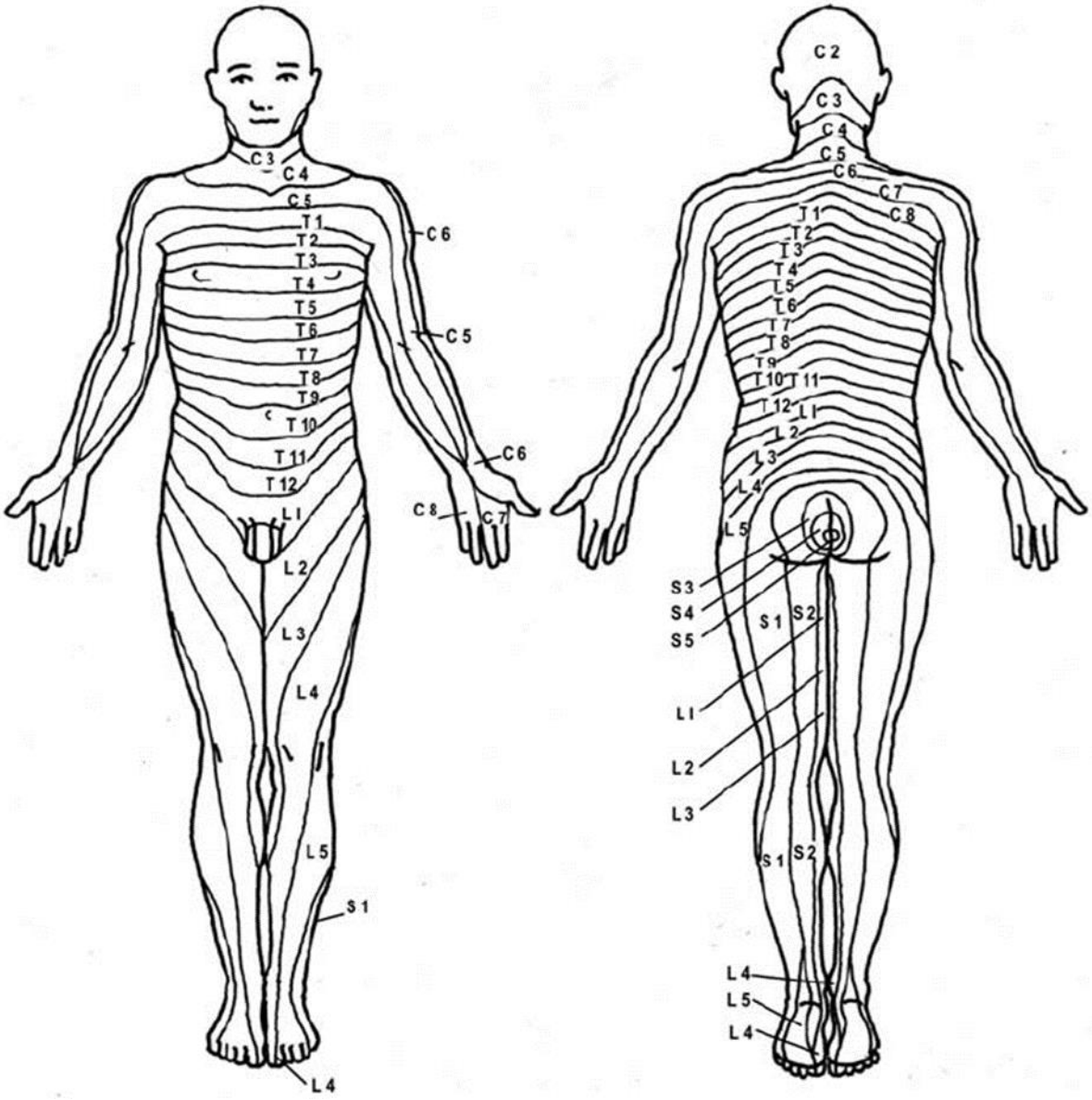
• SUSPECTED PERIPHERAL NERVE DAMAGE

- **IF MOTOR DEFICIT- INFORM ONCALL NEUROLOGY CONSULTANT**
- IF SENSORY/NON PROGRSSIVE DEFICIT- DISCHARGE WITH REFERRAL TO ANAESTHETIC OBS CLINIC/advise to see GP IN 6 WEEKS. (unless symptoms resolved)
- IF OUT OF HOURS, can wait until next day morning to D/W OBSTETRIC Anaesthetic Consultant
- DOCUMENT ALL FINDINGS & DISCUSSIONS

- **NO EVIDENCE OF NEUROLOGICAL DEFICIT**
  - REASSURE PATIENT WITH EXPLANATION OF ALL FINDINGS
  - INFORM CONSULTANT WITHIN 24 HOURS
  - PROVIDE Patient leaflet on discharge with instructions how to contact relevant anaesthetic staff if has concerns (Patient information leaflet “After your spinal/epidural anaesthetic” for obstetric patients).

Appendix 2

SENSORY DERMATOMES



Appendix 3

Nonanaesthetic causes of postpartum neuropathies

Type of neuropathy	Incidence	Cause
Compressive neuropathy	Up to 1 in 100[3]	Fetal head compressing lumbosacral trunk Positioning Instrumental delivery
Ischaemic neuropathy	1 in 500,000[11]	Prolonged hypotension Obstruction of internal iliac arteries by fetal head in prolonged labor

Anaesthetic causes of postpartum neuropathies

Mechanism of injury	Incidence	Cause
Penetrative injuries		
Trauma	1 in 3900[3]	Direct trauma by spinal/epidural needle
Compressive injuries		
Vertebral canal hematoma	1 in 168,000[5]	Commonly due to damage to the epidural venous plexus in the presence of coagulopathy. Hematoma causes neural compression and ischemia
Epidural abscess	1 in 145,000[5]	Causative organism commonly *Staphylococcus aureus*. Risk factors include compromised immunity, concomitant sepsis, poor aseptic technique and prolonged catheter insertion. Abscess causes neural compression and ischemia
Chemical/toxin related injuries		
Meningitis	1 in 150,000 (nonobstetric population)[12]	Causative organism commonly *Streptococcus viridans*.[13] Risk factors are concomitant sepsis, poor aseptic technique and contamination of equipment
Arachnoiditis	Unknown	Chlorhexidine, contrast media, epidural steroids and blood, have been implicated[14]

Reference:

- Duncan and Patel: Obstetric regional anaesthetic practice: Neurological complications. JOACC 2016

Compressive Nerve Injury	Nerves affected	Cause	Presentation
Lateral Cutaneous Nerve of the Thigh	L2-3	Compression of the nerve as it passes under the inguinal ligament. Associated with prolonged hip flexion.	Sensory loss over the anterolateral aspect of the thigh
Lumbosacral plexus	L4,5 S1-5	Compression of the plexus against sacral ala. Usually from the foetal head in the second stage.	Numbness over the lateral aspect of the thigh, lower leg and dorsum of the foot. Results in foot drop, that is almost always unilateral and on the opposite side to the fatal occiput.

Common Perineal Nerve	L4-5, S1-2	Prolonged lithotomy position. The nerve is vulnerable to compression as it passes over the head of the fibula when patients are positioned in stirrups without due care.	Numbness over the lateral aspect of the lower leg and dorsum of the foot, foot drop. Ankle reflex intact.
Femoral Nerve	L2-4	Compression of nerve against inguinal canal during forceps delivery or LSCS. Femoral neuropathy can occur bilaterally 25% of the time and is therefore often mistaken for an intraspinal lesion.	Sensory loss over anterior thigh and inner aspect of lower leg. Weak knee extension. Often presents with difficulty climbing stairs. Loss of knee jerk. Reduced or absent patellar reflex is the most reliable objective sign in femoral neuropathy.
Obturator Nerve	L2-4	Compression of nerve by foetal head or forceps. Obturator neuropathy, which occurs bilaterally 25% of the time, can also be mistaken for an intraspinal lesion.	Usually unilateral sensory loss over inner thigh and weak hip adduction and rotation.

History

- Neurological: including conditions predisposing to neuropathy e.g. backache, obesity, disc disease, diabetes, malignancy, coagulopathy, infection, previous trauma.
- Labour/ mode of delivery - Instrumental delivery (type), posture during labour, use of retractors or diathermy, period of full dilatation, injections given by obstetrician and hypotension.
- Drugs - particularly anticoagulants, steroids, hypoglycaemics
- Anaesthetic - type of block, degree of difficulty, possibility of inadvertent dural puncture, bloody tap, spinal catheters, type/baricity/concentration of anaesthetic, additives, details of aseptic technique, site of injection, pain/paraesthesia during procedure.
- Current symptoms: Pain, altered or absent sensation, motor deficits, sphincter dysfunction.
- Any **RED FLAG SINISTER SYMPTOMS?**
- Faecal incontinence can occur after vaginal delivery even in those patients without perineal tears (2-5%) and is very rarely due to CNB. Furthermore, misoprostol is a pro kinetic agent which can cause diarrhoea. A common cause of faecal incontinence is sphincter damage to the innervation of the sphincter during difficult vaginal delivery. In lower lumbosacral plexopathy, urinary incontinence can even accompany perianal sensory disturbance.
- **MRI must be done on all patients SUSPECTING CENTRAL PATHOLOGY.**
- **Neurologic recovery is improved with early decompression (<8–12 hours from symptom onset in EH and < 36 hours from symptom onset for SEA) and with milder preoperative neurologic deficits.**

Supporting Document 2 – Financial Impact Assessment

To be completed by the key document author and attached to key document when submitted to the appropriate committee for consideration and approval.

	Title of document:	Yes/No
1.	Does the implementation of this document require any additional Capital resources	No
2.	Does the implementation of this document require additional revenue?	No
3.	Does the implementation of this document require additional manpower?	No
4.	Does the implementation of this document release any manpower costs through a change in practice	No
5.	Are there additional staff training costs associated with implementing this document which cannot be delivered through current training programmes or allocated training times for staff?	No
	Other comments:	No

If the response to any of the above is yes, please complete a business case and which is signed by your Finance Manager and Directorate Manager for consideration by the Accountable Director before progressing to the relevant committee for approval.