Management of Post Dural Puncture Headache

Applicable to (please mark with an X)							
Group-wide		**LUHFT-wide**				**Liverpool Women's**	**x**
Aintree Hospital		**Broadgreen Hospital**		**LCL**		**Royal Liverpool Hospital**	

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Evidence Base and References e.g. Regional or National Guidelines such as NICE or Royal College.	• https://ihs-headache.org/wp-content/uploads/2025/04/ICHD-3-Cephalalgia-2018-issue-1.pdf • Factors associated with failed epidural blood patch after accidental dural puncture in obstetrics: a prospective, multicentre, international cohort study • Treatment of obstetric post-dural puncture headache. Part 1: conservative and pharmacological management. R. Russella, C. Laxtonb, D.N. Lucasc, J. Niewiarowskia, M. Scruttond, G. Stockse; *Int J Obstet Anesth.* 2019; **38**:93-103 • Treatment of obstetric post-dural puncture headache. Part 2: epidural blood patch. R. Russella, C. Laxtonb, D.N. Lucasc, J. Niewiarowskia, M. Scruttond, G. Stockse; *Int J Obstet Anesth.* 2019; **38**:104-118 • Subarachnoideal blood spread following epidural blood patch given to treat spontaneous intracranial hypotension: can it cause neurological complications? Ferrante, E., Rubino, F., Mongelli, M., and Arpino, I. *Clin Neurol Neurosurg*. 2016; **140**: 43–46 • Postpartum headache: diagnosis and management. A Sabharwal, G M Stocks. *CEACCP.* 2011; **11**: 181-185 • Complications in obstetric anaesthesia. L. Maronge, D. Bogod, *Anaesthesia*. 2018; **73** (1): 61–66

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What is new in this version?

Latest Version	Page	Changes Made	Date
3.0		Updated references and consent process	**14/11/2025**

Clinical Guideline Contents

1 Introduction

International Headache Society (HIS) defines PDPH as “headache occurring within five days of a lumbar puncture, caused by cerebrospinal fluid (CSF) leakage through the dural puncture. It usually accompanied by neck stiffness and/or subjective hearing symptoms. It remits spontaneously within two weeks, or after sealing of the leak with autologous epidural lumbar patch”.

The headache is typically positional and may follow spinal anaesthesia or dural puncture with an epidural needle. Up to 5% of patient may present with atypical headache without a postural element.

Pathophysiology: Dural puncture causes CSF leak results in sagging of the intracranial structures. The concurrent intracranial hypotension may lead to cerebral and meningeal vasodilation which may cause or contribute to headache.

Other symptoms may be back pain, other neurological complications – ocular and auditory problems. Rarely, PDPH has been associated with severe morbidity and even mortality caused by cerebral haemorrhage and cerebral venous thrombosis.

The 2009–12 MBRRACE-UK report highlighted the deaths of two women in whom dural puncture had occurred during insertion of a labour epidural catheter. Despite suffering long-term headaches, neither woman was adequately followed up after discharge from hospital. Death resulted from a cerebral vein thrombosis in one case and a subdural haematoma in the other.

2 Differential Diagnosis

Postpartum headache is described as a complaint of headache and neck or shoulder pain in the first 6 weeks after delivery. It is one of the most common symptoms with up to 39% of parturient experiencing headache in the first postpartum week.

Primary headaches such as migraine, tension headache are common, and their incidence may increase in pregnancy.

Preeclampsia and hypertensive diseases of pregnancy can cause headaches.
Vascular causes, both haemorrhagic and ischaemic must be considered as well.

2.1 Non-specific/tension headaches

Changes associated with pregnancy and motherhood should always be considered when looking for a cause of headache. These changes can result from fluctuating hormone and hydration levels, caffeine withdrawal as well as various life changes associated with motherhood. An accurate history can highlight simple aggravating factors such as sleep deprivation, or indeed relieving factors such as food or fluid intake and sleep.

Tension headache is characterized by a mild-to-moderate ‘band-like’ headache that lasts from 30 min to 7 days. It is not aggravated by physical activity and is usually self-remitting. There can be associated neck and shoulder pain resulting in a musculoskeletal component. Treatment includes simple analgesia, massage, or physiotherapy.

2.2 Migraine

Migraine headache is usually described as a recurring, unilateral headache lasting 4–72 h. It may be pulsating in nature and associated with nausea and photophobia. There may be focal neurological signs immediately preceding the headache, often described by the patient as 'aura'. Migraine may be associated with visual disturbances such as flashing/flickering lights, zigzag lines, and even temporary blindness, or the experience of numbness, tingling sensations, and slurred speech.

Patients with a history of migraine may notice a reduction in symptoms during pregnancy as a result of hormonal changes. However, immediately postpartum, they may quickly experience a recurrence, with 34% suffering a migraine within the first week postpartum and 55% within the first month. Generally, symptoms are milder and follow their typical pattern. It is rare for migraine to manifest for the first time during the postpartum period.
Treatment includes simple analgesia, non-steroidal anti-inflammatory drugs (NSAIDs) and 5-HT agonists such as sumatriptan.

2.3 Hypertension/pre-eclampsia

Gestational hypertension is commonly associated with headache. However, when the headache is associated with hypertension, proteinuria, or both, the diagnosis of pre-eclampsia should be considered. In pre-eclampsia, headache is a serious premonitory sign, being present in over 50% of women who go on to develop eclampsia. Physical examination may reveal hypertension, peripheral oedema, and brisk reflexes. It can be associated with HELLP (haemolysis, elevated liver enzymes, and low platelets) syndrome and so it is important to check liver function for elevated alanine aminotransferase and aspartate transaminase, platelet count, serum urate, and proteinuria, before establishing a diagnosis.

Eclampsia is a hypertensive encephalopathy characterized by headache, visual disturbance, nausea and vomiting, seizures, and stupor which may progress to coma. Headache is often bilateral, pulsating in nature, and aggravated by physical activity. The diagnosis of eclampsia postpartum may be difficult in a parturient that has a PDPH, as eclampsia first manifests postpartum in 11–44% of affected women.

In both eclampsia and pre-eclampsia, headache can be managed with simple analgesia, but control of the underlying condition is imperative to prevent harm to the mother.

2.4 Cortical vein thrombosis

The incidence of cortical vein thrombosis is increased in pregnancy and is estimated to be between 10 and 20 per 100 000 deliveries in developed countries and higher in developing countries. Patients complain of a non-specific headache often accompanied with focal neurology and seizures. The headache can often be difficult to distinguish from PDPH as it may have a postural component. Indeed, several cases of cortical vein thrombosis have been associated with PDPH, possibly secondary to cerebral vasodilatation after cerebrospinal fluid (CSF) leak and prolonged dehydration.

Diagnosis is best confirmed by magnetic resonance imaging (MRI) and MR venography. Symptom control is the mainstay of treatment with the focus on seizure prevention. The use of anticoagulant therapy remains controversial.

2.5 Subarachnoid haemorrhage

The incidence of subarachnoid haemorrhage is increased in pregnancy occurring in 20 per 100 000 deliveries, usually presenting in patients with arteriovenous malformation, cerebral aneurysms, and hypertensive encephalopathy. The classic presentation is of an acute onset of intense, incapacitating unilateral headache, accompanied by nausea, neck stiffness, and altered consciousness. Diagnosis is confirmed with urgent computed tomography (CT) and urgent neurosurgical opinion should be sought.

2.6 Posterior reversible leucoencephalopathy syndrome

First described in 1996 after recognition of a consistent syndrome presentation in a diverse group, patients describe a severe, diffuse headache, of an acute or gradual onset, occasionally associated with focal neurological deficit such as loss of vision, seizures, and altered level of consciousness There may be an association with pre-eclampsia, as the pathophysiology of posterior reversible leucoencephalopathy syndrome is similar to that of a hypertensive encephalopathy where loss of the cerebrovascular autoregulation is thought to compromise the blood–brain barrier resulting in oedema. This process can be reversed by prompt recognition and supportive therapy which includes aggressive treatment of hypertension and seizure prophylaxis.

Neuroradiological imaging shows symmetrical areas of cerebral oedema, predominantly in white matter regions of the posterior circulation.

2.7 Space-occupying lesions

Headaches are usually dull in nature and associated with symptoms of raised intracranial pressure such as nausea and vomiting. Occasionally, focal neurology and altered level of consciousness may be present. Diagnosis is dependent on history, examination, and neuroimaging. If there is confirmation of a tumour or bleed, urgent neurosurgical opinion should be sought.

2.8 Cerebral infarction/ischaemia

This is one of the causes of stroke in pregnancy and can occur in the peripartum period. Patients present with a sudden onset of headache, vomiting, seizures, and focal neurological deficit. Diagnosis requires cerebral angiography as CT or MRI is often normal. Specialist opinion should be sought on appropriate management.

2.8.1. Sinusitis

Headache is frontal, particularly over the sinuses, and is worse in the morning. Pain is secondary to inflamed paranasal sinuses and associated with nasal congestion, purulent nasal discharge, anosmia, and fever. Initial management includes antibiotics, decongestive, and antipyretics, although some patients may require referral to ENT for a nasal endoscopy and CT/MRI of the sinuses.

2.8.2. Meningitis

The severe headache of meningitis may manifest in the first few days postpartum and is classically associated with neck stiffness, photophobia, and fever. On examination, Kernig and Brudzinski signs are elicited and a petechial rash may be present.
Diagnosis is confirmed by examination and culture of CSF after exclusion of other pathology by CT scan.

3 Treatment of PDPH

Depends on which category the patient falls into.

1. Mild PDPH: no restriction on daily activities; no associated symptoms and responds well to non-opioid analgesia.
2. Moderate PDPH: bedridden for most of the day; may have associated symptoms, requires opiate analgesia.
3. Severe PDPH: completely bedridden; associated symptoms present and no response to conservative management.

3.1 Conservative Management

Bed rest: Although most women gain some relief from obstetric PDPH when supine, the effects may be transient. Prolonged bed rest is not recommended as it may increase the risk of thromboembolic complications.

Oral fluids: Normal hydration should be maintained but there is no evidence of benefit from excessive fluid administration in the treatment of obstetric PDPH.

IV fluids: In the treatment of obstetric PDPH, intravenous fluids need only be used to prevent dehydration when adequate fluid cannot be taken orally.

Abdominal binders – There is currently insufficient evidence to recommend the use of abdominal binders in the treatment of obstetric PDPH.

4 Pharmacological Treatment of PDPH

Simple oral analgesia
Regular oral analgesia should be offered to women with postnatal headache.

Opioid analgesia
Can be considered for short term if simple analgesics are not effective. But not recommended for long term (>72hrs)

Caffeine
There is limited evidence to support the use of caffeine in the treatment of obstetric PDPH. If used, treatment with caffeine should not exceed 24 hours, oral therapy is preferred, and doses should not exceed 300 mg, with a maximum of 900 mg in 24 hours. A lower maximum dose of 200 mg in 24 hours should be considered for women, who are breastfeeding, particularly those with low birth weight or premature infants. Women receiving caffeine therapy should have their intake of caffeinated drinks monitored and the recommended daily dose should not be exceeded.
Large amounts of caffeine can result in maternal restlessness and insomnia. There are reported cases of maternal seizures after large doses of caffeine (>1g). It is transferred into breast milk and may have effect on the infant. Decreased metabolism of caffeine during pregnancy more than doubles its half-life (up to 16 hours)
Advise the mother not to take any caffeinated drink while she is on the caffeine therapy.

4.1 Treatments with Insufficient evidence

There is currently insufficient evidence to recommend the use of aminophylline, theophylline, ACTH and its analogues, hydrocortisone, dexamethasone, methylprednisolone, triptans, gabapentinoids, desmopressin, methylergonovine, ondansetron, mannitol or neostigmine and atropine in the treatment of obstetric PDPH.

5 Invasive Procedures

There is currently insufficient evidence to recommend the use of acupuncture, greater occipital nerve blocks, sphenopalatine ganglion blocks, epidural morphine in the treatment of obstetric PDPH.

5.1 Epidural fluid administration

There is currently insufficient evidence to recommend the use of epidural crystalloid infusions in the treatment of obstetric PDPH. Epidural saline bolus administration may improve symptoms, but the effect is usually transient.
There is currently insufficient evidence to recommend the use of epidural dextran, HES, gelatine or fibrin glue in the treatment of obstetric PDPH.

6 Epidural Blood Patch (EBP)

Indication:
When conservative therapy is ineffective in the management of obstetric PDPH.
The woman has trouble performing activities of daily life and caring for her baby, treatment with an EBP should be considered.

Success rate:
Recent evidence suggests that complete and permanent relief of symptoms following a single EBP is only likely to occur in up to one third of cases where headache follows dural puncture with an epidural needle.
Complete or partial relief may be seen in 50–80%. In cases of partial or no relief, a second EBP may be performed after consideration of other causes of headache.

Optimum time: Women should be informed that performing an EBP within 48 hours of dural puncture is associated with a reduction in its efficacy and a greater requirement for a repeat EBP. Studies in vitro have shown both lidocaine and CSF have a detrimental effect on coagulation. Increasing concentrations of lidocaine cause hypocoagulability and fibrinolysis, whilst CSF has both procoagulant and clot destabilising effects.

However, in severe obstetric PDPH, an EBP within 48 hours of dural puncture may be considered for symptom control, although it may need to be repeated.

6.1 Imaging before EBP:

If the diagnosis of obstetric PDPH is strongly suspected, there is no evidence that imaging is needed before performing an EBP. If the headache changes in nature, neurological signs develop, conscious level reduces, headache is atypical in nature or when two EBPs have been unsuccessful, urgent consideration should be given to further investigation and imaging.

6.2 Practical steps should be completed before an epidural blood patch is performed:

An appropriate time should elapse before an EBP is performed in women receiving anticoagulants. Maternal systemic infection and 'red flag' symptoms suggesting an alternative diagnosis should be excluded.

There is insufficient evidence to support the routine sending of blood cultures or administration of antibiotics at the time of performing an EBP. The decision on whether to do so should remain with the individual clinician. An EBP should not be performed in presence of maternal systemic infection.

1. Before performing an EBP, written information should be offered to women to aid the consent process.
2. An EBP is a therapeutic intervention and written consent is recommended.
3. It has been suggested that women should lie flat for two hours before a blood patch is performed, in order to reduce headache and minimise the volume of CSF in the epidural space that may dilute injected blood.

Ferrante et al. reported a 90% success rate following a single EBP in a cohort study of 106 patients with headache from spontaneous intracranial hypotension. They attributed their success in part to placing patients in a 30° Trendelenburg position for one hour before the procedure. There are no randomised studies investigating the optimum position for patients before an EBP is performed. Of note, a 2017 survey of UK practice found that 42% of responders performed an EBP with women in the sitting position.

7 Auditable Standards

Patient had a spinal or epidural	
Date of RA	
Size of the needle used	
Number of attempts at RA	
Date headache commenced	
Date blood patch done	
Outcome of blood patch	
Has 6week follow up appointment booked	
How many follow up appointments	
Repeat blood patch	
Repeat blood patch date and the number	

Appendix 1: Guide for Treatment of Obstetric Post-Dural Puncture Headache

All women who experience dural puncture with an epidural needle or PDPH after a spinal block should be reviewed daily by a member of the anaesthetic team whilst still in hospital.
Furthermore, any woman suspected of having PDPH should be referred for anaesthetic assessment and reviewed by the anaesthetic team within 24 hours.

A medical history should be taken and a physical examination performed to exclude other potential causes of postnatal headache. When a woman experiences PDPH, follow-up should continue until the headache resolves.
Whether or not an EBP is performed, an appropriate follow-up after discharge from hospital must be arranged for any woman who experiences obstetric PDPH.

When PDPH is diagnosed the following treatment options should be considered:

1. Bed rest may reduce the intensity of symptoms, but prolonged bed rest is not recommended as it may increase the risk of thromboembolic complications. Offer a single room if possible, to reduce disturbance by other parturient and staff and enhance the opportunity for rest.
2. Thromboprophylaxis should be considered for women whose mobility is reduced due to PDPH.
3. Encourage fluid intake to maintain adequate hydration.
4. Offer simple oral analgesia such as paracetamol, weak opioids and NSAIDs if not contraindicated.
5. Stronger opioids such as morphine or oxycodone may be offered but treatment should usually be limited to <72 h duration.
6. Caffeine may be offered but limited to 24 h duration, with a maximum dose of 900 mg (200 mg maximum in breastfeeding women).
7. Offer an epidural blood patch (EBP) when symptoms affect daily living and care of the baby
8. Before hospital discharge, women who have experienced dural puncture with an epidural needle or PDPH should be given information on symptoms that require further medical assessment and on whom they should contact.
9. Refer for postnatal anaesthetic follow-up through K2 Athena. Inform them and stress to cancel the appointment by calling 0151 702 4475/76 (admission) if no longer needed.
10. The general practitioner (GP) and community midwife should be informed of treatment received and arrangements for further follow-up.

Appendix 2: Guidelines on Management of an Epidural Blood Patch

Pre-epidural blood patch (EBP) procedure checklist

- Give patient written information to aid consent process
  - OAA/labour pains website leaflet
    A4 Information Poster - V-1-0 - HQ
  - RCOA leaflet https://www.rcoa.ac.uk/sites/default/files/documents/2019-11/10-HeadachesSpinalEpiduralweb.pdf
- Check when the last dose of anticoagulant was given.
- Check for evidence of maternal systemic infection.
- Check for the absence of 'red flag' symptoms suggesting a different diagnosis e.g. change in the nature of headache, development of focal neurological signs, reduced conscious level and atypical headaches.

Consent:
Complete e-consent form for epidural blood patch.
Pre-populated consent form can be found on e-consent, search for 'blood' under medical tab.

Benefits of EBP

- **Efficacy**: complete relief of symptoms following a single epidural blood patch is likely to occur in up to one third of cases. Complete or partial relief may be seen in 50–80%. In cases of partial or no relief, a second epidural blood patch may be performed after consideration of other causes of headache.

Risk to be explained:

1. A blood patch may cause local bruising on the back where the injection has been done.
2. A blood patch can occasionally cause backache and stiffness which can last a few days. Epidurals and blood patches do not cause long-term backache.
3. There is a small chance that another accidental dural puncture could occur when the blood patch injection is done.
4. Nerve damage, infection or bleeding into the back are very rare complications of epidurals, spinals and blood patches.
5. Get immediate medical help if the following happens after blood patch:
   - Difficulty in passing urine
   - Severe back pain
   - Loss sensation in back or leg.

Pre procedural bed rest: at the discretion of the consultant anaesthetist.
EBP procedure

- The procedure requires two clinicians. A consultant obstetric anaesthetist or experienced senior trainee should perform the epidural injection and a second clinician take blood.
- Cardiovascular monitoring and intravenous access may be considered to detect and treat bradycardia during the procedure.
- The patient may be placed in the lateral or sitting position, considering the comfort of the patient in relation to her symptoms and the preference of the anaesthetist.
- The epidural injection should be performed at the same space or one space lower than the level at which the original dural puncture occurred.
- A full aseptic technique should be employed for both the epidural component and venesection.

- The epidural space should be located before venesection is performed.
- After venesection blood should be injected immediately into the epidural space through the epidural needle. Volumes of up to 20 mL are recommended if tolerated by the patient.
- NR fit venesection kits are available, please use.
- There is insufficient evidence to recommend the routine collection of blood for culture. The decision on whether to do so should remain with the individual clinician.

Post-EBP procedure management

Guidance on the management of obstetric patients immediately following an EBP is lacking. The following is suggested:

- Keep patients in the supine position for 1–2 hours.
- Regular observations of maternal pulse, blood pressure and temperature may be made following the procedure in the recovery as per day case patient. The frequency and duration of these observations must take into account maternal health.
- Consider prescribing laxatives to avoid constipation and advising patients to avoid twisting, bending and straining. Consider paracetamol 1g QDS/PRN and Movicol.
- Women should be reviewed by an anaesthetist within four hours of the procedure. The effect on headache and presence of side effects should be documented. After the initial review, women may mobilise and, where appropriate, they may be discharged home. Those women who remain in hospital should be reviewed daily until discharge or until symptoms resolve.
- When women experience dural puncture with an epidural needle or PDPH, the general practitioner (GP) and community midwife should be informed of treatment received and arrangements for further follow-up.

Patient information leaflet: OAA/labour pains website
A4 Information Poster - V-1-0 - HQ

Appendix 3: Accidental Dural Puncture Follow Up

ACCIDENTAL DURAL PUNCTURE FOLLOW UP:

DATE/TIME OF DURAL PUNCTURE: ……
GUAGE OF NEEDLE:……..
VERTEBRAL INTERSPACE:……..……...
PATIENT CONTACT DETAILS:…….

Patient Sticker Here

MANAGEMENT: subarachnoid catheter / resite / other
…….....……...

ENSURE:

- ☐ Oral hydration, caffeine intake and mobilisation
- ☐ Prescribe regular oral analgesia and laxatives to prevent straining
- ☐ Give OAA Labour Pains leaflet A4 Information Poster - V-1-0 - HQ

DAILY REVIEWS BY AN ANAESTHETIST UNTIL THE PATIENT HAS BEEN DISCHARGED:

DAY 1: date/time …….. (tick all that are applicable)

- ☐ Headache: mild / moderate / severe
- ☐ Photophobia
- ☐ Vomiting
- ☐ Visual disturbances
- ☐ Auditory disturbances eg. tinnitus
- ☐ Fever
- ☐ Motor or sensory dysfunction:……..
- ☐ Bladder dysfunction
- ☐ MANAGEMENT:
  ……

DAY 2: date/time …….. (tick all that are applicable)

- ☐ Headache: mild / moderate / severe
- ☐ Photophobia
- ☐ Vomiting
- ☐ Visual disturbances
- ☐ Auditory disturbances eg. tinnitus
- ☐ Fever
- ☐ Motor or sensory dysfunction:……..
- ☐ Bladder dysfunction
- ☐ MANAGEMENT:
  ……

DAY 3: date/time …….. (tick all that are applicable)

- ☐ Headache: mild / moderate / severe
- ☐ Photophobia
- ☐ Vomiting
- ☐ Visual disturbances
- ☐ Auditory disturbances eg. tinnitus
- ☐ Fever
- ☐ Motor or sensory dysfunction:……..
- ☐ Bladder dysfunction
- ☐ MANAGEMENT: ……

DAY 4: date/time …….. (tick all that are applicable)

- ☐ Headache: mild / moderate / severe
- ☐ Photophobia
- ☐ Vomiting
- ☐ Visual disturbances
- ☐ Fever
- ☐ Motor or sensory dysfunction:……..
- ☐ Bladder dysfunction
- ☐ MANAGEMENT: ……

DAY 5: date/time …….. (tick all that are applicable)

- ☐ Headache: mild / moderate / severe
- ☐ Photophobia
- ☐ Vomiting
- ☐ Visual disturbances
- ☐ Auditory disturbances eg. tinnitus
- ☐ Fever
- ☐ Motor or sensory dysfunction:……..
- ☐ Bladder dysfunction
- ☐ MANAGEMENT: ……

EPIDURAL BLOOD PATCH:

Date/Time:
……
Anaesthetist performing procedure:……..
Anaesthetist performing venesection:
……

Ensure:

- ☐ patient apyrexic
- ☐ patient has given written consent
- ☐ >12hrs after prophylactic LMWH or >24hrs after therapeutic LMWH
- ☐ procedure documented on Centricity.

DISCHARGE CHECKLIST (please tick boxes when done)

- ☐ Assessment of PDPH +/- blood patch documented on Centricity
- ☐ PDPH letter faxed to GP
- ☐ Patient given:
  - ☐ PDPH letter copy
  - ☐ Safety netting details: contact on call anaesthetist on bleep 301 via switch board with any concerns
  - ☐ Offer follow-up appointment within 4-6weeks:
    - ☐ accepted or ☐declined by patient
    - Ask patient to cancel appointment if not needed

Appendix 4: Document History and Version Control

Version	Date	Comments	Author/Job Title
1.0	June 2020	New Guideline	Consultant Anaesthetist
1.1	August 2020	Included Appendix 2.3 accidental dural puncture follow up	Consultant Anaesthetist
2.0	January 2023	No changes required	Consultant Anaesthetist
3.0	14/11/25	Minor updates	Laura Wilson, Consultant Anaesthetist