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Royal Cornwall Hospitals NHS Trust

Accidental Dural Puncture in Obstetric Patients Clinical Guideline

V3.0

June 2021

1. Aim/Purpose of this Guideline

1.1. To give guidance to obstetric Anaesthetists on the management of an accidental dural puncture in the obstetric patient. Rates may vary depending on the anesthetist's experience along with individual patient factors such as patient compliance and anatomy. (RCHT data incidence approximately 1%).

1.2. Accidental dural puncture in obstetric practice describes the process whereby the Epidural Tuohy needle or the Epidural Catheter accidentally punctures the dura at the level of the lumbar spine.

1.3. Dural puncture with a 16G Touhy needle, leads to a high incidence (80%) of post dural puncture headache (PDPH), which is severe and associated with a number of characteristic features. The headache is typically frontal, exacerbated by movement or sitting upright, associated with photophobia tinnitus, nausea and vomiting, and relieved when lying flat. The headache is thought to be due to the leakage of CSF through the puncture site. The optimal means of prevention, management, and treatment of this disorder are still uncertain.

Data Protection Act 2018 (General Data Protection Regulation – GDPR) Legislation

The Trust has a duty under the DPA18 to ensure that there is a valid legal basis to process personal and sensitive data. The legal basis for processing must be identified and documented before the processing begins. In many cases we may need consent; this must be explicit, informed and documented. We cannot rely on opt out, it must be opt in.

DPA18 is applicable to all staff; this includes those working as contractors and providers of services.

For more information about your obligations under the DPA18 please see the *Information Use Framework Policy* or contact the Information Governance Team rch-tr.infogov@nhs.net

2. The Guidance

2.1. Diagnosis

2.1.1. Seeing Cerebral Spinal Fluid (CSF) flow freely from the Tuohy needle.

2.1.2. Aspirating CSF from the epidural catheter – confirmation of CSF by testing for glucose(+ve) or litmus paper (slightly alkaline) Over a third of accidental dural punctures may only be diagnosed by recognition that the epidural catheter is placed intrathecally following a test dose.

2.1.3. The woman complains of a low pressure headache which can present immediately after needle puncture or 24-48 h following an undetected

dural puncture (approximately a third of patients present after an unrecognised dural puncture) **(New 2021).**

2.2. Immediate Action

2.2.1. If a needle tap occurs, attempt to thread the epidural catheter so that 3cm is in the subarachnoid space.

2.2.2. If pain or paraesthesia is elicited do not advance the catheter further.

2.2.3. If catheter tap, leave catheter in CSF.

2.2.4. **Clearly label** the intrathecal catheter and tell the patient and midwife that the anaesthetist perform all 'top ups'.

2.2.5. Give 1ml 0.25% levobupivicaine (2.5mg) with 25mcg Fentanyl for labour analgesia. The catheter should then be flushed with 2ml 0.9% sodium chloride.

2.2.6. Expect to repeat intrathecal doses every 1-2 hours with doses ranging from 0.5-1.5mls plain 0.25% levobupivacaine (1.25-3.75mgs). FLUSH THE CATHETER AFTER EACH ADMINISTRATION.

2.2.7. If unable to thread the catheter or the Touhy needle has been removed then re-site the epidural catheter at a different space. If a further tap occurs a consultant anaesthetist must be called.

2.2.8. If the epidural catheter is re-sited, the bolus regimen given by the midwifery team should only be considered if several bolus top-ups by the anaesthetist have not exhibited excessively fast onset or unusually extensive block (because of the previous dural puncture/tear).

2.2.9. Explain what has happened to the mother and that pain relief can be provided.

2.2.10. Make sure that the midwifery/obstetric and senior anaesthetic staff understand the nature of the block and your management plan

2.2.11. Clearly document management plan in the notes.

2.2.12. **Remember: High blocks may occur with intrathecal catheters, or re-sited epidurals in patients who have had inadvertent dural puncture**.

2.3. Delivery

2.3.1. The presence of a dural puncture does not require a change of plan for delivery.

2.3.2. For a vaginal delivery use the above intrathecal dosing regime.

2.3.3. If caesarean section is required, titrate 0.5ml increments of 0.5% plain Levobupivicaine (2.5mg) to the required level of block.+/- Fentanyl 50mcg.FLUSH THE CATHETER AFTER ADMINISTRATION.

2.3.4. One dose of Diamorphine 0.3mg can be given additionally for post-operative analgesia.

2.3.5. After delivery, the catheter should be removed as normal.

2.3.6. Do not perform a prophylactic blood patch.

2.4. Post Delivery

2.4.1. There is no good evidence that enforced recumbency is of any use in the prevention of PDPH.

2.4.2. For women with known dural punctures, complete the accidental Dural Puncture proforma (Appendix 3) and record the event on Euroking and the anaesthetic OneDrive folder (New 2021).

2.4.3. Encourage good oral fluid intake to maintain normal hydration. Intravenous fluids are only needed if adequate oral intake cannot be maintained. (NEW 2021).

2.4.4. Ensure regular analgesia is prescribed- Paracetamol + Dihydrocodeine +/-NSAID. A laxative such as Fybogel should be prescribed to avoid straining.

2.4.5. Review the woman daily until discharged. Do not enforce a prolonged inpatient stay but when the woman is discharged allow her an open appointment to return to post-natal ward/Day Assessment Unit (DAU) (New 2021).

2.4.6. Women who did not had an obvious dural puncture, but now have symptoms of dural puncture headache, may be identified on the anaesthetic follow up ward round, present to DAU, or be referred by their community midwife. These women should have a telephone assessment as per the Obstetric Post Dural Puncture Headache Pathway (see Appendix) and be offered a face to face review if indicated (New 2021).

2.4.7. Discuss the dural puncture again with the mother and discuss the signs of PDPH and the possibility that some headaches will resolve spontaneously within 6 weeks.

2.4.8. A sphenopalatine ganglion (SPG) block can help relieve headache symptoms. This can be offered as a temporising measure while awaiting an epidural blood patch. In a cohort of women with an uncertain diagnosis of dural puncture, it may be sufficient treatment to prevent the need for a blood patch. See appendix 4. (New 2021).

2.4.9. If PDPH symptoms are severe and not abating with simple treatments as above, then a blood patch should be considered and discussed with the patient. Plans should be made for a blood patch, with a consultant obstetric anaesthetist >48h after the dural puncture (to decrease the

likelihood of recurrent headache). Two anaesthetists must be present during the procedure.

2.4.10. If the woman is receiving pharmacological thromboprohylaxis, adequate time must have elapsed before proceeding with a blood patch (12 hours after a prophylactic LMWH dose and 24 hours after a treatment dose) (New 2021).

2.4.11. The success of an epidural blood patch depends on using as much as 20 ml of blood, injected in the lumbar region about 48 hours after the dural puncture.

2.4.12. The patient should be kept horizontal (slight head up allowed) for 1 hour after the blood patch and advised to avoid bending or straining afterwards.

2.4.13. If a mother has a blood patch, she should be offered follow up by one of the Consultant Obstetric Anaesthetists.

2.5. Important points

2.5.1. Postdural puncture headache must be distinguished from tension headache, migraine, pre-eclampsia, meningitis, cortical vein thrombosis, intracerebral haemorrhage, subdural haematoma and intracranial tumour. A history of dural puncture may be absent. An MRI may assist in the differential diagnosis.

2.5.2. The headache varies in character but is relieved by lying down and by abdominal compression. Associated symptoms include neck ache, nausea, vomiting, photophobia, tinnitus and diplopia.

2.5.3. A neglected dural leak may result in convulsions or cranial subdural haematoma, coning and death although this is very rare

2.5.4. If the epidural catheter is not retained intrathecally, it can be re-sited at a higher interspace. This may risk a second dural puncture and can cause a high block.

2.5.5. All women require close monitoring, and top-ups administered by an anaesthetist. Clear and detailed documentation is paramount.

2.5.6. Bed rest is of no prophylactic value but, in the presence of headache, mobilisation should be postponed pending definitive treatment. Hydration and analgesia provide only symptomatic relief. Women who have reduced mobilisation should be considered for thromboprophylaxis (New 2021).

2.5.7. Epidural blood patch relieves symptoms and stops the CSF leak in 60% of cases and is therefore definitive treatment. Some women will experience a mild backache following the blood patch procedure.

2.5.8. Alternatives to blood, such as normal saline 0.9% 10-30mls (New 2021) may be useful for women who decline blood products or if there is bacteraemia. The effects are more likely to be transient than when

using blood. Jehovah's Witnesses may discuss any concerns with a member of the Jehovah's Witness Liaison team (see Guideline for Women Declining Blood Products) (New 2021).

2.5.9. Leaving the intrathecal catheter insitu for 24-hours post-delivery may reduce the incidence of PDPH from 80 to 60% however all epidural catheters must be removed before women are transferred to the post-natal ward.

3. Monitoring compliance and effectiveness

Element to be monitored	All women with a post dural puncture will be followed up by the Obstetric Anaesthetist on-call and feedback given to the Anaesthetist who performed the procedures.
Lead	Obstetric Anaesthetic Lead Consultant
Tool	Review of notes of all woman with a post dural puncture
Frequency	Yearly
Reporting arrangements	Through the Maternity Forum
Acting on recommendations and Lead(s)	Maternity Forum will monitor any action plans arising
Change in practice and lessons to be shared	One to one feedback to individual anaesthetists Any training needs will be addressed by the training lead for anaesthetics

4. Equality and Diversity

4.1. This document complies with the Royal Cornwall Hospitals NHS Trust service Equality and Diversity statement.

4.2. Equality Impact Assessment

The Initial Equality Impact Assessment Screening Form is at Appendix 2.

Appendix 1. Governance Information

Document Title	Accidental Dural Puncture in Obstetric Patients Clinical Guideline V3.0		
This document replaces (exact title of previous version):	Accidental Dural Puncture in Obstetric Patients - Clinical Guideline For Management V2.0		
Date Issued/Approved:	18th June 2021		
Date Valid From:	June 2021		
Date Valid To:	June 2024		
Directorate / Department responsible (author/owner):	Dr S Banks Obstetric Anaesthetic Consultant Lead		
Contact details:	01872 25 3132		
Brief summary of contents	To give guidance to obstetric anaesthetist on the management of an accidental dural puncture in the obstetric patient.		
Suggested Keywords:	Dural, puncture, epidural, tap, blood patch, CSE,spinal		
Target Audience	RCHT	CFT	KCCG
	✓		
Executive Director responsible for Policy:	Medical Director		
Approval route for consultation and ratification:	Maternity Guidelines Group Obs and Gynae Directorate Care Group Board		
General Manager confirming approval processes	Mary Baulch		
Name of Governance Lead confirming approval by specialty and care group management meetings	Caroline Amukusana		
Links to key external standards	None		
Related Documents:	• Russell et al. Treatment of obstetric post dural puncture headache part 1: conservative and pharmacological management. IJOA 2019: 38; 93-103 • Van de Velde M, Schepers R, et al. Ten years of experience with accidental dural puncture and post dural puncture headache in a tertiary obstetric anaesthetic department. International Journal of		

	Anaesthesia.2009; 17:329-335 • Gleeson CM, Reynolds E. Accidental dural puncture rates in UK obstetric practice. International Journal of Obstetric Anaesthesia. 1998 Oct;7(4):242-6 • Stride PC, Cooper GM: Dural taps revisited. A 20-year survey from Birmingham Maternity Hospital. Anaesthesia 1993; 48:247-55 • Harrington BE, Schmitt AM. Meningeal puncture headache, unintentional dural puncture, and the epidural blood patch: a national survey of United States practice. Reg Anaesth Pain Med, 2009Sep-Oct; 34(5):430-7 • Rutter SV, Shields F et al. Management of accidental dural puncture in labour with intrathecal catheters: an analysis of 10 years experience. International Journal of Obstetric Anaesthesia.2001; 10:177-181 • Turnbull DK, Shepherd DB. Post dural puncture headache pathogenesis, prevention and treatment. British Journal of Anaesthesia 2003; 91: 718–29 • Camann WR, Murray RS etal. Effects of oral caffeine on postdural puncture headache. A double-blind, placebo-controlled trial. Anaesthesia & Analgesia. 1990; 70:181-4 • Carp H, Singh PJ et al. Effects of the serotonin receptor agonist sumatriptan on postdural puncture headache; report of six cases. Anaesthesia & Analgesia 1994;79:180-2 M Rupasinghe. Recognition and treatment of post-dural puncture headache			
Training Need Identified?	Yes – Training as per anaesthetics training log			
Publication Location (refer to Policy on Policies – Approvals and Ratification):	Internet & Intranet	✓	Intranet Only	
Document Library Folder/Sub Folder	Clinical / Midwifery and Obstetrics			

Version Control Table

Date	Version No	Summary of Changes	Changes Made by *(Name and Job Title)*
January 2006	V1.0	Initial Issue	DR Bill Harvey Consultant Aanaesthetist
December 2009	V1.1	Added care post dural tap and follow up.	Dr Catherine Ralph Consultant Anaesthetist
February 2012	V1.2	Added compliance monitoring Document Manager Upload Form.	Dr Catherine Ralph Consultant Anaesthetist
5th March 2015	V1.3	Flush the catheter after each administration. Removal of caffeine and Sumitriptan	Sam Banks Consultant Anaesthetist
14th March 2018	V2.0	See new 2018 in body of the text	Sam Banks Consultant Anaesthetist
20th May 2021	V3.0	Addition of sphenopalatine ganglion blocks as analgesic option.	Katharine Sprigge Consultant Anaesthetist

All or part of this document can be released under the Freedom of Information Act 2000

This document is to be retained for 10 years from the date of expiry.

This document is only valid on the day of printing

Controlled Document

This document has been created following the Royal Cornwall Hospitals NHS Trust Policy on Document Production. It should not be altered in any way without the express permission of the author or their Line Manager.

Appendix 2. Equality Impact Assessment

<table>
<tr><th colspan="6">Section 1: Equality Impact Assessment Form</th></tr>
<tr><td colspan="6">Name of the strategy / policy /proposal / service function to be assessed;
Accidental Dural Puncture in Obstetric Patients Clinical Guideline V3.0</td></tr>
<tr><td colspan="3">Directorate and service area:
Obst and Gynae directorate</td><td colspan="3">Is this a new or existing Policy?
Existing</td></tr>
<tr><td colspan="3">Name of individual/group completing EIA
Katherine Sprigge, Consultant Anaesthetist</td><td colspan="3">Contact details:
01872 25 3132</td></tr>
<tr><td>1. Policy Aim
Who is the strategy / policy / proposal / service function aimed at?</td><td colspan="5">To give guidance to obstetric anaesthetists on the management of an accidental dural puncture in the obstetric patient.</td></tr>
<tr><td>2. Policy Objectives</td><td colspan="5">To ensure early identification, appropriate and timely management of a dural tap.</td></tr>
<tr><td>3. Policy Intended Outcomes</td><td colspan="5">Compliance Monitoring Tool</td></tr>
<tr><td>4. How will you measure the outcome?</td><td colspan="5">All obstetric women who have had an accidental dural tap.</td></tr>
<tr><td>5. Who is intended to benefit from the policy?</td><td colspan="5">Patients</td></tr>
<tr><td rowspan="3">6a). Who did you consult with?

b). Please list any groups who have been consulted about this procedure.</td><td>Workforce</td><td>Patients</td><td>Local groups</td><td>External organisations</td><td>Other</td></tr>
<tr><td>x</td><td></td><td></td><td></td><td></td></tr>
<tr><td colspan="5">Please record specific names of groups:
Obstetric Guidelines Group
Obs and Gynae Directorate
Care Group Board</td></tr>
<tr><td>c). What was the outcome of the consultation?</td><td colspan="5">Guideline agreed</td></tr>
</table>

7. The Impact
Please complete the following table. If you are unsure/don't know if there is a negative impact you need to repeat the consultation step.

Are there concerns that the policy **could** have a positive/negative impact on:

Protected Characteristic	Yes	No	Unsure	Rationale for Assessment / Existing Evidence
Age		**X**		All pregnant women
Sex (male, female non-binary, asexual etc.)		**X**		All pregnant women
Gender reassignment		**X**		All pregnant women
Race/ethnic communities /groups		**X**		All pregnant women
Disability (learning disability, physical disability, sensory impairment, mental health problems and some long term health conditions)		**X**		All pregnant women
Religion/ other beliefs		**X**		All pregnant women
Marriage and civil partnership		**X**		All pregnant women
Pregnancy and maternity		**X**		All pregnant women
Sexual orientation (bisexual, gay, heterosexual, lesbian)		**X**		All pregnant women

If all characteristics are ticked 'no', and this is not a major working or service change, you can end the assessment here as long as you have a robust rationale in place.

I am confident that section 2 of this EIA does not need completing as there are no highlighted risks of negative impact occurring because of this policy.

Name of person confirming result of initial impact assessment:	Dr Katherine Sprigge, Consultant Anaesthetist

If you have ticked 'yes' to any characteristic above OR this is a major working or service change, you will need to complete section 2 of the EIA form available here:
Section 2. Full Equality Analysis

For guidance please refer to the Equality Impact Assessments Policy (available from the document library) or contact the Human Rights, Equality and Inclusion Lead india.bundock@nhs.net

Appendix 3: Accidental Dural Puncture Proforma

UNINTENTIONAL DURAL PUNCTURE AND POST DURAL PUNCTURE HEADACHE FOLLOW-UP FORM

Section 1: Details of Patient and dural puncture

Patient details (sticker)
Name
DOB
Hospital No.

Home number_____

Mobile number_____

Date and time of dural puncture (complete where applicable)

Anaesthetist: _____

Details of dural puncture:

Dural puncture with needle/catheter or neither

Which interspace:

Depth to epidural/intrathecal space

Management of dural puncture (ie. ee-sited, intrathecal catheter or abandoned)

Date and time of onset of headache:

Section 2: Management of dural puncture headache

Daily follow up is required for a minimum of 72 hours or until the headache is completely resolved (whichever is longer)

Follow up in person or by telephone

Please handover details to oncoming obstetric anaesthetist at each handover

Date	Symptoms							
	Headache	Positional	Site	Neck stiffness?	Photophobia	Tinnitus	Fits	Other
	Y/N	Y/N		Y/N	Y/N	Y/N	Y/N	
	Management Signature Name							
Date	Symptoms							
	Headache	Positional	Site	Neck stiffness?	Photophobia	Tinnitus	Fits	Other
	Y/N	Y/N		Y/N	Y/N	Y/N	Y/N	
	Management Signature Name							

Section 3: Epidural Blood Patch

Patient details (sticker)

- Is the patient pyrexial? Yes/No
- Is the WCC normal? Yes/No
- Is the patient more that 12 hours from prophylactic LMWH? Yes/No
- Has written consent been obtained? Yes/No

Have side effects been discussed:

(circle as discussed)

Failure Repeat dural puncture

Backache Radicular pain

Radiation Neurological injury

Procedure:

Monitoring: Pulse oximetry Blood pressure

Epidural performed by:

_____

Venesection performed by:

_____

Epiduralist: Gown/Gloves/Mask
Chlorhexidine spray

Venesector: Gloves/Mask

Level:

Loss of resistance to: Air/Saline

Depth of epidural space

Blood in CSF of Tuohy: Y/N

Volume of blood injected (mls)

Injection limited by pain? Y/N

Immediate improvement of symptoms? Y/N

Post blood patch management

Bed rest for hrs Discharge after hrs

Post procedural advice: Return if headache returns or any red flag symptoms develop

Avoid straining

Avoid heavy lifting

Once completed file in patient notes. Follow up by telephone for next 24 hours.

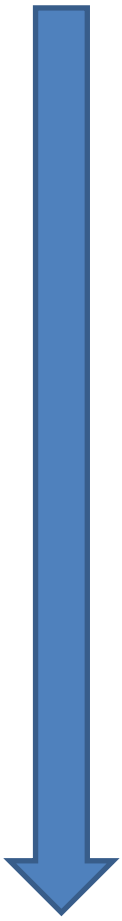
Appendix 4. Obstetric Post Dural Puncture Headache Patient Pathway (New 2021)

Patients may be identified via their community midwife or present to Day Assessment Unit (DAU). They may also present on the anaesthetic follow up ward round.

For patients at home

Anaesthetist on duty telephones to assess patient

- Headache history
- Make an initial assessment over the phone and document on E3
- Add patient to anaesthetic handover whiteboard & OneDrive database



If the patient definitely does not require face to face assessment (e.g. simple tension headache suspected) then provide safety netting advice.

Patients will require immediate face to face assessment if:

- Severe back pain with temperature
- Worsening headache and neck stiffness
- Leg weakness
- Incontinence of urine or stool
- Any other abnormal neurology, or persisting, severe headache
- If a woman is unable to manage activities of daily living or care for her baby she should also be offered a face to face assessment

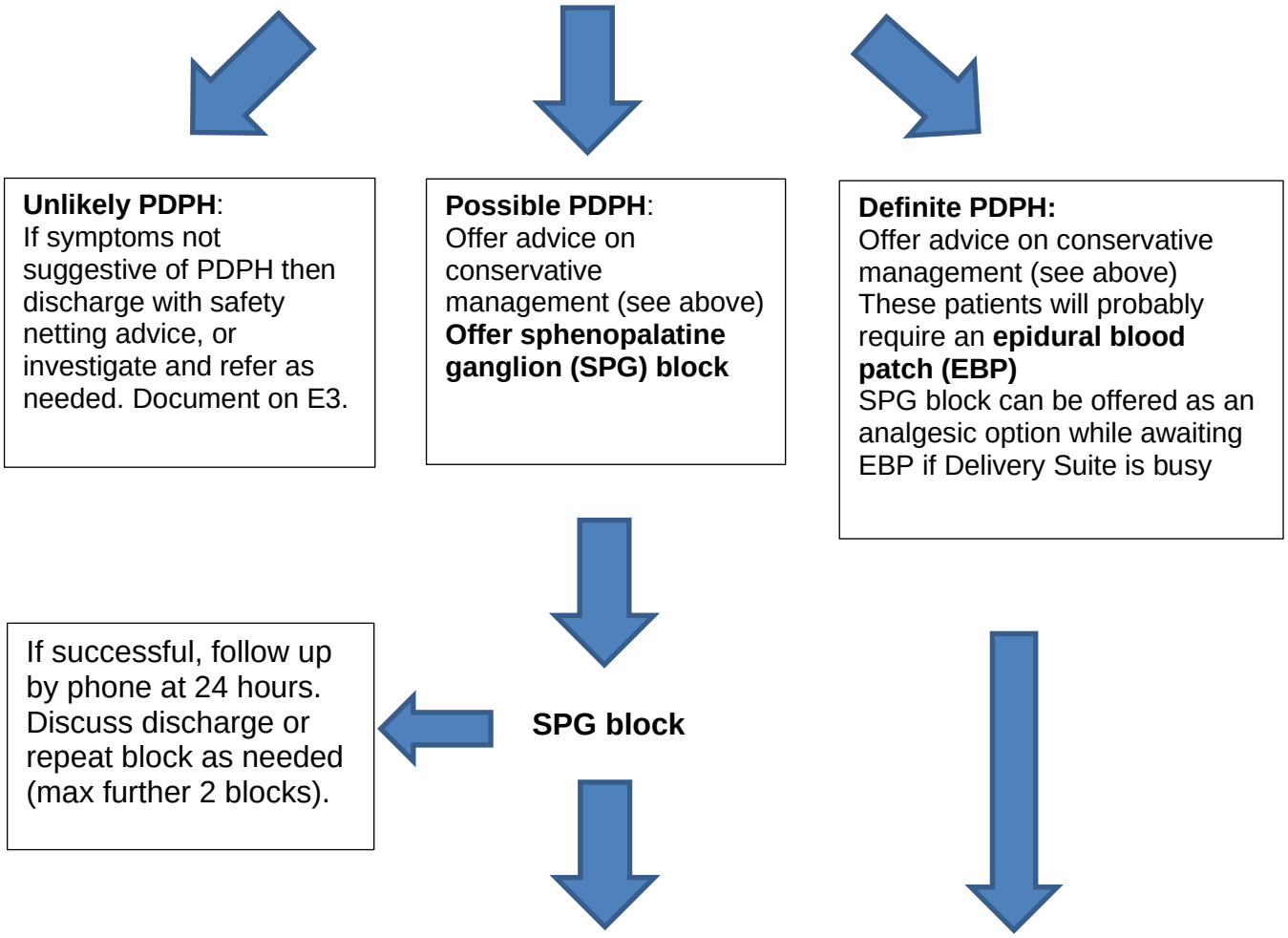
If suspected post dural puncture headache (PDPH) offer conservative management as an option to the patient:

Bed rest
Drinking plenty of fluids
Caffeinated drinks
Regular painkillers: paracetamol, ibuprofen and dihydrocodeine
Laxative to avoid straining
Explain that most headaches resolve in 11-14 days

Bring the patient in to DAU for examination and investigation if required

Patients presenting for face to face assessment

- Further history and neurological examination
- Review notes – is there documented evidence of a definite dural puncture with a Tuohy needle? These patients have a high incidence of severe PDPH and are most likely to require an epidural blood patch. *A significant epidural leak should not be left untreated.*
- Explain findings to patient. Give patient information leaflets



If no relief from SPG block offer epidural blood patch (EBP)

- If presenting with a severe headache <48 hours discuss with consultant as increased likelihood of needing repeat EBP
- If >2 weeks discuss with consultant. A small subset of patients may benefit

- Please document all interactions on E3 and the OneDrive/Anaesthetic communication whiteboard.
- Telephone all patients at 24 hours post either procedure.
- If persistent headache despite SPG and EBP consider imaging and referral to neurology.
- On discharge remind patient of safety netting advice.

Appendix 5: Sphenopalatine Ganglion (SPG) Block Standard Operating Procedure (New 2021)

Location:
Delivery suite room or post natal ward depending on beds/staffing levels/other labour ward activity. Either a midwife or anaesthetist must stay for the first 15 minutes after the procedure.

Before Procedure:
Discuss procedure and sign formal consent for procedure (to include use of confidential data anonymised for study)

Procedure:

- Lie patient flat on bed with pillow under shoulders to encourage head to tip slightly back. Apply sats, BP and ECG monitoring. Take baseline set of observations.
- Insert one 20G plastic cannula into each nostril (plastic cannula only, needle removed). Direct the cannula superiorly within nostril
- Inject 1.5mls 4% lignocaine slowly into each side so that it trickles out of the end of the plastic cannula over the back of the nose. (Total dose 120mg, max dose 3mg/kg)
- Keep patient lying flat for 20 mins with continuous ECG and sats monitoring and 5 minute NIBP. Record 3 sets of observations after the block.
- Sit patient up
- Wait further 10 mins with one final set of observations before discharge

Post Procedure and Follow Up:

1. Document procedure on E3.

2. Discharge patient back home (or back to ward if an inpatient for another reason).

3. Ensure patient recorded on labour ward anaesthetic communication board for team to follow up at 24 hours after procedure.

4. If the SPG block initially relieves symptoms, but wears off at 24-48 hours, offer a further 2 blocks as required (not after 2 weeks following dural puncture).

5. If no relief from SPG consider EBP. Discuss with patient and organise for that day or following day depending on time of day and labour ward activity. If patient declines then discharge home and follow up phone call at 24 hours.

6. Check patient has information leaflets and knows how to contact DAU/Delivery Suite if further concerns.