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 of accidental dural puncture may vary depending on the anaesthetist’s experience and individual patient factors such as patient compliance and anatomy. (RCHT incidence approximately 1%).

1.2. Accidental dural puncture in obstetric practice occurs when 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. It is associated with photophobia, nausea and vomiting, and relieved when lying flat. The headache is thought to be due to the leakage of cerebral spinal fluid through the puncture site. The optimal means of prevention, management, and treatment of this disorder are still uncertain.

2. **The Guidance**

2.1. **Diagnosis**

- Seeing cerebral spinal fluid (CSF) flow freely from the Tuohy needle
- 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.
- The woman complains of a low pressure headache which can present immediately after needle puncture or 24-48hrs following an undetected dural puncture

2.2. **Immediate Action**

- If a needle tap occurs, attempt to thread the epidural catheter so that 3cm is in the subarachnoid space
- If pain or paraesthesia is elicited do not advance the catheter further
- If catheter tap, leave catheter in CSF.
- Clearly label the intrathecal catheter and tell the patient and midwife that the anaesthetist is to perform all ‘top ups’
• Give 1ml 0.25% Bupivicaine with 25mcg Fentanyl for labour analgesia, this can be flushed with 2ml 0.9% sodium chloride
• Expect to repeat intrathecal doses every 1-2 hours with doses ranging from 0.5-1.5mls plain 0.25% bupivacaine. FLUSH THE CATHETER AFTER EACH ADMINISTRATION WITH 1.5mls of normal saline
• 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
• If using the epidural catheter for midwifery led top ups, the midwife should only commence top ups once 2 top ups by the anaesthetist have not exhibited a fast onset or unusually extensive block (because of the previous dural puncture/tear)
• Explain what has happened to the mother and that pain relief can be provided
• Make sure that the midwifery/obstetric and senior anaesthetic staff understand the nature of the block and your management plan
• Clearly document management plan in the notes
• Remember: High blocks may occur with intrathecal catheters, or re-sited epidurals in patients who have had inadvertent dural puncture

2.3. Delivery
• The presence of a dural puncture does not require a change of plan for delivery
• For a vaginal delivery use the above intrathecal dosing regime
• If caesarean section is required, titrate 0.5ml increments of 0.5% plain Bupivicaine to the required level of block +/- Fentanyl 50mcg. FLUSH THE CATHETER AFTER ADMINISTRATION with 1.5mls of Normal Saline.
• One dose of Morphine 0.1mg can be given additionally for post-operative analgesia
• After delivery, the catheter should be removed as normal
• Do not perform a prophylactic blood patch

2.4. Post Delivery
• There is no good evidence that enforced recumbency is of any use in the prevention of post dural puncture headache (PDPH)
• Encourage good oral/intravenous hydration
• 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
• 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
• Ensure regular analgesia is prescribed- Paracetamol + DihydroCodeine +/- Non steroidal Anti-inflammatory Drug (NSAID). A laxative such as Fybogel should be prescribed to avoid straining.
• 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.

- 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
- 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
- Following the blood patch the mother 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. A Magnetic Resonance Image (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 and double vision.

2.5.3. A neglected dural leak may result in convulsions or cranial subdural haematoma, coning and death.

2.5.4. If the epidural catheter is not retained intrathecally, it can be resited 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. 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.

2.5.7. Alternatives to blood, such as dextran 40, may be useful for women who decline blood products or if there is bacteraemia

2.5.8. 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

<table>
<thead>
<tr>
<th>Element to be monitored</th>
<th>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.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lead</td>
<td>Obstetric Anaesthetic Lead Consultant</td>
</tr>
<tr>
<td>Tool</td>
<td>Review of notes of all woman with a post dural puncture</td>
</tr>
<tr>
<td>Frequency</td>
<td>Every woman with a post dural puncture</td>
</tr>
<tr>
<td>Reporting arrangements</td>
<td>Through the Maternity Risk Management Forum</td>
</tr>
<tr>
<td>Acting on recommendations and Lead(s)</td>
<td>Maternity Risk Management Forum will monitor any action plans arising</td>
</tr>
</tbody>
</table>
| 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

<table>
<thead>
<tr>
<th>Document Title</th>
<th>DURAL PUNCTURE IN OBSTETRIC PATIENTS - CLINICAL GUIDELINE FOR MANAGEMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date Issued/Approved:</td>
<td>2&lt;sup&gt;nd&lt;/sup&gt; April 2015</td>
</tr>
<tr>
<td>Date Valid From:</td>
<td>2&lt;sup&gt;nd&lt;/sup&gt; April 2015</td>
</tr>
<tr>
<td>Date Valid To:</td>
<td>2&lt;sup&gt;nd&lt;/sup&gt; April 2018</td>
</tr>
<tr>
<td>Directorate / Department responsible (author/owner):</td>
<td>Dr Sam Banks Obstetric Anaesthetic Consultant Lead</td>
</tr>
<tr>
<td>Contact details:</td>
<td>01872 253132</td>
</tr>
<tr>
<td>Brief summary of contents</td>
<td>To give guidance to obstetric anaesthetist on the management of an accidental dural puncture in the obstetric patient.</td>
</tr>
<tr>
<td>Suggested Keywords:</td>
<td>Dural, puncture, epidural, tap, blood, patch, CSF, headache, accidental</td>
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<tr>
<td>Target Audience</td>
<td>RCHT</td>
</tr>
<tr>
<td>Executive Director responsible for Policy:</td>
<td>Medical Director</td>
</tr>
<tr>
<td>Date revised:</td>
<td>2&lt;sup&gt;nd&lt;/sup&gt; April 2015</td>
</tr>
<tr>
<td>This document replaces (exact title of previous version):</td>
<td>Guideline for the Management of Accidental Dural Puncture</td>
</tr>
<tr>
<td>Approval route (names of committees)/consultation:</td>
<td>Maternity Guideline Group Obs &amp; Gynae Directorate Divisional Board</td>
</tr>
<tr>
<td>Divisional Manager confirming approval processes</td>
<td>Head of Midwifery</td>
</tr>
<tr>
<td>Name and Post Title of additional signatories</td>
<td>Not required</td>
</tr>
<tr>
<td>Signature of Executive Director giving approval</td>
<td>{Original Copy Signed}</td>
</tr>
<tr>
<td>Publication Location (refer to Policy on Policies – Approvals and Ratification):</td>
<td>Internet &amp; Intranet</td>
</tr>
<tr>
<td>Document Library Folder/Sub Folder</td>
<td>Clinical/Midwifery and Obstetrics</td>
</tr>
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</table>
• Related Documents:

  - M Rupasinghe. Recognition and treatment of post-dural puncture headache
Training Need Identified? | Training as per anaesthetists training log

Version Control Table

<table>
<thead>
<tr>
<th>Date</th>
<th>Version No</th>
<th>Summary of Changes</th>
<th>Changes Made by (Name and Job Title)</th>
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</thead>
<tbody>
<tr>
<td>January 2006</td>
<td>V1.0</td>
<td>Initial Issue</td>
<td>Dr Bill Harvey Consultant Anaesthetist</td>
</tr>
<tr>
<td>December 2009</td>
<td>V1.1</td>
<td>Added care post dural tap and follow up.</td>
<td>Dr Catherine Ralph Consultant Anaesthetist</td>
</tr>
<tr>
<td>February 2012</td>
<td>V1.2</td>
<td>Added compliance monitoring Document Manager Upload Form.</td>
<td>Dr Catherine Ralph Consultant Anaesthetist</td>
</tr>
<tr>
<td>5th March 2015</td>
<td>V1.3</td>
<td>Flush the catheter after each administration. Removal of caffeine and Sumitriptan.</td>
<td>Sam Banks Consultant Anaesthetist</td>
</tr>
</tbody>
</table>

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

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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. Initial Equality Impact Assessment Form

<table>
<thead>
<tr>
<th>Name of Name of the strategy / policy / proposal / service function to be assessed (hereafter referred to as policy)</th>
<th>DURAL PUNCTURE IN OBSTETRIC PATIENTS - CLINICAL GUIDELINE FOR MANAGEMENT OF ACCIDENTAL PUNCTURE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Directorate and service area: Obstetrics and Gynaecology</td>
<td>Is this a new or existing Policy? Existing</td>
</tr>
<tr>
<td>Name of individual completing assessment: Elizabeth Anderson</td>
<td>Telephone: 01872 252879</td>
</tr>
</tbody>
</table>

1. Policy Aim*  
   Who is the strategy / policy / proposal / service function aimed at?  
   To give guidance to obstetric anaesthetists on the management of an accidental dural puncture in the obstetric patient.

2. Policy Objectives*  
   To ensure early identification, appropriate and timely management of a dural tap.

3. Policy – intended Outcomes*  
   Safe management of the obstetric woman who has had an accidental dural tap.

4. *How will you measure the outcome?  
   Compliance monitoring tool.

5. Who is intended to benefit from the policy?  
   All obstetric women who have had an accidental dural tap.

6a) Is consultation required with the workforce, equality groups, local interest groups etc. around this policy?  
   No

   b) If yes, have these *groups been consulted?  
   N/A

   C). Please list any groups who have been consulted about this procedure.  
   N/A

7. The Impact  
   Please complete the following table.

   Are there concerns that the policy could have differential impact on:

<table>
<thead>
<tr>
<th>Equality Strands:</th>
<th>Yes</th>
<th>No</th>
<th>Rationale for Assessment / Existing Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>X</td>
<td></td>
<td>All pregnant women</td>
</tr>
<tr>
<td>Sex (male, female, trans-gender / gender reassignment)</td>
<td>X</td>
<td>All pregnant women</td>
<td></td>
</tr>
<tr>
<td>Race / Ethnic communities /groups</td>
<td>X</td>
<td>All pregnant women</td>
<td></td>
</tr>
<tr>
<td>Disability - learning disability, physical disability, sensory impairment and mental health problems</td>
<td>X</td>
<td>All pregnant women</td>
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<tr>
<td>Religion / other beliefs</td>
<td>X</td>
<td>All pregnant women</td>
<td></td>
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<tr>
<td>Marriage and civil partnership</td>
<td>X</td>
<td>All pregnant women</td>
<td></td>
</tr>
<tr>
<td>Pregnancy and maternity</td>
<td>X</td>
<td>All pregnant women</td>
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<tr>
<td>Sexual Orientation, Bisexual, Gay, heterosexual, Lesbian</td>
<td>X</td>
<td>All pregnant women</td>
<td></td>
</tr>
</tbody>
</table>

You will need to continue to a full Equality Impact Assessment if the following have been highlighted:
- You have ticked “Yes” in any column above and
- No consultation or evidence of there being consultation - this excludes any policies which have been identified as not requiring consultation. or
- Major service redesign or development

8. Please indicate if a full equality analysis is recommended. | Yes | No |

9. If you are not recommending a Full Impact assessment please explain why.

N/A

Signature of policy developer / lead manager / director
Sam Banks

Date of completion and submission 2<sup>nd</sup> April 2015

Names and signatures of members carrying out the Screening Assessment
1. Elizabeth Anderson
2. Sam Banks

Keep one copy and send a copy to the Human Rights, Equality and Inclusion Lead, c/o Royal Cornwall Hospitals NHS Trust, Human Resources Department, Knowledge Spa, Truro, Cornwall, TR1 3HD

A summary of the results will be published on the Trust’s web site.

Signed: Elizabeth Anderson

Date: 2<sup>nd</sup> April 2015