

Lumbar Puncture- Assisting with

Procedure Responsibilities and Authorisation

Department Responsible for Procedure	Newborn Intensive Care Unit (NICU)
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Target Audience	Nurses
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Procedure Review History

Version	Updated by	Date Updated	Summary of Changes
1	Lee-Anne Gray	July 2002	Nursing procedure developed in 2002
2	Tricia Ho	Oct 2009	Updating an existing procedure
3	Joyce Mok	April 2013	3-yearly update
4	Joyce Mok	Sept 2016	3-yearly update
5	Richard Pagdanganan	Dec 2019	3-yearly update

Lumbar Puncture- Assisting with

1 Overview

1.1 Purpose

To obtain cerebrospinal fluid (CSF) for diagnostic purposes, or to relieve pressure within the skull. It is performed by medical staff (Registrar/Nurse Practitioner/Clinical Nurse Specialist/Senior Medical Officer) using aseptic technique.

1.2 Scope

Waikato District Health Board nursing staff working in NICU

1.3 Patient / client group

Babies and infants in NICU

1.4 Contraindications

- Coma: absent or non-purposeful response to painful stimulus.
- Signs of raised intracranial pressure: e.g. drowsy, diplopia, abnormal pupillary responses, unilateral or bilateral motor posturing or papilloedema (NB papilloedema is an unreliable and late sign of raised Intracranial Pressure (ICP) in meningitis; a bulging fontanelle in the absence of other signs of raised ICP, is not a contraindication).
- Cardiovascular compromise/ shock
- Respiratory compromise
- Focal neurological signs or seizures
- Recent seizures (within 30 minutes or not regained normal conscious level afterwards).
- Coagulopathy/thrombocytopenia
- Local infection (in the area where an LP would be performed)
- The febrile child with purpura where meningococcal infection is suspected.

1.5 Definitions

CSF	Cerebrospinal Fluid is clear, colourless liquid found in your brain and spinal cord.
Lumbar Puncture (LP)	The introduction of a hollow needle and stylet into the subarachnoid space of the lumbar part of the spinal cord. It may be performed as part of the initial work up of a sick baby, or later in the course of an illness once the patient has stabilised if there were initial contraindications. It is preferable to obtain a CSF specimen prior to antibiotic administration; however this should not be unduly delayed in a baby with signs of meningitis or sepsis.

Lumbar Puncture- Assisting with

2 Clinical Management

2.1 Competency required

Registered Nurse who has completed Level 3 or Level 2 orientation

2.2 Equipment

- Trolley, cleaned and dried
- Sterile dressing pack
- 21 gauge spinal needle
- Three collection tubes (pre-labelled 1,2 & 3)
- Aqueous alcohol-free chlorhexidine solution (in medicine room)
- Extra gauze swabs
- Opsite/Tegaderm to secure dressing
- Opsite spray
- Sterile gloves
- Sterile gown pack
- Masks
- Blood sugar tube

2.3 Procedure

2.3.1 Preparations

- Medical staff explains to parent(s) and obtains informed consent to ensure parent(s) are aware of the indication for the procedure and management of their baby.
- Staff assisting and performing LP must wear masks.
- Perform hand hygiene
- Check blood sugar before or immediately following LP, for comparison against blood sugar level in CSF (marked difference suggests infection).
- Consider use of dextrose gel, intranasal Midazolam or a bolus of Fentanyl to provide adequate pain relief, check with medical staff.
- Perform hand hygiene.
- Open up dressing pack onto cleaned trolley and place all sterile equipment on sterile field.

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Lumbar Puncture- Assisting with

2.3.2 Positioning of infant

- Prepare infant and position infant on side (or sitting upright, not NICU usual practice). Hold infant securely in a curved position which ensures a flexed position.
- A flexed position ensures the spine is curved, thus widens the vertebrae and facilitates the insertion of the needle
- Avoid extreme flexion during positioning to prevent iatrogenic vertebral body compression.

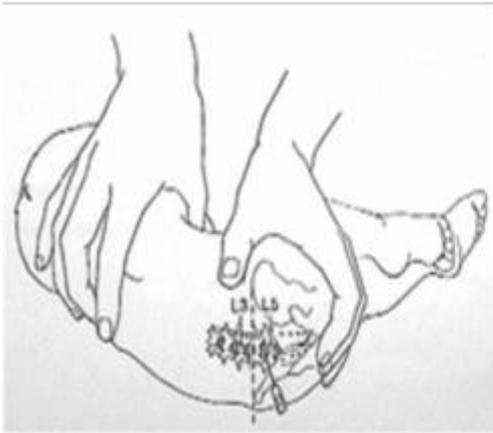


Image 1: Positioning of Infant for Lumbar Puncture

Note:

Many infants requiring lumbar punctures are very ill and to position them with an exaggerated curving of their back may obstruct their airway. Care must be taken and a reduction in the degree of the flexion to ensure a patent airway at all times.

- Lie the infant on his/her side and have his/her back positioned close to the edge of the mattress to provide easier access during the procedure.
- Hold the infant firmly throughout the procedure and ensure infant remains as still as possible to minimise discomfort and trauma, and prevent accident needle displacement.

2.3.3 Observations during LP

- Watch closely for signs of reactions to the procedure such as apnoea, obstructed airway, increased pulse rate, desaturations, pallor and neurologic status.
- Ensure an aseptic technique is used throughout.

Lumbar Puncture- Assisting with

2.3.4 Collection of CSF

- Medical staff will collect CSF for laboratory analysis. (CSF is normally under slight pressure so should drip out without any need for suction).
- Ensure specimens are collected (approximately 5 drops in each container) in correct sequence.
- Ensure specimen is securely capped and label correctly.
- Send to laboratory promptly.

2.3.5 Observation after LP

- Apply Opsite spray, then small dry gauze dressing to puncture site and secure dressing with Opsite/Tegaderm.
- Reposition infant comfortably.
- Check puncture site for redness, swelling or oozing during cares time, e.g. 3-4 hourly for the first 24 hours.
- Observe and record vital signs 1-2 hourly, as required according to baby's condition.
- Observe baby for signs of pain/discomfort/irritability – may indicate headache. Report to medical staff.
- Remove equipment and rubbish and dispose into appropriate container.
- Perform hand hygiene.
- Record details of procedure and infant's response in the clinical notes.

3 Audit

3.1 Indicators

- Informed consent from parents/caregiver is obtained prior to the procedures (and documented)
- A blood sugar level is measured prior and post a lumbar puncture
- There is documentation to evidence physiological investigations are undertaken according 2.3.3 & 2.3.5

4 Evidence base

4.1 References

- Adigun, O. & Aldahir, M. (2018). Anatmoy, head, neck and cerebrospinal fluid. Retrieved on November 20, 2019 from <https://www.ncbi.nlm.nih.gov/books/NBK459286/>

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Lumbar Puncture- Assisting with

- Royal Children’s Hospital (2019). Lumbar Puncture. Retrieved on November 20, 2019 from https://www.rch.org.au/clinicalguide/guideline_index/Lumbar_puncture/
- Wolters Kluwer Health (2018). Lumbar puncture, assisting, paediatric. Retrieved on November 20, 2019 from <https://procedures.lww.com/lmp/view.do?pld=729359>

4.2 Associated Waikato DHB Documents

- Waikato DHB NICU Nursing Guideline: Neonatal pain and sedation: Assessment and nursing management (1684).
- Waikato DHB NICU Drug Manual

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IF THIS DOCUMENT IS PRINTED, IT IS VALID ONLY FOR THE DAY OF PRINTING							Page 6 of 6