Lumbar Puncture (Adult) Standard Operating Procedure UHL Emergency and Specialist Medicine (ESM) (LocSSIPs)

Change Description	**Reason for Change**
☐ Change in format	√ Trust requirement

APPROVERS	**POSITION**	**NAME**
Person Responsible for Procedure:	Consultant in Acute Medicine Consultant Physician and Geriatrician	Salam Al-Alousi Nainal Shah
SOP Owner:	Consultant in Acute Medicine Consultant Physician and Geriatrician Consultant in Stroke Medicine	Salam Al-Alousi Nainal Shah Amit Mistri

Appendices in this document:

Appendix 1: UHL Safer Surgery Adult Lumbar Puncture Checklist
Appendix 2: Patient Information Leaflet for *Adult Lumbar Puncture* Available at: Having a lumbar puncture to get a sample of spinal fluid (adults) (leicestershospitals.nhs.uk)

Introduction and Background:

This SOP has been based on the National Safety Standards for Invasive Procedures (NatSSIP) template for Local Safety Standards for Invasive Procedures (LocSSIPs). It was developed to improve safety and efficiency with adult lumbar punctures whilst also minimising the risks involved.
Quick link to the Safer Surgery Checklist: **UHL Safer Surgery Adult Lumbar Puncture Checklist**

Lumbar puncture is a common diagnostic procedure used to investigate causes of neurological/brain pathologies. It can also be a therapeutic procedure to help symptoms in idiopathic intracranial hypertension.

It is a simple procedure commonly performed on medical wards, medical ambulatory and day case units. It involves sampling of the cerebrospinal fluid from the subarachnoid space of the lumbar sac, at a level below the termination of the spinal cord, by introducing a needle between the spinal processes. It is associated with risks and complications that require thorough consenting and appropriate technique.

Indications:

- Investigate for:
  - Meningitis/encephalitis
  - Subarachnoid haemorrhage (SAH)
  - Idiopathic intracranial hypertension (IIH)
  - Other neurological/brain pathologies
- Therapeutic treatment of symptoms in IIH.

Relative contra-indications:

- Space-occupying lesions with mass effect.
- Evidence of raised intracranial pressure with risk of cerebral herniation.
- Thrombocytopaenia (<50 x10^9 /L) or other bleeding tendencies, includinganticoagulation
- Suspected spinal epidural abscess.
- Skin infection at the site of the lumbar puncture.
- Suspected meningococcal septicaemia with purpuric rash.

Risk factors for post-lumbar puncture (LP) complications:

- Patient-related:
  - Increased risk of developing post-LP headache and back pain:
    - Young age <40 years
    - Female sex
    - History of headache
  - Fear of lumbar puncture.
- Procedure-related:
  - Needle gauge (larger bore associated with increased risk of post-LP headache)
  - Atraumatic needles associated with less risk of post-LP complaints.
  - Number of lumbar puncture attempts (>4) increases risk of post-LP back pain.
  - Sitting position is associated with increased risk of post-LP headache.
  - Passive withdrawal of CSF associated with less risk of post-LP headache and bleeding.
  - Not re-inserting the stylet to the tip of the needle before its removal on completion of procedure increases prevalence of post-LP headache.
  - Collecting more than 30ml of CSF is associated with increased risk of post-LP headache.

Risks & complications:

- Common
  - Headache (1 in 3)
  - Back ache (1 in 4)
  - Shooting pains in legs during procedure
  - Failure of procedure
- Uncommon / Rare
  - Bleeding (<1 in 50)
  - Infection (1 in 500)
  - CSF Leak
  - Nerve Injury temporary or permanent (<1 in 1000)
- Very Rare

- Severe injury including long term weakness/numbness
- Brain herniation

Where the procedure takes place:

The most common areas, but not exclusively it can take place are:

- Medical admissions wards or inpatient medical wards
- High dependency and ITU
- Day case wards

Never Events:

- Patient identification should be checked prior to starting the procedure.
- Coagulation screen and serum platelets should be checked to ensure it is safe to proceed with LP.
- Patient must be screened for evidence/signs of raised intracranial pressure to ensure it is safe to proceed with LP.
- Written consent must be obtained (or otherwise documented if unable to obtain due to patient lack of capacity, with suitable discussion with next of kin).
- The smallest needle gauge available should be used if the operator is trained to do so (see below)
- Operator must be trained to perform lumbar puncture (this includes simulation training).
- Adequate supervision must be available to thoseoperators without competency to perform the procedure independently.

List management and scheduling:

The decision to perform a lumbar puncture should be made by a physician (specialist registrar or above) or appropriately qualified non-physician (Advanced Nurse Practitioner: ANP or Physician Associate: PA) with knowledge of the indications, cautions, contraindications and complications of the procedure.

The minimum dataset required are:

- Name
- Hospital S number
- Date of birth
- Responsible Consultant
- Decision Maker
- Operator
- Indication
- Pre-procedure blood test, including full blood count and coagulation.
- Current medications especially if on anticoagulation.
- If any drug allergies, particularly to local anaesthetic.
- Clear consideration of evidence for raised intracranial pressure.

Patients booked for elective lumbar puncture should be listed by their parent speciality (Neurology for LP

clinic; Acute Medicine for inpatient admission/ambulatory clinic). Elective lumbar punctures should have follow-up with their responsible speciality.

This LocSSIP is mostly for emergency procedures during inpatient admissions (other than LP clinic under neurology, this procedure is not performed anywhere else electively).

Patient preparation:

1. Identity of the patient must be checked and written consent obtained. If patient lacks capacity, then consent form 4 should be used with clear documentation of any family/NOK discussions and acting in best interest.
    a. A lumbar puncture consent label is available for use with the standard NHS consent forms.
    b. A Lumbar Puncture patient leaflet must be given to the patient or family/NOK and any questions should be addressed. https://yourhealth.leicestershospitals.nhs.uk/library/emergency-specialist-medicine/infectious-diseases/252-lumbar-puncture-in-adults/file
    (Please also see appendix 2 for a copy of this leaflet)
2. Digital consent via Concentric can also be used instead of the NHS paper consent forms.
3. Indication for the procedure must be confirmed. If indication is subarachnoid haemorrhage, a 12 hour delay from symptom onset is required to improve sensitivity of the test.
4. **Anticoagulation / Anti-platelet use:**
    a. If on anticoagulation and indication is urgent, please discuss with Haematology team for reversal.
    b. If indication is not urgent, anticoagulation should be withheld if it is safe to do so, tominimise bleeding risk. Please see below or click this link.
    c. If on anti-platelet therapy, such as Clopidogrel, and indication is urgent, please discuss with Haematology team.
    d. It is safe to perform lumbar puncture with Aspirin alone.
5. **Abnormal clotting results:**
    a. Discuss with Haematology team as may require treatment prior to lumbar puncture.
    b. Platelets less than $<50 \times 10^9$ /L need discussion with Haematology team.
6. **Care must be taken to investigate for raised intracranial pressure:**
    a. Request brain imaging via CT head prior to lumbar puncture if there is any of the following:
        i. Known intracranial lesion with mass effect.
        ii. Known abnormal intracranial pressure.
        iii. Recent seizures.
        iv. Impaired consciousness.
        v. Papilloedema.
    b. In the absence of the above, fundoscopy alone is sufficient.
7. Make sure all necessary equipment is collected prior to starting the procedure:

a. A lumbar puncture kit is available from AMU East procedure cupboard. Alternatively, the following can be collected individually:
   i. Dressing pack
   ii. Sterile gloves
   iii. LP needles
   iv. Manometer to measure CSF pressure
   v. Lidocaine 1% or 2%
   vi. 10ml syringe with needles (green & blue)
   vii. Chlorprep x2
   viii. Dressing
   ix. 4x white top bottles, yellow top fluoride tube (glucose)
   x. Envelope for Xanthochromia sample (If needed)
   xi. Sharps bin.

8. Ensure the UHL Safer Surgery Adult Lumbar Puncture Checklist (See Appendix 1) is used to document pre-procedure preparation, intra-procedure and post-procedure notes.

9. Other considerations prior to the procedure:
   a. There is no need to fast patients prior to the procedure.
   b. Patients with diabetes do not need to be treated differently.
   c. No prophylactic antibiotics are required prior to the procedure.
   d. Ensure the patient has emptied their bladder prior to starting the procedure to avoid interruptions.

Workforce – staffing requirements:

The minimum safe staffing required is two; the person performing the procedure (the operator) and the assistant to open packs using an aseptic technique. This is no difference in-hours or out-of-hours.

Competency of the operator (doctor, ANP or PA) performing the procedure, will have been documented in their training portfolio following formative and a summative DOPs or equivalents. The operator should also have demonstrated knowledge of the UHL Consent to Treatment or Examination Policy A16/2002.

Both the operator and the assistant should have up-to-date statutory and mandatory training on infection prevention.

If the operator requires assistance with the technical aspects of the procedure, then the assistant should call the registrar covering the ward. If the assistant needs help, then the nurse-in-charge for the ward area should be called. For inpatients, the patient's trained nurse will provide the post-procedure monitoring. Trained nursing support will also be required to monitor the patient after the procedure.

Ward checklist, and ward to procedure room handover:

The Adult Lumbar Puncture Checklist (see Appendix 1) should be filled in and filed in the notes. This should be partially filled up by any Doctor/ANP/PA looking after the patient and completed by the operator. Alternatively, the operator can initiate and complete the checklist entirely.

Procedural Verification of Site Marking:

The patient should be placed in the correct position, which if possible should be the left lateral position to enable measurement of opening CSF pressure. If this is not possible, the sitting position can be used.

The site of procedure should be decided after physical examination: make sure the patient is asked to remove any clothing obscuring the back; palpate for the highest points of the iliac crests – a direct line joining these structures is a guide to the fourth lumbar vertebral body (may be higher in obese patients); then palpate inferiorly for the spinous processes of L3, L4 and L5 and the interspaces in between. The spinal needle can be inserted safely into the subarachnoid space at L3-4 or L4-5 interspaces.

Bedside ultrasound can be used to verify the chosen site of needle insertion prior to the procedure if the operator is trained in its use – this is recommended in patients with a BMI ≥ 25 kg/m^2

Team Safety Briefing:

The procedure should be undertaken in a private area of the ward or a side room. The operator and the assistant should both be present, and both should check that the pre-procedure section of the checklist is completed. They should also confirm the identity of the patient, the indication, the patient has consented via written consent (or Consent 4 where applicable in line with the Mental Capacity Act), the equipment trolley is prepared with all necessary equipment, and ensure the patient has emptied their bladder to minimise procedure interruptions.

Sign In:

The assistant and operator will run through the "Sign In" section of the procedure checklist (Appendix 1).

Time Out:

At the bedside, the assistant and operator will run through the "Time Out" section of the procedure checklist (Appendix 1). Where appropriate, the patient's participation should be encouraged.

Performing the procedure:

1. Care must be taken to use aseptic technique, with use of sterile gloves, an apron, and a face mask (evidence suggests this could reduce risk of infection further).
2. Make sure your equipment trolley is ready with a sterile field and equipment ready for use.
3. Put the patient in the correct position ready for the procedure. Ensuring optimal patient position will reduce the chances of an unsuccessful attempt.
4. Palpate landmarks and identify a suitable site of needle insertion: palpate for the highest points of the iliac crests – a direct line joining these structures is a guide to the fourth lumbar vertebral body (may be higher in obese patients); then palpate distally for the spinous processes of L3, L4 and L5 and the interspaces in between. The spinal needle can be inserted safely into the subarachnoid space at L3-4 or L4-5 interspaces.
5. Wear sterile gloves.
6. Clean the area of skin with Chlorprep and ensure it is dry before insertion of the LP needle, to avoid risk of arachnoiditis.
7. Draw 5ml of Lidocaine into the 10ml syringe and inject local anaesthetic, please warn the patient that there will be a "sharp sting". Also inform the patient that the local anaesthetic will numb the 'sharp' pain sensation, but they will still be able to feel a pushing/prodding of the needle. Please note – maximum dose in an adult is 3mg/kg (100mg is equal to 10ml of 1% or 5ml of 2%).
8. Allow 1-2 minutes for the local anaesthetic to work. In this time, make sure your LP needle is functioning normally, and prepare the manometer. Make sure the bottles are ready for CSF collection.

9. The following LP needles are available in medicine:
    a. Orange 25G (0.5mm diameter) x 3.5 inch (Sprotte or pencil point atraumatic type) with inducer - AMU
    b. Black 22G (0.7 mm diameter) x 3.5 inch (Quincke 'cutting' type) – AMU
    c. Yellow 20G (0.9 mm diameter) x 3.5 inch (Quincke 'cutting' type) - AMU
    d. Pink 18G (1.3 mm diameter) x 3.5 inch (Quincke 'cutting' type) – available on request
    Longer needles are also available – up to 6.1 inch 22G
10. The recommended LP needle to use in medicine is the smallest gauge available and ideally, the atraumatic needle (orange 25G) to minimise risk of post-procedure CSF leak and headache (12). However, this will require use of an inducer by a trained operator – if suitable supervisor/trained operator unavailable, use the Black 22G needle.
11. Atraumatic Sprotte or pencil point needles are available on AMU and Intensive care.
12. Insert the LP needle (or if using the atraumatic needle, insert the inducer first, and then the LP needle through it), and check you are in the right space regularly by drawing back the stylet to check for CSF. In most patients, there will be a resistance followed by a sudden ease of insertion (a "give"), which should represent successful insertion into the subarachnoid space.
13. Attempts should be minimised where possible. Seek help from an experienced colleague after a maximum of three failed attempts.
14. Once in the correct space, attach the manometer to measure the opening pressure.
    a. Measuring opening pressure is important in all indications for lumbar puncture, and an attempt should be made, if it is safe to do so, with the patient in the lateral recumbent position to allow for its measure. Pressures cannot be measured in the seated position, and patients should, in no circumstances, be moved to a lateral position with a needle in situ.
    b. Measuring closing pressure is required in all cases of therapeutic lumbar puncture for removalof CSF in IIH.
15. Once measured, collect the CSF samples into the appropriate white-top bottles:
    a. Each bottle should be clearly labelled with at least three patient identifiers, including patient S number, if a pre-printed label is not available.
    b. Each bottle should be labelled 1 – 4 in chronological order of collection:
        i. Bottles 1 + 3 should be reserved for MCS
        ii. Bottles 2 and yellow fluoride tube should be reserved for biochemistry (CSF protein & CSF glucose respectively)
        iii. Bottle 4 (and any others if required) should be for special biochemistry/virology/other tests.
        iv. If sending a bottle for xanthochromia, ensure it is protected from light in an opaque envelope (can be obtained from a ward clerk).
    c. Simultaneous serum glucose should always be taken. If this is not possible, at least a bedside BM measurement must be documented.
16. The stylet must be reinserted into the lumbar puncture needle prior to removal after collection of CSF sample is complete, to minimise subsequent CSF leak.
17. Apply a dressing to the insertion site.

Monitoring:

Immediately prior to the procedure and immediately after the procedure these observations should be recorded:

- Blood Pressure
- Pulse rate
- Respiratory rate
- Temp
- O2 Saturations
- (Capillary Blood Glucose) CBGs

No monitoring is required during the procedure unless the patient becomes unwell or there is a complication with the procedure.

Prosthesis verification:

Not Applicable.

Prevention of retained Foreign Objects:

There should not be any foreign objects retained on completion of this procedure.

Ensure the patient does not move/is not moved once the LP needle is inserted to minimise the risk of the needle breaking and being retained.

Radiography:

If suitably trained, the operator may wish to check and mark the site of insertion using ultrasound at the bedside prior to insertion of the needle.

Marking the site using ultrasound prior to lumbar puncture has been shown to improve success rates, reduce duration of procedure, and reduce perceived pain by patients in patients with BMI ≥ 25 kg/m^2 (13).

Sign Out:

On completion of the procedure, the “Sign Out” section of the procedure checklist (Appendix A) should be completed by the operator:

- Ensure post-procedure advice is given.
- Ensure any sharps are disposed of safely using a sharps bin.
- Ensure any non-sharp waste if disposed of in the appropriate bin.
- Ensure that the specimens are labelled correctly.
- Ensure that the specimens are sent to the lab either by hand or via a porter if the indication for the procedure was urgent. If via porter, please document the reference number on the procedure checklist.
- If out of hours after 8pm, please check with the laboratory that CSF tests can be performed out of hours.
    - For Xanthochromia, special biochemist must be informed via switchboard.
    - Microbiology should also be informed if samples need processing out of hours.
- Ensure the procedure checklist, once completed, is filed appropriately in the patient’s medical notes. This checklist will be deemed a suitable account of the procedure and no further separate documentation is required (unless more information needs documenting, for example, a complication or patient complaint from the procedure).
- Ensure appropriate analgesia is prescribed if the patient is in pain/develops headache.

Handover:

The nurse looking after the patient should be informed that the procedure is now complete. This handover should also include:

- The indication for the procedure.
- If there were any complications.
- That post-procedure monitoring is required, as detailed above.
- That if the patient is in pain, analgesia is prescribed on their drug chart.
- A rough estimate of how long it will take for results, which is usually around 2 hours once the samples are received in the lab and within working hours.
- Who to escalate to if the patient becomes unwell.

If the operator is not part of the medical team looking after the patient, then they should also handover to the medical team as above.

Team Debrief:

A team debrief should occur at the end of all procedure sessions.
This should take place away from the patient's bedside in a private area, and should include:

- What went well?
- Any problems with equipment or other issues.
- Areas for improvement.
- A named person for escalating issues.

This discussion can be documented as part of the procedure checklist (Appendix 1).

Post-procedural aftercare:

- Standard observations should be made as detailed above.
- Patient should be instructed, as per the "Lumbar Puncture in adults" UHL leaflet (Appendix 2), to:
    - Lie flat for 30 minutes.
    - Drink plenty of fluids.
    - If headache develops then simple painkillers such as Paracetamol can be taken. Caffeine may also help, such as coffee or tea.
    - Results can come back within a day, others can take weeks. It depends on which tests have been requested by your doctor and why the lumbar puncture is being done.
    - Avoid driving or manual labour for a day.
- Ensure site of lumbar puncture is inspected for evidence of infection if there is on-going pain.

Discharge:

For day case patients, if observations are normal the patient can be discharged without delay. If there is a complication or it was a difficult procedure, a period of short observation is justified.

With regards to restarting anticoagulation: if low bleed risk can restart on the same day. Please see UHL guideline: Anticoagulation management ("bridging") at the time of elective surgery and invasive procedures (adult) B30/2016 or more information.

Current guidance on anticoagulation from the Association of British Neurologists is as follows:

Discontinuing medications in patients with normal renal function

Antiplatelets	Withhold prior to LP	First dose after LP
Aspirin low dose 75mg	Continue	No delay
Clopidogrel	7 Days consider aspirin cover	6 Hours
Prasugrel	7 Days	6 Hours
Ticagrelor	7 Days	6 Hours
Dipyridamole	24 Hours	6 Hours
Tirofiban + Eptifibatide	4-8 Hours	24 Hours
Abciximab	48 Hours	24 Hours

Anticoagulants	Withhold prior to LP	First dose after LP
Warfarin	5 Days check INR ≤1.4	12 Hours
LMWH prophylaxis	12 Hours	4 Hours
LMWH treatment	24 Hours	4 Hours (24 hours if traumatic)
Fondaparinux prophylaxis	36 Hours	6-12 Hours
Fondaparinux treatment	Avoid LP	Avoid LP
Unfractionated heparin IV	4-6 Hours	1 Hour
Rivaroxaban + Apixaban	24 Hours	6 Hours
Dabigatran	48 Hours	6 Hours

Governance and Audit:

All incidents will be reported on Datix.
Any breach in the SOP in which a patient potentially could or did come to harm is a safety incident that should be reported via Datix.

The incident will then be reviewed and investigated by the parent's department where the procedure took place, and disseminated to all relevant members of the team to learn from such incidents.

An audit will take place initially yearly by logging values from the completed checklist forms. Results will then be presented in the respective departmental meetings.

To submit monthly Safe Surgery Audit and WHOBARS assessment as per Safe Surgery Quality Assurance & Accreditation programme.

Training:

All operators should have knowledge of this SOP.

Training new operators will take place via portfolio assessments of direct observational procedural skills assessment. Once the new operator feels confident with competency, a summative assessment will be required prior to undertaking independent practice of the procedure.

Nursing staff should also be aware of this SOP.

All medical registrars specifically should be competent with procedural elements of this SOP and be available to train others where possible.

Documentation:

The UHL Safer Surgery Adult Lumbar Puncture Checklist (Appendix 1) should be used as documentation of all parts of the Lumbar Puncture process, including the procedural notes, and should be filled in the patient notes.

References to other standards, alerts and procedures:

- Xu H, Liu Y, Song W, Kan S, Liu F, Zhang D, Ning G, Feng S. Comparison of cutting and pencil-point spinal needle in spinal anesthesia regarding postdural puncture headache: A meta-analysis. Medicine (Baltimore). 2017 Apr;96(14):e6527. PMID: 28383416; PMCID: PMC5411200. DOI: https://doi.org/10.1097%2FMD.0000000000006527
- Ultrasound-guided lumbar puncture improves success rate and efficiency in overweight patients. Yi Li, Raphael A. Carandang, Swetha Ade, Julie Flahive, Kate Daniello. Neurol Clin Pract Aug 2020, 10 (4) 307-313; DOI: https://doi.org/10.1212/CPJ.0000000000000725
- Engelborghs S, Niemantsverdriet E, Struyfs H, et al. Consensus guidelines for lumbar puncture in patients with neurological diseases. Alzheimers Dement (Amst). 2017;8:111–126. Published 2017 May 18. doi:10.1016/j.dadm.2017.04.007
- Dodd KC et al. Periprocedural antithrombotic management for lumbar puncture: Associationof British Neurologists clinical guideline. Pract Neurol 2018;18:436–446
- Up-to-date:
- Lumbar puncture: Technique, indications, contraindications, and complications in adults
- UHL Audit 10010 Lumbar Puncture Consent - Clinician Survey
- National Safety Standards for Invasive Procedures, NHS England 2015: https://www.england.nhs.uk/patientsafety/wp-content/uploads/sites/32/2015/09/natssips-safety-standards.pdf
- UHL Safer Surgery Policy: B40/2010
- UHL Sedation Policy: Safety and Sedation of Patients Undergoing Diagnostic and Therapeutic Procedures B10/2005

- UHL Consent to Treatment or Examination Policy A16/2002
- UHL Delegated Consent Policy B10/2013
- UHL Guideline: Anticoagulation management ("bridging") at the time of elective surgery and invasive procedures (adult) B30/2016
- Shared decision making for doctors: Decision making and consent (gmc-uk.org)
- COVID and PPE: UHL PPE for Transmission Based Precautions - A Visual Guide
- COVID and PPE: UHL PPE for Aerosol Generating Procedures (AGPs) - A Visual Guide

Changelog:

V2.0

- Added guidance on use of atraumatic Sprotte or pencil point spinal needles.
- Added use of bedside ultrasound for marking in patients with high BMI.
- Added use of digital consent.
- Updated checklist with: updated extension numbers for lab and porters; digital consent

END

Appendix 1: UHL Safer Surgery Lumbar Puncture Checklist

Patient ID Label *or write name and number*
Hospital No.:
Name:
Address:

D.O.B.: Sex:
Telephone No. 1:
Telephone No. 2:

Safer Surgery Checklist

Adult Lumbar Puncture Checklist

NHS
University Hospitals of Leicester
NHS Trust

Date:
Time:
Location:

SIGN IN

Pre-procedure checklist

Confirm patient's Name, DOB and Hospital Number with patient and against wristband/consent/procedure list ☐

Elective ☐ **Emergency** ☐
Indication: Meningitis/Encephalitis ☐ SAH ☐
IIH ☐ Other:
If ?SAH, onset of headache ≥12 hours ago? Yes ☐ No ☐

Known allergy: Yes ☐ No ☐

Is patient on anticoagulation / anti-platelets? Yes ☐ No ☐
If **Yes,** *refer to guidance/discuss with Haematologist*

Blood Results Date: ☐ INR: ☐ Platelets: ☐
If abnormal, refer to guidance/discuss with Haematologist

If out of hours, please check with lab that samples can be processed

Is there evidence for raised intracranial pressure?
Papilloedema on fundoscopy? Not done ☐ Yes ☐ No ☐
Is CT head required *(see guidance for indications)* Yes ☐ No ☐
CT head result *(if performed)*: Verbal ☐ Reported ☐
If evidence of raised intracranial pressure, discuss with Neurologist

Confirm procedure and risks explained
Information leaflet given? Yes ☐ No ☐
Appropriate consent taken **No** ☐ **Cannot proceed**
Consent form 1/ Digital consent from patient Yes ☐ No ☐
Consent form 4/ Digital with NOK input Yes ☐ No ☐

LP equipment obtained? *(For details see guidance)* Yes ☐ No ☐
Kit not available - Equipment collected Yes ☐ No ☐

Read out by: (PRINT)

Signed: Date:

TIME OUT

During procedure checklist

Confirm patient's Name, DOB and Hospital Number with patient and against wristband/consent/procedure list ☐

Patient position: Lateral *(recommended)* ☐ Sitting ☐

Confirm aseptic technique ☐
Sterile gloves, apron and face mask recommended
Skin cleaned with Chlorprep and allowed to dry for at least 5 minutes

Lidocaine strength & volume: 1% ☐ 2% ☐ ☐ ml

Needle type and gauge: Orange 25G ☐ Black 22G ☐
Introducer used ☐ Other :

Level: L3/4 ☐ L4/5 ☐ L5/S1 ☐

Confirm post-procedure patient observations requested ☐

Number of attempts: ☐

Opening pressure *(if lateral position)*: ☐ cm of CSF

Closing pressure *(if checked)*: ☐ cm of CSF

Volume CSF drained *(if known)*: ☐ ml

CSF fluid: Clear ☐ Cloudy ☐ Blood-stained ☐

Confirm stylet re-inserted before removing needle ☐

Immediate complications: None ☐
Headache ☐ Back pain ☐ Bleeding ☐
Other:

Read out by: (PRINT)

Signed: Date:

SIGN OUT

Post-procedure checklist

Post procedure advice given: Yes ☐ No ☐
- Lie flat for at least 30 mins
- Drink plenty of fluids if headache develops, simple painkillers & caffeine and avoid driving/manual labour for a day

Samples Requested: MCS ☐ Protein ☐
Glucose ☐ Viral PCR ☐
Xanthochromia *(protect from light in envelope)* ☐
Other:
Inform biochemistry lab sample being sent (x16565 / x16561)

If out of hours, please inform relevant departments (see guidance)

Samples labelled & numbered? Yes ☐ No ☐

Simultaneous serum glucose sent: ☐ Yes ☐ No ☐ **BM:** ☐

Time samples sent: ☐
Please request porter x17888, or hand deliver samples
Porter reference No: ☐

Date & Time of procedure: ☐

Performed by: ☐

Supervised by: ☐

Read out by: (PRINT)

Signed: Date:

(62314164)KR

'Based on the WHO Surgical Safety Checklist, URL http://www.who.int/patientsafety/safesurgery/en, © World Health Organization 2008 All rights reserved.'

Appendix 2: Patient Information Leaflet for *Adult Lumbar Puncture* Available at: [Having a lumbar puncture to get a sample of spinal fluid (adults) (leicestershospitals.nhs.uk)]()

Caring at its best

University Hospitals of Leicester
NHS Trust

Having a lumbar puncture to get a sample of spinal fluid (adults)

Information for Patients

Produced: March 2022
Review: March 2025
Leaflet number: 313 Version: 2

What is a lumbar puncture?

A lumbar puncture (LP) is a common procedure performed to take a sample of cerebrospinal fluid (CSF). CSF is a special fluid in your body that surrounds and protects the brain and spinal cord and is constantly made by your body.

Why are lumbar punctures useful?

CSF analysis and pressure measurement can help diagnose a wide range of neurological conditions. The procedure can be done as an emergency test or as a planned procedure. Your doctor should have explained why the lumbar puncture is needed.

Please ask if you are still unsure or have any further questions.

How is it done?

- You will be asked to give your consent before the lumbar puncture (unless you are unable to give consent due to illness). The doctor will explain what is involved at this time too.
- You can eat and drink normally beforehand, but please use the toilet so you aren't uncomfortable during the procedure.
- It can be done lying down on your side with your knees tucked up in the foetal position (staff can help). It can also be done sitting down, bending forwards and resting your arms on a chair.
- It usually takes about 15 to 20 minutes.

Health information and support is available at www.nhs.uk
or call 111 for non-emergency medical advice

Visit www.leicestershospitals.nhs.uk for maps and information about visiting Leicester's Hospitals
To give feedback about this information sheet, contact InformationForPatients@uhl-tr.nhs.uk

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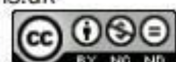
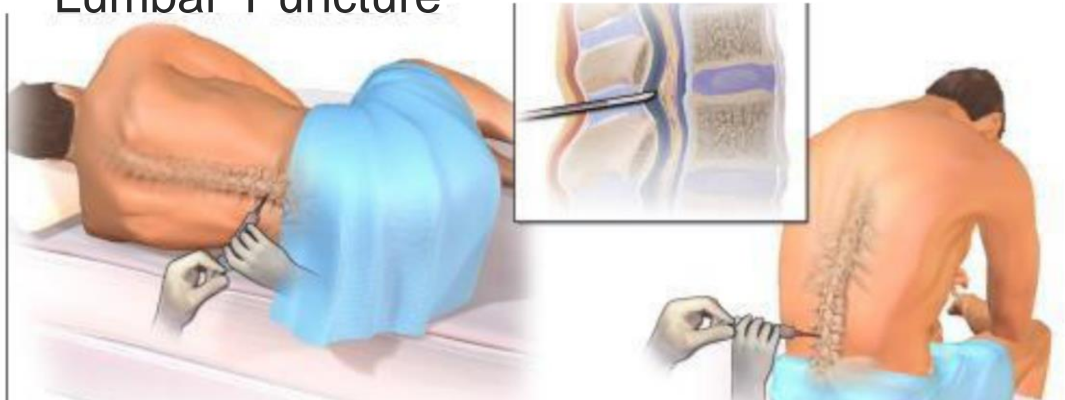


- The skin on the back is cleaned with an antiseptic wipe, which can feel cold. Local anaesthetic is injected under the skin with a very small needle. This is used to numb the area and can sting fo a few seconds.
- **It is important not to move.**
- A thin needle is inserted through the gap between 2 spinal bones below where the spinal cord ends (so there is no risk of injuring the spinal cord).
- You may feel a pushing or pressure sensation as the lumbar puncture needle is inserted Which can be slightly uncomfortable.
- It is normal to feel a similar sensation down one leg. This does not mean anything is wrong, but please let us know if you do feel this.
- The CSF fluid pressure is measured with a small tube (manomete) and small amounts are taken for laboratory analysis.
- The needle is taken out and a small dressing is applied to the skin, Which you can take off afte 1 day.



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W lJournal of Med1cine 1 (2). DO1:10 .1 5347/wjm/2014.010. ISS 2002-4436.

Aftercare advice

- Lie flat for 30 minutes.
- Drink plenty of fluids.
- If you get a headache then simple painkillers such as paracetamol can be taken . Caffeine may also help, such as coffee or tea.
- It is recommended to avoid driving or manual labour for a day.

When will the results be known?

Some results can come back within a day, others can take weeks. It depends on which tests have been requested by your doctor and why the lumbar puncture is being done.

Are there any risks?

- **Headache** - around 10% of people will develop a headache after having a lumbar puncture. It is due to leakage of spinal fluid. Sometimes neck stiffness, feeling sick (nausea) and dizziness can develop temporarily. Painkillers, fluids, lying flat and drinking caffeine can make the headache better. In rare cases the headache is severe and needs medical attention.
- **Back pain** - at the site of needle insertion. Use paracetamol.
- **Procedure** - occasionally we cannot obtain a sample for technical reasons. The procedure can be repeated with X-rays to guide the needle to the right place.
- **Bleeding** - before the lumbar puncture, you should tell the doctor if you are taking blood thinning medications such as aspirin, clopidogrel, warfarin, apixaban, rivaroxaban or dabigatran. You should also inform them if you have any bleeding disorders.

Extremely rare risks:

- **Nerve damage** - usually from nerve irritation which is temporary. Tingling or discomfort in legs.
- **Infection** - contact a doctor immediately if you develop a high fever in the days after the lumbar puncture, or you notice any significant redness or swelling around the site of the lumbar puncture.
- **Blood clot** - surgery may be needed if a blood clot develops around the spinal cord.

What should I look out for?

Seek medical advice from your GP or call the NHS helpline on 111 if you have:

- severe, persistent headache which does not go away after lying flat.
- weakness in your arm or leg.
- losing control over bowels or bladder.
- a high temperature (38 degrees).
- sweats or confusion.
- severe eye pain on seeing light.

Who can I contact if I have a query?

If you had your procedure in an outpatient clinic, please contact the consultant's secretary if you have any queries.

If you had your procedure as an inpatient as an emergency, please contact the ward team, or the consultant's secretary, or your GP if you have been discharged home.

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