Spinal Anaesthesia

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

Document ID:	LWH-INTR-447
Author with Contact Details:	Laura Wilson, Consultant Anaesthetist, laura.wilson2@lwh.nhs.uk
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What is new in this version?

Latest Version	Page	Changes Made	Date
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1 Introduction

The Gynaecology & Surgical Services Policy, Audit and Patient Information Group has compiled this policy document as an accurate aid to staff involved in the care of patients receiving spinal anaesthesia.
That staff are trained and deemed competent to complete spinal anaesthesia and recognise and treat complications.

Policy objectives

i. To ensure that all staff involved in the care of patients receiving spinal anaesthesia have received adequate training and are deemed competent in the care of these patients.

ii. To ensure that this training encompasses known complications, side-effects and clinical management of spinal anaesthesia.

Scope of the Policy

This policy applies to all staff involved in the care of patients receiving spinal anaesthesia in theatres at Liverpool Women's NHS Foundation Trust.

2 Guidance

If possible, use these techniques to enable a common approach to establishing a spinal block, which will allow comparison, research and audit of the methods.

2a. Spinal for Obstetric Surgery

i. Site a peripheral IV access using 16G cannula where possible.

ii. Use warm I.V. fluid from heating cabinet.

iii. Attach phenylephrine infusion to cannula alongside I.V. fluids using a Y connector. Commence the phenylephrine infusion at time of spinal anaesthesia at rate of 30ml/h (100mcg/ml, achieved by diluting 10mg phenylephrine into 100ml 0.9% saline bag, draw up 30ml into a 30ml syringe) and titrate to blood pressure.

iv. Place patient in SITTING or LATERAL position. Ensure the patients spine is straight in either position.

v. Sterile technique including full surgical scrub, face mask, gown and gloves and preparation of lumbo-sacral area (chlorhexidine 0.5% in 70% alcohol sprayed twice[1] and allow to dry between sprays). Ensure the area is dry before insertion of the needle. The area should be draped with the adhesive drape provided in the spinal pack.

vi. Prepare syringe for spinal injection:

- Diamorphine is prepared at the Royal Liverpool University Hospital CIVAS unit as 0.5mg in 0.5ml.

- 0.3ml (300mcg) of diamorphine should be drawn up into a 1ml NR fit syringe using separate NR fit filter needle.
- Add diamorphine to 3ml NR fit syringe containing 2.5ml 0.5% heavy bupivacaine[2], drawn up using separate NR filter needle.
- Total volume 2.8mls.
- Volume of heavy bupivacaine can be adjusted as clinically indicated.
- See Appendix A for further details.

vii. Lignocaine 1% infiltration of skin at L3/4 interspace using a 25G needle (orange).

viii. Use 24G Sprotte needle with introducer. 90mm unless otherwise clinically indicated.

ix. Obtain clean flow of cerebrospinal fluid in midline.

x. Administer dose of local anaesthetic (bupivacaine) with diamorphine.

xi. Remove needle. Spray plaster dressing to puncture site.

xii. Lie the patient supine and turn her to a left lateral tilt to reduce the effects of aorto-caval syndrome in pregnant patients.

xiii. Perform routine haemodynamic measurements, every 1-2 minutes.

xiv. Assess sensory block to cold and record it at start and end of surgery. Record motor block using the modified Bromage scale. Record assessment on anaesthetic chart under evaluation of spinal.

xv. Administer antibiotics before knife to skin as per antibiotic prophylaxis guidelines for surgery. In obstetric surgery, cefuroxime and metronidazole (Caesarean Section, MROP) or co-amoxiclav (Forceps delivery) unless MRSA positive or penicillin allergic (see antibiotic prophylaxis guideline for alternatives). Ensure that the spinal block is sufficient prior to giving antibiotics so that surgery can commence soon after administration.

xvi. In obstetric surgery when block is at T4 or above to cold spray and adequate, allow surgery to commence.

xvii. In the case of obstetric surgery start the phenylephrine infusion at the start of spinal anaesthesia, see above. Phenylephrine 100 micrograms/ml or ephedrine 3mg/ml should be available to treat hypotension should this occur. Boluses of ephedrine 3-6mgs or phenylephrine 50-100 micrograms are recommended (this can be given via the pump if set up as phenylephrine TCI).

xviii. Document time of spinal anaesthetic, time of antibiotic administration and time of surgery commencement on the anaesthetic chart.

2b. Spinal for Gynaecological Surgery

i. Site 18G or 16G cannula as appropriate for surgery

ii. Connect warm IV fluids

iii. Place patient in SITTING or LATERAL position. Ensure the patients spine is straight in either position.

iv. Sterile technique including full surgical scrub, face mask, gown and gloves and preparation of lumbo-sacral area (chlorhexidine 0.5% in 70% alcohol sprayed twice1 and allow to dry between sprays). Ensure the area is dry before insertion of the needle. The area should be draped with the adhesive drape provided in the spinal pack.

v. Prepare syringe for spinal injection:

- Diamorphine is prepared at the Royal Liverpool University Hospital CIVAS unit as 0.5mg in 0.5ml.
- Up to 0.5ml (500mcg) of diamorphine should be drawn up into a 1ml NR fit syringe using separate NR fit filter needle, total dose to the discretion of the Consultant Anaesthetist.
- Add diamorphine to NR fit syringe containing 0.5% heavy bupivacaine, drawn up using separate NR filter needle, volume of bupivacaine to the discretion of the Consultant Anaesthetist.
- See Appendix A for further details.

vi. Lignocaine 1% infiltration of skin at L3/4 interspace using a 25G needle (orange).

vii. Use 24G Sprotte needle with introducer. 90mm unless otherwise clinically indicated.

viii. Obtain clean flow of cerebrospinal fluid in midline.

ix. Administer dose of local anaesthetic (bupivacaine) with diamorphine.

x. Remove needle. Spray plaster dressing to puncture site.

xi. Lie the patient supine.

xii. Perform routine haemodynamic measurements as required.

xiii. The level of block required may vary based on the type of surgery and patient's clinical condition. Discuss with starred Consultant Anaesthetist before spinal.

xiv. Administer antibiotics before knife to skin as per antibiotic prophylaxis guidelines for surgery, cefuroxime and metronidazole, unless MRSA positive or penicillin allergic (see antibiotic prophylaxis guideline for alternatives).

3 Monitoring

It is the responsibility of the Gynaecology, Anaesthesia and Theatre Audit Group to monitor and audit compliance with this policy every 3 years.

4 Professional Responsibilities

It is the responsibility of all staff involved in the care of patients receiving spinal anaesthesia at Liverpool Women's NHS Foundation Trust to be aware of their obligations and responsibilities

to ensure safe clinical care, timely recognition and treatment of possible complications and keep clear records of interventions, including follow-up, within the patient's electronic health records.

5 Patient Education

A copy of the patient information leaflet 'Your Spinal Anaesthetic' from the Royal College of Anaesthetists[3] should be made available for the patient prior to the spinal procedure. See appendix B.

6 Training

Management of spinal anaesthesia will be included in junior anaesthetists' induction pack.

7 Equality and Diversity

A proforma has been completed for this policy to ensure there is no differential impact for people on account of age, race, disability, gender, religion or sexual orientation. See appendix C.

8 References

1. Association of Anaesthetists of Great Britain & Ireland. Safety guideline: skin antisepsis for central neuraxial blockade. Anaesthesia. 2014 Nov; 69 (11): 1279-86 https://doi.org/10.1111/anae.12844
2. Cowan CM, Kendall JB, Barclay PM, Wilkes RG. Comparison of intrathecal fentanyl and diamorphine in addition to bupivacaine for caesarean section under spinal anaesthesia. British Journal of Anaesthesia. 2002 Sept; 89 (3): 452-8 https://www.bjanaesthesia.org/article/S0007-0912(17)37428-7/pdf
3. The Royal College of Anaesthetists & The Association of Anaesthetists of Great Britain and Ireland. Your Spinal Anaesthetic. Fifth edition 2020. https://www.rcoa.ac.uk/sites/default/files/documents/2020-03/03-YourSpinal2020web.pdf

9 Auditable Standards

Any recommendations and changes in practice will be monitored by the Gynaecology, Anaesthesia and Theatre Audit Group.

10 Consultation and Ratification Process

This policy was written and ratified by the Anaesthetic department and circulated to the consultant anaesthetists for consultation.

Appendix A: Guidelines for using Premixed Diamorphine Syringes

Guidelines for using Premixed Diamorphine Syringes

Premixed syringes will save time taken for preparation and eliminate the risk of incorrect dosage through mistakes in dilution. Each syringe contains 0.5mg of Diamorphine in 0.5ml at a dilution of 1mg/ml.

The syringes are manufactured by the CIVAS unit at the Royal Liverpool University Hospital.

The plastic bag and outer surface of the syringe are not sterile. The syringe must not be placed on the sterile surface used for spinal drugs and needles.

The syringes must be kept in a locked refrigerator to maintain a shelf life of 7 days. Syringes may be kept out of the fridge for up to 4 hours before administration. To ensure adequate supplies, a stock of 30 syringes will be kept and replenished twice weekly from Pharmacy.

Storage

1. Diamorphine syringes will be kept in a dedicated, locked fridge in Obstetrics and Gynaecology Recovery. No non-controlled drugs should be kept in this fridge.

2. The stock of Diamorphine syringes should be checked daily to ensure that sufficient remains for the day's anticipated requirements.

3. Syringe dates should be checked daily to ensure that none have reached their use by date. Expired syringes should be returned to Pharmacy.

4. Twice weekly, on Mondays and Thursdays, stock should be ordered to bring the stock level to 30 syringes.

5. Stock should be rotated so that old syringes are used first.

Administration

1. The keys to the fridge will be kept with the keys to the Controlled Drugs cupboard in Obstetrics and Gynaecology Recovery.

2. Each premixed syringe should be recorded in the Controlled Drugs book when removed from the fridge.

3. The contents of the syringe and use by date should be double-checked by ODP/anaesthetic nurse and the anaesthetist.

4. The ODP/anaesthetic nurse should remove syringe from the non-sterile packaging and remove the bung, immediately prior to aspiration by the anaesthetist.

5. The anaesthetist should take required volume of solution (usually 0.3ml in obstetric surgery) from the premixed diamorphine syringe using a 1ml NR fit syringe and a separate NR fit filter needle. This is then injected into the syringe containing local anaesthetic (usually 2.5ml 0.5% heavy bupivacaine 0.5% in obstetric surgery, dose can be adjusted at extremes of patient size).

Appendix B: Patient Information Leaflet

Your spinal anaesthetic

This leaflet explains what to expect when you have an operation with a spinal anaesthetic.

It has been written by anaesthetists, patients and patient representatives, working together.

Introduction

This leaflet explains:

- **what** a spinal anaesthetic is
- **how** it works
- **why** you could benefit from having one for your operation.

What is a 'spinal'?

For many operations it is usual for patients to have a general anaesthetic. However, for operations in the lower part of the body, sometimes it is often possible for you to have a spinal anaesthetic instead. This is when an anaesthetic is injected into your lower back (between the bones of your spine). This makes the lower part of the body numb so you do not feel the pain of the operation and can stay awake.

Typically, a spinal lasts one to two hours. Other drugs may be injected at the same time to help with pain relief for many hours after the anaesthetic has worn off.

During your spinal anaesthetic you may be:

- fully awake
- sedated – with drugs that make you relaxed, but not unconscious.

For some operations a spinal anaesthetic can also be given before a general anaesthetic to give additional pain relief afterwards.

Your anaesthetist can help you decide which of these would be best for you.

Many operations in the lower part of the body are suitable for a spinal anaesthetic with or without a general anaesthetic. Depending on your personal health, there may be benefits to you from having a spinal anaesthetic. Your anaesthetist is there to discuss this with you and to help you make a decision as to what suits you best.

A spinal anaesthetic can often be used on its own or with a general anaesthetic for:

- orthopaedic surgery on joints or bones of the leg
- groin hernia repair, varicose veins, haemorrhoid surgery (piles)
- vascular surgery: operations on the blood vessels in the leg
- gynaecology: prolapse repairs, hysteroscopy and some kinds of hysterectomy
- urology: prostate surgery, bladder operations, genital surgery.

How is the spinal performed?

■ You may have your spinal in the anaesthetic room or in the operating theatre. You will meet the anaesthetic assistant who is part of the team that will look after you.
■ Your anaesthetist will first use a needle to insert a thin plastic tube (a 'cannula') into a vein in your hand or arm. This allows your anaesthetist to give you fluids and any drugs you may need.
■ You will be helped into the correct position for the spinal.
You will either sit on the side of the bed with your feet on a low stool or you will lie on your side, curled up with your knees tucked up towards your chest.
■ The anaesthetic team will explain what is happening, so that you are aware of what is taking place.
■ A local anaesthetic is injected first to numb the skin and so make the spinal injection more comfortable. This will sting for a few seconds. The anaesthetist will give the spinal injection and you will need to keep still for this to be done. A nurse or healthcare assistant will usually support and reassure you during the injection.
You may also meet Anaesthesia Associates who are highly trained healthcare professionals.
You can read more about their role and the anaesthesia team on our website:
rcoa.ac.uk/patientinfo/anaesthesia-team

What will I feel?

A spinal injection is often no more painful than having a blood test or having a cannula inserted. It may take a few minutes to perform, but may take longer if you have had any problems with your back or have obesity.
■ During the injection you may feel pins and needles or a sharp pain in one of your legs – if you do, try to remain still, and tell your anaesthetist.
■ When the injection is finished, you will usually be asked to lie flat if you have been sitting up.
The spinal usually begins to have an effect within a few minutes.

Your spinal anaesthetic

■ To start with, your skin will feel warm, then numb to the touch and then gradually you will feel your legs becoming heavier and more difficult to move.
■ When the injection is working fully, you will be unable to lift your legs up or feel any pain in the lower part of the body.

Testing if the spinal has worked

Your anaesthetist will use a range of simple tests to see if the anaesthetic is working properly, which may include:
■ spraying a cold liquid and ask if you can feel it as cold
■ brushing a swab or a probe on your skin and asking what you can feel
■ asking you to lift your legs.
It is important to concentrate during these tests so that you and your anaesthetist can be reassured that the anaesthetic is working. The anaesthetist will only allow the surgery to begin when they are satisfied that the anaesthetic is working.

During the operation (spinal anaesthetic alone)

■ In the operating theatre, a full team of staff will look after you. If you are awake, they will introduce themselves and try to put you at ease.
■ You will be positioned for the operation. You should tell your anaesthetist if there is something that will make you more comfortable, such as an extra pillow or an armrest.
■ You may be given oxygen to breathe, through a lightweight, clear plastic mask, to improve oxygen levels in your blood.

■ You will be aware of the 'hustle and bustle' of the operating theatre, but you will be able to relax, with your anaesthetist looking after you.
■ You may be able to listen to music during the operation. If you are allowed, bring your own music, with headphones. Some units supply headphones or play music
in the operating theatre.
■ You can talk with the anaesthetist and anaesthetic assistant during the operation. If you have sedation during the operation, you will be relaxed and may be sleepy.
You may snooze through the operation, or you may be awake during some or all of it. You may remember some, none or all of your time in theatre.
For more information about sedation, please see our '*Sedation explained*' leaflet, which can be found on our website: rcoa.ac.uk/patientinfo/sedation
You may still need a general anaesthetic if:
■ your anaesthetist cannot perform the spinal
■ the spinal does not work well enough around the area of the surgery
■ the surgery is more complicated or takes longer than expected.

Your spinal anaesthetic

After the operation

■ It takes up to four hours for sensation (feeling) to fully return. You should tell the ward staff about any concerns or worries you may have.
■ As sensation returns, you will usually feel some tingling. You may also become aware of some pain from the operation and you can ask for any pain relief you need.
■ You may be unsteady on your feet when the spinal first wears off and may be a little lightheaded if your blood pressure is low. Please ask for help from the staff looking after you when you first get out of bed.
■ You can usually eat and drink much sooner after a spinal anaesthetic than after a general anaesthetic.

Why have a spinal?

The advantages of spinal alone compared with having a general anaesthetic may be:
■ a lower risk of a chest infection after surgery
■ less effect on the lungs and the breathing
■ good pain relief immediately after surgery
■ less need for strong pain-relieving drugs that can have side effects
■ less sickness and vomiting
■ earlier return to drinking and eating after surgery.

Understanding risk

People vary in how they interpret words and numbers. This scale is provided to help.

1 in 10
One person in your family
1 in 100
One person in a street
1 in 1,000
One person in a village
1 in 10,000
One person in a small town
1 in 100,000

One person in a large town
Serious problems are uncommon with modern anaesthetics. New equipment and techniques, training standards and more effective drugs have made it a much safer procedure.
To understand the risk to you, you must know:

- how likely it is to happen
- how serious it could be
- how it can be treated.

The anaesthetist can discuss risks with you and help you make a decision on what type of anaesthetic is best for you.

Your spinal anaesthetic

Side effects and complications

As with all anaesthetic techniques, there is a possibility of unwanted side effects or complications with a spinal anaesthetic. More information about the side effects and complications from a spinal anaesthetic can be found on our website: rcoa.ac.uk/patientinfo/risks/risk-leaflets

Very common events and common side effects

- **Low blood pressure –** as the spinal takes effect, it can lower your blood pressure. This can make you feel faint or sick. This will be controlled by your anaesthetist with the fluids given through your drip and by giving you drugs to raise your blood pressure.
- **Itching –** this can commonly occur if morphine-like drugs have been used in the spinal anaesthetic. If you have severe itching, a drug can be given to help.
- **Difficulty passing urine (urinary retention) or loss of bladder control (incontinence) –** you may find it difficult to empty your bladder normally while the spinal is working or, more rarely, you may have loss of bladder control. Your bladder function will return to normal after the spinal wears off. You may need to have a catheter placed in your bladder temporarily, while the spinal wears off and for a short time afterwards. Your bowel function is not affected by the spinal.
- **Pain during the injection –** if you feel pain in places other than where the needle is – you should immediately tell your anaesthetist. This might be in your legs or bottom, and might be due to the needle touching a nerve. The needle will be repositioned.
- **Post-dural puncture headache –** there are many causes of headache after an operation, including being dehydrated, not eating and anxiety. Most headaches can be treated with simple pain relief. Uncommonly, after a spinal it is possible to develop a more severe, persistent headache called a post-dural puncture headache, for which there is specific treatment. This happens on average about 1 in 200 spinal injections. This headache is usually worse if you sit up and is better if you lie flat. The headache may be accompanied by loss of hearing or muffling or distortion of hearing.

For more information about post-dural puncture headaches, please read the leaflet *Headache after a spinal or epidural injection* which is available on our website: rcoa.ac.uk/patientinfo/risks/risk-leaflets

Rare complications

Nerve damage – this is a rare complication of spinal anaesthesia. Temporary loss of sensation, pins and needles and sometimes muscle weakness may last for a few days or even weeks, but most disappear with time and a full recovery is made. Permanent nerve damage is rare (approximately 1 in 50,000 spinals). It has about the same chance of occurring as major complications of having a general anaesthetic.
For more information on nerve damage please read the leaflet *Nerve damage associated with a spinal: or epidural injection* which is available on our website: rcoa.ac.uk/patientinfo/risks/risk-leaflets

Your spinal anaesthetic

Frequently asked questions

Can I eat and drink before my spinal?

You will be asked to follow the same rules as if you were going to have a general anaesthetic. This is because it is occasionally necessary to change from a spinal to a general anaesthetic. The hospital should give you clear instructions about when to stop eating and drinking before your surgery.

Do I have to stay fully conscious?

Before the operation, you and your anaesthetist can decide together whether you remain fully awake during the operation or would prefer to be sedated so that you are not so aware of the whole process. The amount of sedation can usually be adjusted so that you are aware, but no longer anxious. It is also possible to combine a spinal with a general anaesthetic but this does mean there are risks of both a spinal and a general anaesthetic.

Will I see what is happening to me?

A screen is placed across your body at chest level, so that you can't see the surgery. Some operations use video cameras and telescopes for 'keyhole' surgery. Some hospitals give patients the option to see what is happening on the screen.

Do I have a choice of anaesthetic?

Yes usually, depending on the actual surgery and any potential problems with you having a spinal. Your anaesthetist will discuss choices with you. There are uncommon reasons why you may not be able to have, or may be advised not to have, a spinal anaesthetic. These include having:

- certain abnormalities of your spine or previous surgery on your back
- 'blood thinning drugs' that cannot be stopped or abnormalities of your blood clotting
- infection in the skin of your back or a high temperature
- certain heart conditions.

Can I refuse to have the spinal?

Yes. If, following discussion with your anaesthetist, you decide you do not want one or are still unhappy about having a spinal anaesthetic, you can always say no.

Will I feel anything during the operation?

You should not feel pain during the operation but for some procedures you may be aware of pressure as the surgical team carry out their work.

Should I tell the anaesthetist anything during the operation?

Yes, your anaesthetist will want to know about any sensations or other feelings you experience during the operation; this is part of their monitoring of the anaesthetic.

Your spinal anaesthetic

Is a spinal the same as an epidural?

No. Although they both involve an injection of local anaesthetic between the bones of the spine, the injections work in a slightly different way. With an epidural a fine plastic tube remains in your back during the operation meaning that more anaesthetic can be used as necessary.

More details can be found in our leaflet *Epidural pain relief after surgery,* which is available from our website: rcoa.ac.uk/patientinfo/leaflets-video-resources

Where can I learn more about having a spinal?

You can speak to your anaesthetist or contact the pre-assessment clinic or anaesthetic department in your local hospital.

Appendix C: Document History and Version Control

Version	Date	Comments	Author/Job Title
4.4	Nov 15	Reviewed and Updated	Consultant Anaesthetist
5.0	Nov 17	Reviewed and Updated	Consultant Anaesthetist
5.2	Dec 18	Minor Amendments	Consultant Anaesthetist
5.3	Apr 19	New Automated Template	Consultant Anaesthetist
5.4	Apr 22	No changes required	Consultant Anaesthetist
5.5	19/04/25	Updated references and minor amendment	Laura Wilson, Consultant Anaesthetist