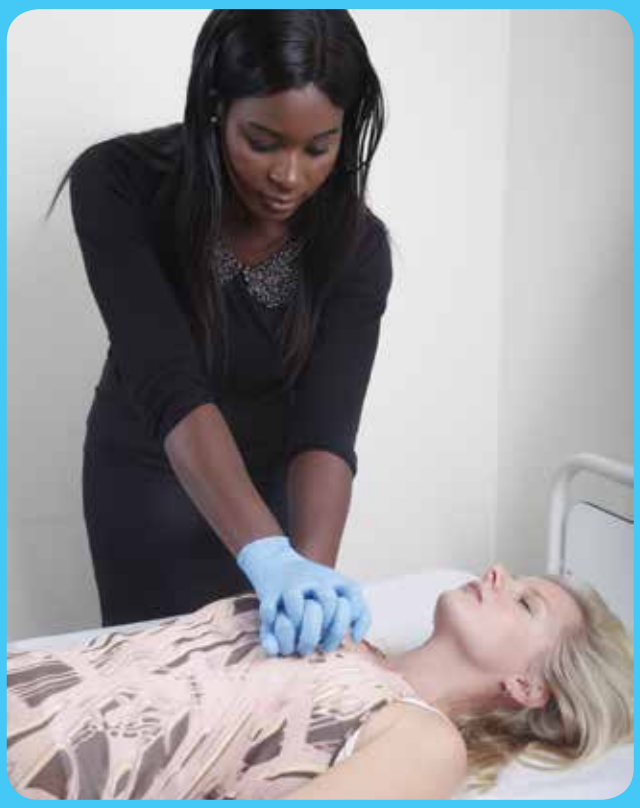

The Unofficial Guide to

Practical Skills

Step-By-Step Illustrated Guides to Over 50 Core Practical Skills, with Accompanying Mark Schemes, and Typical Exam Questions

FIRST EDITION

Emily Hotton and Zeshan Qureshi

THE UNOFFICIAL GUIDE TO PRACTICAL SKILLS

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INTRODUCTION

'The Unofficial Guide to Practical Skills' follows on from the huge success of 'The Unofficial Guide to Passing OSCEs'. This book covers the core clinical competencies for new graduates, as well as additional practical procedures that are expected to be performed by junior doctors. Written by recently qualified foundation doctors, with review by senior clinicians, we have ensured that all procedures follow current guidelines.

This book has detailed explanations of over 50 practical skills stations. Each station includes a corresponding mark scheme, associated questions and answers as well as further areas to explore. The aim is to give you a comprehensive overview of all procedures, even if you have yet to witness them in your training. Covering both basic and more advanced practical skills, we hope this book will prove to be a handy study companion for your undergraduate and postgraduate training.

Practical procedures can be nerve-wracking to perform, both under the close scrutiny of OSCE examiners and pressures of daily clinical practice. The following simple measures are central to performing practical skills proficiently and effectively:

... take time to prepare yourself for the procedure
... ensure you are familiar with the method and equipment you need
... make sure that correct infection control measures are undertaken, from hand washing to use of personal protective items
... always identify the patient you are about to perform a procedure on and obtain the appropriate consent
... check the patient understands your explanation and allow time for them to ask any questions
... be confident in your ability
... use the experience of your peers
... if you are having difficulty, seek help

With this textbook, we hope you will become more confident and competent in these skills both in exams and in clinical practice, but we hope that this is just the beginning. We want you to get involved, this textbook has been written by junior doctors and students just like you because we believe:

... that fresh graduates have a **unique perspective** on what works **for students.** We have tried to capture the insight of students and recent graduates to make the language we use to discuss this complex material more digestible **for students.**
... that texts are in **constant** need of being updated. **Every student** has the potential to contribute to the education of others by innovative ways of thinking and learning. This book is an open collaboration with you.

You have the power to **contribute** something valuable to medicine; we welcome your suggestions and would love for you to get in touch. A good starting point is our facebook page, which is growing into a forum for medical education, search for "The Unofficial Guide to Medicine" or enter the hyperlink below into your web browser.

Please get in touch and be part of the medical education project

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FOREWORD

This book is the latest addition to 'The Unofficial Guide to…' series, giving high quality advice and guidance to medical students through their transition into doctors. Previous books in the series have focused on tackling the nuances of OSCE stations. However, 'The Unofficial Guide to Practical Skills' aims to reflect the recent emphasis, by the General Medical Council (GMC), on practical skills.

Approaching practical stations in exams can be challenging. Many medical students struggle to get hands-on experience of practical procedures during time on the wards. In addition, doctors have their own methods for a given skill and contrasting advice can be given. Although a breadth of opinion is good to allow you to develop, it can be a hurdle under exam pressure. This book provides an interactive framework from which to hang this array of knowledge. Directing you through a wide range of scenarios, from knee joint aspirations and ascitic taps to administering oxygen, with skill specific mark schemes, it gives you a clear structure from which to hone and perfect your practical skills.

The once daunting prospect of approaching practical skills can now be overcome by using this refreshingly comprehensive and user-friendly guide. Including both skills focused upon by the GMC and an array of additional skills essential in the armoury of a junior doctor, this book really is the must have!

Best of luck with all your practical skills!

Robert Miller, Final Year Medical Student, University of Bristol

HOW TO USE THIS BOOK

This book has been created for you. We aim to ease the stress of studying and assist in making learning enjoyable to help you become a better clinician. The book is split into eight chapters, following a logical order from simple procedures to those that are more challenging.

Each practical skill station has a method outlining how to perform the skill as well as detailed objectives, general advice and facts dispersed throughout. This is followed by a matched mark scheme and a series of questions. This format allows for individual study or group work. There are three roles that may be adopted: the patient; the examiner and the candidate. The roles of the patient and examiner can be combined if working in pairs.

Scenario

These are real life instructions that would be found in OSCEs or on the wards. Take your time to read the passage and note any salient points. In OSCE scenarios you will not be able to ask the examiner any questions regarding the passage, so carefully reading it before starting is paramount.

Mark Scheme

This is a checklist of points that are important to cover in each station. It is not based on any specific university mark scheme, but covers principles we believe are important to address. The examiner can tick off points in the boxes as they are covered. These mark schemes can be used several times to gauge progress over a period of time.

Questions and Answers for Candidate

These questions can be asked to the candidate with model answers provided.

Additional Questions to Consider

These are other questions surrounding the theme of the station. They are ones to consider, discuss and think through further to those provided.

ABBREVIATIONS AND SYMBOLS

°	degrees
ABPI	ankle brachial pressure index
AMD	age-related macular degeneration
ß	beta
BE	base excess
BiPAP	bilevel positive airway pressure
BMI	body mass index
BP	blood pressure
cm	centimetre(s)
cmH_2O	centimetre of water
CO_2	carbon dioxide
COPD	chronic obstructive pulmonary disease
CPAP	continuous positive airway pressure
CPR	cardiopulmonary resuscitation
CRP	C reactive protein
CSF	cerebrospinal fluid
CT	computed tomography
CVP	central venous pressure
DKA	diabetic ketoacidosis
DLCO	diffusion capacity of the lung for carbon monoxide
ECG	electrocardiogram
EDTA	ethylenediaminetetraacetic acid
FBC	full blood count
FEV_1	forced expiratory volume in one second
FiO_2	inspired oxygen concentration
FVC	forced vital capacity
GCS	Glasgow Coma Score
Hb	haemoglobin
HCO_3^-	bicarbonate
HAS	human albumin solution
ICP	intracranial pressure
ID	identification
IJV	internal jugular vein
INR	international normalised ratio
IV	intravenous
kg	kilograms
kPa	kilopascal(s) pressure
L	litre
LA	local anaesthetic
LFTs	liver function tests
LP	lumbar puncture
m	metres
MC&S	microscopy, culture and sensitivity
mg	milligram(s)
MI	myocardial infarction
min	minute(s)
mL	millilitre(s)
mmHg	millimetres of mercury pressure
mmol	millimoles
MRSA	methicillin-resistant Staphylococcus aureus
NPDR	non-proliferative diabetic retinopathy
NTT	non touch technique
O_2	oxygen
OP	oropharyngeal
$PaCO_2$	arterial partial pressure of carbon dioxide
PaO_2	arterial partial pressure of oxygen
PCI	primary coronary intervention
PEA	pulseless electrical activity
PICC	peripherally inserted central catheter
PPE	personal protective equipment
PT	prothrombin time
SaO_2	arterial oxygen saturation
SAAG	serum-ascites albumin gradient
SBP	spontaneous bacterial peritonitis
STEMI	ST elevation myocardial infarction
TB	tuberculosis
TLCO	transfer factor of the lung for carbon monoxide
U&E	urea and electrolyte
USS	ultrasound scan
VF	ventricular fibrillation
VT	ventricular tachycardia
WCC	white cell count

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Body Mass Index
Choking
Drug Administration via Nebuliser
Hand Washing
Heart Rate and Respiratory Rate
Infection Control
Intradermal Injections
Intramuscular Injections
Intravenous Drugs
Knee Joint Aspiration
Lying and Standing Blood Pressure
Manual Handling
MRSA Swab
Nasogastric Tube Insertion
Nutritional Assessment
Operating a Syringe Driver
Oxygen Saturation
Phlebotomy
Preparing Baby Formula Milk
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CONTENTS

Station 3: ARTERIAL BLOOD GAS

Mr Bridge is a 57-year-old man who has been admitted due to an exacerbation of his COPD. He is unable to speak in full sentences and has a respiratory rate of 26 breaths per minute. He has found no relief from his usual medications. Please perform a radial arterial blood gas (ABG) puncture.

Objectives

- Performing a radial ABG puncture

General Advice

- Ensure that your patient has given valid consent for the procedure
- Check whether the patient is on anticoagulant medication
- Ideally, the patient would be breathing room air for a minimum of 20 minutes before taking the sample. If this is not possible, then we should know what oxygen supplementation (and by extension the FiO2) the patient is receiving, as this needs to be taken into account when interpreting the results

Fig 2.12: The doctor is occluding both the radial and ulnar arteries

What test should be performed prior to sampling the radial arterial blood?

Allen's Test

This tests the patency of the radial and ulnar arteries, ensuring the circulation to the hand will not be compromised when performing the radial arterial blood test

How do you perform the modified Allen's Test?

1. Ask the patient to open and close his or her hand to form a fist for 30 seconds
2. Whilst the hand is elevated, occlude both the radial and ulnar arteries (Fig 2.12)
3. With the hand still elevated, ask the patient to open the hand, which should be pale
4. Release pressure from the ulnar artery and observe any colour changes

A normal negative result: hand colour returns within 5-10 seconds, suggesting good ulnar artery supply. The radial arterial blood sampling can therefore be safely performed

An abnormal positive result: hand colour does not return within 5-10 seconds, suggesting poor ulnar artery supply. The radial arterial blood sampling cannot be safely performed from this arm

Equipment Checklist (remember to check expiry dates on all equipment) (Fig 2.13)

a) Tray: either single-use, disposable sterilised tray, or a decontaminated plastic tray that is cleaned pre/post procedure
b) Non-sterile gloves and single use apron
c) Skin cleansing solution (e.g. ChloraPrep®)
d) Arterial blood gas set (these vary between Trusts)
e) Sterile cotton wool
f) Tape
g) Sharps bin: sharps bin should always be taken to the point of care

Note: Skin cleansing solutions and method will vary depending on local policy

Fig 2.13: Make sure you are familiar with the arterial blood test kit that is used in your Trust

Indications for performing an ABG puncture:

- Assessment of acid/base balance
- Assessment of oxygenation status: arterial partial pressure of oxygen (PaO_2)
- Assessment of ventilatory status: arterial partial pressure of carbon dioxide ($PaCO_2$)

Performing a Radial Arterial Blood Gas Puncture

Skin Preparation

1. Wash hands and put on non sterile gloves/apron
2. Clean site for 30 seconds with a ChloraPrep® swab in an up-and-down, back-and-forth friction technique. Allow to fully dry

Palpating the Radial Artery

1. Ensure the patient is comfortable, with their forearm resting on a flat surface
2. Hyperextend the wrist joint over a rolled towel
3. Palpate the radial artery using your index and middle fingers to determine a good position for the procedure

Sample Collection

Method A

1. Once the radial artery is located, shift your index and middle fingers proximally by 1-2 cm
2. Hold the needle like a pencil, bevel up
3. Insert the needle at 45° just distal to your index finger (Fig 2.14)

OR

Method B

1. Once the radial artery is located, separate your index and middle fingers by 2-4 cm
2. Hold the needle like a pencil, bevel up
3. Insert the needle at 45° between your index and middle fingers (Fig 2.15)

- Advance the needle into the radial artery
- Obtain the sample (usually 3 mL)
- Withdraw the needle
- Apply pressure to the puncture site using cotton wool and secure with tape
- Direct pressure should be continued until bleeding has stopped
- Dispose of the needle in a sharps bin
- Gently mix the sample by inverting the syringe up and down
- Inform the patient to let a member of staff know if the site is painful, continues to bleed, or if they have any other concerns
- Explain that they can remove the dressing after a couple of hours
- Take the blood sample to the nearest blood gas analyser
- Once analysed dispose of the syringe into a sharps bin
- Remove gloves and wash hands
- Document the procedure and findings in the patient's notes

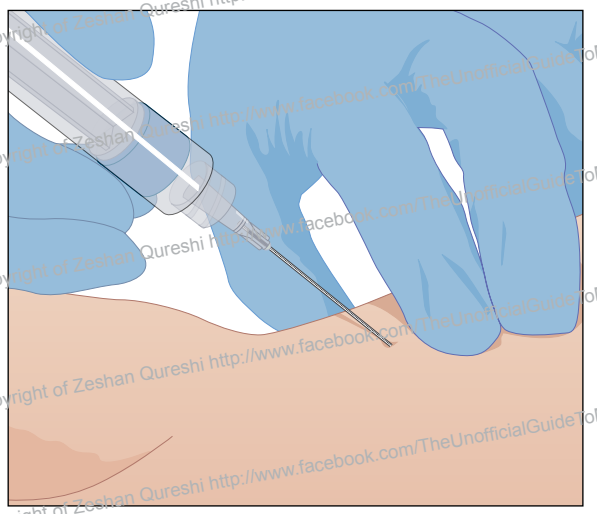


Fig 2.14: Method A. The ABG needle is inserted distal to the index finger

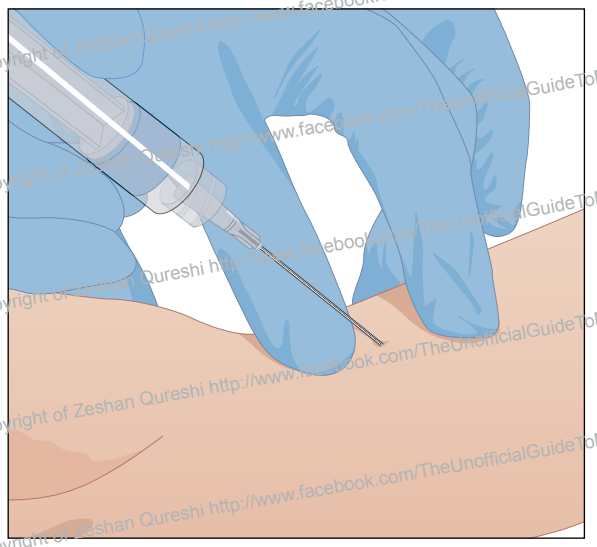


Fig 2.15: Method B. The ABG needle is inserted between the palpating fingers

Some doctors choose to infiltrate the superficial skin with local anaesthetic prior to performing the arterial puncture. 1-3 mL of lidocaine 2% can be infiltrated to assist with pain control

'If filling stops prior to the syringe being full, retract the needle slightly. Most commonly, this occurs because the needle has pierced the posterior arterial wall, preventing further filling. By retracting the needle, the bevel will be placed inside the artery, allowing for filling to occur. Most blood gas analysis machines only require 1 mL of blood'

Arterial blood samples can also be taken from the femoral and brachial arteries

Mark Scheme for Examiner

Introduction and General Advice

- Introduces self (clean hands)
- Identifies patient (3 points of ID)
- Explains procedure, identify concerns and obtains consent
- Notes respiratory support

Skin Preparation

- Washes hands and dons non-sterile gloves/apron
- Cleans puncture site

Palpating the Radial Artery

- Positions the patient's wrist
- Locates puncture site

Sample Collection

- Assembles equipment and checks expiry dates
- Punctures the skin to collect the sample (3 mL)
- Removes the needle and applies direct pressure
- Disposes of needle immediately
- Gently mixes the sample
- Applies dressing over puncture site

Finishing

- Tells patient to inform staff if site becomes painful or continues to bleed and that they can remove the dressing after a few hours
- Disposes of equipment and cleans tray
- Takes sample to nearest blood gas analyser
- Removes gloves/apron and washes hands
- Documents procedure in the patient notes

General Points

- Talks throughout the procedure to the patient
- Avoids patient contamination (i.e. NTT)

Questions and Answers for Candidate

What are the complications of performing an arterial puncture?

- Infection
- Bleeding
- Thrombosis
- Pain
- Pseudoaneurysm formation

What can you do to preserve an arterial blood gas sample, if it cannot be analysed straight away?

- The sample can be stored on ice, allowing it to be analysed within two hours

Additional Questions to Consider

1. Which patients would you perform an arterial blood gas on?
2. How does supplementary oxygen change your interpretation of blood gas results?
3. What information does a venous blood gas give you?
4. What might cause a respiratory acidosis?
5. What might cause a metabolic acidosis?

Station 4: BLOOD GAS INTERPRETATION

Mr Bridge is a 57-year-old man who has been admitted due to an exacerbation of his COPD. He is unable to speak in full sentences and has a respiratory rate of 26 breaths per minute. He has found no relief from his usual medications. An arterial blood gas has been performed, please discuss the findings with your examiner.

Objectives

- Interpreting an ABG

General Advice

It is important to know what, if any, ventilatory support or oxygenation the patient is receiving at the time of ABG sample collection as this will help you to interpret the results.

This might include:

- Percentage of oxygen being supplied
- Type of oxygen mask being used
- Pressure of non-invasive/ invasive ventilatory support

Note: commonly the units for partial pressure are kiloPascals pressure (kPa); however, they can be measured in mmHg. Please ensure that you are familiar with the units and reference ranges used in your hospital

Method for Interpreting Blood Gas Results

1. Assess the pH

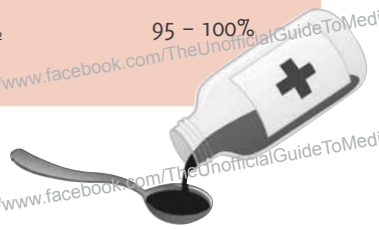
- Low < 7.35 indicates acidosis
- High > 7.45 indicates alkalosis

An ABG can provide the following information:

ABG measures	ABG calculates
PaO_2	Base excess (BE)
$PaCO_2$	Anion gap
SaO_2 (arterial oxygen saturation)	
pH	
Haemoglobin (Hb)	
Na^+, K^+, Ca^{2+}, Cl^-, lactate, bicarbonate (HCO_3^-)	

Normal Blood Gas Ranges (for a patient breathing room air)

Reading	Normal Range
pH	7.35 – 7.45
PaO_2	10.6 – 13.3 kPa
$PaCO_2$	4.7 – 6.0 kPa
HCO_3^-	22 – 28 mmol/L
BE	-2 to +2
SaO_2	95 – 100%



Questions and Answers for Candidate

What would be the most appropriate method for use in the case of Mr Hill?

- A non-rebreather facemask with high flow oxygen (10-15L/min) provided he has no underlying lung pathology contraindicating high flow oxygen

Why is high-flow oxygen potentially problematic in patients with type II respiratory failure?

- Due to long-standing hypercapnia, these patients may have a hypoxia-driven respiratory centre. High flow oxygen could suppress this drive, resulting in apnoea

Additional Questions to Consider

1. How would you differentiate type I and type II respiratory failure, on the basis of ABG results?
2. What patient information must you take into account when prescribing oxygen?
3. What are the indications for non-invasive ventilation?
4. Describe the difference between bilevel positive airway pressure (BiPAP) and continuous positive airway pressure (CPAP) ventilation
5. Outline some causes of hypoxia

ACUTE PATIENT MANAGEMENT

Station 6: INTRAVENOUS CANNULATION

Mrs Jones has been diagnosed with small bowel obstruction. She requires cannulation so that IV fluids can be administered. Please obtain consent for this and then, on the mannequin provided, demonstrate how to insert an IV cannula.

Objectives

- To learn correct technique for cannula insertion

General Advice

- Obtain valid consent
- Ask the patient if they have an arm preference
- Consider if there are any pre-disposing medical or surgical conditions that would not allow using a specific arm/blood vessel, such as a renal fistula, cellulitis, mastectomy
- Check if the patient has any allergies such as to chlorhexidine

Equipment Checklist

(remember to check expiry dates on all equipment) (Fig 3.33)

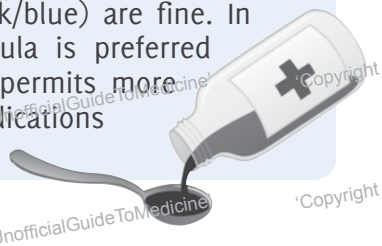
a) Skin cleansing solution (e.g. ChloraPrep®)
b) 21-gauge needle (though for drawing up medications, IN ALL cases a blunt draw up needle is preferred if available)
c) 10 mL syringe and syringe cap (or second needle if syringe cap not available)
d) 10 mL 0.9% saline ampoule for flush
e) Sterile adhesive dressing
f) Cannula
g) Disposable tourniquet
h) Cotton wool
i) 2 pairs of non-sterile gloves
j) Tape (if you fail to site the cannula you will need to tape some cotton wool over the puncture site)
k) Tray (as with phlebotomy)
l) Sharps bin: the sharps bin should always be taken to the point of care
m) Single use disposable apron

Fig 3.33: Equipment required for cannulation

'If the patient has suffered vasovagal episodes with needles in the past, lay the patient flat'

Note: Skin cleansing methods and methods of capping will vary depending on local policy. In addition, local policy may use alternative methods to cap. Any tubing that is attached, such as a bioconnector or a line, needs to be flushed first with 0.9% saline to avoid injecting air and risking an air embolus

Cannulae are sized by gauge (smaller the number = bigger the size), all with corresponding colours. Bigger cannulae can achieve higher flow rates. For administering IV medication and IV maintenance fluids, smaller cannulae (pink/blue) are fine. In an emergency, a large cannula is preferred (green or bigger) since this permits more rapid administration of medications and fluids



'Patient comfort is very important in considering where to place the cannula, particularly in non emergency situations. Put it in the left arm if they are right handed, use a small cannula if that is all that might be needed, and remember that although the antecubital fossa is tempting, placing a cannula here makes moving the arm more difficult'

Explaining Cannulation to the Patient

1. A cannula is a small plastic tube that remains in your vein allowing you to receive fluid and medication
2. It is inserted using a needle, a bit like having a blood test. You will feel a sharp scratch but the needle is removed once the plastic tube is in place
3. It is held in place with a sticky dressing
4. The cannula will be changed every three days if you need it for a longer period of time
5. It may take a few attempts to ensure the plastic tube is in the correct place

Performing the Procedure

Preparing the Flush

1. Clean hands and put on non sterile gloves
2. Attach the 21-gauge needle to the 10 mL syringe (leave the sheath on for now) (Fig 3.34)
3. Double check that you have selected 0.9% saline, that it is in date, and that the packaging is clean and intact – many IV medications appear in near-identical ampoules
4. Remove the top from the 0.9% saline and draw 10 mL up into your syringe using a 21-gauge needle (Fig 3.35)
5. Expel any air from the syringe by tapping it/advancing the plunger (Fig 3.36)
6. Discard the needle in the sharps bin and attach the syringe to the second needle for storage (or if available, a sterilised cap for the syringe tip)
7. Place the flush into the equipment tray alongside the other cannulation equipment

Fig 3.34: Prepare your needle and syringe

Fig 3.35: Draw up the saline flush

Fig 3.36: Expel any air present

Insert the Cannula

1. Remove the cannula from its packaging and open the sterile dressing pack
2. Position the patient's arm comfortably
3. Place the tourniquet approximately 7-10cm proximal to the site of insertion (Fig 3.37)
4. Select vein, then loosen tourniquet
5. Wash hands, put on new non sterile gloves and apron
6. Clean the site using the skin cleansing solution – clean for 30 seconds and leave to air dry (Fig 3.38)
7. Retighten tourniquet
8. Tether the vein that you have selected beneath the insertion site and insert the cannula at approximately 15° using NTT, while warning the patient of a 'sharp scratch' (Fig 3.39)
9. Advance the cannula until flashback is obtained. **Do not repalpate the aseptic area** of the skin at any time during the procedure
10. Once flashback has been seen, advance the cannula slightly further (1-2mm). This ensures the cannula tubing is within the vein before you advance it forward, over and off the needle

'It's fine to re-palpate for a vein, if you've lost it – you just need to clean the skin again, or wear sterile gloves'

Fig 3.37: Ensure tourniquet out of the sterile field

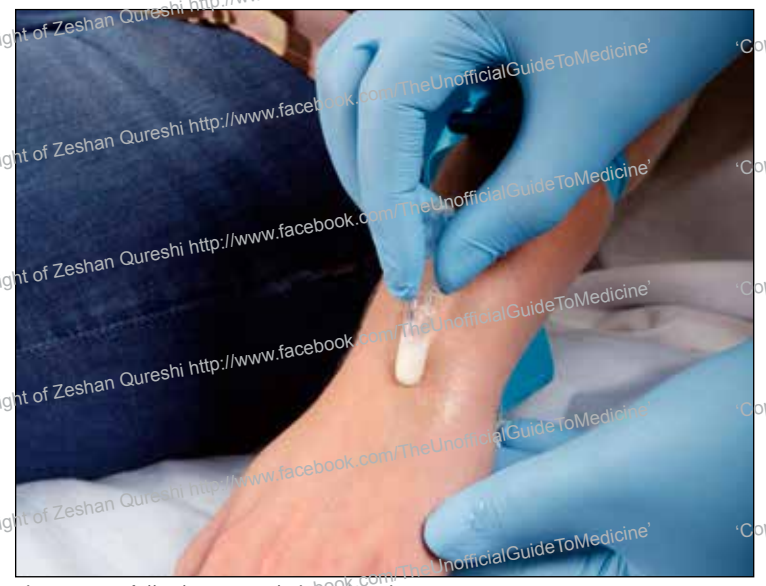


Fig 3.38: Carefully clean cannula insertion site

Fig 3.39: Enter the skin using a NTT

11. Hold the needle still and advance the cannula over it, all the way into the vein. No part of the cannula tubing must be seen at the point of entry (Fig 3.40)
12. Release the tourniquet
13. Occlude the vein and cannula with firm pressure (Fig 3.41) and then gently remove the needle
14. Dispose of the needle straight into the sharps bin (Fig 3.42)
15. Depending on Trust policy, attach a cap, bung or IV extension set (which requires separate preparation) on the end of the cannula
16. Wipe away any blood that may have leaked around the cannula with cotton wool
17. Apply sterile adhesive dressing (Fig 3.43)
18. Write the date and time on the cannula dressing label

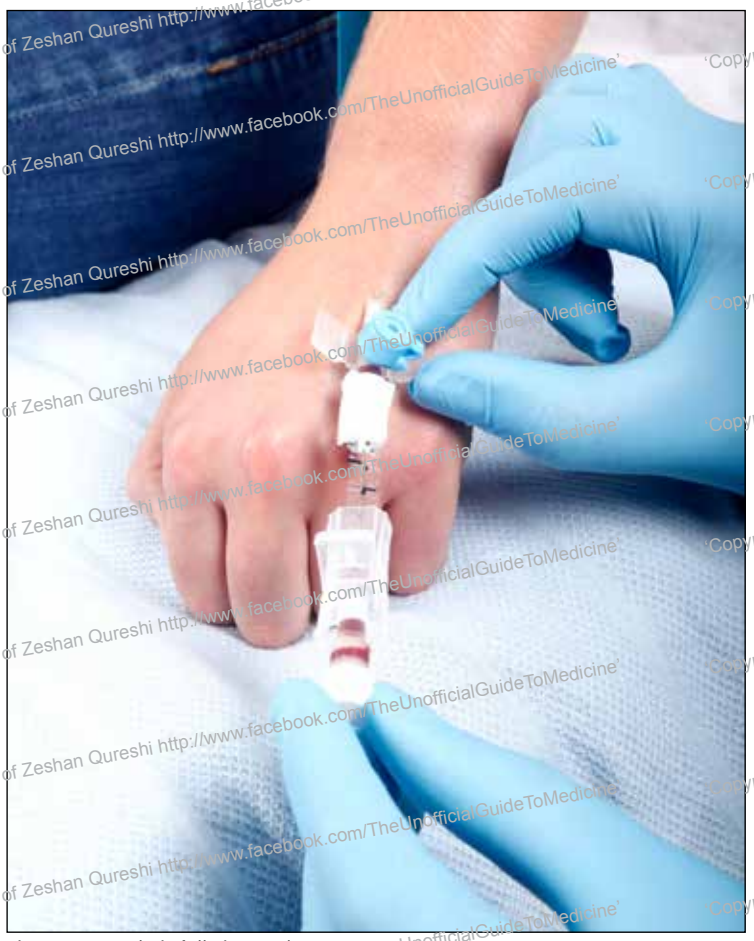


Fig 3.40: Cannula is fully inserted

'As a general rule, if you fail twice at putting a cannula in, ask a senior colleague to place it instead'

Fig 3.41: Press firmly over the plastic cannula tubing to occlude it

Fig 3.42: Ensure you have a sharps bin nearby

Fig 3.43: Secure the cannula in place

Flush the Cannula

1. Flip open the coloured cap of the cannula (note however that if an IV extension set is applied, you would flush the cannula through this, not the coloured cap)
2. Remove the needle or sterilised cap from the saline flush syringe and attach the flush to the cannula
3. Slowly flush the cannula (1 ml at a time) with 5-10 mL of 0.9% saline, checking that the fluid doesn't leak into the surrounding tissues, causing swelling (Fig 3.44)
4. Explain to the patient that they might feel coldness running up their arm as you are flushing the cannula
5. When finished, remove the syringe and re-cap the cannula
6. Dispose of the syringe in a sharps bin

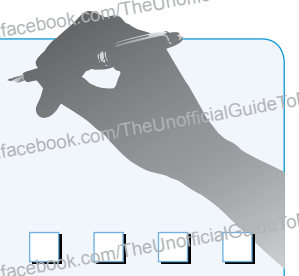
Fig 3.44: Always flush the cannula after insertion

Finishing Off

1. Decontaminate tray as per local policy
2. Dispose of equipment in a clinical waste bin
3. Remove gloves
4. Wash hands
5. Complete a cannula insertion record, and place in notes
6. Explain to the patient that if they have any pain or redness at or around the cannula site, or if they have any other concerns, they should speak to a member of staff

'A cannula should be changed every 72 hours but may need to be replaced earlier if there are any problems such as infection, misplacement or blockage'

Mark Scheme for Examiner



Introduction and General Advice

Introduces self (clean hands)

Identifies patient (3 points of ID)

Explains procedure, identifies concerns and obtains consent

Checks for allergies and arm preference

Preparation

Obtains equipment and checks expiry date

Washes hands and puts on gloves

Assembles equipment

Preparation of IV Flush

Draws up saline flush using NTT

Safely stows syringe in tray

Cannulation

Positions arm appropriately

Applies tourniquet, selects vein, loosens tourniquet

Washes hands

Puts on non-sterile gloves and single use apron	☐	☐	☐	☐	☐
Cleans puncture site (30 seconds) and allows to air dry	☐	☐	☐	☐	☐
Reapplies tourniquet	☐	☐	☐	☐	☐
Appropriate insertion technique	☐	☐	☐	☐	☐
Removes tourniquet	☐	☐	☐	☐	☐
Removes needle (whilst occluding vein) and immediately disposes of sharp safely	☐	☐	☐	☐	☐
Attaches cap and cleans any leakage of blood	☐	☐	☐	☐	☐
Applies sterile dressing with date and time	☐	☐	☐	☐	☐
Flushing the Cannula					
Opens coloured cap of cannula and attaches pre-prepared flush	☐	☐	☐	☐	☐
Flushes cannula 1mL at a time	☐	☐	☐	☐	☐
Disposes of syringe	☐	☐	☐	☐	☐
Finishing					
Disposes of equipment	☐	☐	☐	☐	☐
Removes gloves and apron	☐	☐	☐	☐	☐
Washes hands	☐	☐	☐	☐	☐
Documents insertion	☐	☐	☐	☐	☐
Explains to patient to be wary of signs of infection	☐	☐	☐	☐	☐
General Points					
Talks throughout the procedure to the patient	☐	☐	☐	☐	☐
Avoids patient contamination (i.e. NTT)	☐	☐	☐	☐	☐

Questions and Answers for Candidate

What cannula would you use for a blood transfusion?

- If it was a scheduled blood transfusion, a pink (20G) cannula would be sufficient, but a green cannula (22G) is recommended. If it were an emergency, a larger cannula would be preferred

Additional Questions to Consider

1. What factor is the most critical determinant of flow rate through a cannula?
2. What are the complications of IV cannulation?
3. In an emergency, if you cannot gain IV access, what other routes are acceptable for drug delivery?
4. When might you remove a cannula?
5. What should you advise the patient to watch out for if they have a cannula?

Station 9: LUMBAR PUNCTURE

Mr Waters is a 22-year-old university student who presents to the Emergency Department with an acute severe headache. Associated symptoms include fever, vomiting and photophobia. On examination you note marked neck stiffness and Kernig's sign is positive. There are no features suggestive of raised intracranial pressure. You strongly suspect bacterial meningitis and after a CT scan is performed, you are asked by your registrar to perform a LP in order to confirm the diagnosis.

Objectives

- Perform a LP
- Interpret the results

General Advice

- Performing a LP allows the clinician to obtain a sample of cerebrospinal fluid (CSF) from the subarachnoid space below the level at which the spinal cord terminates (L1/L2)
- As a junior doctor you should only perform this procedure following adequate instruction and under close supervision
- The key contraindication to performing a LP is raised intracranial pressure (ICP) – the combination of which may result in tonsillar herniation (i.e. 'coning')
- A head CT scan is generally performed prior to performing an LP

Contraindications to performing an LP:

- Raised ICP
- Coagulopathy or low platelet count
- Cutaneous infection at the LP site

Features suggestive of raised ICP or intracerebral mass:

- Papilloedema
- Focal neurological signs
- Decreased level of consciousness (GCS <8/15)
- Bradycardia, hypertension and an irregular breathing pattern (Cushing's triad)

Equipment Checklist

(remember to check expiry dates on all equipment) (Fig 5.36)

a) Sterile gloves and single use apron
b) Chlorhexidine swabs
c) Procedure tray with sterile drape and swabs
d) Sterile dressing
e) 10 mL syringe
f) 10 mL lidocaine 1%
g) 25-gauge needle
h) 2 x 21-gauge needles
i) LP kit:
   - LP needle (typically 22-gauge)
   - 3-way tap
   - Manometer
   - CSF collection tubes (for microbiology and biochemistry including glucose)

Fig 5.36: Not all wards will have the equipment for this procedure. Ensure you are aware where you can obtain all the equipment you need

Explaining an LP to the Patient

1. An LP is a procedure used to obtain a sample of cerebrospinal fluid – a type of body fluid which bathes the brain and spinal cord
2. It is important to obtain a sample where possible, because analysis of this fluid allows the medical team to ensure the correct diagnosis is made and appropriate treatment given
3. You will be asked to lie on the bed on your left hand side with your knees drawn up to your chest and lower back exposed
4. A needle is inserted into the lower part of the spine where the spinal cord ends, thereby reducing the risk of damage to the cord
5. An injection of local anaesthetic will be administered first into the skin overlying the puncture site in order to reduce pain; however, you may still experience a sensation of pressure/discomfort
6. A special needle will then be inserted into the space containing the cerebrospinal fluid and samples of the fluid will be taken
7. You may experience a headache and nausea following the procedure – this is the most common side effect. You will also need to lie flat for an hour after the procedure

Performing a LP

1. Introduce yourself, check the patient's ID and obtain informed consent
2. Ask the patient to adopt the left lateral position with their lumbar spine exposed
3. Position the patient with maximum flexion of the spine, hips and knees (widening the intervertebral space)
4. Palpate the superior iliac crest and then follow a vertical line down to the space between the vertebral spines immediately below (corresponds to L3/L4 or L4/L5 intervertebral disc space)
5. Mark this space with an indentation/pen
6. Wash hands. Put on sterile gloves and single use apron. Drape the lumbar spine region
7. Check all of the equipment and open onto the procedure tray
8. Sterilize the skin using the swabs
9. Attach the 21-gauge needle to the 10 mL syringe and draw up the lidocaine
10. Infiltrate the lidocaine superficially at the marked location, using a 25-gauge needle
11. Exchange the 25-gauge needle for the larger 21-gauge needle and continue to infiltrate lidocaine into the deeper tissues (N.B. ensure you aspirate before injecting to reduce the risk of accidental intravascular injection)
12. Wait approximately one minute for the LA to take effect
13. Take the LP needle and introduce it into the skin at the marked site, with the bevel of the needle pointing up (Fig 5.37)
14. Carefully advance the needle through the spinal ligaments, feeling a 'give' in resistance as you penetrate the dura mater and enter the subarachnoid space
15. Now withdraw the stylet from the LP needle and watch for CSF to begin dripping from the needle cuff
16. Attach the manometer and 3-way tap to the needle in a vertical position, allowing you to measure CSF pressure (wait for the fluid to stop rising up the column and read off the value)
17. Open the 3-way tap and allow 5-10 drops of CSF to drip into each of the three collection tubes (label these tubes 1 to 3 in the order of collection)
18. If still dripping, collect a glucose sample as well
19. Reinsert the stylet to stop the flow of CSF and remove the needle
20. Apply a sterile dressing

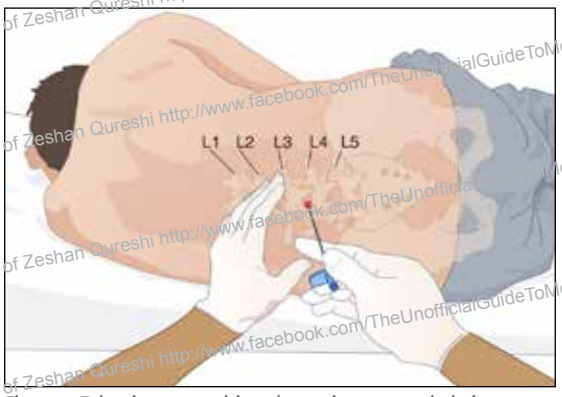


Fig 5.37: Take time to position the patient correctly before inserting the LP needle (drapes not shown)

'When introducing the LP needle, imagine you are aiming for the umbilicus – this will help to ensure correct positioning. Many doctors will tell you that this practical skill involves a certain amount of "feel" – practice makes perfect!'

Finishing the Procedure

- Remove the drape and ensure safe disposal of sharps/packaging
- Prescribe simple analgesia PRN for any resultant headache
- Label the collection tubes appropriately and send to the lab for:
  - MC&S
  - Cell count
  - Biochemistry (protein and glucose)
- Document the procedure and any complications/ technical difficulty
- To be able to interpret the results of a LP, a capillary blood sample is also necessary to allow measurement of plasma glucose levels

The anatomical layers that are penetrated when inserted a LP needle are (Fig 5.38):

1. Skin
2. Supraspinous ligament
3. Interspinous ligament and ligamentum flavum
4. (Extradural space)
5. Dura mater
6. Arachnoid mater

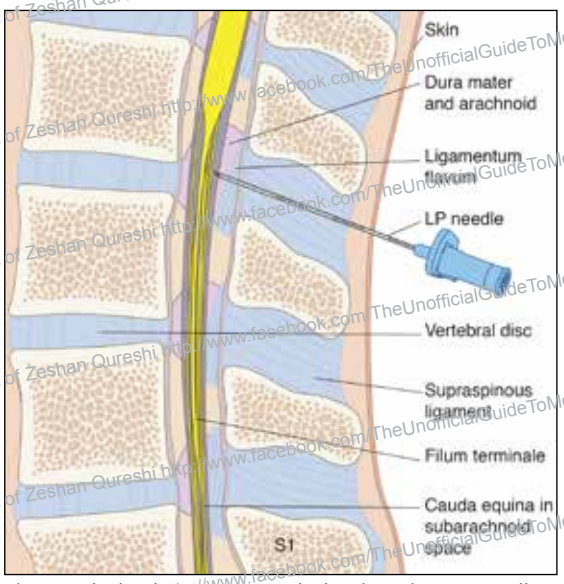


Fig 5.38: The key layers penetrated when inserting a LP needle

MEDICINE AND SURGERY

Common causative organisms in meningitis

Adults: meningococcus, pneumococcus, haemophilus (less commonly)

Neonates and infants: meningococcus, pneumococcus, listeria, group B streptococci

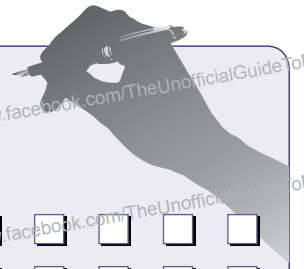
Elderly: meningococcus, pneumococcus, listeria

Immunocompromised: cryptococcus, TB

Note: Attaching a manometer allows you to measure the CSF pressure. A normal pressure is 5-20 cmH_2O; in meningitis it may be as high as 40 cmH_2O

LP Results in Meningitis

	Appearance	Predominant white cells	Protein (g/L)	Glucose
Normal	Clear	Lymphocytes	0.2-0.4	2/3-0.5 plasma glucose
Viral	Clear	Lymphocytes	0.4-0.8	> 0.5 plasma glucose
Bacterial	Turbid	Neutrophils	0.5-2	< 0.5 plasma glucose
TB	Fibrin web	Lymphocytes	0.5-3	< 0.5 plasma glucose



Mark Scheme for Examiner

Introduction and General Advice

Introduces self (clean hands)

Identifies patient (3 points of ID)

Explains procedure, identifies concerns and obtains consent

Explains common side effects (headache, nausea)

Checks allergies

Preparation

Obtains equipment and checks expiry dates

Prepares equipment

Patient Positioning

Positions patient in left lateral position with maximal flexion

Correctly identifies puncture site

LP

Washes hands

Puts on sterile gloves and single use apron

Drapes lumbar spine with sterile sheet

Sterilises skin

Superficial and deep infiltration of LA

Waits approximately one minute for onset of action of LA	☐	☐	☐	☐	☐
Correct technique for LP needle insertion	☐	☐	☐	☐	☐
Measures CSF pressure using manometer	☐	☐	☐	☐	☐
Collects CSF sample in collection tubes	☐	☐	☐	☐	☐
Re-inserts stylet and withdraws LP needle	☐	☐	☐	☐	☐
Safely disposes of needle in sharps bin	☐	☐	☐	☐	☐
Applies sterile dressing	☐	☐	☐	☐	☐
Finishing					
Removes drape, apron and gloves and disposes in clinical waste bin	☐	☐	☐	☐	☐
Disposes of equipment packaging	☐	☐	☐	☐	☐
Labels collection tubes	☐	☐	☐	☐	☐
Documents the procedure appropriately	☐	☐	☐	☐	☐
General Points					
Talks throughout the procedure to the patient	☐	☐	☐	☐	☐
Avoids patient contamination	☐	☐	☐	☐	☐

Questions and Answers for Candidate

What are the key contraindications to performing a LP?

- Raised ICP
- Coagulopathy or low platelet count
- Cutaneous infection at the LP site

What clinical features are suggestive of raised ICP?

- Papilloedema
- Focal neurological signs
- Decreased level of consciousness (GCS <8/15)
- Bradycardia, hypertension and an irregular breathing pattern (Cushing's triad)

In what type of meningitis would you expect to find an increased neutrophil count?

- Bacterial meningitis

Additional Questions to Consider

1. What is post-lumbar puncture headache and why does it occur?
2. What anatomical layers are penetrated during this procedure?
3. What are the differential diagnoses for raised ICP?
4. How would you manage suspected meningitis?

Station 2: MALE URETHRAL CATHETERISATION

Mr Gear has not urinated following an elective operation he had last night and is becoming distressed by abdominal pain. An examination reveals a soft non-tender suprapubic mass which, when palpated deeply, makes Mr Gear feel like he wishes to pass urine. You diagnose acute urinary retention and feel that he requires a urethral catheter. Having already obtained his consent, demonstrate this procedure on the mannequin provided.

Objectives

- Learn how to perform male catheterisation

General Advice

- Confirm that the patient understands what is going to happen and is happy to continue
- Obtain valid consent
- Always ask for a chaperone

Catheter Selection

Size: Use the smallest catheter you can. Normally 14 Ch is used in males and 12 Ch in females
Length: A male catheter is approximately 40 cm; a female catheter is approximately 25 cm
Material: Silicone or hydrogel (lasts up to 3 months) or coated latex (lasts up to 4 weeks). Remember to ask about allergies; a patient with latex allergies should have an all silicone catheter and you should use non-latex gloves

> 'Make sure you carefully select the right catheter for your patient, paying particular attention to the length. You must never use a female catheter in a male patient'

Equipment Checklist

(remember to check expiry dates on all equipment) (Fig 6.5)

a) Procedure trolley
b) Sharps bin
c) Disposable bag (for rubbish)
d) Catheterisation pack (including disposable dish, plastic pots, cotton swabs and sterile drape)
e) 2 × sterile water/0.9% saline sachets, according to Trust policy
f) 2 x pairs sterile gloves
g) LA gel or lubricant, according to Trust policy
h) 21-gauge needle
i) 10 mL syringe
j) Sterile water vial (often pre-drawn up with the catheter)
k) Large incontinence pad
l) Single use disposable apron
m) Male catheter
n) Catheter bag (leg bag if appropriate for the patient)
o) Sterile universal container (if collecting urine sample)

Causes of Urinary Retention

Bladder
- Detrusor problems
- Bladder tumours
- Neurogenic bladder (e.g. spinal injuries, Parkinson's syndrome or Multiple Sclerosis)
- Damage to the bladder and bladder neck

Prostatic
- Benign prostatic hypertrophy
- Prostatic cancer
- Prostatitis

Penile
- Congenital urethral valves
- Phimosis
- Obstruction (e.g. tumour, stone or a stricture)

Other
- Pelvic malignancy
- Constipation
- Metastases
- Post-operatively
- Drugs (e.g. anticholinergics or psychoactive drugs)

Fig 6.5: Ensure you prepare your equipment

Explaining Catheterisation to the Patient

1. A urinary catheter is a tube that is placed into the bladder through the hole in the end of your penis, called the urethra, and attached to a bag that collects the urine
2. You will need to be exposed from your belly button to your knees and lie with your legs slightly apart
3. Initially, the genitalia will be cleaned and then some anaesthetic gel will be inserted into the urethral meatus to make the procedure more comfortable
4. The catheter will then be inserted and held in place using a balloon
5. It is really important that if you feel any pain that you tell a nurse or doctor immediately

Performing Catheterisation

Prepare Procedure Trolley

1. Clean your hands
2. Clean the trolley according to local policy
3. Place a sharps bin on the bottom of your trolley
4. Open a disposable rubbish bag and attach it to the side of the trolley
5. Gather your equipment and check the expiry dates
6. Open the catheterisation pack using a sterile NTT on the centre of trolley
7. Then open the packaging and drop the lubricant, sachets, gloves and catheter onto the aseptic field
8. Open the packaging of the catheter bag
9. If not pre-prepared, draw up sterile water using a 21-gauge needle and a 10 mL syringe. After use, place the needle in the sharps bin

Prepare the Patient

1. Expose and position the patient supine but keep them covered with a blanket or towel until just before the procedure, ensuring patient dignity
2. Put the incontinence pad under the patient
3. Wash your hands thoroughly, put on a single use disposable apron and put on sterile gloves
4. Place a sterile drape with central hole over the penis (leaving the penis exposed)

Asepsis and Anaesthesia

1. Ask assistant to empty both sterile water sachets into plastic pot
2. Soak the cotton swabs in water
3. Hold the penis with the non-dominant hand and retract the prepuce/foreskin. This hand is contaminated and should now not touch the aseptic trolley
4. With the right hand, clean the penis in circles beginning at the urethra and moving progressively outwards. Repeat this at least 3 times
5. Dispose of the swabs in disposable rubbish bag
6. Holding the penis in the non-dominant hand, apply some upwards traction and insert the tip of the lubricant syringe into the urethral meatus (Fig 6.6)
7. Administer the entire lubricant syringe, allowing some to coat the glans
8. Leave the lubricant for five minutes to take effect
9. Remove gloves, wash hands and put on second pair of sterile gloves

Fig 6.6: Use anaesthetic gel prior to catheter insertion

Inserting the Catheter

1. Place the disposable dish between the patient's legs so that once the catheter is in, urine does not spill onto the bed sheets
2. Hold the catheter between your thumb and forefinger in your dominant hand
3. Hold the base of the penis with the non-dominant hand. Apply gentle upward traction to the penis, while inserting the catheter with the other hand into the urethral meatus
4. Insert the catheter using a NTT by touching only the packaging, i.e. insert directly from sterilised packaging (without taking the catheter completely out of the packaging) (Fig 6.7)

Fig 6.7: Carefully insert the catheter

5. Use steady gentle pressure and never force a catheter
6. Advance the catheter until urine is seen to flow into the container
7. Then, once urine is seen to be draining, advance the catheter by another 2.5cm
8. If no urine is seen draining, advance the catheter to the fork at the end
9. Attach the sterile water syringe to the balloon port of the catheter and insert 10 mL slowly. STOP if there is pain or high resistance (Fig 6.8)
10. Attach the catheter to the catheter bag by removing the cap from the tubing and plugging the plastic tube end into the catheter (Fig 6.9)
11. Replace the prepuce
12. If there is a leg-bag, attach it to the leg. Larger collection bags may be attached to the side of the patient's bed
13. Clean the patient, remove the incontinence pad and ensure dignity by rearranging bed-clothes
14. Dispose of waste
15. Clean the trolley according to local policy
16. Remove gloves and decontaminate hands
17. Tell the patient to report any pain or other concerns to the nursing staff
18. Document insertion of catheter

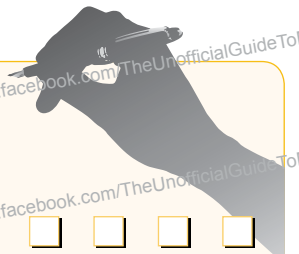
Fig 6.8: Inflate the balloon using sterile water into the side-port

Fig 6.9: Attach the drainage bag

Documenting the Procedure

You need to document the procedure in the medical notes (often a sticker from catheter pack is provided for this purpose). Document the procedure writing the following points:

- Consent obtained and chaperone present
- Date and time of insertion
- Reason for insertion
- Size, length and material of catheter
- Ease with which catheter passed
- Colour of urine drained
- Volume of sterile water inserted into balloon
- Residual volume of urine (5-10 minutes after insertion)
- Sign and print your name under your entry



Mark Scheme for Examiner

Introduction and General Advice

Introduces self (clean hands)

Identifies patient (3 points of ID)

Ensures that consent has been obtained

Explains procedure and identify concerns

Asks for a chaperone

Positions and exposes the patient

Chooses the correct size, material and type of catheter

Procedure Preparation

- Cleans hands
- Obtains equipment and checks expiry dates
- Cleans the trolley
- Prepares trolley and equipment
- If not provided, draws up sterile water into a syringe using a green needle

Procedure

- Washes hands, dons sterile gloves and apron
- Places sterile drape leaving the central hole for the penis
- Asks assistant to put sterile water into the plastic pot
- Cleans the genitalia including the urethral opening
- Administers the lubricant correctly
- Removes gloves, washes hands and puts on second pair of sterile gloves
- Places disposable dish between the legs to catch the urine
- Holds the penis in the non-dominant hand and applies upward traction
- Inserts the catheter slowly using a NTT until urine passes into the dish or pain/resistance is experienced
- Inflates the balloon with 10 mL sterile water (asks if this is painful and stops if it is)
- Connects catheter to catheter bag
- Replaces the prepuce
- Washes hands
- Informs patient to inform someone if any pain occurs
- Documents the procedure in the notes

General Points

- Continuous communication with the patient throughout the procedure
- Aseptic technique throughout
- Disposes of sharps and clinical waste appropriately

Questions and Answers for Candidate

When would you think about inserting a urethral catheter?

- To relieve urinary retention
- To monitor urine output in a critically ill patient
- To collect uncontaminated urine for diagnosis

What are the potential risks of urethral catheterisation?

- Infection
- Trauma
- Bladder spasm
- Paraphimosis

How could you damage urethral sphincters during urethral catheterisation?

- If the balloon was inflated in the urethra, this can lead to complete urinary incontinence

Q&A Additional Questions to Consider

1. What would you do if you met significant resistance when blowing up the catheter balloon?
2. When would you use a 3-way catheter?
3. How would you manage a patient who developed paraphimosis?
4. How would you perform suprapubic catheterisation?
5. When would you consider a trial without catheter?

Station 3: FEMALE URETHRAL CATHETERISATION

Mrs Shannon is a 75-year-old woman who comes into the Emergency Department in shock. You have been asked by your registrar to insert a catheter to monitor her fluid balance.

Objectives

- Learn how to perform female catheterisation

General Advice

The same general principles, equipment, explanation and preparation apply to female catheterisation as stated in the male catheterisation section. But remember:

- To place a sterile drape over the patient with the female external genitalia exposed
- Female catheters are shorter and normally smaller than male one – due to errors involved with insertion of female catheters in male patients, some trusts may only supply male catheters

Performing Catheterisation

Asepsis and Anaesthesia

1. Ask an assistant to empty both sterile water sachets into a plastic pot. Washes hands. Dons apron and gloves
2. Soak the cotton swabs in water
3. Hold the labia apart with the left (non-dominant) hand. This hand is contaminated and should now not touch the aseptic trolley
4. With the right hand, clean the external genitalia anteriorly to posteriorly. Repeat this at least 3 times
5. Dispose of the swabs in the disposable rubbish bag
6. Insert the tip of the lubricant syringe into the urethral meatus
7. Administer at least 6 mL of lubricant
8. Leave the lubricant for five minutes to take effect
9. Remove gloves, wash hands and put on second pair of sterile gloves

Inserting the Catheter

1. Place the disposable dish between the patient's legs so that once the catheter is in, urine does not spill onto the bed sheets
2. Hold the catheter between your thumb and forefinger in your dominant hand
3. Insert catheter using a NTT by touching only the packaging; i.e. insert directly from sterilised packaging (without taking the catheter completely out of the packaging)
4. Advance the catheter until urine is seen to flow into the container
5. Then, once urine is seen to be draining, advance the catheter by another 2.5 cm
6. If no urine is seen draining, advance the catheter to the fork at the end
7. Attach the sterile water syringe to the balloon port of the catheter and insert 10 mL. Stop if there is pain or high resistance
8. Attach the catheter to the drainage bag by removing the cap from the tubing and plug the plastic tube end into the catheter (Fig 6.10)

Fig 6.10: Female catheter in situ

Questions and Answers for Candidate

What factors affect the peak flow result?

- Quality of peak flow technique
- Degree of lung disease
- Height, age and gender

Why is a peak flow diary useful?

- To establish if there is diurnal variation in peak flow associated with asthma
- To establish if there are any environmental triggers associated with asthma

What are the typical changes in lung spirometry in asthma?

- If there is an obstructive defect
  - The FEV_1 is reduced
  - The FEV_1/FVC is reduced
  - >15% improvement in FEV_1 following a B_2 agonist or steroid trial, demonstrating reversibility of airway constriction

Additional Questions to Consider

1. What age group can peak flow be used for?
2. What is the British Thoracic Society's step-wise approach to management in asthma and when do you move up or down a step?
3. What are the differences between a severe and life-threatening asthma attack?
4. What would be your initial management in an acute asthma attack?

Station 2: INHALER TECHNIQUE

Mrs Page has come to your clinic with her 7-year-old son, Toby. He has recently been diagnosed with asthma and has been given inhalers. Please teach him how to use an inhaler and a spacer.

Objectives

- Learn inhaler technique
- Learn how to use a spacer device

Explaining the Inhalers to the Patient

- People who have been diagnosed with asthma use inhalers to help with their breathing. Some inhalers are used every day and some are just used when the patient gets wheezy or thinks they will get wheezy
- The different colours of the inhalers show that they do different things: (Fig 7.5)
  - The blue inhaler is a reliever and should be used when the patient is wheezy as he will feel an immediate improvement in his breathing. If he uses this more than three times a week, he needs to see his GP
  - The brown/orange inhaler is a preventer and should be used regularly. He will not notice a difference quickly with this inhaler, but it helps in the long term
  - Other colours may mean that the inhaler contains two different types of medication e.g. a purple inhaler

Fig 7.5: Inhalers come in all shapes and sizes

Inhaler Technique

After demonstrating inhaler technique to the patient, ask him to perform the procedure without instruction to check understanding and technique. Language used may need to be adjusted dependent on the child's level of understanding

1. Check the expiry date of the inhaler
2. Ask the patient to stand up or sit up straight and lift his chin
3. Shake the inhaler well
4. Take the cap off the inhaler (Fig 7.6)
5. Ask the patient to exhale completely
6. Ask the patient to place his lips firmly around the mouthpiece (Fig 7.7)
7. Ask the patient to press the canister as he starts to inhale slowly. Remove inhaler from mouth
8. Ask the patient to hold his breath for ten seconds and then breath out slowly
9. If more than one puff is required, wait ten seconds before repeating the process

Fig 7.6: Prepare the inhaler for use

- Inhalers last for about 200 puffs
- The inhalers have a use-by-date printed on the side; if this expires, a new inhaler is needed
- If the child is using their inhaler more than 3 times a week he needs to see his GP to assess his treatment options
- It is important that you inform patients that they must rinse their mouth out after using steroid inhalers to reduce the risk of oral candida

'Encourage patients to carry a blue reliever inhaler with them as well as having one at home as it is hard to predict when they become symptomatic'

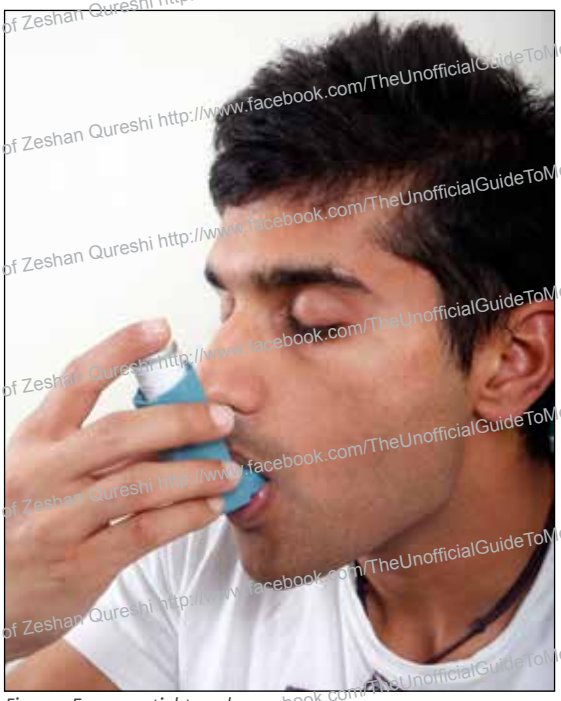


Fig 7.7: Ensure a tight seal

Using a Spacer

It is important to explain the advantages of using a spacer; i.e. that even with good inhaler technique, it is hard to inhale all of the medication and using a spacer makes this a much easier process as it removes the need to coordinate inhalation and activation

1. Check the expiry date of the inhaler
2. Ask the patient to stand up or sit up straight and lift his chin
3. Shake the inhaler well
4. Take the cap off the inhaler
5. Ask the patient to assemble the spacer and attach the inhaler to it (Fig 7.8)
6. Ask the patient to exhale completely
7. Ask the patient to place his lips firmly around the mouthpiece (Fig 7.9)
8. Ask the patient to press the canister to release a dose into the spacer
9. Ask the patient to take five slow, deep breaths
10. If more than one puff is required, wait 30 seconds before repeating the process

Fig 7.8: Assemble the equipment correctly

Make sure you inform patients about cleaning the spacer. It needs to be washed once a week in warm soapy water and left to air dry. Also, spacers need to be replaced every three to six months

Fig 7.9: Ensure a tight seal

There are different types of spacers. For example:

- Babyhaler: in <2 year-olds (with face mask) - does not have to be upright; listen for five clicks
- Volumatic: in >2 year-olds (with or without face mask) - should be seated upright
- Aerochamber with 3 different sized masks for infants, children and adults (now the most commonly prescribed spacer in the UK)

Mark Scheme for Examiner

Introduction and General Advice

Introduces self (clean hands)

Identifies patient (3 points of ID)

Ensures that consent has been obtained

Asks what the patient already knows and if they are on treatment already, ask them to demonstrate technique

Provides simple explanation of how a reliever inhaler works

Inhaler Technique

Checks expiry date

Removes cap and shakes inhaler

Sits upright or stands

Exhales

Seals lips around the mouthpiece

Inhales deeply and presses the canister to release the drug during inhalation

Removes the inhaler and holds breath for 10 seconds then breathes out slowly

Checks patient understanding

Asks the patient to demonstrate/repeat

Using a Spacer

Explains what a spacer device is and why it is used

Shakes the inhaler and attaches it to the aerochamber

Exhales completely. Seals lips around mouth piece. Presses canister once

Inhales slowly and deeply, repeat up to 4-5 times

Provides cleaning advice – rinse and air dry

Asks the patient to demonstrate/repeat

Asks the patient if they have any questions

Finishing the Consultation

Arranges a follow up appointment if necessary or offers contact details

Thanks the patient and close the consultation

General Points

Checks patient understanding throughout the consultation, avoiding medical jargon, and offers information leaflets

Maintains good eye contact; remains polite and engaged with the patient

Questions and Answers for Candidate

What are the side effects of inhaled steroids?

- Candida infection of the mouth
- Hoarseness

Rarely:

- Skin – easy bruising and thinning
- Weakened immunity – instruct patients that they should inform their doctors if ill

What are some important questions to ask a patient with chronic asthma?

- What are you like at your worst and how is your asthma normally?
- Have you ever been admitted to hospital with your asthma? What treatment did you receive?
- Have you ever been admitted to intensive care to help with your breathing?
- Do you use home oxygen, inhalers or nebulisers? Are you on any other medications for asthma?
- How many courses of steroids have you taken in the last year?
- Are there any specific triggers to your asthma?
- Have you had any chest infections in the last year?
- Can you demonstrate your inhaler technique?

Name two different types on inhaler available

- Metered dose inhalers
- Breath-activated inhalers – Autohaler, Easibreathe
- Dry powder inhalers – Accuhaler

Additional Questions to Consider

1. What is the difference between moderate, severe and life-threatening asthma?
2. What is the difference between type one and type two respiratory failure?
3. What are the differentials for a presentation of acute breathlessness in a five year old child?
4. Give some examples of possible triggers for an asthma exacerbation

Station 3: PREPARING BABY FORMULA MILK

Mrs Fenton is a 29-year-old with a two-month-old child. She has decided to stop breastfeeding and wants to use baby formula milk. Please demonstrate to her how to correctly prepare baby formula milk.

Objectives

- Preparing baby formula milk

Explaining Preparing Baby Formula Milk

- Preparing milk in a sterilised manner is vital. Although rare, bacterial infections in infants can be life-threatening
- The main method used to reduce the risk of bacterial infection is to prepare each feed with boiling water, as this kills any potentially harmful bacteria
- It's critical to remember to cool the water fully before giving the feed to the infant

Preparation

- Ensure you wash your hands with soap and water before handling any of the equipment needed
- All equipment must be sterilised before each use
- Clean the work surface before you prepare the formula milk

PAEDIATRICS