

Management of Safe Anaesthesia

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2. Introduction

Facilities and resources for anaesthetic practice may vary from hospital to hospital. Junior medical officers in anaesthetics are expected to anaesthetise ASA I and II patients. These guidelines are to correctly guide and help the anaesthetic medical officers. Whenever there is a need for further clarification and advice, they should not hesitate to discuss with the consultant anaesthetist of the hospital or the nearest hospital in case there is no consultant cover in the local hospital.

2.1 ASA classification

ASA Grading	
Grade 1	“Normal healthy patient” (without any clinically important co-morbidity and without any clinically significant past/present medical history).
Grade 2	“A patient with mild systemic disease that does not limit activity”
Grade 3	“A patient with severe systemic illness that limits physical activity”
Grade 4	“ A patient with severe systemic disease that is a constant threat to life”
Grade 5	“ Moribund patient”

3. Pre operative assessment

3.1 Introduction

Consultation by an anaesthetist is essential for the medical assessment of a patient prior to anaesthesia for surgery or any other procedure to ensure that the patient is in optimal condition for the procedure. These guidelines apply to the care of all patients who require anaesthesia. In unusual circumstances e.g. extreme emergencies these guidelines may need to be modified and the reasons for so doing must be documented in patients' records.

3.2 General principles

- All patients should be seen by an anaesthetist before undergoing an operation that requires the services of an anaesthetist. Ideally this should be the doctor who is to give the anaesthetic.
- The responsibility for ensuring that appropriate pre op assessment has been carried out rests with the most senior anaesthetist for the given operating list.
- If that person is a trainee or non consultant grade advice must be taken from a duty consultant.
- All patients should have had a basic physical examination of the cardiovascular and respiratory system by a medical practitioner

3.3 Purpose of pre-operative assessment

This enables the identification of those patients who require:

- Few or no pre op investigation
- Targeted investigations, the results of which must be available when the anaesthetist visits the patient in the immediate pre operative period.
- Further assessment or referral after specific investigations.

3.3.1 Objectives of pre -operative assessment

1. Identify potential anaesthetic difficulties
2. Identify existing medical conditions
3. Improve safety by assessing and quantifying risk.
4. Allowing planning of pre -operative care
5. Provide opportunity for explanation and discussion
6. Allaying fear and anxiety

3.3.2 The anaesthetic pre- op assessment clinic (if available in your hospital)

- This provides the opportunity for anaesthetist to see those patients who have been identified by screening and assessment as presenting potential anaesthetic problems by non anaesthetic medical officer.
- The anaesthetic pre operative assessment clinic should preferably involve a consultant anaesthetist/ a senior medical officer in anaesthesia
- The hospital must be fully resourced with staff and equipment facilities for X-ray, ECG, and other pre operative testing.
- Patient should ideally be seen within two weeks before admission for surgery

Pre – Op Clinic

- Patient known to have an anaesthetic problem can be assessed by an anaesthetist
- Preferably run by a consultant / senior MO Anaesthesia
- Facilities for relevant investigations should be available
- Assessment probably 2/52 prior to surgery

3.3.3 The role of the anaesthetist

- The anaesthetist is responsible for deciding whether a patient is fit for anaesthesia.
- With previously screened healthy patients the anaesthetist must check the results of screening and other pre op testing on the day of surgery or on the previous day.
- Any test performed pre operatively must be available to and read by the anaesthetist
- The anaesthetist should explain the proposed anaesthetic procedure and advantages and complications of anaesthetic technique to the patient.
- Discussion of postoperative pain strategy and requirement for monitoring intravascular lines and other invasive procedures should also be done.

The role of the anaesthetist

- The Anaesthetist should decide whether the patient is fit for anaesthesia.
- Pre- op tests must be available read by the anaesthetist.
- The patient should be explained of the proposed anaesthetic technique and post op pain strategy

3.4 Investigations

- Urine ward test- for all
- ECG – all with HT/IHD/DM/ CVA/ valvular HD
 - Male >40 yr
 - Female > 50 yr
- Full blood count
 - Males > 40 yr
 - All Females
 - All moderate and major surgery
 - If anemia is suspected
- Fasting blood sugar
 - Age >40 yr
 - Obesity
 - Known diabetic or F/H of DM
 - Steroid therapy
 - Non healing ulcers
- Chest X- ray
 - CVS and RS disease
 - Risk of pulmonary TB
 - Malignant disease
- Coagulation screen
 - History of bleeding disorder
 - anti coagulant therapy
 - liver disease
- Echocardiogram
 - cardiac symptoms and signs
 - Abnormal ECG
- Electrolyte (creatinine if possible)
 - Age >60 yr
 - Major surgery
 - Diuretic therapy
 - Renal diseases

3.5 Fasting Policies

Minimum fasting guidelines based on the American Society of Anaesthesiologists:

- 6hrs for solid food infant formula or other milk
- 4 hr for breast milk
- 2 hr for clear non particulate and non carbonated fluids

Patients who have undergone bowel preparations, sick patient, children and breast feeding mothers should not be left for long periods without hydration. They may require intravenous fluids prior to surgery.

Minimum Fasting Guidelines

- 6hrs - solid food infant formula or other milk
- 4 hr - breast milk
- 2 hr - clear non particulate and non carbonated fluids

See preoperative preparation and immediate postoperative care guidelines for further details

4. Minimum resources that should be available when administering an anaesthetic

4.1 Drugs

4.1.1 Anaesthetic drugs

- **Induction agents** – Thiopentone sodium, (Ketamine, Propofol, Etomidate)
- **Sedative drugs** – midazolam
- **Analgesics** – Pethidine, Morphine,(Fentanyl)
- **Muscle relaxants** – Suxamethonium, Atracurium, (vecuronium)
- **Inhalational agents** – Halothane
- Neostigmine, Atropine
- 2% lignocaine (20ml bottle)
- 0.5% plain bupivacaine(10ml ampoule)
- 2% lignocaine (2/5ml ampoule)
- 0.5% heavy bupivacaine (4ml ampoule)
- Ephedrine (phenylephrine)
- Metoclopramide

4.1.2 Emergency drugs

- Adrenaline 1:1000
- Amiodarone, Xylocard
- Aminophylline, Hydrocortisone, Salbutamol solution for nebulisation
- Naloxone
- Promethazine, Chlorpheniramine
- Dopamine, Dobutamine
- Calcium Gluconate
- Frusemide, KCl
- Dexamethasone
- 25% dextrose

4.2 Equipment

- Anaesthetic machine
- Adequate number of O₂ and N₂O cylinders
- Breathing circuits – Mapleson A, D, F and circle
- Anaesthetic ventilator
- Defibrillator
- Multi monitor with NIBP, ECG, SpO₂ and ETCO₂
or sphygmomanometer, ECG, pulse oximeter and
capnometer separately
- Suction apparatus with suction handles
- Endotracheal tubes of all sizes (number depending on surgical
population)
- Facemasks of all sizes
- Oropharyngeal airways of all sizes
- Tracheostomy tubes
- Laryngeal mask airways
- Two or more functioning laryngoscopes with three sizes
of blades
- Stillettes, gum elastic bougie
- Spinal needles, pencil point type, 25G or smaller
- Syringes – 2, 5, 10, 20ml
- Cannulae - 24 – 14G
- Gloves

4.3 Personnel

4.3.1 If specialist services are available –

Any child less than 5 years, any patient with significant medical problems, complicated surgery, needing anaesthesia, the consultant should be informed and further plan of action to be discussed and agreed with the consultant anaesthetist.

4.3.2 If specialist services are not available –

There should always be 2 MO anaesthetists when anaesthetizing children

<1 year – only **minor surgery** (I & D).

Routine surgery should be transferred to nearest hospital with consultant cover.

Major surgery if life saving should be undertaken and consultant anaesthetist at closest hospital contacted for any advice needed.

1 – 3 years – **minor surgery** such as I & D could be anaesthetized.

Urgent surgery could be undertaken if the MOs are capable and confident of safely anaesthetizing the child. If they are uncomfortable with the situation, they should transfer the child to the closest hospital with consultant cover.

Major surgery if life saving should be done.

>3 years – should be able to anaesthetize most minor **uncomplicated**

routine (hernia, hydrocele , circumcision, dermoid cyst) and casualty patients. If anaesthetic or surgical complications anticipated, should discuss with consultant anaesthetist in the closest hospital

Paediatric Anaesthesia

■ **Specialist service available** – < 5 years, should be informed to the consultant

■ **Specialist service not available** – 2 MO anaesthetists competent in paediatric anaesthesia should always be available.

<1 year – only **minor surgery** (I & D).

- life saving major surgery – contact consultant anaesthetist of the closest hospital for advice
- Routine Surgery - Transfer.

1 – 3 years

- **Urgent surgery**-if the MOs are confident and capable
- **Major surgery** if life saving should be done.

>3 years –

- Minor **uncomplicated routine surgery** discuss with consultant anaesthetist of the nearest hospital if problems are anticipated.

5 Checking the anaesthetic machine

Checking the machine before starting each list is the responsibility of the anaesthetist. If any problem occurs to the patient (eg. hypoxic brain damage due to O₂ failure, delayed recovery due to inadvertent administration of high concentrations of inhaled anaesthetics) the anaesthetist could be held responsible.

Checking the Anaesthetic Machine

Mandatory before starting each list

- Electrical supply
- Gas supply
- O₂ analyzer
- Manoeuvres to prevent delivery of a hypoxic mixture
- Flow meters
- Vapourizer
- Circuits
- Monitors
- Suction apparatus
- Ventilator

5.1 Electrical supply – check that the anaesthetic machine is connected to the mains and is switched on.

5.2 Gas supply –

Oxygen analyzer if available should be attached to the common gas outlet.

5.2.1 Pipe line supply-

- i. Check for O₂ and adequate supplies of other gases (N₂O/air).
- ii. Check that connections are appropriate and confirm with TUG test.
- iii. Check all pipeline pressure gauges indicate 400 kPa.
- iv. Check that the reserve O₂ cylinder is available attached to the machine.

5.2.2 Cylinder supply-

- i. Open only the O₂ cylinder and check the cylinder gauge (136 x100 KPa/136bar).

5.3 O₂ analyzer

5.3.1 Open the Rota meter to 6L/min.check analyzer. Should reach 100%

5.4 Manoeuvres to prevent delivery of a hypoxic mixture

5.4.1 Turn off the O₂ cylinder with the rota meter open, the O₂ failure alarm should sound.

5.4.2 Turn on the N₂O cylinder 6L/min; check the pressure gauge (50KPa x100/ 50 bar). No gas should flow through the O₂ rota meter; O₂ analyzer should reach 50%.

5.4.3. Turn on the O₂ cylinder with O₂ rota meter still closed, O₂ may flow if fitted with a minimum O₂ flow device (250ml).

5.4.4 Turn on the N₂O rota meter only. See if the O₂ flow occurs at a ratio of 1/3 (O₂ /N₂O)

5.5 Flow meters

- 5.5.1 Ensure that each flow control valve operates smoothly.
- 5.5.2 Ensure the bobbin moves freely throughout its range.
- 5.5.3 Check the operation of the emergency O₂ bypass

5.6 Vapourizer-

- Ensure each vaporizer is adequately filled
- Ensure correct seating of the vaporizer on the back bar, (not tilted)

5.6.1 Check the vaporizer for leak. (with the vaporizer off) by temporarily occluding the common gas outlet.

5.6.2 Check for leak immediately after changing any vaporizer.

5.7 Circuits –

Magill, circle, Bain and Mapleson F breathing systems should be checked.

5.7.1 Magill circuit-

The pressure relief valve (APL valve) should be closed, and the patient end is occluded and the oxygen flush pressed. If there are no leaks, the reservoir bag should fill.

5.7.2 Bain circuit-

Correct functioning of the Bain circuit is dependent on the integrity of the inner tube.

- The system must be checked for damage visually. Visual check is not sufficient
Pethick test should be performed before use.

- **Pethick** test for integrity of the inner tube-
 1. Fill the bag with the patient port occluded
 2. Press on the oxygen flush whilst removing the occlusion
 3. If the inner tube is intact , the flush of gas from the inner tube causes collapse of the reservoir bag by venturi effect
 4. If the inner tube is not intact, the reservoir bag will fill further

5.7.3 Circle circuit-

Check integrity of the one way valves (two bag test)

Attach a 2 litre bag to the patient end of the circle system

With a FGF of 6L/min:

Squeeze the bag on the machine:

The bag at the patient end should fill

One way valve on the inspiratory limb should open, and one way valve on the expiratory limb should remain shut.

Squeeze the bag at the patient end;

The bag at the machine end should fill,

One way valve on the expiratory limb should open, and one way valve on the inspiratory limb should remain shut

Leaks in the circuit with the absorber in the “on” position only, are due to leaks in the canister, due to overfilling or loose connections.

If the leak cannot be corrected the circuit can still be used. But with high flows (5l/min) as given below.

Check efficiency of the soda lime by the colour of the indicator

5.8 Check monitors (SpO₂, ETCO₂, NIBP)

5.9 Check suction apparatus is connected to the mains and functioning.

5.10 Check ventilator

Connections to mains, alarms and settings.

6. Minimum monitoring standards

Minimum monitoring depends on the type, duration of surgery and patient factors (ASA III, IV, V)

6.1 The **presence of an anaesthetist** through out surgery is essential for general, regional and monitored anaesthesia.

The maintenance of a monitoring chart, with maximum details is the responsibility of the anaesthetist.

Minimum monitoring includes monitoring clinical parameters and of equipment monitoring.

6.2 Clinical monitoring.

6.2.1 Blood and tissue oxygenation by assessing the colour of the blood in the surgical field, mucus membranes or conjunctiva under good light.

6.2.2 Ventilation- by chest expansion, excursion, tension and movement of reservoir bag , auscultation of breath sounds.

6.2.3 Circulation- by palpation of the pulse for volume, rate and rhythm, capillary refill time, temperature of extremities, and urine output for extensive surgery.

6.3 Equipment monitoring.

6.3.1 Non invasive

- NIBP
- SpO₂
- ECG
- ETCO₂
- Temperature

- Peripheral Nerve Stimulator (PNS).

6.3.2 Invasive

Direct arterial BP, CVP and PAC (pulmonary artery catheter as required)

Minimum monitoring Standards

- **Presence of an anaesthetist**
- **Maintenance of a monitoring chart**
- **Clinical monitoring:**
 - o Colour of the blood in the surgical field, mucus membranes
 - o Ventilation- chest expansion, excursion, tension and reservoir bag , auscultation
 - o Circulation- pulse, capillary refill, temperature and urine output
- **Equipment monitoring:**
 - o Non invasive
 - § NIBP, SpO₂, ECG, ETCO₂ (Mandatory) **X**
 - § Temp and Peripheral Nerve Stimulator (PNS). **Y**
 - o Invasive
 - § Direct arterial BP ,CVP, PAC (pulmonary artery catheter as required) **Z**

7. Guidelines for administration of subarachnoid anaesthesia for non obstetric patients

7.1 Introduction

These guidelines apply to the use of subarachnoid anaesthesia. They are intended to encourage quality patient care but cannot guarantee any specific patient outcome. As the availability of anaesthesia resources may vary, members are responsible for interpreting and establishing the guidelines for their own institutions and practices. These guidelines are subject to revision from time to time as warranted by the evolution of technology and practice.

7.2 Regional anaesthesia should be initiated and maintained only in locations in which appropriate resuscitation equipment and drugs are immediately available. :

- 1) Source of oxygen
- 2) Equipment to maintain an airway and perform endotracheal intubation and suction
- 3) A means to provide positive pressure ventilation
- 4) Drugs and equipment for cardiopulmonary resuscitation

Following drugs should be drawn up, diluted appropriately & labeled

Atropine 0.1mg/ml &

Any one of the following drugs

Ephedrine 6mg/ml , Meteraminol 0.5mg/ml

Phenylephrine 10mg/500ml n. saline as an infusion titrated to the response

Sub arachnoid anesthesia for non obstetric patients

- Appropriate resuscitation equipment readily available
- Draw up and label Atropine 0.1 mg/ml, Ephedrine 6mg/ml, Meteraminol 0.5mg/ml or Phenylephrine 10mg/500ml N/Saline.
- Examine, explain, exclude contraindications and obtain consent from the patient
- Intravenous infusion with a cannula (18 gauge or bigger).
- Monitoring should be applied
 - BP, SpO₂, ECG
- Communication with the patient
- Strict aseptic conditions should be applied (Mask & cap, scrubbed, gowned & gloved)
- Pencil point needles (25 G or smaller)
- Check the level of the block
- Monitor until post anesthesia condition is satisfactory.

7.3 Regional anesthesia should not be administered until:

- 1) The patient has been examined by a qualified medical personnel
- 2) Explained of the procedure and properly consented. An intravenous infusion should be established before the initiation of regional anesthesia and maintained throughout the duration of the regional anaesthetic (18 gauge or bigger).

7.4 The standards for basic anaesthetic monitoring should be applied

- BP
- SPO₂
- ECG

Communication with the patient should be maintained throughout the procedure

7.5 Administration of spinal anaesthesia

Strict aseptic conditions should be applied

- Mask & cap
- Scrubbed
- Gown & gloves

Pencil point needles with a gauge of 25 or smaller are recommended to reduce spinal headache.

Choice of the local anaesthetic & the dosage may vary depending on the availability, condition of the patient & type of surgery. Check all the drugs for accuracy & the date of expiry before use.

The skin should be cleaned with chlorhexidine and spirits and allowed to dry

7.6 Checking of the level

- Appropriate level of block should be achieved (2-3 segments above the surgical incision).
- The level of the block should be checked (with temperature (cold spray), pain, & touch) before commencing surgery
- The anaesthetist should remain with the patient during the regional anaesthetic until the patient's post anaesthesia condition is satisfactory and stable.
- All patients recovering from regional anaesthesia should receive appropriate post anaesthesia care; the standards for post-anaesthesia care should be applied

7.7 Complications

7.7.1 Inadequate block

- Lower the head end and / remove pillow allow 5-15minutes & reasses continously
- Supplement with IV sedation, opiates or light GA as appropriate
- Convert to GA

7.7.2 Failed block

- Repeat the procedure
- Convert to GA
- If GA is not feasible call senior help/ postpone

7.7.3 PDPH-(Post Dural Puncture Headache)

Complications

- Inadequate block
- Failed block
- Post Dural Puncture Headache
- High Spinal Block
- Nerve Damage
- Meningitis

Signs and symptoms-

- Headache usually occurs 12 to 48 hours after the procedure. The headache is typically described as throbbing in nature in the frontal and occipital regions and may be associated with neck stiffness, tinnitus, deafness, photophobia or diplopia. The defining feature of a PDPH is usually its relationship to posture. It is classically worse in the upright position and better or absent in the supine position.

Management of headache-

- If no headache is present, allow the patient to mobilise. Lying flat in bed will not prevent the incidence of post-dural puncture headache.
- If a postural headache develops, encourage oral fluid intake, oral analgesics, and bed rest. CSF production is not influenced by excessive fluid intake.
- Consider oral caffeine .As we do not have oral caffeine benzoate consider giving coffee, tea or coke.

Caffeine is a cerebral vasoconstrictor and has been shown to decrease cerebral blood flow for up to 90ml/min. It may help to treat the cerebral vasodilatory phenomenon that is thought to contribute to the headache.

- Consider delayed blood patch (20 ml of the patient's blood through an epidural needle) after 24 hrs if postpartum or if the headache is severely limiting normal activities.

Prophylactic blood patch has not shown decrease in the morbidity.

Management of post-dural puncture headache

- o Encourage oral fluid, oral analgesics, and bed rest.
- o Consider oral caffeine (coffee, tea or coke.)
- o Blood patch by a consultant anaesthetist.

Procedure:

- Always consult anaesthetic consultant.
- The patient must be apyrexial - otherwise do not perform a blood patch.

- Give a full explanation to the patient of the reasons for performing a blood patch. Explain that it is completely successful in 50% and partially in 39 % of patients on the first attempt. The complete success rate can go up to 70% if a blood patch is performed for the second time. Please warn patients that there may be pain referred to the leg or hip as well as back pain during and immediately after the blood patch procedure.
- Two people are needed, both scrubbed and gowned. Perform an epidural as close to the original puncture site as possible. (MRI scans have shown that a blood patch spreads about 3 segments above and 1 segment below the injection site). When the epidural space has been found, take 20 ml of the patient's blood aseptically.
- Inject 20 ml of blood over 1 minute. The larger the volume the better the result. Flush the epidural needle with 2ml of saline after the injection of blood, prior to the removal of the epidural needle.
- Ask the patient to lie flat for 2 hours. Then cautiously mobilise.
- Check the temperature regularly for 24 hours.
- If the headache does not resolve after a blood patch or recurs after an initial successful blood patch, refer to a consultant. A 2nd blood patch may be needed. The use of a blood patch does not affect the future success of a subsequent epidural block.

7.7.4 High spinal

See Obstetric protocol

7.5 Nerve damage

7.7.6. Meningitis

Prevention of Meningitis following subarachnoid block

- o Strict asepsis
- o Use only recommended sterile solution
- o Follow up until discharge
- o Look for fever, unusual headache, neck stiffness, photophobia and other neurological signs.
- o If suspected refer to consultant physician/ neurologist

- Prevention

Strict aseptic conditions maintained

Recommended sterile solution for SAB should be used

0.5% hyperbaric bupivacaine

0.5% isobaric bupivacaine

Fentanyl

Morphine 2mg /2 ml

- Follow up

To be done until discharge.

Look for fever, unusual headache, neck stiffness, photophobia, Signs and symptoms of other neurological symptoms in any suspected patient

- If there is any suspicion of meningitis contact the consultant physician/ consultant neurologist in the hospital/ province

8. Prevention of endocarditis¹ in patients with heart-valve lesions, septal defect, patent ductus, prosthetic valve, or history of endocarditis

8.1 Introduction

Prevention of endocarditis should always be considered in the following conditions. These guidelines are adopted from British National Formulary, Feb 2006.

- Prosthetic Heart Valve
- History of Bacterial endocarditis
- PDA
- Coarctation of Aorta
- Complex cyanotic congenital heart disease
- Complex congenital lesions after correction
- Congenital cardiac malformations, ASD/VSD, Bicuspid Aortic Valve,
- Acquired Aortic/Mitral Valve dysfunction,
- HOCM, MVP with Valvular regurgitation or thickened leaflets,
- Surgically constructed systemic pulmonary shunts.

8.2 Dental procedures² under local or no anaesthesia

8.2.1 Patients with no special risks

Patients who have not received more than a single dose of a penicillin³ in the previous month, including those with a prosthetic valve (but not those who have had endocarditis)

Adults : oral amoxicillin 3g 1hour before procedure

Children : 5 - 10 year - half adult dose

Under 5 years - quarter adult dose

8.2.2 Patients with special risks

Patients who have had endocarditis

Amoxicillin + gentamicin, as under general anaesthesia

Patients who are penicillin-allergic or have received more than a single dose of a penicillin³ in the previous month

Adults : oral clindamycin⁴ 600 mg 1hour before procedure

Child : 5 - 10 years - clindamycin⁴ 300mg or azithromycin⁵ 300mg

Under 5 years - clindamycin⁴ 150mg or azithromycin⁵ 200 mg

8.3 Dental procedures² under general anaesthesia

8.3.1 Patients with no special risks

No special risk (including patients who have not received more than a single dose of a penicillin in the previous month)

adults : i.v. amoxicillin 1g at induction, then oral amoxicillin 500mg 6 hours later

child : 5 - 10 years - half adult dose or oral amoxicillin 3g 4hours before induction then oral amoxicillin 3g as soon as possible after procedure.
under 5 years - quarter adult dose.

8.3.1 Patients with special risks

Special risk (patients with a prosthetic valve or who have had endocarditis)

Adults : i.v. amoxicillin 1g + i.v. gentamicin 120mg at induction, then oral amoxicillin 500mg 6 hours later

Child : 5 - 10 years- amoxicillin half adult dose, gentamicin 2 mg/kg under 5 years- amoxicillin quarter adult dose, gentamicin 2 mg/kg;

8.3.2 Patients who are penicillin-allergic or who have received more than a single dose of a penicillin in the previous month

Adults either i.v. vancomycin 1g over at least 100minutes then i.v. gentamicin 120mg at induction or 15minutes before procedure

Child under 14 years - teicoplanin 6mg/kg. gentamicin 2mg/kg or i.v. clindamycin⁴ 300 mg over at least 10 minutes at induction or 15 minutes before procedure then oral or i.v. clindamycin 150mg 6 hours later.

under 10 years- vancomycin 20mg/kg, gentamicin 2mg/kg or i.v. teicoplanin 400mg + gentamicin 120mg at induction or 15minutes before procedure.

5 - 10 years - half adult dose

under 5 years - quarter adult dose

8.4 Upper respiratory-tract procedures

As for dental procedures; post-operative dose may be given parenterally if swallowing is painful.

8.5 Genito-urinary procedures

As for special risk patients undergoing dental procedures under general anaesthesia except that clindamycin is not given above; if urine infected, prophylaxis should also cover infective organism

8.6 Obstetric, gynaecological and gastro-intestinal procedures

Prophylaxis required for patients with prosthetic valves or those who have had endocarditis only, as for genito-urinary procedures

1. Advice on the prevention of endocarditis reflects the recommendations of a Working Party of the British Society for Antimicrobial Chemotherapy, *Lancet*, 1982, 2. 1323—26; *idem*, 1986. 1, 1267; *idem*. 1990. 335. 88—9; *idem*. 1992. 339. 1292—93. *idem*. 1997, 350. 1100; also *J Antimicrob Chemother*, 1993; 31 437—8
2. Dental procedures that require antibacterial prophylaxis are - extractions, scaling, and surgery involving gingival tissues. Antibiotic prophylaxis for dental procedures may be supplemented with chlorhexidine gluconate gel 1% or chlorhexidine gluconate mouthwash 0.2% used 5 minutes before procedure. Oral antibacterial should be taken in the presence of a dental surgeon or a dental nurse
3. For multistage procedures a max. of 2 single doses of a penicillin may be given in a month. Alternative drugs should be used for further treatment and the penicillin should not be used again for 3—4 months

- 4 If clindamycin is used, periodontal or other multistage procedures should not be repeated at intervals of less than 2 weeks; clindamycin is not licensed for use in endocarditis prophylaxis but it is recommended by the Endocarditis Working Party
- 5 Azithromycin is not licensed for use in endocarditis prophylaxis but it is recommended by the Endocarditis Working Party.

Cardiac Conditions that are considered as low risk of endocarditis for which Prophylaxis not recommended

- Isolated secundum ASD
- Surgically repaired ASD/VSD/PDA (without residual defect 6 months after repair)
- MVP without regurgitation / Thickened valve leaflets
- Physiological / functional murmurs
- Cardiac Pacemaker/ implanted defibrillator
- After coronary by pass surgery.

9. Guidelines for rapid sequence induction.

9.1 Rapid sequence induction is a method of inducing general anaesthesia in patients who are at risk of aspirating gastric contents into the lungs. (induction followed by intubation)

Aim - to shorten the period from loss of consciousness to securing of airway and to minimize risk of regurgitation during this period

Rapid Sequence Induction (RSI)

- Reduces the risk of aspirating gastric contents into the lungs.
- Shortens the time periods from loss of consciousness to securing the airway.

Indications for RSI

- Abdominal pathology (intestinal obstruction or ileus or any inflammatory pathology)
- Delayed gastric emptying (trauma, opioids)
- Incompetent lower oesophageal sphincter
- Impaired laryngeal reflexes
- Neuromuscular diseases
- Pregnancy
- Autonomic neuropathy as in long standing diabetics

9.2 Preparation of the patient

- Fasting – There should be an adequate period of fasting where possible.

This should be 6 hours for solids and formula milk, 4 hours for breast milk and 2 hours for clear fluids.

But in the presence of significant pain and anxiety, there could be a delay in gastric emptying even though the fasting time is adequate.

Antacids and gastric prokinetic drugs should be given. The consequences of aspiration depend on the volume and acidity of the gastric contents. Drugs should be given to reduce the acidity and the volume, where ever appropriate.

For elective surgery:

Ranitidine 150mg and metoclopramide 10mg, orally 2 hours before surgery

For emergency surgery:

Ranitidine 50mg and metoclopramide 10mg, i.v. ½ an hour before surgery

(According to manufacturer’s advice, famotidine should be avoided in pregnancy unless the potential benefits outweigh the risks)

0.3M Sodium Citrate solution, freshly prepared, 15 – 30ml just before induction to neutralize the gastric contents

Insertion of a nasogastric tube to remove gastric contents, where appropriate, such as with intestinal obstruction.

9.3 Preparation of equipment

- Prepare drugs, airway equipment and personnel to assist during the procedure
- Drugs – pre-calculated dose of induction agent, suxamethonium (1.5mg/kg) and opioid analgesic as appropriate (avoid in Caesarean sections) should be prepared in addition to the emergency drugs
- Equipment – 2 functioning laryngoscopes, range of endotracheal tubes, oropharyngeal airways, facemasks, laryngeal mask airways and the difficult intubation trolley should be at hand. The trolley should be tiltable and suction apparatus should be switched on at induction.

9.4 Personnel

- A person trained in applying cricoid pressure accurately should be present. (cricoid cartilage should be identified and held firmly between thumb and middle finger. Index finger should be used to apply approximately 20N pressure directly backwards. Other hand can be placed behind the neck to stabilize it.)
- Procedure should be explained to the patient and cricoid pressure applied with the loss of eyelash reflex. This should not be removed until the trachea is intubated, cuff inflated and the proper position of the endotracheal tube confirmed.
- **If there is active vomiting, cricoid pressure should be released to avoid the danger of oesophageal rupture.**
- If cricoid pressure is preventing visualisation of the vocal cords and thereby causing failure to intubate, cricoid pressure should be released.

Preparation for RSI

- **Patient**
 - Adequate fasting when possible
 - Antacids and gastric prokinetics
 - NG tube where necessary
- **Equipment**
 - Airway equipment
 - Tiltabe table
 - Suction apparatus switched on
- **Drugs**
 - Precalculated dose of induction agent
 - Suxamethonium 1.5mg/Kg
 - Opioids as appropriate (not in pregnancy)
 - Emergency drugs
- **Personnel**
 - Person trained to apply cricoid pressure

Cricoid Pressure

- Should be explained to the patient
- Apply with the loss of eyelash reflex
- Released only when
 - Trachea intubated
 - Cuff inflated
 - Proper position of the ET tube confirmed
- Special circumstances to release cricoid pressure
 - Active vomiting (to prevent oesophageal rupture)
 - Cricoid pressure is preventing visualization of vocal cords

Procedre

- Position the patient in the best intubating position.
- Attach monitoring and get baseline values.
- Obtain IV access and attach a running drip.
- Preoxygenate the patient with 100% oxygen for 5 minutes or 3 vital capacity breaths (using Magill breathing system with an oxygen flow of 6L/min.)
- Administer precalculated dose of appropriate induction agent, followed immediately by suxamethonium.
- Do not manually ventilate but continue to hold the face mask so that 100% oxygen can enter the lungs due to mass flow until the patient is paralysed.
- Once the fasciculations cease, laryngoscope patient and pass endotracheal tube through the vocal cords and immediately cuff the tube.
- Confirm proper placement of the tube
- Release the cricoid pressure and turn the anaesthetic gases
Remember to perform a fully awake extubation (in the lateral position if possible) since these patients are at risk of regurgitation and aspiration during recovery

Teaching/General/ Base Hospital
Anaesthetic Record

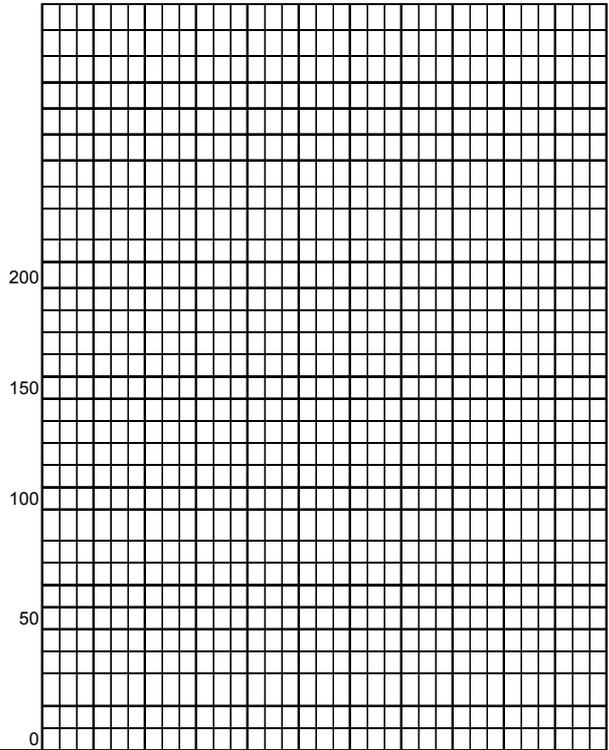
To be filled by Ward Staff		Surgeon	
Patient Details		Weight Temp Pulse BP Urine Analysis Last Oral Intake Consent for Op	Blood group Units crossmatched
BHT No	Ward		
Name			
Date of Birth	Age		
Proposed Operation		Mode of Anaesthesia	
Preoperative Assessment		Allergies	
Presenting Complaint		Airway Dentition Malampathy Thyromental Neck movement	
CVS		Investigations Hb	
RS		RBS	
Other Medical problems		Blood Urea Serum Electrolytes Na ⁺ K ⁺	
Drugs		CXRAY	
Previous Anaesthetics		ECG	
Problems anticipated		Platelet	
		PT/APTT/INR	
		USS	
Pre Anaesthetic Instructions			
ASA Grade			
Name of the Anaesthetist			Date

Operation						Surgeon					
Drugs											

Monitoring
Saturation
ETCO₂
Airway Pressure
Agent
Temparatue
ECG
CVP

Vascular Access
Peripheral
Central
Arterial

Position
Supine
Prone
Lithotomy
Trender
Lateral
Seated



Blood Loss	
Urine	
IV fluid	

<i>Fluid loss</i>		
Pre op deficit		
Maintanance		
Evaporation		
3rd space loss		
Blood loss		
Ascitic fluid		
NG aspiration		
Pleural fluid		
Total		

<i>Fluid intake</i>	
Crystalloids	
Colloids	
5% dextrose	
Blood	
Total	

Regional Technique

Date	Procedure	Surgeon	Anaesthetist
Consent IV Line Monitoring Technique Sitting/Lateral level Needle size/catheter size/ c level. Cap/gown/mask/gloves/syringes Sensory level Drugs Other treatment/other regional Technique		Complications Failure Inadequate block Hypotension Bradycardia/ Arrythmia High spinal Pruritus Dural tap Bloody tap Restlessness Others	

Post operative Instructions Monitoring Oxygen Nil by Mouth Pain relief IV fluids Special Investigations	Recovery CVS Pulse BP RS Airway Breathing Spo2 CNS LOC Pain BLEEDING DRAINS Complications in recovery Date Time Signatue of N/O Signature of Anaesthetist
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