Department of Anaesthesia

Anaesthetists Handbook

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This handbook has been approved by the Department of Anaesthesia and the clinical director for anaesthesia. My thanks are due to those of my colleagues who have advised on or provided content or appraised sections. Further copies are available from the Anaesthesia Office at the University Hospital, Coventry.

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The guidelines within are presented in good faith and are believed to be accurate. The responsibility for actions and drug administration remains with the clinician concerned.

All sections have been written by me except where otherwise indicated, with amendments by appraisers. All sections have been appraised by me except where otherwise indicated, and reviewed by Dr Falguni Choksey.

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Introduction and scope of guidelines

[Appraised by Dr Edwin Borman, January 2010]

Welcome to the Department of Anaesthesia.

We all hope that you will enjoy your time in University Hospitals Coventry and Warwickshire, and find it a useful part of your training, education and development as an anaesthetist.

This handbook is provided to ease the process of settling in to the department and familiarise you with the work in Coventry and Rugby. It contains important information that is essential for your practice in Coventry and Rugby. This handbook is for all anaesthetists. However, consultants retain clinical autonomy and nothing in this handbook changes their status.

There are about one hundred anaesthetists among about six and a half thousand staff in total and you may feel intimidated at first – please don’t. Read the handbook and if in doubt, ask one of your colleagues. All the staff members are listed on the department intranet site.

No guidelines can be exhaustive, nor should they be very prescriptive. You should become familiar with procedures in the areas where you work. This handbook fills in the gaps that are caused by not having worked in the department before. Although it contains some clinical guidelines, it is not intended for use as a clinical guide or a reference work for the practice of anaesthesia.

Remember that you are a professional, a doctor and an anaesthetist; you should conduct yourself appropriately in these roles at all times. You are responsible for your actions and inactions, and should aspire to the highest standards of practice.

If you come across an item of equipment, a drug or a problem with which you are unfamiliar - ask someone for advice.
Introduction and scope of guidelines

Further advice

This handbook supplements the advice to doctors and anaesthetists published by a variety of professional associations. You should be aware of the latest advice that governs your professional life.

The following organisations, among others, all publish such advice regularly.

- **General Medical Council**: For example, *Good Medical Practice*
- **British Medical Association**: For example, the *Junior Doctors Handbook*
- **Royal College of Anaesthetists**: For example, the guidance on training and CCST
- **Association of Anaesthetists of Great Britain and Ireland**: For example, the clinical guidelines series

There is a departmental web site at <www.anaesthetics.uk.com>

I have provided downloadable copies of this handbook and the Obstetric Anaesthetists Handbook in both PDF and HTML formats, should you wish to download them to your PDA.

Information and clinical guidelines in UHCW

There are many clinical guidelines available on e-library on the trust intranet. Those that are relevant to anaesthetists are often included or summarised in this book.

You will also find employment and other UHCW policies and procedures on the intranet.

You are advised to check the intranet and see what is there early in your stay with us.
Introduction and scope of guidelines

Induction in the department of anaesthesia

Specialty registrars rotate on the first Wednesday of each February and August, which is when the scheduled inductions are held. At other times we may need to mount a specific programme.

You should receive induction to the department. We need your help to make arrangements.

You should be sure that you receive inductions in the following areas:

1. Introduction to the University Hospital and what is expected you on your first duty shifts. This is usually given by one of the college tutors on the day you rotate, or may be given by the relevant consultant if you start work with us between rotation dates.

2. A printed copy of this handbook.


4. An introduction to the equipment that we use in Coventry.
   You must make sure that you are familiar with the use of the equipment in theatres. It includes:
   - Datex Aestiva 5 anaesthesia machines.
   - Datex Avance anaesthesia machines.
   - Alaris Asena GH, CC and PK syringe drivers.

If there is anything on this list that you do not know how to use, ask for specific training.

This will usually be given by Dr Krish Ramachandran who has a special interest in equipment inductions. If you start between rotation dates you may need a clinical induction by the on call team. Be sure to contact Dr Ramachandran as soon as possible.

5. Statutory and UHCW requirements for induction and mandatory training e.g. fire lectures and ALS updates. You should make the
What this handbook contains

This handbook started in 1999 as a compilation of the folder of memos that each incoming registrar was required to read and initial. I claimed that the entire folder could be reproduced on one piece of paper. That turned out to be true – but the handbook then grew…

Some of those memos still remain as some of the short segments in the ‘miscellaneous issues’ section; others have been expanded and changed over the years. I also wrote sections on how the on call duties are structured, and solicited sections on how departments such as critical care are interfaced with anaesthetists.

Clinical sections have often been devised originally following audit reports, or guidelines brought to department meetings have been adopted into the handbook.

The largest section of clinical guidelines in the book is that dealing with management of pain and associated issues; this is because many of these policies are written so as to coordinate anaesthetists, pain management clinicians and other doctors working on the hospitals.

If you feel that you would like to write a chapter, a section or a guideline, something that would have been useful to you when you started here or something about which you feel strongly, just get in touch with me.
Managing difficult airways

[Dr Cyprian Mendonca & Dr Mark Porter, January 2006; appraised by Dr Cyprian Mendonca, January 2010]

The incidence of failed intubation is approximately 1:2230 in surgical patients and 1:150 to 1:300 in obstetric patients. Problem with tracheal intubation is the principal cause of hypoxaemic brain damage and anaesthetic death. Therefore management of difficult intubation must concentrate on maintenance of oxygenation. Repeated unsuccessful attempts at intubation can cause significant airway trauma and further impair oxygenation.

You should ask for senior help, the best available assistance and the difficult intubation trolley as soon as you experience difficulty with mask ventilation and laryngoscopy.

This section is appropriate for most general use. There is a specific difficult airway procedure for obstetric patients.

Known previous, or anticipated, difficult intubation

You should perform an airway assessment, including Mallampati score and an assessment of other relevant anatomical and obstetric features, for all patients presenting for anaesthetic procedures.

You should determine whether difficult intubation could be anticipated. It is not possible to give exact criteria for this and the predictive power of criteria may not be good. However, if you are faced with a patient whose Mallampati class is 3 or 4 and who has associated features such as a short neck or a receding mandible etc., it is reasonable to anticipate a difficult intubation.

You must notify the consultant anaesthetist on call before undertaking general anaesthesia in a patient in whom you anticipate a difficult intubation.
Airway assessment

A detailed preoperative airway assessment can assist you in predicting difficult intubation. Effective airway management requires careful planning. You should have a back up plan for when the primary plan fails.

**History**

During the preoperative visit, you should elicit previous ‘difficult airway alerts’, surgeries or injuries in head and neck, radiotherapy, snoring, obstructive sleep apnoea, neurological disorders.

**Clinical examination:**

Any gross craniofacial anomaly and gross abnormality of neck should be apparent on clinical examination

- **Mouth opening:** when fully opened should allow patient’s middle three fingers held in vertical plane.

- **Jaw movement:** Good forward movement (lower teeth can protrude further than the upper teeth) is associated with easy laryngoscopy.

- **Buck teeth** are associated with high score on Mallampati classification and also limit the protrusion of lower teeth further than upper teeth.

- **Movement of cervical spine and extension at atlanto-occipital joint.**

- **Thyromental distance should be > 6.5 cm** (measured while neck is extended).

- **Sternomental distance should be > 12.5 cm** (measured while neck is extended).
Managing difficult airways

*Modified Mallampati’s classification*

Conducted with the patient sitting upright, opening the mouth as far as is possible and maximally protruding the tongue. Allocate a class based on what you see at the back of the mouth.

Class 1: Faucial pillars, soft palate and uvula seen.

Class 2: Faucial pillars and soft palate seen. Base of tongue masks uvula.

Class 3: Only soft palate visible

Class 4: Even soft palate not visible.

**Difficult airway trolley**

You will find the following equipment in the difficult airway trolleys. You should familiarise yourself with this equipment and also with techniques for maintaining oxygenation. As soon as you experience difficulty with airway maintenance or tracheal intubation you should ask for the difficult intubation trolley.

- Curved blade laryngoscope: McCoy.
- Straight blade laryngoscopes: Miller or Henderson.
- Frova tracheal introducer or gum elastic bougie.
- Laryngeal Mask Airway.
- iLMA.
- MicroLaryngoscopy Tracheal tube (MLT).
- Jet ventilation catheter : 13 G / 14 G
- Manujet III jet ventilation device and catheters.
- QuickTrach emergency cricothyrotomy devices.
- Aintree catheter (for fibreoptic intubation via LMA).
Managing difficult airways

- Flexible intubating fibreoptic laryngoscope is available in all theatre locations except in day case surgical theatres.
- Cook airway exchange catheter (in ENT/maxillofacial theatre for nasal ETT exchange).

Algorithm for management

Algorithms for different scenarios are available at www.das.uk.com (the Difficult Airway Society). You should educate yourself in their use as part of your CEPD. The following algorithm is a composite appropriate to most situations, which you should study before having to use it in an emergency situation.
Managing difficult airways

Training

Dr Cyprian Mendonca and Dr Carl Hillermann organise regular CEPD sessions in the management of difficult airways and in particular the use of the following equipment (available in all operating theatres):

- **QuickTrach** emergency cricothyrotomy device. Used for percutaneous access to the trachea. It establishes a 4 mm ID airway which can be used to continue anaesthesia.
Managing difficult airways

- **Manujet III.** A manual jet device for difficult airway management. It generates a high-pressure oxygen flow for use down a Ravussin-type jet ventilation catheter, which can itself be placed percutaneously in an emergency.

- **Ravussin-type jet ventilation catheters** as above.

You should make sure that you arrange a place on the study sessions as soon as possible. Some are in-house CEPD and some are formal courses for which you will have to be granted study leave.

**Record keeping**

If you encounter significant difficulty when managing a patient’s airway you must make a full record in the patient’s clinical records folder.

Make sure that all details including the degree of difficulty in airway management encountered, the probable reason and potential suggestions for the future are clearly recorded in the clinical notes. You should also inform the patient of the nature of the problem.

You can download an ‘Airway alert form’ from www.das.uk.com. When completed, send one copy to the patient’s records, one to the patient and one to the GP.

The DAS airway alert forms are kept in the guideline folder in each theatre.
Resuscitation – advanced life support

[Appraised by Dr Alistair Brookes, January 2009]

Your responsibilities

- Ensure you are familiar with the resuscitation equipment within your clinical areas – see page 74.
- All anaesthetists are required to attend an ALS update annually. It would be beneficial if you are a current ALS provider.
- Fill in appropriate records as below.

Use of biphasic defibrillators

The Trust uses biphasic defibrillators on both sites. The energy setting for defibrillation is 150 J and escalating energy settings of 100 J, 150 J and 200 J for synchronised cardioversion. To refresh the memory of your update course:

- Connect the multifunction defibrillator pads to the patient.
- Turn on the machine with dial 1.
- Charge (if appropriate) with button 2.
- Perform safety checks (‘clear…’).
- Discharge with button 3.

The current guidelines are at http://www.resus.org.uk/pages/guide.htm.

Records

All in-hospital adult cardiac arrests must be documented in the CPR record books which can be found on all cardiac arrest trolleys. The yellow sheet must be filed in the medical notes and the pink sheet returned to the Resuscitation and Clinical Skills Department.
This form must be filled in regardless of whether the cardiac arrest teams were called or attended. This includes cardiac arrests in theatres (that are not a planned part of the procedure). You should also write a separate record in the anaesthesia chart.

**Algorithms**

The figure on the next page is the algorithm for Adult Advanced Life Support 2005, published by the Resuscitation Council (UK).
ADULT

Unresponsive?

Open airway
Look for signs of life

Call Resuscitation Team

CPR 30:2
Until defibrillator / monitor attached

Assess rhythm

Shockable
(VF / pulseless VT)

1 Shock
150-360 J biphasic or 360 J monophasic

Immediately resume CPR 30:2 for 2 min

During CPR:
- Correct reversible causes*
- Check electrode position and contact
- Attempt / verify:
  - IV access
  - airway and oxygen
- Give uninterrupted compressions when airway secure
- Give adrenaline every 3-5 min
- Consider: amiodarone, atropine, magnesium

Non-Shockable
(PEA / Asystole)

Immediately resume CPR 30:2 for 2 min

* Reversible Causes
Hypoxia
Hypovolaemia
Hypo/hyperkalaemia/metabolic
Hypothermia

Tension pneumothorax
Tamponade, cardiac
Toxins
Thrombosis (coronary or pulmonary)
PAEDIATRIC

Unresponsive?

Commence BLS
Oxygenate / ventilate

Call Resuscitation Team

CPR 15:2
Until defibrillator / monitor attached

Assess rhythm

Shockable (VF/pulseless VT)

1 Shock
4 J/kg or AED (attenuated as appropriate)

Immediately resume CPR 15:2 for 2 min

During CPR:
- Correct reversible causes*
- Check electrode position and contact
- Attempt / verify: IV/IO access
- Give uninterrupted compressions when trachea intubated
- Give adrenaline every 3-5 min
- Consider: amiodarone, atropine, magnesium

Non-Shockable (PEA/Asystole)

Immediately resume CPR 15:2 for 2 min

* Reversible Causes
- Hypoxia
- Hypovolaemia
- Hypo/hyperkalaemia/metabolic
- Hypothermia
- Tension pneumothorax
- Tamponade, cardiac
- Toxins
- Thromboembolism
Duties of the on call anaesthetists

[Appraised by Dr Robin Correa and Dr Edwin Borman, January 2010]

Important notice

The on call arrangements undergo continual examination to see if they are appropriate. At present there are proposals to change the arrangements for consultants on call.

Three things will remain constant:

1. The importance of checking with your consultant if you are not sure what you should be doing.
2. The 2813 and 2814 bleeps will continue to be the means of contacting the on call team, whoever carries them.
3. The duties of the labour ward resident on 2178 will not change.

Be vigilant about these changes. In particular, check your rota carefully. After distribution of the rota any necessary swaps are your responsibility and you must notify us properly of any swaps you have made.

Introduction

See page 39 for information about consultants on call.

- StR – specialty registrar.
- SpR – specialist registrar, now a closed grade.
- StR3 is equivalent to SpR1.

The department now has a Working Time Regulations compliant rota – average working time will not exceed 48 hours per week.

The on call residents are meant to function as a team rather than a hierarchy. Close coordination between members of the on call team
Duties of the on call anaesthetists

(including the general on call consultant) is needed at all times for efficient disposal of emergency cases.

**Shift times**

This does not include intensive care medicine shifts, which are administered from the critical care unit.

Shift times have 15-minute handover periods built in.

<table>
<thead>
<tr>
<th></th>
<th>Long day</th>
<th>Night</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Resident anaesthetist</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Senior resident anaesthetist</strong></td>
<td>08:00-20:00</td>
<td>19:45-08:15</td>
</tr>
<tr>
<td><strong>Labour ward anaesthetist</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Trauma anaesthetist</strong></td>
<td>13:00-21:00 Mon-Thu</td>
<td>None</td>
</tr>
<tr>
<td></td>
<td>08:00-19:00 Fri</td>
<td></td>
</tr>
<tr>
<td><strong>CEPOD list anaesthetist</strong></td>
<td>13:00-21:00 Mon-Thu</td>
<td>None</td>
</tr>
<tr>
<td></td>
<td>08:00-19:00 Fri</td>
<td></td>
</tr>
</tbody>
</table>

Each weekend rota will be covered by two residents. One resident will work Friday, Saturday and Sunday long days, with the preceding Thursday and the following Monday off duty. One resident will work the corresponding nights, with the preceding Friday and the following Monday and Tuesday off duty.

The arrangements for Monday to Thursday are different; you will work occasional days and nights.

All resident on call rotas are prepared six months in advance and are 'rolling rotas' (see page 66).
Duties of the on call anaesthetists

This shift pattern does lead to occasional handovers of care of anaesthetised patients, especially at the evening handover. You must **conduct a full professional handover of care** and document the handover as necessary on the anaesthesia chart.

The duties are summarised in the following table, and details given on subsequent pages. The left hand column on the table gives the designation on the weekly rota.

If you receive an ‘anaesthesia emergency’ call over your on-call bleep, you must attend if you are not engaged in direct patient care duties.

<table>
<thead>
<tr>
<th>Bleep</th>
<th>Title</th>
<th>Availability</th>
<th>Principal duties</th>
</tr>
</thead>
<tbody>
<tr>
<td>2178</td>
<td>Labour ward anaesthetist</td>
<td>24 hours, seven days a week</td>
<td>Obstetric anaesthesia and analgesia</td>
</tr>
<tr>
<td></td>
<td>Trauma anaesthetist</td>
<td>13:00-21:00 weekdays (08:00-19:00 on Fridays) 08:00-18:00 weekends</td>
<td>Trauma list – predominantly orthopaedic cases – working with resident anaesthetist</td>
</tr>
<tr>
<td>2400</td>
<td>Starred registrar</td>
<td>08:00-13:00 Monday to Thursday</td>
<td>Assisting on emergencies if needed. Otherwise attend supervised list.</td>
</tr>
<tr>
<td>2400</td>
<td>CEPOD anaesthetist</td>
<td>13:00-21:00 weekdays (08:00-19:00 on Fridays)</td>
<td>General emergency list – working with resident anaesthetist</td>
</tr>
<tr>
<td>2814</td>
<td>Resident anaesthetist</td>
<td>24 hours, seven days a week</td>
<td>Urgent theatre cases in general theatres (not trauma during trauma list hours)</td>
</tr>
<tr>
<td>2813</td>
<td>Senior resident anaesthetist</td>
<td>24 hours, seven days a week</td>
<td>Supervises all other residents; senior coordination role; cardiac ICU, general ICU, neurosurgical &amp; cardiac procedures</td>
</tr>
</tbody>
</table>

From October 2008 weekend and public holiday day shifts as the senior resident anaesthetist have been covered by consultant anaesthetists on a rota.
What we circulate to the rest of the hospital

Calling an appropriate anaesthetist – a guide for clinicians at the University Hospital, Coventry

There are several emergency bleeps carried by the anaesthesia team, apart from their involvement in some of the resuscitation group calls.

There are also three consultant anaesthetists on call each night (and one for the critical care unit) – call switchboard to contact them.

Bleep 2814 – resident anaesthetist

This is carried by a specialty registrar who is responsible for taking calls about:

- Urgent theatre cases in all disciplines except cardiothoracic surgery, neurosurgery, obstetrics, and trauma list.
- Trauma patients needing operation outside trauma list times.
- Assistance in the emergency department (not ‘trauma team’ calls).
- Patients in PACU.
- Assistance with epidurals in critical care and on surgical wards.
- Cardiac arrest if the critical care team needs assistance from an anaesthetist.
- Other calls not covered here.

Bleep 2813 – senior resident anaesthetist

This is carried by a senior specialty registrar or consultant who is responsible for taking calls about:

- Urgent theatre cases in cardiothoracic surgery and neurosurgery.
Duties of the on call anaesthetists

- Anaesthesia assistance needed on cardiothoracic critical care unit.
- Seriously-ill patients requiring resuscitation or life-saving surgery in any discipline.
- Children needing stabilisation and transfer.
- ‘Extended trauma team’ calls to the Emergency Department.
- Major scheduling problems with anaesthesia workload.

Bleep 2178 – labour ward anaesthetist

This is carried by a specialty registrar who is responsible for taking all calls about obstetric anaesthesia.

Bleeps

You must ensure that you can be contacted through the hospital bleep system at all times when not off duty. Check your bleep by paging yourself when coming on duty, when receiving it from a colleague and at any other time you suspect it may not be working. Change the battery (see page 63) when the “Low Battery” indicator comes on – do not pass it to the next person. Remember to check both your personal bleep and any handed on for specific duties.

Do not flick the battery cover out to clear the memory. The Blick bleeps will break if you do this repeatedly.

Transfers

Transfers of ventilated patients may take place. These are normally done with critical care staff but on occasion they may request help from the resident anaesthetists. You should notify the general consultant on call when a transfer is proposed. There are usually three options. You should discuss these options with the consultant.

- The consultant may attend to continue theatre work or other duties.
Duties of the on call anaesthetists

- The consultant may perform the transfer while you continue with the theatre list.
- The consultant may cover the hospital from a distance while being able to attend any call within 30 minutes.

Inform the hospital switchboard if you leave the hospital.

Non-intubated patients requiring transfer are the responsibility of the appropriate surgeon and usually do not have an accompanying anaesthetist. If in doubt about a particular case, contact the general consultant on call.

See page 59 for further advice on transfers.

Senior resident anaesthetist

The on call room is in the anaesthesia department. The bleep (2813) is handed from the outgoing to the incoming SRA, usually at the main theatre reception desk, at 08:00 and 19:45 hours. As the senior resident anaesthetist, you are the key to successful delivery of anaesthesia services, especially out of hours.

You have three main roles: supervising other anaesthetists, practising specialised skills and organising anaesthesia services in close co-ordination with the general on call consultant. You are also on the paediatric cardiac arrest group call and the extended trauma team (after the ICU specialty registrar), and you are responsible for acute pain management (epidural services on ward 21) and care of some patients in PACU.

There is a specialty registrar working in critical care. If there is a ventilated patient in theatre recovery, the critical care consultant will determine whether your help is needed to care for the patient; sometimes patients ventilated postoperatively may be looked after by the critical care team. Liaise closely with them on this.

Supervising other anaesthetists

The emergency theatres will be in the first floor theatres at all times. You are the co-ordinator for all urgent and emergency anaesthesia
Duties of the on call anaesthetists

carried out in the University Hospital. You advise and assist the other resident anaesthetists. Although in practice more of your time will be spent with the resident anaesthetist, you may be needed for advice or assistance by the labour ward anaesthetist. The trauma theatre has a separately allocated anaesthetist, who may be a staff grade anaesthetist, and defined times of operation (see page 236).

It is appropriate for you to delegate certain specialist duties to the other resident anaesthetists so long as they are competent to undertake the duties. However, you should not take the anaesthetist out of the labour ward or the trauma theatre without calling the consultant on call.

Rarely, you may be asked to leave the UHC site. Speak with the general consultant on call before doing this, and inform the other residents and the switchboard. Usually the bleep will be left with the general consultant on call.

Make sure that the handover form carried by the resident anaesthetist is maintained accurately with any cases with which you are involved.

Specialised skills

You also have a specific role as first anaesthetist called for neurosurgical urgent cases and many cardiac urgent cases, and as the provider of anaesthesia-related services to the cardiothoracic intensive care and high dependency care areas.

[Note that during the 08:00-20:00 period of every day, services to the cardiothoracic unit are restricted to urgent lifesaving interventions. Calls for routine assistance will normally be handled through contacting the cardiac theatres or the cardiothoracic consultant anaesthetist on call.]

Neurosurgical cases will usually be burr holes or craniotomy for intracranial haematoma, or spinal decompression in the presence of cord compression signs. This will sometimes run in parallel with the general surgical workload. These cases can be challenging and you should contact the general consultant on call if you need advice or help. In general, anaesthesia for these cases is similar to that given
for elective cases, but you should remember that the cases are booked usually when irreversible neurological damage is imminent, making a prompt response vital.

Calls for urgent cardiac bypass procedures will go in the first instance, to the cardiothoracic consultant on call, who may call you to ask for assistance before or during the case. If a primary bypass procedure is referred to you, call the consultant.

You are responsible for emergency chest re-openings on the cardiothoracic ICU and those that are taken back to theatre. If re-opening on the ICU, treat it as a full anaesthetic and keep a new record sheet. Try to have an ODP called to assist and if this is not possible (there may not be a resident ODP available for the ICU) ask the nurse in charge to have an ICU nurse allocated as your assistant.

Organising anaesthesia services

You may be called at any time with a variety of organisational or clinical problems whether related to urgent or routine work. It is your responsibility to match resources to demand in the most appropriate way. Liaison with the Anaesthesia Office during the day is helpful. Important decisions should be reported to or referred to the administrative staff as appropriate.

Out of hours, liaison with the relevant consultant on call and the senior theatre nurse (‘floor control’) is essential if you are not clear as to the appropriate course of action. You may feel it necessary to open a second emergency theatre, where the urgency of the clinical situation so demands and you may do this after consulting the consultant and senior theatre nurse.

Calls to the paediatric ward

You may be called to see a paediatric patient for resuscitation or stabilisation. There is no paediatric ICU in Coventry and so patients needing critical care will be taken to Birmingham, Leicester or further afield. Usually a retrieval team will collect the child but sometimes you will have to transfer them.
Duties of the on call anaesthetists

Calls for urgent resuscitation of sick children will go to the senior resident anaesthetist. You must attend promptly. If you are not able to attend due to workload then you must inform the switchboard operators, who will call the general on call consultant.

Always make sure that a consultant anaesthetist is informed about every case. A consultant paediatrician should also be involved and present as the consultant primarily responsible for the care of the sick child (the paediatrics department have confirmed this in writing). Check drug doses and clinical algorithms with them.

The paediatric nurses will be able to assist with necessary equipment for airway and ventilation. Nevertheless, you must have either a second anaesthetist or an ODP in attendance before administering induction agents to a critically-ill child.

 Calls for paediatric respiratory or cardiorespiratory arrest will go to both the critical care StR and the senior resident anaesthetist. The skills of both teams are needed and you must attend promptly. If you are not able to attend due to workload then you must inform the switchboard operators on ‘2222’, who will call the general on call consultant.

You must ensure that you have a current update or provider status in paediatric resuscitation. Contact the resuscitation department on extension 28800 for help with this; if you need further help then contact Dr Suja Chari (lead paediatric anaesthetist) or Dr Alistair Brookes (chairman of the Resuscitation Committee).

Guidance to the paediatricians and switchboard operators

Care of a sick child requiring resuscitation is a multidisciplinary matter between paediatric and anaesthesia teams, at consultant level. A consultant paediatrician will be primarily responsible for every such case and will be present to supervise care. When calling for assistance, the call should be placed to the senior resident anaesthetist (2813). If this anaesthetist is unable to attend, call the general on call consultant.
Duties of the on call anaesthetists

Trauma calls

The senior nurse or doctor in the Emergency Department will call trauma alerts, on information received or patient assessment. The ICU specialty registrar is normally called first on bleep 1352 as a member of the core trauma team and you will be called as a member of the extended trauma team if anaesthesia services are needed. Where possible an estimated time of arrival will be given. A small number of trauma alerts turn out to be false alarms. These are considered the acceptable false positive rate in order to ensure a comprehensive response for trauma patients.

You are expected to supply anaesthesia services to such patients, although if you are engaged in anaesthetising a patient you should ensure that the trauma team is aware of this. If you cannot attend when crash-called, phone 2222 immediately and inform switchboard. Liaise with the general consultant on call when a patient is admitted with serious injuries. Confirmed major trauma should be notified immediately to the general consultant on call.

Remember to liaise with the trauma anaesthetist on bleep 2721 if you are aware of cases that will need to go to theatre as an emergency.

There is a Major Incident Procedure (see page 240). Read it before one happens.

Perianaesthesia care unit (PACU)

You are responsible for making sure that the resident anaesthesia team reviews patients in the overnight intensive recovery area at 08:00 and 17:00, and when necessary in between regular ward rounds (see page 51 for details about PACU). You should involve the surgical team as appropriate.

Working with other departments

You may be called to assist with a variety of problems in the hospital. The department has circulated advice on the appropriate means for doing this in order to limit inappropriate calls (see page 48).
Duties of the on call anaesthetists

Acute pain management

As senior resident anaesthetist you will develop considerable skill in treating postoperative pain, especially where this involves epidural analgesia. ICU SHOs have rather less skill and you may be asked to help with epidural patients in the critical care unit, PACU or ward 21 (epidural bay). You will also be supervising the resident anaesthetist in such work. You should respond promptly and professionally to such requests. See page 132 for advice on troubleshooting epidurals.

Labour ward anaesthetist

You will be given the latest edition of the Obstetric Anaesthetists Handbook which you must read and use in practice. This handbook contains considerable detail and many clinical guidelines. It underpins practice in the labour ward.

See ‘Obstetric anaesthesia’ on page 216.

Resident anaesthetist

The on call room is in the anaesthesia department. The bleep (2814) is handed from the outgoing to the incoming resident anaesthetist, usually at the main theatre reception desk, at 08:00 and 19:45 hours. You are expected to be present at this time. If you are delayed and may arrive late you must call the hospital to arrange a replacement anaesthetist.

You are responsible for receiving calls for urgent cases in general surgery and subspecialties, ENT and gynaecology. Trauma cases will be handled by the trauma anaesthetist during the trauma list hours. Assess the patients and, in liaison with the senior resident anaesthetist, perform anaesthesia as necessary.

You should discuss any cases about which you are unsure, or with which you need help, with the senior resident anaesthetist. In particular, all cases must be assigned an ASA grading and any patients graded ASA 3, 4 or 5 must be brought to the attention of the senior resident anaesthetist.
Whenever a non-consultant is covering urgent theatres during the daytime, any delay to or postponement of a case must be discussed with the senior resident anaesthetist.

You may be called for ‘cardiac arrest’ if the intensive care SHO (who is the primary point of contact for arrests) is attending another incident.

You will also be called by PACU and ward staff about problems with epidurals. See page 122 for details.

The arrangements for the morning emergency theatres (general and trauma) depend on being able to start procedures on time. The surgical teams will supply surgeons to start promptly. Agreement should be made with the surgeons the night before if possible as to the first cases for next morning. You should make sure that the first patients listed for the next day are assessed during the evening.

**Trauma list anaesthetist (trauma)**

The trauma list is in theatre 8 in the main theatre block, first floor. Trainees are allocated as the trauma list anaesthetist from 13:00 to 21:00 during the week (08:00 to 19:00 on Fridays).

See page 236 for details of the local guideline.

**General emergency teams and starred registrars**

The general emergency team is constituted differently according to the time of day and type of day.

<table>
<thead>
<tr>
<th>Weekday</th>
<th>One StR holding 2814.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Day time 08:00-20:00</td>
<td>One starred StR available if needed, with a CEPOD shift StR covering from 13:00 to 21:00 (08:00-19:00 Fridays). These may be the same person.</td>
</tr>
<tr>
<td></td>
<td>One consultant holding 2813 and on call.</td>
</tr>
</tbody>
</table>
Duties of the on call anaesthetists

<table>
<thead>
<tr>
<th>Weekends and holidays</th>
<th>One StR holding 2814.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Day time 08:00-20:00</td>
<td>One consultant allocated to the emergency list and holding 2813.</td>
</tr>
<tr>
<td></td>
<td>One consultant on call.</td>
</tr>
<tr>
<td>Every day</td>
<td>One StR holding 2814.</td>
</tr>
<tr>
<td>Night time 20:00-08:00</td>
<td>One StR holding 2813.</td>
</tr>
<tr>
<td></td>
<td>One consultant on call.</td>
</tr>
</tbody>
</table>

A second on call consultant (see below) is available out of hours.

**Starred StR**

The starred StR is an StR on a supervised training session who may be called (and should only be called) if there is an urgent need by the on call team for a further anaesthetist to assist with a heavy workload. The consultant on call is the only person who should call the starred StR (unless they are too busy in which case they may ask another person to do so). The college tutors are monitoring inappropriate calls to the starred StR, and StRs should report instances of inappropriate calls to them.

Although the primary duty of the starred registrar is to assist the on call team, you will be allocated a supervised training list should there be no need for assistance in the emergency theatres.

**Conduct of general emergency lists**

The emergency team is made up two residents as above, holding the 2813 and 2814 bleeps.

There are coordinators for both elective and emergency work in the main theatre suite at the University Hospital. You should work with them and in particular remain in close liaison with the emergency theatre coordinator when on call.
Duties of the on call anaesthetists

The principal responsibility held by the emergency team is to clear the emergency cases during the 08:00-20:00 period. Night time cases should only be those essential to be conducted at that time, for example, life and limb saving, acute paediatrics etc.

If at any time further assistance is needed, immediately contact the general consultant anaesthetist on call.

**Preparation for morning emergencies**

It is not appropriate for the day team to arrive and then have to spend time reviewing stable patients who have been in hospital for some time. The night resident team is expected to prepare the first patients for the morning general emergency lists and hand over a summary to the incoming resident team.

**Consultants on call**

**Cardiothoracic anaesthesia**

This consultant will receive calls for urgent cardiac bypass procedures directly from the surgical staff, usually in patients with unstable or critical angina. You should call the consultant in the case of difficult problems with patients in the cardiothoracic unit and its specialist areas, when a patient is re-opened for postoperative bleeding, and for any case going on to cardiopulmonary bypass.

**Intensive care medicine**

See page 56 for ‘Integration with the critical care unit’. The consultant intensivist leads an intensive care team with which anaesthetists work closely. This consultant will receive referrals for new preanaesthetic and postanaesthetic admissions to the ICU.

**General on call**

During normal weekdays the general consultant on call is freed from other commitments and is based at the University Hospital dedicated to emergencies, and supervision of trainees not otherwise directly supervised.
Duties of the on call anaesthetists

Out of hours arrangements

This consultant is available to you for advice and assistance on matters not covered above, on all sites, including general and vascular surgery, obstetrics, neurosurgery, paediatrics and trauma. In particular, you should inform them of any occasion where service availability is overstretched. For example:

- The work to be performed exceeds the capacity of the resident anaesthetists.
- On call residents are used to transfer patients out.
- An unusually high workload.
- A serious clinical adverse event or critical incident.

There is a second-on general consultant anaesthetist available. You may not contact this consultant directly unless specifically asked to do so by the first-on consultant. The general consultant on call has the responsibility to call in the second-on consultant if needed.

Deferring urgent cases and advising against anaesthesia

The surgeons are responsible for the running order of operating lists. They may ask your advice on the ranking or priority of cases, an entirely proper move, but you should not become involved in disputes between different surgeons as to whose case takes the higher priority on an urgent list. Your role should be restricted to recommendations on timing of anaesthesia when affected by resuscitation, investigation or fasting criteria.

Patients will occasionally be deferred to the next day due to lack of operating time or because it is unreasonable to do non-emergency cases at night. You should inform the senior resident anaesthetist of any cases that you defer because of clinical reasons. In particular, you may advise that anaesthesia would not benefit the patient, as the risk would be too high. The senior resident anaesthetist must review these patients. All such cases must be discussed with the relevant
consultant on call. You should make a note of this discussion and the
decision, in the patient’s medical record and on the handover form.

**Consultant advice for subspecialty interests**

There is also an informal system for contacting consultants with
certain subspecialty interests as below. The general consultant on
call (who you must call first) may consider it appropriate to seek
specific subspecialty advice.

*This is an informal system* and there is no commitment on the part
of the named consultants to be available at times when not listed on
the on call rota. Consultants are listed in alphabetical order, not
necessarily in call order.

It is likely that over 2010 a new system will be introduced whereby
there are specialist consultants on call to support the first on call
consultant. Further details will be circulated as appropriate.

**Obstetrics**

Consultants with regular work in obstetric anaesthesia are:

| Dr Edwin Borman | Dr John Elton (lead) |
| Dr Suja Chari   | Dr Mark Porter       |
| Dr Falguni Choksey | Dr Matthew Wyse    |
| Dr Robin Correa | Dr Mohamed Ziauddin |

**Neurosurgery**

Consultants with regular work in neurosurgical anaesthesia are:

| Dr Daniel Amutike | Dr S. Krishnamoorthy |
| Dr Robin Correa   | Dr Cyprian Mendonca  |
| Dr Jon Echebarria | Dr Andrew Phillips   |
| Dr John Elton     | Dr Mark Porter       |
| Dr Sujay Jayaratnasingam | Dr Andreas Ruhnke |
|                   | Dr Ram Tripathy      |
**Paediatrics**

**You must discuss children under the age of five years with the general consultant on call.**

There is a system of designated paediatric anaesthetists for children under one year of age, with conditions such as pyloric stenosis, intestinal intussusception and incarcerated inguinal hernia. After liaising with the general consultant on call, the senior resident anaesthetist should contact:

<table>
<thead>
<tr>
<th>Dr Daniel Amutike</th>
<th>Dr Zahid Kazmi</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dr Suja Chari (lead)</td>
<td>Dr Kunle Okunuga</td>
</tr>
<tr>
<td>Dr Falguni Choksey</td>
<td>Dr Balachandran Santhosh</td>
</tr>
<tr>
<td>Dr Rati Danha</td>
<td>Dr Andrew Thacker</td>
</tr>
<tr>
<td>Dr John Elton</td>
<td>Dr Duncan Watson</td>
</tr>
</tbody>
</table>

**Difficult airways**

The following consultants have indicated that they have a particular skill in the management of difficult airways (including awake fibreoptic intubation) and are available to help with such cases.

| Dr Joy Beamer | Dr Richard Johnson (also difficult vascular access) |
| Dr Edwin Borman | Dr Ravi Joshi |
| Dr Robin Correa | Dr Bill McCulloch |
| Dr Rati Danha | Dr Cyprian Mendonca |
| Dr John Elton | Dr Subrahmanynam Radhakrishna |
| Dr Carl Hillermann | Dr Andreas Ruhnke |
| | Dr Madhu Srivastava |
Getting senior help

[Appraised by Dr Edwin Borman, January 2010]

Clinical alarm system

This is for use in a clinical emergency.

Many clinical areas and all anaesthesia rooms in theatres have a red triangular knob on the wall. If you pull out this red knob, a siren will sound in that clinical area and all nearby staff should attend to help.

‘Anaesthesia emergency’ group call

The anaesthesia emergency group page may be activated by anyone who needs emergency assistance from more than one anaesthetist, with a serious anaesthesia problem.

Call – 2222 “anaesthesia emergency in…”

Group bleep numbers

The following bleeps will be activated by a single call to ‘2222’.

- 2178 labour ward anaesthetist
- 2814 resident anaesthetist
- 2813 senior resident anaesthetist
- 1465 labour ward ODP
- 2597 theatres coordinator

On call anaesthetists receiving such a call, should attend if they are not otherwise engaged in direct patient care duties.

Examples of appropriate calls:

- Any life-threatening or serious emergency.
- Difficult intubation.
- Life-threatening airway obstruction or emergency.
Getting senior help

- Prolonged severe hypoxia.
- Anaphylaxis.
- Malignant hyperpyrexia.
- Cardiac arrest in theatre.
- Sudden massive haemorrhage.
- Air embolism.
- Severe hypotension or hypertension in theatre.

All calls received over this system will be audited regularly.

Contacting clinical staff in anaesthesia or elsewhere

There is an urgent clinician-to-clinician number. You should call this number if you need to speak urgently to another clinician (for example, your consultant) urgently and you find that the switchboard is delayed in answering.

Call 27027 (DDI 024 7696 7027).

This is for urgent calls only; non-urgent calls will not be connected.

Mobile communications

Mobile phones do not work reliably in the University Hospital. At present, UHCW does not intend to make mobile phone function possible. This has been raised repeatedly as a clinical risk.

You may not be able to call consultants on their mobile phones.

All consultant anaesthetists have bleep numbers (listed on the ‘staff list’ page on the intranet). Either bleep them directly or phone switchboard, state your needs and ask them to find the consultant you need. You should state the degree of urgency associated with this call.
On call cases

You must seek help from a more senior anaesthetist in various specific circumstances outlined in this handbook, and in any case where you are unsure of, or inexperienced in, the required course of action. On occasion, this will mean telephoning a consultant. The rest of this section is written with that in mind, though the advice is more widely applicable.

All on call consultants are available via the University Hospital switchboard using a variety of means – telephones, pagers, bleeps etc. Discuss your needs with the switchboard operator and tell them if it is urgent. The departmental standard for consultant attendance, if needed, is within 30 minutes of a call (60 minutes for the St Cross Hospital). In cases of urgent clinical need ask any nearby staff to find the nearest senior anaesthetist promptly.

Decide before contacting a consultant:

- Whether you need them to come in to the hospital, and if so how quickly. State your request clearly at the start of the phone call. This will assist the consultant whom you call to determine the appropriate response, which may include changing the recommendation.

  Alternatively:

  - Whether you want to let the consultant know about something you feel they should know.
  
  - Whether you need advice from them on clinical or organisational matters.

It is important to know what you want from a consultant. Remember that they may have just woken up and have not seen the patient, so you have to provide the information on which a decision can be taken.
If you are uncertain as to whether you need advice or you need the consultant to come in, or if you feel that you are not confident to handle the situation on your own, ask the consultant to come in and help you.

Routine cases

On accompanied lists, the senior anaesthetist to whom you are attached is your supervisor. Any problems, including those that may arise before the start of the list, should be raised with them.

On solo lists, you should discuss problems with the senior resident anaesthetist or the general consultant on call. If a problem will necessitate assistance during the list, make sure that this is arranged far enough in advance with the Anaesthesia Office and with any senior staff who will be helping you.

Documentation

In all cases that you seek senior help you must make a note in the patient record (cross-referenced between the anaesthesia record and continuity sheets as appropriate). This note should detail the discussion, any relevant points and must record any decisions made.

Referral to the senior resident anaesthetist

As a general rule, if you are working as a sole anaesthetist and need help, you should refer problems to the senior resident anaesthetist. During normal hours, you may be asked to refer the problem to a nearby consultant. In particular, you must call before you cancel or postpone any elective or routine patient, for whatever reason.

You must make a note as above. In addition, you should record postponements and cancellations on the handover form.
Supervision for sick patients

Assess patients carefully and assign an ASA grade. The table shows the minimum seniority of anaesthetist needed for routine and urgent cases. There is no distinction between general or regional anaesthesia, and sedation. In dire emergency with sick patients, call for senior help and offer what help you can.

ASA 3
• StR2 after discussion with senior resident
• StR
• Specialty registrar (year 3 onwards)

ASA 4 or 5
• StR (year 4) after discussion with senior resident StR or consultant
• StR (year 5-7)
• Inform the relevant consultant on call of every case
Calling the senior resident anaesthetist

Introduction

This guidance details the method by which they may be called and gives advice on situations when it is not appropriate to call the senior resident anaesthetist. It is circulated for action by those who may have an interest in calling.

The senior resident anaesthetist supervises other anaesthetic residents who may refer to them as necessary. Other calls to the senior resident anaesthetist, especially during out of hours periods, must only be for the most urgent reasons and, in general, come from a referring consultant or senior specialty registrar.

Only life and limb saving surgery should be started during the period 10.00 pm to 8.00 am.

It should be noted that prioritisation of cases is firmly the responsibility of consultant surgeons.

Cardiac

All calls from the Cardiothoracic Unit must come through the nurse in charge or the cardiothoracic specialty registrar or consultant; there should be no exceptions to this requirement.

The senior resident anaesthetist should undertake no technical tasks related to equipment.

Invasive monitoring and therapy techniques are the responsibility of the surgical teams with the exception of those related to anaesthesia or airway care. The cardiothoracic specialty registrar is permitted to ask the senior resident anaesthetist for assistance, for teaching purposes, if they are unable to perform a particular technique on a particular patient.
Calling the senior resident anaesthetist

The surgical specialty registrar supervises the surgical SHO.

The senior resident anaesthetist should not be contacted for transfers within the Cardiothoracic Unit. The intensive care team should be contacted for transfers to CT scan.

CT scan

The reception of patients into CT scan is the responsibility of the intensive care team and the senior resident anaesthetist should only be called if the patient is to be taken straight to the operating theatre.

Internal transfers of patients to CT scan are the responsibility of the intensive care team, who will call the senior resident anaesthetist if busy.

Intensive Care Unit

The senior resident anaesthetist is primarily an anaesthetist but may be asked to assist with intensive care patients by the consultant intensivist.

Transfers of ventilated patients to other hospitals are a collaborative process between Intensive Care and Anaesthetics, and the senior resident anaesthetist will be involved in mobilising appropriate staff for this.

All referrals for intensive care should be on a consultant-to-consultant basis. Referral to an intensive care resident to assess a deteriorating patient must come at least from a specialty registrar.

The finding of intensive care beds and making all appropriate referrals to the receiving hospital is the clear responsibility of the medical or surgical team caring for the patient. Contact details are at the nursing station on the critical care unit.

Should the intensive care resident be attending a cardiac arrest, the next in line point of contact for cardiac arrest is the resident anaesthetist.
Calling the senior resident anaesthetist

Obstetrics

All calls to the senior resident anaesthetist must come from the resident labour ward anaesthetist, or at their express direction. If the senior resident anaesthetist is busy, the labour ward anaesthetist should contact the general on call consultant anaesthetist.

Pain

The senior resident anaesthetist should not be called for the removal of epidural catheters, unless there is serious concern from the doctors caring for the patient that there is a coagulopathy, or that the catheter is knotted or broken.

PCA equipment and drugs are the responsibility of the medical or surgical team caring for the patient.

Medical

The senior resident anaesthetist is occasionally asked for assistance with intravascular access. Calls for such assistance must come from at least a specialty registrar (StR3 and more senior). Assistance cannot be guaranteed, but the senior resident anaesthetist may be able to supervise a training opportunity for the StR concerned.
Perianaesthesia Care Unit (PACU)

[Dr Mark Porter, August 2006; revised by Dr Ram Tripathy and Dr Daniel Amutike, January 2010]

The PACU is a twenty-three-bedded space at the centre of the main theatre suite on the first floor. Fifteen of the spaces are for immediate adult postanaesthetic recovery, four spaces for paediatric recovery and two have been specified with equipment suitable for extended recovery, including up to level 3 critical care.

Dr Daniel Amutike, Dr Liz Summ and Dr Ram Tripathy lead for the department on PACU issues; Mr Oswin Jackson is the charge nurse managing the area.

The general on call consultant anaesthetist is ultimately responsible for admissions and care of patients on PACU, supervising the resident on call anaesthetists. The on call anaesthesia team should undertake regular review of the extended recovery patients including a 08.00 and 17.00 ward round. The anaesthesia team should involve the relevant surgical team in management decisions.

Extended recovery is designed for patients who will require a stay of no more than twenty-four hours before their return to a standard surgical ward.

Patients who are predicted during their preoperative assessment as requiring care for twenty-four hours or more at levels 2 or 3 should be transferred directly to the critical care unit after their operation.

Overflow critical care patients: if UHCW critical care capacity is exhausted, extended recovery capacity may be utilised. Such patients will remain under the medical care and responsibility of the critical care team. Maximum length of stay will be twenty-four hours.

It is not appropriate to admit patients to extended recovery who have recently relocated or stepped down from higher levels of care.
Points to remember

• Postoperative patient management is an important part of anaesthetic training.

• All patients transferred to recovery area from theatre should have appropriate monitoring and supplemental oxygen.

• The involved anaesthetists should hand over the care of the patient to a recovery nurse or continue the care until a nurse becomes available.

• Recovery nurses accept patients with supraglottic airway devices.

• Do not leave syringes with drugs on patient bed.

• Fill in the appropriate advice regarding analgesia, PONV prevention and fluid balance.

• Attend calls with respect to your patient in recovery.

• Do not hesitate to ask for help.

• See page 35 for duties of senior resident anaesthetists.

• See page 57 for ventilated patients outside critical care.

• See page 141 for guidelines for discharge from PACU to ward for colorectal patients with epidural or intrathecal analgesia.

PACU admission policy

Elective

Extended recovery beds for elective cases should be booked as far in advance as possible. Extended recovery will also accommodate patients whose condition has deteriorated unexpectedly while in the theatre suite and who need an extended recovery bed.
The surgical team responsible for the patient is responsible for ensuring that an extended recovery bed is booked. The anaesthetist may also book extended recovery beds.

Bed availability in extended recovery must be confirmed before sending for a case.

Patients will be accepted in order of priority; this priority will be determined by the consultant anaesthetist responsible for PACU for that day in close liaison with the prospective admitting consultant surgeons.

The patient’s ward bed must be kept available throughout their stay for their discharge from extended recovery.

**Emergency**

The referring consultant should discuss any potential admissions with the duty PACU consultant anaesthetist. When UHCW critical care capacity has been exhausted, emergency admissions to extended recovery will usually take priority over elective cases.

The ultimate decision to admit or not lies with the duty PACU consultant anaesthetist.

**PACU discharge policy**

Patients may be discharged to wards or to the critical care unit.

The standard will be practitioner-led discharge.

All transfers to a critical care unit occur on a consultant-to-consultant basis.

Patients leaving OIR will be transferred to the receiving ward or critical care unit when the receiving area is ready to receive, and will not usually be transferred between midnight and 08:00.

A ward bed must be reserved for OIR patients in advance of their admission. For emergency cases a ward bed must be reserved as soon as possible. In case of any difficulty, the bed manager will find
suitable alternative accommodation for the patient on transfer from the unit.

Inadequate ward staffing is not an indication for continued stay in PACU or stay in extended recovery beyond 24 hours, but where appropriate a planned time for discharge will be accommodated. This time should be recorded at the time of booking.

The nursing documentation will be completed by the PACU team prior to transfer and will accompany the patient to the ward.

The PACU practitioner will ensure that the patient and audit data is entered on the relevant database prior to transfer.

Discharge from immediate postanaesthesia recovery to a ward

Discharge criteria are:

1. The patient is fully conscious without excessive stimulation, able to maintain a clear airway and exhibits protective airway reflexes.

2. Respiration and oxygenation are satisfactory. Inspired oxygen is no more than 40% and $S_pO_2 > 95%$.

3. Cardiovascular support is no longer required. The cardiovascular system is stable with no unexplained cardiac irregularity or persistent bleeding. The specific values of pulse and blood pressure should approximate to normal preoperative values or be at an acceptable level commensurate with the planned postoperative care. Peripheral perfusion should be adequate.

4. Pain and emesis should be controlled, and suitable analgesic and antiemetic regimens prescribed. The pain score should be 1 or less.

5. Temperature should be within acceptable limits. Patients should not be returned to the ward if significant hypothermia is present (core temperature less than 35.5°C).
6. Oxygen and intravenous therapy, if appropriate, should be prescribed.

*Discharge from extended recovery to a ward*

In addition to the above criteria:

1. MEWS score 3 or less.

2. Patient has produced adequate amounts of urine. Patient may be discharged with urinary catheters in place.

*Discharge from OIR to the critical care unit*

Patients needing a higher level of care than that which can safely be provided on the ward after 24 hours stay in extended recovery, will be transferred to the critical care unit as soon as practicable.

*Excessive workload*

In the case of excessive demands on the time of the duty PACU consultant anaesthetist and the resident anaesthesia team, it may be necessary to restrict the availability of the urgent operating theatres from time to time.

*Problems for which a PACU nurse may need help*

- Delayed recovery.
- Delirium and agitation, convulsion, hypothermia and shivering.
- Airway obstruction, hypoventilation, hypoxia
- Hypovolaemia, dysrhythmias, hypotension, hypertension.
- Inadequate analgesia.
- Control of PONV.
Integration with the critical care unit

[Appraised by Dr Roger Townsend, January 2010]

The resident StR middle grade bleep is 1684; the junior StRs are 1889 and 2592.

ICU induction sessions run four times a year. If you are scheduled to do a critical care block in the future, make sure you are on one of these sessions.

Medical staff

There are two junior resident doctors at all times. These doctors may be physicians or surgeons. They may occasionally need your help particularly with technical procedures.

There is a middle-grade rota of clinical fellows; some of the anaesthesia specialty registrars are attached to this rota at any one time. Very occasionally there may be no out of hours middle grade cover for critical care. The consultant is available at all times – contact the switchboard if they are not on the ICU. Two consultants cover critical care for a week at a time, during which they have no other clinical commitments during ‘office hours’.

Admissions

Admissions should be planned as early as possible. Speak to the nurse in charge of the unit to determine the bed status. All admissions must be discussed with, and accepted by, the consultant on call for intensive care. When considering admission of an elective or emergency patient to the ICU, liaise with the on call SHO (bleep 1889 or 2592). The senior resident anaesthetist or the ICU SHO, are the persons who will usually discuss a potential admission with the ICU consultant. Referral is however on a consultant-to-consultant basis. You should notify the senior resident anaesthetist of any non-elective admission to ICU or HDU, which occurs from theatres.

Admissions to HDU are under the care of the relevant consultant surgeon, shared with the ICU team. For elective admissions to HDU,
register the patient's name in the HDU and reserve a bed well in advance.

You must confirm ICU or HDU bed availability on the day of operation, before beginning the case.

You must accompany your patient during transfer to the ICU or the HDU; you must inform the ICU resident that the patient has arrived and give handover in person.

**Transfers**

Copies of the UHCW protocol for adult critical care transfers are available in theatres, Emergency Admissions Unit, Emergency Department, ICU and the Anaesthesia Office. This outlines the process to be followed and describes the critical care network and UHCW's transfer group.

Your responsibility as an anaesthetist is to continue with management of the patient and ensure optimal fitness prior to transfer. Either the intensive care or the anaesthetics team will conduct transfers (see page 59). In practice, the decision will follow discussion between the two groups and will depend on workload, grades of staff available and the stability of the patient being transferred.

**General**

Anaesthetics trainees are welcome to discuss any problems directly with any of the ICU consultants at any time. You are welcome to attend the training programme currently running on ICU. Check in the Anaesthesia Office for details.

**Ventilated patients outside ICU**

When critical care beds are full and a further patient needs critical care, the consultant intensivist will determine the appropriate care. This may involve transfer to another ICU in the transfer group. At night this may lead to ventilation of a patient in PACU, or the theatre.
Integration with the critical care unit

Such a decision makes the delivery of the emergency theatre service very difficult. Close liaison with the nurse in charge of theatres and the consultant intensivist is mandatory. It is likely that all urgent operating will have to cease, with emergency cases only being taken. Discuss this with the general consultant on call.
Inter-hospital transfers

[Appraised by Dr Mark Mead, January 2010]

The referring consultant has responsibility for transferring a patient. Referral should be on a consultant-to-consultant basis. If intensive care is likely to be needed then the consultant intensivist should also be informed.

Accompanying personnel

Identifying an anaesthetist to go with the patient can be difficult (see also page 30), if no critical care doctor is available to go. Liaise with the general consultant on call, who may need to make plans for reduction in available resident staff.

All front-line ambulances are equipped for ventilation. If you are taking skilled staff with you, you may not need a paramedic crew. Discuss your needs with the senior nurse and the ambulance control.

Protocol

An agreed protocol covering all aspects of patient transfer (including a separate head injury transfer protocol) is in place, and is found on the critical care unit and in the emergency department. Essential points are given below.

Patients should not be transferred until they are physiologically stable and full monitoring is in place. Monitoring should always be of the standard required for monitoring a patient on the ICU (provided there are no contraindications) and therefore includes ECG, SpO₂, invasive arterial blood pressure, expired CO₂, urinary catheter and gastric decompression tube. Please note that capnography is available and should be used. CVP, temperature probe and pulmonary artery catheter may be necessary. Management of specific conditions prior to transfer should be agreed with the receiving unit and all relevant investigations should be completed such as arterial blood gases, biochemistry, haematology, appropriate radiology and more extensive investigations such as CT, MRI or peritoneal lavage if indicated.
Inter-hospital transfers

Prior to departure check that you have appropriate assistance, drugs, equipment, sufficient oxygen and the relevant documentation and films.

Good communication is essential for a smooth transfer so confirm all arrangements made with the receiving unit and ensure that relatives are properly informed before transfer.

You should notify the general consultant on call (for Coventry or Rugby as relevant) of any transfer that is arranged using on call staff.

Transfer documentation

The audit record keeping and physiological record keeping have been combined into one form that is a triplicate carbon copy. These forms are kept on the critical care unit. The audit is now centralised and all transfers occurring in our transfer network group are collected by critical care.

The transferring doctor should find one of these forms wherever the transfer originates from within the University Hospital. Complete it for all out of hospital transfers.

1. Top copy: returns to the originating hospital and is retained in patient’s notes.
2. Yellow copy: patients notes at receiving hospital.
3. Green copy: return to originating unit to be forwarded for audit (to Angela Himsworth).

Insurance and indemnity

Members of the Association of Anaesthetists of Great Britain and Ireland, and the Intensive Care Society, benefit from automatic indemnity arrangements during transfer, which greatly extend the cover offered by the NHS Injury Benefits Scheme. For this reason if for no other you are strongly advised to join the Association and remain in the NHS Superannuation Scheme.
Consultant leads

Problems or queries regarding the transfer of patients should be directed to:

- Dr M. Mead (Rugby)
- Dr B.V.R.N. Murthy (Coventry)
Administrative issues

The Anaesthesia Office

This is located on the first floor (central wing). Go in through the main entrance and take the first staircase on the left on the hospital street; the offices are a few metres to the left opposite the staircase exit, on the first floor.

<table>
<thead>
<tr>
<th>OFFICE</th>
<th>(024 7696 5892) 25892</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gill Prior</td>
<td>Administration manager</td>
</tr>
<tr>
<td>Fran Bourne</td>
<td>Administrative officer</td>
</tr>
<tr>
<td>Jane Lee</td>
<td>Administrative officer</td>
</tr>
<tr>
<td>Charlene Allen</td>
<td>Theatre utilisation manager (including rota allocations)</td>
</tr>
<tr>
<td>Tracy Devantier</td>
<td>Performance manager</td>
</tr>
<tr>
<td>Fax</td>
<td>(024 7696 5888) 25888</td>
</tr>
<tr>
<td>Dr Edwin Borman</td>
<td>Clinical director for anaesthesia and pain management</td>
</tr>
<tr>
<td>Dr Matthew Patteril</td>
<td>Deputy clinical director</td>
</tr>
<tr>
<td>Ms Donna Fox</td>
<td>Interim general manager</td>
</tr>
</tbody>
</table>
Signing on

Your first days in UHCW will run smoothly if you prepare for them. Remember to bring important documents to the Anaesthetics Office. Make sure you attend your induction (see page 14).

1. GMC annual renewal certificate for the current year.
2. Criminal Records Board clearance certificate.
3. Evidence of your National Training Number if relevant.
4. Obstetric anaesthesia assessment certificate (all StR3+, and StR1-2 if you have one).
5. Birth certificate or passport.
7. Staff Transfer Form from your previous employer.
8. Last payslip from your previous employer.
9. P45 tax form from your previous employer.
10. Your contact addresses, email address, phone numbers and so forth, to be recorded in the department and held at switchboard.

You will be asked to complete an engagement form, and you will be given various items including your contract of employment.

Communications

The Anaesthesia Office issues bleeps. Batteries are available from the office or from the switchboard in the FM building.

You must carry, and respond appropriately to, your bleep at all times when on duty. You should test your bleep when starting any duty period and report any problems to the Anaesthesia Office.

There are some fixed bleep numbers for on call personnel.
Administrative issues

2813 Senior resident anaesthetist
2814 Resident anaesthetist
2178 Labour ward anaesthetist
2400 Starred StR

To bleep a person directly, key ‘66’ and wait for the tone to change, then key the bleep number required followed by the five-digit extension number you are calling from. Then key ‘#’ and replace the handset.

The Postgraduate Centre will arrange for email addresses and passwords to be issued to you. Please ensure that the Anaesthesia Office have an accurate record of your personal email address as all communication from the department including the weekly rotas are disseminated via email. The deanery strongly recommends that all trainees sign up for an NHSmail account.

Should you wish to email the office, use the Anaesthesia (RKB) address in the UHCW address book. The internet email address is anaesthesia@uhcw.nhs.uk.

Identifying each other can be difficult. We will take a photograph of you when you arrive, and publish it on the department website.

Mobile phones

Mobile phones are a boon to communication, but they can be intrusive and they can impair concentration. You should take common sense measures.

Do not allow mobile phone calls to interrupt clinical work, whether in theatres or outside. If it is necessary to leave the phone on, have it set to silent mode while you are engaged in clinical work. Do not risk potential distraction by making non-essential mobile phone calls during clinical work, including texting.
Administrative issues

Mobile phones have only patchy reception in the University Hospital and you must not rely on them for clinical communication. Carry your bleep at all times when on duty.

Identity badges

Your UHCW identity badge must be worn at all times. Aside from being a general security and approachability measure, the badge is coded to give access to certain restricted areas. You should obtain one as soon as possible. It is not possible to move around the University Hospital without a coded badge. The staff in the Anaesthesia Office can sign the necessary paperwork for you and you will need to take it to the security office on the ground floor of the University Hospital, which is where the badges are issued.

Car parking

You will need a car parking pass. Ask the staff in the Anaesthesia Office to sign the necessary paperwork for you. Car parking spaces can be difficult to obtain at any time of the day and especially if you arrive after 08:00. Make sure you get to work in time to park.

Weekly rotas

Rotas are now prepared up to six weeks in advance by the Theatre Access Manager, and checked by the college tutors. You will be allocated to a list in accordance with your current module as much as possible. However, this may not be possible at times when many people are away on leave.

The rota is published live on the world wide web, including all daily corrections and changes. It is your responsibility to check the weekly and on call rotas. You must determine where you are meant to be and notify the office immediately if you think there is an error. Check page 65 in the handbook for information about on call rotas.

We have a web resource for checking the weekly rotas:

https://coventry.clwrota.com
Administrative issues

You will need a user name and password which you can get from the office staff. The rota is available from all locations inside and outside the trust; you can check it from home.

Make sure you check the rota every Friday afternoon for the week ahead. The rotas will not be circulated by any other medium and are not sent round on paper.

List cancellations and changes

In the event of a list cancellation or early finish for whatever reason, you must notify the Anaesthesia Office and the general on call consultant. The administrative staff will then determine whether to reallocate you to a different list.

On call rotas

Training modules are now organised in one-month blocks with designated modules allocated flexibly to maximise training opportunities. The exception to this is Intensive Care Medicine which is a three-month block. You will be doing on call duties around your modular attachments.

On-call duties include long day shifts, night shifts, and trauma and CEPOD list work in the afternoon and evening. Rotas for this work are published at the start of the rotation by the college tutor.

Trainees wishing to take leave of any description will be responsible for arranging swaps of on call duty with their colleagues so as to maintain on-call coverage.

All swaps must be notified to the office on a swap form that has been fully completed and signed by both trainees. In the absence of a properly-completed swap form, signed by both doctors, the trainee whose name appears on the published rota is responsible for working the shift. It is only possible to swap duties with a colleague who has worked on the type of shift that they will be covering. For
obstetrics, we strongly expect that cover will first be arranged with other doctors attached on that particular block.

You will be contracted for and working on a twice daily shift arrangement with one weekend in four partly committed to work.

The on call rotas are 1:7 and are compliant with the Working Time Regulations. Average working time will not exceed 48 hours per week.

StRs may be attached to a critical care medicine block from time to time, organised by the critical care doctors.

**Applying for leave and your entitlements**

Application for study and annual leave is done via the Anaesthesia Office. Downloadable forms are posted on the web sites for you to email in with your requests. **The maximum number of specialty registrars allowed on leave at any one time is six.**

You must complete an application form for leave, and if any on-call duties are involved, a duty swap form. Do not enter these details in the diary yourself. The application form will be forwarded to you as confirmation that leave has been approved. Only in exceptional circumstances will leave be approved less than four weeks in advance.

All leave must be confirmed with the office staff and entered into the diary, including lieu days for bank holiday working.

Details on annual leave are in your contract. The usual entitlements are:

<table>
<thead>
<tr>
<th>StRs on the base salary point and first incremental point</th>
<th>Five weeks plus two floating days per annum pro rata (27 days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>StRs on the second incremental point and above</td>
<td>Six weeks plus two floating days per annum pro rata (32 days)</td>
</tr>
</tbody>
</table>
Administrative issues

Annual leave is calculated on a five-day week basis. Study leave expenses are described below and applications on page 82.

Expenses

You can claim study leave expenses after the leave has been completed. You must support the claim with full receipts in accord with the expenses approved for the application, and a copy of the grant of approval.

Trainees on rotation can claim for excess mileage at public transport rates if not moving house to each job. This mileage is the excess to your ‘home to base hospital’ mileage (the base hospital is that on the rotation closest to your house).

You must sign all expense claims and then submit them to the administrative office staff for countersignature. Payment will be made through your monthly pay slip, non-taxed where appropriate.

UHCW has a policy of not paying claims submitted more than three months after the expenses have been incurred.

Absence and sickness

In the case of absence and sickness, you must telephone the Anaesthesia Office as soon as possible. The office is staffed from 07:30. You must not leave an answering machine message. If no person answers the call, you must contact the consultant anaesthetist on call through the switchboard.

Anaesthesia office 024 7696 5892
Hospital switchboard 024 7696 4000

You should indicate if you can how long you will be absent, and also telephone each day to confirm that you are still absent.

It may be a professional courtesy to inform the theatre staff members know where you are supposed to be working.
Administrative issues

Main theatre reception 024 7696 5959
Surgical day unit reception 024 7696 6826

Family planning claims

The trust has recently abolished all family planning fee payments. It is therefore optional as to whether one undertakes such work as a sole procedure. The medical director advises that doctors should still do cases that arise in the course of other procedures, e.g. sterilisation during caesarean section.
The CLWrota system is used for scheduling and staff management. Passwords and usernames are available from the Anaesthesia Office.

**Booking of annual leave**

The CLWrota System has the function to book online – we have temporary switched this off to allow everyone to familiarise themselves with the system first and will switch this function back on at a future date. Until then please continue to book leave as per the current process. Please note you will still be able to view leave.

**Notification of change of allocation**

Due to the nature of the department it may be necessary to re-allocate you on the rota, however should this occur once the rota has been published a notification will be emailed to you. If changes occur on the rota one working day before the session is to take place, the Anaesthesia Office will contact you using telephone or bleep to inform you. In a months time we aim to switch on the SMS messaging function which will send a message to your mobile phone about changes.

**Responsibility of anaesthetists**

- The onus will be on the anaesthetist to check daily on the CLWrota system as to where they have been allocated.

- To email the anaesthesia mailbox anaesthesia@uhcw.nhs.uk with changes of details e.g. preferred email addresses, bleep numbers, mobile numbers, discrepancies in the rota, on-call swaps (consultants only) etc.
CLWrota processes

- To complete cancellations and leave requests forms and ensure they are placed in the tray in the Anaesthesia Office.

- Trainees to complete on-call swap forms and ensure they are placed in the tray in the Anaesthesia Office.

Accessing the rota

The rota can be accessed on the following link: https://coventry.clwrota.com on any PC which has internet access.

Extra sessions

Please note extra sessions will be offered out 4 weeks in advance.

Key for the rota

- Sessions which have been altered on a published rota will be shaded in BLUE.

- Sessions which have no anaesthetist cover will be highlighted in a RED BOX.

- Sessions covered by someone doing an extra session are highlighted with a DARK BLUE BOX.

- Sessions which have a trainee doing a solo list will be highlighted with a YELLOW BOX.

- Trainees who require supervised lists cannot be assigned to lists unless a consultant has been allocated first (if you have not been allocated please contact Charlene).
Data security

There is a heavy emphasis on data security throughout the NHS. If you take confidential data out of the secure trust environment you will get into deep trouble. There is a trust policy on this which you must read. Data should be treated as confidential whether it applies to identifiable patients, or staff members.

You should be aware that the ICT department maintains access logs for emails, internet and database usage.

You should apply for and use an NHSmail address. This is best practice and will shortly be required by the deanery.

Using someone else’s PC

When someone else has logged into a computer, you can still use it to check your UHCW emails, and clinical results and records. This may happen in theatre where PCs are left logged in for Opera, or on wards. You do not need to log someone else out and log yourself in – you simply enter your appropriate password into the email or data application.

- Trust email: intranet home page | Links | General | Web mail. Close the page when finished.
- CRRS and PACS: you can sign in to these systems from any open computer. All pages you view are logged centrally. Only check records for patients under your care. Close the page when finished.

Erasing browsing history

It is good practice to erase your history and cookies when closing a browser window on a shared computer. This will stop the next person on that PC from recovering and using your information.

Use Tools | Internet options.
Security rules:

• Do not put confidential data onto USB memory sticks.

• Do not send emails containing confidential data outside the trust network or NHSmail.

• Do not send emails to any outside addresses without thinking about their contents.

• Do not send emails from your home address that mention patients.

• Do not forward your NHS emails home (other than NHSmail). NHSmail is considered a secure environment and can be accessed off site.

• Do not share passwords.

• Do not access inappropriate web sites.

• Do not leave your PC terminal unattended while you are logged in – they can be locked out using Ctrl-Alt-Delete.

• Do not collect data for clinical audit without approval by the clinical audit and effectiveness department.

USB memory sticks

You will not be able to save data to memory sticks. However, the sticks can still be read should you need to bring work in such as presentations.
ALS training

All trainees must be ALS competent. If you do not hold a valid ALS provider certificate you must arrange to take an assessment in the first few weeks of joining UHCW. Contact the resuscitation department on extension 28800 for help with this. (Dr Alistair Brookes is the chairman of the Resuscitation Committee).

Records of supervised training

You are responsible for the completion of competency records at all levels. In addition to competency documents, ST1 and 2 trainees will need to complete a number of formal assessments as detailed in the 'Training' section of the college website under 'Workplace Based Assessment – blueprint, forms, guidance and portfolio'

West Midlands Deanery and the Warwickshire School of Anaesthesia hold to the policy ‘no paper, no progress’.

If you wish to amend the module plan or attend certain lists, contact your college tutor.

Supervised training is now being monitored centrally by the department. Individual as well as overall supervision rates will be recorded electronically and reviewed periodically by the college tutors.

You should take your logbook and appropriate assessment forms to all lists.

The GMC supports the principle of revalidation and will require all doctors to be appraised annually in order to maintain their licence to practice. The NHS training and appraisal portfolio will be provided on joining the department alternatively you can download a copy from
the Royal College of Anaesthetists website (www.rcoa.ac.uk) under ‘College Publications’.

You must ensure that you are appraised annually, preferably by your nominated educational supervisor.

Please note this process will be in addition to the college tutor reviews and the Annual Review of Competence Progression (ARCP) meetings. These were formerly known as RITA.

**Obstetric anaesthesia assessments**

Trainee assessments in obstetric anaesthesia are conducted by the consultant obstetric anaesthetists with a mix of logbook, supervised practice, case reports and viva examination. Trainees should be able to pass the assessment after one block in labour ward. The documentation can be downloaded from the intranet (under education) or hard copies obtained from the anaesthesia office; they have been approved at regional level.

You can only pass the obstetrics module in this way. The schedule of assessments is usually available two to three months in advance.

**Modular training**

The training programme at all levels consists of modules of specialty attachments determined by the individual’s needs, the requirements of the Royal College of Anaesthetists and the Postgraduate Medical Education and Training Board (PMETB) along with the training capacity of the hospital. The College Tutor makes modular allocations to training modules for each six months, in advance of the StR rotation dates. Rotations happen on the first Wednesdays in August and February. As many daytime sessions as possible will be spent in this work although flexibility in accordance with service needs is required.

All trainees receive a booklet of assessment records, which should be kept safe and completed in time for college tutor or school reviews.
Training modules are now organised in one-month blocks with designated modules allocated flexibly to maximise training opportunities. The exception to this is Intensive Care Medicine which is a three-month block. The external training modules are allocated for four or twelve weeks depending on the level of training.

Priorities in training modules

Some modules involve working a separate shift pattern for a while, and some are expressed as targets for the achievement of specialised experience. While you are entitled to take reasonable annual and study leave, you should not concentrate leave in these modules, as this will cause severe scheduling problems for you and your colleagues. The most important modules are as follows.

1. Critical care resident: four StRs working a separate shift pattern wholly in critical care medicine.

2. Neurosurgical anaesthesia: training in UHCW is provided with over two hundred craniotomies and fifteen hundred cases in total being done annually. Training is also available in neuroradiology especially interventional techniques for the coiling of cerebral aneurysms. UHCW is able to provide all the clinical requirements necessary for advanced sub-speciality training in neuroanaesthesia as defined in the RCoA document ‘CCT in Anaesthetics IV’. There is an option for modular attachment to the neurosurgical unit at the Queen Elizabeth Hospital in Birmingham (see below). This attachment must be arranged by the programme director of the school of anaesthesia

3. Cardiothoracic anaesthesia: at least one specialty registrar should be attached to the cardiac theatres at all times.

4. Paediatric anaesthesia: there are paediatric opportunities available in Coventry. Ask Dr Chari (paediatric anaesthesia lead) about this. There is also a modular attachment in Birmingham – see below.

5. ATM (advanced training module): year 5, 6 and 7 specialty registrars are allocated to this in their first month in order to gain
the necessary experience in cardiac and neurosurgical anaesthesia to be the senior resident anaesthetist.

6. A variety of other training modules are allocated. If you want to follow a more specialised module or attend certain lists then please contact the college tutor.

The weekly and block rotas are prepared with the allocations in mind and delivery of the allocations currently averages around 50%. You should be aware however that on occasion, service needs might require you to be moved away from a modular allocation even at relatively short notice.

You have a major responsibility to monitor your own training and education, including the amount of experience that you have obtained. Problems and requests should be discussed with the College Tutor or the rota consultant. Diligent keeping of a logbook and modular diaries will facilitate such monitoring, which is now a basic professional requirement for all trainee anaesthetists. You must keep a logbook and should aggregate data regularly. Always keep a backup paper copy of all your records.

Anaesthesia specialty modules in Birmingham

These modules are allocated in order to ensure that the specialty modules are completed during your specialist training, wherever you may be employed at the time.

Preference is now given to trainees based at the district general hospitals however a few trainees may still be allocated external specialist training modules while based at UHCW. While they happen, the advice here will help you to get to where you need to be.

During the specialty attachment you will hold an honorary contract, work under direct supervision and remain as an employee of the University Hospitals Coventry and Warwickshire NHS Trust.

It is strongly recommended that you do not book annual leave or study leave during the Birmingham modules (or the one-month cardiac module). You should only go on study leave for examinations.
You are not expected to attend the final FRCA course while in Birmingham. These modules are supported by complex planning and are also vital to the attainment of your educational objectives. They could be considered as equivalent to study leave.

You should discuss problems with your consultant mentor, or with the college tutors.

Use [http://maps.google.co.uk/maps](http://maps.google.co.uk/maps) for maps, entering the postcodes of the hospitals.

**Neurosurgical anaesthesia**

Queen Elizabeth Hospital  
Queen Elizabeth Medical Centre  
Edgbaston  
Birmingham  
B15 2TH

Telephone: 0121 472 1311

Educational supervisor – Dr Nigel Huggins nigel.huggins@ukf.net

*Modules usually start on the first Monday of the month and last for four weeks. Contact Dr Huggins by email at least a month before you are due to start this module.*

Motor transport from Coventry can be difficult because of traffic in Birmingham and the hefty car parking charges at the QEH, after the major problem of finding a parking place. Your alternative is to take the train to Birmingham New Street station and then change to the Redditch or Longbridge local line, getting off at University station.

At the hospital, the neurosurgical unit is colour-coded green; follow the directions and go down stairs to the basement where the neurosurgical intensive care unit and theatres are. Do not look for the anaesthetic department.

The lead neuroanaesthetist is Dr Nigel Huggins (always in theatre 2 on Wednesday to Friday) who will advise on what to do and where to go on a day-to-day basis. The start time is between 0900 and 0930 –
arrive in theatre for 0900. Due to the nature of the placement, you are not usually expected to see the patients the night before.

There are some experiences you should look out for. Theatre 1 is normally used for back surgery; on Thursdays and Fridays, patients are orally intubated using a fibreoptic scope. Dr Ann Sutcliffe has a session on Thursdays for elective neuroradiological cases in the MRI suite. Most anaesthetists use TIVA (Dr Huggins is particularly keen) and this placement can be used to provide experience in this mode of anaesthesia.

Paediatric anaesthesia

Birmingham Children’s Hospital
Steelhouse Lane
Birmingham
B4 6NH

Telephone 0121 333 9999

Educational supervisor – Dr Lola Adewale lola.adewale@bch.nhs.uk

Year 3 and 4 specialty registrars will be attached to Birmingham Children's Hospital for one month to gain concentrated experience in paediatric anaesthesia. This is an excellent opportunity to gain experience at a renowned centre. Further paediatric attachments last for three months and are mandatory in years 5, 6 and 7 to achieve the necessary competencies. The programme director can arrange additional experience for trainees with an interest in paediatric anaesthesia.

All trainees posted to BCH will need enhanced Criminal Records Board clearance before starting work there. You must contact Dr Adewale at BCH as soon as possible. Criminal Records Board clearance can take up to 12 weeks. Without this, you will forfeit your place.

This attachment runs serially with the neurosurgery attachment – one trainee is on the paediatrics or the neurosurgery attachment at any one time.
Local teaching and courses

1. **All trainees** should attend a consultant-led seminar, at 08:00 on Fridays in the seminar room of the anaesthesia department. The program is on the intranet. PowerPoint must be used for all presentations. Subject allocation is by Dr Elton. A register is kept; the college tutors require your attendance as part of the training program. It is understood that trainees on attached lists may be late on Friday mornings. Trainees coming on call or going off duty are expected to attend unless delivering patient care or exhausted.

Exceptions to attendance are as follows. Trainees on a cardiac anaesthesia module or allocated to a solo list are expected to attend only if presenting. Make sure that the theatres or your supervising consultant know this. **If you are unable to make your presentation on the allocated date for any reason, you must arrange a swap with a colleague and inform Dr Elton as soon as possible.**

2. There is a local primary course in Solihull on Tuesday mornings, on a half-day release basis. A copy of the course programme can be obtained by e-mailing Ann Amos, the anaesthesia secretary at Birmingham Heartlands Hospital: ann.amos@heartofengland.nhs.uk.

3. A final FRCA course takes place in Coventry on alternate Wednesdays, on a day release basis. Dr Pyda Venkatesh is the consultant responsible for this course.

Please note that trainees will need to apply for study leave in order to be rostered out for both the Primary and Final courses.

4. Post fellowship specialty registrars are expected to attend the professional development course organised by the Stoke-on-Trent school although preference is given to senior trainees StR 6 and 7. You must apply for study leave for this course. Places are limited on this course and you are advised to apply as soon as the yearly programme is advertised by the school. Further
information can be obtained by emailing Ann Moore, the secretary of the Stoke school: ann.moore@uhns.nhs.uk.

5. Breakfast meetings are also organised by the Intensive Care groups as part of a regular programme of local meetings.

6. The anaesthesia department mounts many regional and national courses (see the departmental website for details). These courses present an invaluable opportunity for trainee anaesthetists to develop their teaching and training skills and participation is actively encouraged by the department. Contact Dr Cyprian Mendonca if you are interested in teaching on any departmental course.

7. The anaesthesia department offers advanced training posts in ‘Teaching’ and ‘Airway Management’ earmarked for ST 5 to 7. These posts have a six-monthly intake and are allocated after competitive interview within the Warwickshire School of Anaesthesia. For details and current schedules check in the Anaesthesia Office.

For details and current schedules, you should check in the Anaesthesia Office.

Audit

You are expected to participate and contribute to the audit process. The aim is for every trainee to complete at least one audit project during their stay at Coventry.

Dr Krishnamoorthy is the audit lead for the department, who will be able to suggest suitable topics for audit. You must take initiative in this regard.

Study leave

The department maintains a list of current opportunities, in a folder and displayed on the notice board in the ‘quiet room’ of the department, opposite the coffee room. Check this especially for exam
preparation courses and those out of region. A good way of learning about opportunities is to join the relevant anaesthesia societies. Start with the Association of Anaesthetists and then join subspecialty groups. You will also find this to have been invaluable when it comes to interviews for consultant posts.

Obstetric Anaesthetists Association  www.oaa-anaes.ac.uk
Association of Cardiothoracic Anaesthetists  www.acta.org.uk
Neuroanaesthesia Society of Great Britain and Ireland  www.nasgbi.org.uk
Intensive Care Society  www.ics.ac.uk
British Association of Day Surgery  www.daysurgeryuk.org
Association of Paediatric Anaesthesia  www.apagbi.org.uk
Society for Education in Anaesthesia  www.seauk.org
Vascular Anaesthesia Society of Great Britain and Ireland  www.vasgbi.com

National opportunities

You may attend national courses approved by the College Tutor with the exception of exam preparatory courses.

All courses will be considered on their merits, but you would normally be expected to exhaust the opportunities for regional courses first.

Applications for courses and study leave

You must apply for courses that require applications, and pay any advance fees, yourself. You must also arrange your own transport and accommodation if required. Expenses will only be paid up to a limit, as advised by the postgraduate deanery (currently £500 per year).

You must also apply for study leave (see page 67). All study leave applications must be submitted on forms held in the Anaesthesia Office, supported by programmes for the relevant meeting or course. There are limits on the numbers of trainee anaesthetists allowed on leave at any one time for popular courses. The exception is the
examination itself when every effort will be made to accommodate those sitting the examination.

We follow the postgraduate dean’s policy of not supporting study leave for pre-examination courses outside the region or at the Royal College of Anaesthetists. Private study leave will be granted at the discretion of the college tutors on a first-come, first-served basis and deducted from your normal study leave allocation. The usual conditions for granting of leave (on call swaps, maximum number off and so on) still apply.

Incurred expenses can be claimed after attendance, as described on page 68. UHCW uses a system of rail warrants to pay for rail travel. Remember to apply for a warrant when applying for your study leave.

**Junior doctors forum**

A junior doctors’ forum is held on the last Friday of each month in the doctors’ mess from 13:00-14:00. This meeting is chaired by the clinical tutor and is an opportunity for you to meet and exchange views with junior doctors from other specialties as well as to raise any hospital-related training issues.

**Location of duties – study sessions**

Study and research sessions allocated to you on the weekly rota are liable to be changed to clinical sessions at little or no notice. During such sessions, you should be available on UHCW premises except by special arrangement with the Anaesthesia Office.

**Role of the college tutors**

Dr Andreas Ruhnke and Dr Krish Ramachandran are the college tutors. They have overall responsibility for education and training in the department, allocating trainees to modules and collating data on assessments. They act as general advisors to all trainees. The college tutors and others arrange clinical meetings and breakfast
Education and training

seminars. Attendance where possible is expected and registers of attendance and presentations are kept.

You should keep your own logbook and workplace assessments as a basis for your personal development portfolio. This portfolio should be reviewed at six-weekly intervals during meetings with your educational supervisors.

You should discuss problems in training with one of these tutors. The college tutors each have an office in the anaesthesia department.

Role of the educational supervisors

Each trainee is allocated an educational supervisor; each consultant mentor usually has two trainees. The role comprises both pastoral and training supervision in addition to acting as the trainee’s advocate when required.

Pastoral supervision

We recommend that you meet with your educational supervisor within a week of joining the department and at least once every six weeks thereafter. You are encouraged to discuss any problems that you may have whether these are personal or related to employment or training. You must be proactive in this.

Training supervision

Supervision is not only general but also in relation to the subspecialty assessments carried out in Coventry.

You should take your logbook and appropriate assessment forms to all lists.

Role of the lead assessors

Lead assessors in each subspecialty are responsible for setting the educational goals for trainees, formulating the method of assessment and ensuring that the assessments take place.
All consultant anaesthetists are assessors in their specialties. In order to facilitate the assessments taking place, you should ensure that for each list you attend, you take the relevant assessment documentation and your logbook. You must adopt a proactive approach to your assessments in order to avoid last minute panics and possible failure of assessments or poor references.
Presenting at seminars

[Appraised by Dr John Elton, January 2009]

**Logistic support and network computers**

There are a large number of networked PCs, around UHCW, in service areas and the postgraduate centre (CSB), and in the anaesthesia department.

You will need a network log on code in order to access these computers. The Postgraduate Centre allocates the log on codes to all trainees; you should contact them for advice on your first day. The induction program for new anaesthetists usually includes a trip to the Postgraduate Centre when these codes will be issued. You should be able to operate a computer without a code as long as you use the equipment number as identity and password; this will allow you to display a presentation but not access some other applications.

UHCW has many PowerPoint projection systems that will display PowerPoint files. They will accept files from your network log on, a USB memory stick, a CD-ROM or from a 1.4 MB floppy disk prepared on a PC or Macintosh (in the latter case format the disk for DOS 1.4 MB).

Using PowerPoint live can be very embarrassing – for you and your audience – if you do not know how to use it and how to rescue problems. Before attempting to present work on any audiovisual system you should:

- Practise your presentation in advance on the system to be used.
- Bring your file on a USB pen drive or memory stick (or CD-ROM or even floppy disk) in case you cannot access the network resource to which you saved the work. Save the file to the desktop as a PowerPoint Show before the scheduled time for the presentation.
Presenting at seminars

- Bring hard copy of your material in case the system does not work.

Ask somebody to listen to and criticise your presentation a few days before you are due to give it. The college tutors, the audit coordinator, your educational supervisor or another appropriate consultant should be able to do this.

How to avoid a truly awful presentation

[Dr Mark Porter, 2003; revised by Dr John Elton, January 2009]

The seminar program is designed to develop skills in understanding, abstracting and presenting academic papers in anaesthesia and related subjects. Dr Elton allocates subjects to trainees. It is then up to you to present this work to your colleagues. Remember that there are two keys to successful communication – having a message to present, and presenting it in an effective way.

The Friday morning seminars are 08:00 gather, 08:10 first seminar, and 08:30 second seminar. If you are in the audience help the presenter by sticking to these times. This advice is applicable to all seminars, meetings and other lectures. Have pity on your audience!

Remember that the projected screen will be darker than the PC screen, and the room lights will be kept up. Use black writing on a white screen.

If you are using photographs and will be putting the lights down, then white writing on a dark screen can work.

Recent seminars have demonstrated that the good presentations are those where the presenter brings in pictures or graphs. Please try to do this. However, use clip art judiciously – it can look tacky.

## Presenting at seminars

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<thead>
<tr>
<th><strong>DO</strong></th>
<th><strong>DON’T</strong></th>
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</thead>
<tbody>
<tr>
<td><strong>You must:</strong></td>
<td><strong>You must not:</strong></td>
</tr>
<tr>
<td>• Prepare a seminar with a conclusion that will interest the audience. Decide on the message you want to get over, or the question on which you want discussion to focus. Demonstrate a critical faculty.</td>
<td>• Turn up late.</td>
</tr>
<tr>
<td>• Prepare PowerPoint visual aids.</td>
<td>• Exceed 15 minutes talking time (or agreed time).</td>
</tr>
<tr>
<td>• Use them as an aid to your talk, as an illustration and summary of the things that you talk about.</td>
<td>• Project slides and just read them out. This is the most common major problem.</td>
</tr>
<tr>
<td>• Bring your presentation on a medium the PC will accept. The network PCs in the CSB will accept USB pen drives, floppy disks and CD-ROMs. (You can read from USB memory sticks but not write to them.)</td>
<td>• Talk while facing the projection screen.</td>
</tr>
<tr>
<td>• Stand to face the audience when giving your talk. It makes you much more audible.</td>
<td>• Use tiny font sizes. Project the show on a PC screen. Hold a standard pen at arm’s length and move backwards until the pen appears longer than the screen is wide. If you cannot read the type easily at a glance, the audience can’t either.</td>
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<tr>
<td></td>
<td>• Present the entire allocated paper without critical editing.</td>
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## Presenting at seminars

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<th>DO</th>
<th>DON’T</th>
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<tbody>
<tr>
<td><strong>I advise you to:</strong></td>
<td><strong>I advise you not to:</strong></td>
</tr>
<tr>
<td>• Rehearse your talk.</td>
<td>• Put more than five lines of text on a slide – and never more than eight.</td>
</tr>
<tr>
<td>• Bring your presentation as a Microsoft PowerPoint Slide Show – use the ‘Save As’ command. This will cut out all the playing around with opening presentations and finding the slide show button.</td>
<td>• Use more than twelve slides. Often, using fewer is better.</td>
</tr>
<tr>
<td>• Copy it to the Desktop before starting.</td>
<td>• Experiment with different fonts, builds and slide transitions. This looks messy and distracts people from the message. Save special effects for special messages.</td>
</tr>
<tr>
<td>• Use standard PowerPoint formats and design templates. They have been carefully constructed to communicate effectively.</td>
<td>• Write in capital letters. It’s unreadable.</td>
</tr>
<tr>
<td>• Check the spelling and get it right.</td>
<td>• Mumble, read from a script, and lack eye contact with the audience.</td>
</tr>
<tr>
<td>• Have a take-home message.</td>
<td>• Bring lots of presentations on one disk or drive, and hunt amongst them for the right one while we wait for you to talk.</td>
</tr>
<tr>
<td>• Use the wireless remote control to change the slides, and use the built-in laser pointer for emphasis.</td>
<td></td>
</tr>
</tbody>
</table>
The Clinical Sciences Library

The library is on the first floor of the Clinical Sciences Building.

The library maintains subscriptions to the following anaesthesia journals:

- Anesthesia and Analgesia
- Anesthesiology
- Anaesthesia & Intensive Care (also Rugby and online)
- Anaesthesia (also online)
- Anaesthesia & Intensive Care Medicine (only Rugby)
- British Journal of Anaesthesia
- Canadian Journal of Anesthesia (also online via Ebsco EJS)
- Current Anaesthesia & Critical Care (only Rugby)
- Journal of Cardiothoracic and Vascular Anesthesia (also online)

You should obtain an ATHENS account access code from the library; this will allow online access to a variety of abstracting databases and the National electronic Library for Health.

The library’s intranet site contains much detail about access times and catalogues – look under ‘Departments’. Access is available to Online Journals, the Knowledge Skills Courses and Literature Search Request forms.

http://intranet/library/

The online public access catalogue is on the world wide web, which enables staff to request books, photocopies, searches and so forth.

http://www.uhcw.nhs.uk/clinical_sciences_library.htm
Clinical adverse event reporting

[Appraised by Dr Keith Clayton and Dr Edwin Borman, January 2010]

A clinical adverse event is an untoward event that led to harm, or if allowed to progress could have led to harm. Clinical adverse event reporting is an essential element of clinical governance, helping to improve the quality of clinical services, and UHCW has such a system in operation.

Forms to report these adverse events are located in each theatre suite, intensive care unit and delivery suite. Ask the sister in charge. All clinical adverse events should be reported on these forms. When completed, place in the CAE box in the Anaesthesia Office (forms relating to maternity care should be submitted through labour ward).

If appropriate, action will be taken to prevent these incidents from happening again. In the past, significant improvements in patient safety have been implemented as a direct result of reported clinical adverse events, so you are encouraged to report any such events.

Clinical adverse events are discussed at the monthly audit meetings for educational and information purposes. The identity of the anaesthetist involved is not made public unless they choose to identify themselves.

Clinical adverse events are grouped into three broad categories. Examples of the sort of events that you should report are given below. Please remember that these examples are not exhaustive and you should report any incident that you feel falls within the basic definition above.

Anything which has or, if uncorrected could, put at risk the safety and well being of the patient.

Human

- Cardiopulmonary arrest.
- Airway obstruction.
Clinical adverse event reporting

- Aspiration of gastric contents.
- Failed intubation.
- Oesophageal intubation.

Equipment
- Anaesthetic machine malfunction or failure.
- Monitor malfunction or failure.
- Ventilator or breathing system problem.
- Drug or fluid delivery system problem.

Organisational
- Non-availability of a needed intensive care or high dependency bed.
- Failure of communication.
- Delays in obtaining essential preoperative tests.
- Inappropriate grade of anaesthetists in relation to the complexity of the case.
- Inappropriate pressure to proceed or relief not available.

There is an opportunity on the day of the clinical audit meeting to discuss anonymously a significant or interesting event related to a clinical case or the system of delivering care. Contact the consultant leads on this for further information:

- Dr Falguni Choksey.
- Dr Keith Clayton.
- Dr Rati Danha.
- Dr Jon Echebarria.
- Dr Krish Ramachandran.
Clinical audit

[Appraised by Dr S. Krishnamoorthy, January 2006]

The department actively takes part in clinical audit and you will be required to participate in the development, data collection and presentation of audit projects as determined by the department.

There is a regular meetings programme, with meetings taking place for a morning or an afternoon in ten months of the year. The day rotates through the week. Each meeting has certain common elements – clinical adverse events, mortality review – and is usually themed to a subspecialty. A number of meetings are held jointly with a department of surgeons.

The audit programme is usually determined at least a year in advance, with subspecialties appearing in rotation. Each subspecialty has a lead auditor who will coordinate the projects conducted and presented. If you have a good idea for a worthwhile audit, then space can usually be made.

Getting help

If you wish to conduct a project in a specific subspecialty, you should see the lead auditor for that subspecialty. The Departmental Audit Coordinator (currently Dr Krishnamoorthy) will be able to discuss ideas for projects.

The clinical audit and effectiveness officer, will be able to advise and help on the execution and presentation of projects.

For help with presentation materials see page 86.

The clinical audit and effectiveness department produces a resource pack available on paper and e-copy. You may find this useful when thinking about or preparing a project.
Guidelines for undertaking clinical audit

These guidelines have been developed by the Clinical Effectiveness Department to ensure that the clinical audit we undertake leads to significant and long lasting improvements to patient care.

Practical tips

Major clinical audit projects should be identified and agreed upon through clinical audit meetings. Sub-specialty clinical audit projects should be identified and prioritised through a sub-group discussion meeting attended by the consultants attached to the sub-group and trainees. This will ensure that every opinion is considered.

The project should be clinical in nature and should be directly related to patient care and based on either national priorities, research evidence and/or expert opinion, professional concern (e.g. variation in practice, recent change, high volume, high risk or high cost) or patient perceptions (e.g. a complaint or clinical adverse event).

All relevant staff (in all disciplines), and GPs and patients where applicable, should be involved in the design of the clinical audit. It is important to explain what is to be evaluated and why and to highlight the implications for change in order to gain commitment and ownership; staff should also be invited to attend the audit presentation. This should ensure a higher completion rate of proformas and increase compliance with any audit recommendations.

Explicit standards or guidelines should be used where possible (national, regional and local).

Data collection should be as current as possible (i.e. within 2 years), relevant and valid (to reflect actual practice not assumed practice).

Using the audit meeting

It is best to keep the overall presentation to a maximum 15 minutes, as the audit meeting must be a conduit to discuss results, agree recommendations, plan changes and complete the action plan.
Clinical audit

Your presentation should include:

<table>
<thead>
<tr>
<th>Slide</th>
<th>Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aims</td>
<td>State what the audit will assess. Identify the source of standards and guidelines. State the date, findings, source and grade of any research evidence.</td>
</tr>
<tr>
<td>Method</td>
<td>Note the time period, patient sample <em>(with any exclusions)</em>, information sources, relevant statistics and consultation exercise / opinions sought in design period of the audit.</td>
</tr>
<tr>
<td>Results</td>
<td>Provide clear descriptions of findings against the standards and guidelines used.</td>
</tr>
<tr>
<td>Conclusions</td>
<td>Provide a summary of the main findings</td>
</tr>
<tr>
<td>Recommendations</td>
<td>Provisional recommendations should be formulated before the meeting.</td>
</tr>
<tr>
<td>Action plan</td>
<td>Once consensus recommendations have been reached, an action plan must be completed with responsible people named. Any changes to the action plan arising through discussions with management must be related to the department.</td>
</tr>
</tbody>
</table>

**Change**

A lead person must be nominated to oversee all audit recommendations but individuals may be nominated to action specific areas.

Action plans with time scales and re-audit dates should be agreed prior to presentation or at the departmental meeting if there are any areas of uncertainty or disagreement.
Clinical audit

The department must be updated on the progress of action plans, no later than three months after presentation of the audit, at the clinical audit meeting. This ensures that all members of staff are aware of any changes. The health standards board requires that the division present progress regularly and currently.
Pain management and postoperative care

[Appraised by Sister Sue Millerchip, January 2010; guidelines supplied by Sister Sue Millerchip except where specified]

The pain management service

The Pain Offices are situated on the first floor (central wing) of the University Hospital, in the anaesthesia department.

Dr Richard Walker, Dr S. Krishnamoorthy and Dr Shyam Balasubramanian are the chronic pain management consultants. Dr Krish Ramachandran is the lead for acute pain. Sue Millerchip is the lead nurse and Josie Josen, Tracy Barnes and Jo Saeed are the pain sisters. They carry bleeps 2492 and 2493. The pain nurses carry out daily acute pain ward rounds, and are available for help and advice on all acute and chronic pain issues.

The treatment and clinic area is in a dedicated suite in the surgical day unit on the ground floor.

Guidelines for acute pain management

This guideline was last reviewed in 2009.

Severe pain options

- Epidural analgesia.
- Intravenous patient controlled analgesia.
- Intravenous morphine infusion.
- Intramuscular morphine 5-20 mg 2-hourly.
- If eating and drinking consider oral morphine solution 10 mg qds. AND 10 mg p.r.n. between regular doses.

In addition consider regular oral or rectal paracetamol AND NSAIDs if appropriate.
Pain management and postoperative care

Moderate to severe pain options

- Paracetamol 1000 mg qds. AND oral morphine 10 mg qds. (with 10 mg oral morphine p.r.n. between regular doses).
- Paracetamol 1000 mg qds. AND dihydrocodeine 30-60 mg qds.
- Paracetamol 1000 mg qds. AND codeine 30-60 mg qds.

In addition, consider NSAIDs if appropriate.

Mild to moderate pain options

- Regular or p.r.n. co-dydramol (paracetamol 500 mg with dihydrocodeine 10 mg), two tablets up to four times a day.
- Regular or p.r.n. co-codamol 8/500, two tablets up to four times a day.
- Regular or p.r.n. paracetamol 1000 mg up to four times a day.

In addition, consider NSAIDs if appropriate.

Do not forget

Laxatives – lactulose with or without senna to prevent and treat opioid-induced constipation.

Anti-emetics – to prevent and treat opioid-induced nausea and vomiting.

Ketamine infusions for acute pain

[Acute pain team, November 2008]

Ketamine is an NMDA receptor antagonist which has been used as an anaesthetic agent for many years. Ketamine acts at a number of receptors including NMDA and opioid receptors. It can provide excellent analgesia at small sub-anaesthetic doses and is opioid-sparing, reducing sedation and other opiate side effects, and leading to a faster return of bowel function after gastrointestinal surgery.

Uses

- Treatment of acute pain
• Management of neuropathic pain
• Management of pain in opioid tolerant patients
• Management of pain in patients who are too sedated with opioids and yet do not have adequate analgesia

Infusion guidelines:

This must be prescribed by an anaesthetist.

1. Draw up 20 mL from 10 mg mL\(^{-1}\) strength ketamine solution vial and dilute to 50 ml with 0.9% saline. This gives a 4 mg mL\(^{-1}\) solution. (If only 50 mg mL\(^{-1}\) strength available, draw up 4 mL and dilute to 50 mL with saline).

2. Usual dosage range: younger patients 1-2 mL h\(^{-1}\) (4 to 8 mg h\(^{-1}\)) up to a maximum of 3 mL h\(^{-1}\) (12 mg h\(^{-1}\)). Smaller doses may be required in the elderly. (Suggest using half-strength solution instead, in this case, as such small volumes are involved with standard solution.)

3. A small initial intravenous bolus of 10-20 mg should be given very slowly by an anaesthetist before commencing the infusion.

4. Ketamine infusions may be run in the same line as the PCA as long as a non-return valve is used.

5. Routine observations as per PCA chart.

6. Discontinue the ketamine infusion when stopping the PCA morphine.

7. In patients at risk of neuropathic pain or patients who are opioid tolerant the infusion may run for 3 to 5 days.

8. At the above recommended doses, ketamine should not cause confusion, sedation, or other mental state changes, or hypertension. If there are any concerns, contact the acute pain team nurses or the anaesthetist on call.

Reference

P.E. Macintyre, B.L. Ready: Acute pain management, a practical guide (2\(^{nd}\) Ed), London, W.B. Saunders.
Paediatric acute pain medication

[Sr Sue Millerchip, Dr Suja Chari, Ms Val Madden, July 2005; reviewed 2009]

Paediatric pain dosage guidelines

The doses in this guide are for guidance only and should be used in combination with the appropriate formulary, e.g. Medicines for Children and the BNF for Children.

Reassess pain periodically using the pain assessment tool and step treatment up or down as below.

Doses

The doses above are for inpatient treatment of acute pain and for discharge following admission to a ward. SEEK ADVICE IF PAIN NOT ADEQUATELY CONTROLLED- PAIN TEAM, SENIOR PAEDIATRIC OR ANAESTHETIC STAFF MAY INCREASE DOSE or FREQUENCY. Note in particular that there is no ceiling dose for morphine and dose or frequency may be increased with appropriate monitoring.

Discharge medication

Children treated under a PGD or supplied medication by nursing staff using pre-labelled supplies will received age related instructions. See PGD or BNF for doses

Doses on discharge when supplies are made from the pharmacy departments will be rounded slightly up or down to facilitate measurement. See chart.

Combination therapy

It is safe to combine paracetamol, non-steroidal drugs together with codeine or morphine. If a patient is experiencing acute pain please ensure that both paracetamol and NSAID are given regularly if appropriate. Do not alternate doses as there is no evidence that this reduces side effects and may not give adequate analgesia. Codeine and morphine should not be given at the same time - however note
that morphine may be used for breakthrough pain when codeine is being taken regularly or as a step up when pain insufficiently controlled by codeine.

The combination preparations of codeine and paracetamol are not used in paediatrics.

Rectal doses

Patients with febrile neutropenia must not have rectal medication, as this may lead to sepsis.
PARACETAMOL – For mild pain or moderate in combination with NSAID. Give regularly for 24-48 hours. Use weight related doses when possible. Minimum 4 hours between doses. Maximum 4g in 24 hours.

<table>
<thead>
<tr>
<th>Age</th>
<th>Birth to 3 months</th>
<th>3 months to 12 years.</th>
<th>12 to 16 years if less than 50kg</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Maximum dose per 24 hours</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oral loading dose</td>
<td>20mg/kg</td>
<td>20mg/kg Max 1g</td>
<td>1g</td>
<td></td>
</tr>
<tr>
<td>Oral maintenance dose</td>
<td>20mg/kg 8 hourly</td>
<td>15mg/kg 4-6 hourly Max 1g</td>
<td>500 mg - 1g 4-6 hourly</td>
<td></td>
</tr>
<tr>
<td>Rectal loading dose</td>
<td>30mg/kg</td>
<td>40mg/kg Max 1g</td>
<td>1g</td>
<td></td>
</tr>
<tr>
<td>Rectal maintenance dose</td>
<td>20mg/kg 8 hourly</td>
<td>20mg/kg 4-6 hourly Max 1g</td>
<td>500mg-1g 4-6 hourly</td>
<td></td>
</tr>
</tbody>
</table>

**Liquid 120mg in 5mL under 6 years must be used on discharge**

**Liquid 250mg/5mL over 6 years (under 6 – may use on ward if smaller volume beneficial)**

**Suppositories – do not cut or break. Round dose but must not exceed daily maximum. Do not use rectal use in febrile neutropenia**

**No single dose to exceed 1g. Minimum interval 4 hours. Maximum dose in 24 hours 4g**

**Supps available as 60mg, 120mg, 240mg, 1g**
Pain management and postoperative care

NSAIDS – For mild pain or moderate in combination with paracetamol. Give regularly for 24 – 48 hours. Give with food / milk if possible

Do not prescribe more than one NSAID

<table>
<thead>
<tr>
<th>IBUPROFEN</th>
<th>1 month to 6 months</th>
<th>6 months to 16 years</th>
<th>Comments – Ensure doses are practicable to measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral dose</td>
<td>Prescription by Registrar or above only</td>
<td>5mg/kg 6-8 hourly</td>
<td>Max single dose 600mg</td>
</tr>
<tr>
<td></td>
<td>5mg/kg 6-8 hourly</td>
<td></td>
<td>Maximum daily dose 2.4g</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>DICLOFENAC</th>
<th>Oral dose</th>
<th>Rectal dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral dose</td>
<td>Not recommended</td>
<td>1mg/kg up to 3 times a day. Max single dose 50mg</td>
</tr>
<tr>
<td>Rectal dose</td>
<td>3mg/kg/24 hours (150mg) maximum single dose not to exceed 2mg/kg Round doses to available suppositories.</td>
<td>Do not cut suppositories</td>
</tr>
<tr>
<td></td>
<td>3mg/kg/24 hours maximum single dose not to exceed 2mg/kg Round doses to available suppositories.</td>
<td>Do not exceed daily maximum</td>
</tr>
<tr>
<td></td>
<td>12.5mg/25mg/50mg/100mg available</td>
<td></td>
</tr>
</tbody>
</table>

**Anaesthetists Handbook January 2010**
### Pain management and postoperative care

**CODEINE PHOSPHATE** – Moderate pain with paracetamol and/or NSAID (may go straight to morphine sulphate)

<table>
<thead>
<tr>
<th></th>
<th>Birth – 1 year</th>
<th>1–16 years</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral / IM / SC</td>
<td>500 µg/kg 6hourly</td>
<td>500 µg - 1mg/kg</td>
<td>Maximum daily dose 240mg. IM only under anaesthesia</td>
</tr>
<tr>
<td>These routes only</td>
<td>Maximum dose 60mg 4-6 hourly</td>
<td>Syrup contains 2.1%v/v alcohol</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Note opioid thus may cause respiratory depression</td>
</tr>
</tbody>
</table>

Note: Syrup contains 2.1%v/v alcohol.
**MORPHINE SULPHATE** – moderate to severe pain with paracetamol and/or NSAID

SEEK ADVICE IF PAIN NOT ADEQUATELY CONTROLLED - PAIN TEAM, SENIOR PAEDIATRIC OR ANAESTHETIC STAFF MAY INCREASE DOSE or FREQUENCY  NOTE NO CEILING DOSE FOR MORPHINE FOR PAIN RELIEF

**Children prescribed IV/ SC morphine for acute pain should have naloxone prescribed 10µg/kg to be repeated as necessary**

<table>
<thead>
<tr>
<th>Seek senior advice for babies under 3months</th>
<th>Birth – 1 month</th>
<th>1 – 3 months</th>
<th>3-6 months</th>
<th>6months – 1 year</th>
<th>12 years</th>
<th>12 – 16 years if more than 50kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monitor closely: wide variation in response</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oral</td>
<td>100 µg/kg</td>
<td>200 µg/kg</td>
<td>200 µg/kg</td>
<td>200 µg/kg</td>
<td>200 – 400 µg/kg</td>
<td>10 – 15mg 2 hourly</td>
</tr>
<tr>
<td></td>
<td>4 hourly</td>
<td>4 hourly</td>
<td>4 hourly</td>
<td>4 hourly</td>
<td>Max 10mg 3 hourly</td>
<td></td>
</tr>
<tr>
<td>IV bolus</td>
<td>25-100 µg/kg</td>
<td>50-100 µg/kg</td>
<td>100 µg/kg</td>
<td>200 µg/kg</td>
<td>200 µg/kg</td>
<td>5 – 10mg Max 10mg 2 hourly</td>
</tr>
<tr>
<td></td>
<td>4 hourly</td>
<td>4 hourly</td>
<td>4 hourly</td>
<td>4 hourly</td>
<td>Max 10mg 3 hourly</td>
<td></td>
</tr>
<tr>
<td>IV infusion</td>
<td>Start 10 µg/kg/h up to 20µg/kg/h</td>
<td>Start 10 µg/kg/h up to 30µg/kg/h</td>
<td>Start 10 µg/kg/h up to 30µg/kg/h</td>
<td>Start 20 µg/kg/h up to 30µg/kg/h</td>
<td>Start 20 µg/kg/h up to 30µg/kg/h</td>
<td></td>
</tr>
<tr>
<td>Load with bolus dose</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Instructions next sheet</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SC Bolus</td>
<td>150 µg/kg</td>
<td>150 µg/kg</td>
<td>150 µg/kg</td>
<td>200 µg/kg</td>
<td>5 – 20mg</td>
<td></td>
</tr>
</tbody>
</table>

PCA may be available. Seek guidance from pain control team / pharmacy and see separate guidelines.
**Paediatric Intravenous Morphine Algorithm**

- Check prescription is clear.
- Double check dose calculation.
- Check naloxone is prescribed.
- IV morphine should only be used when oral is not available.
- Check strength of ampoule carefully. A range is stocked from 1mg in 1mL up to 60mg in 1mL.
- Always dilute dose to 10mL with Sodium Chloride 0.9%.
- Note that the peak effect of an I.V morphine dose may not occur for over 15 minutes.
- Patients should be monitored closely with vital signs recorded every 5 minutes for 30 minutes following the I.V dose.

**Step 1**

Pain score = 2 or 3

Sedation = 0 or 1

Respiration rate:

- greater than 25 if less than 1 year
- greater than 20 if 2-5 years
- greater than 16 if 5-12 years
- greater than 12 if over 12 years

$S_pO_2 \geq 95\%$

If **NO** to any of these, do not proceed to **STEP 2** but seek medical advice.
Pain management and postoperative care

Step 2

Give 0.5mL – 1mL of the diluted morphine solution
Wait 3 - 5 minutes
Return to STEP 1

Repeat STEP 2 until a pain score of 0 or 1 has been achieved.
If pain score remains 2 or 3 contact medical team / pain team for further advice.

Patient controlled analgesia

Pre-filled Baxter disposable morphine PCA devices are available in 1 mg and 2 mg bolus preparations.

This guideline was last reviewed in 2007. Essential points are listed below.

- The anaesthetist should assess and educate the patient.
- PCA devices must not be used in areas where staff have not received relevant education.
- PCA devices must be attached using a dedicated intravenous line or using a one-way valve.
- PCA must be prescribed properly on the drug chart.
- Supplemental oxygen must be prescribed for at least 24 hours unless contraindicated.
- Intramuscular opioids must not be co-prescribed.
- An appropriate rescue antiemetic must be prescribed.
- Always ensure that if sudden severe pain or an unexpected increase in pain scores occurs, that appropriate medical examination is carried out to exclude surgical or medical complications.
Points to remember:

1. Stick the correct strength device label on to the back of the drug chart, signed and dated. This label is provided as a pink or orange sticker inside the PCA bag when supplied.

2. When the device is attached to the patient the date, time and signature boxes need to be completed to indicate the drug has been administered; otherwise, it appears that the device has never been connected.

3. It is not acceptable to write “Morphine PCA as per policy”. This does not indicate the strength of PCA required.

**PCA for children**

This guideline was written in June 2007. Essential points are listed below.

PCA is used for the treatment of acute pain in children. It is a safe and effective method of providing post-operative pain relief when analgesia is required for moderate or severe pain for a period of more than 24 hours.

Any child who can understand and has the physical capacity to operate the PCA demand button can usually use PCA after tuition and with encouragement. Most five-year old children can operate PCAs very successfully. Children must weigh at least 18 kg and be aged five years old to be assessed for using a PCA.

**Initial assessment to determine if the child is suitable for PCA**

1. Child can handle the PCA button.

2. Child wants to use PCA.

3. Child can understand that pushing the button will not necessarily always give them their medicine.

5. Child understands that the nurse is still there to help them, especially if the PCA ‘doesn’t work’.

6. Child should understand that the PCA should help their pain but it should not make them very, very sleepy (sedated) although they can obviously go to sleep.

7. Child can explain to the nurse about how PCA works to show they have grasped the essentials.

8. Child understands that they are the only ones to press the button (not family members) unless they ask the nurse to push the button for them.

9. Parents should be given a clear explanation of how the pump works.

10. Parents should be discouraged from pressing the PCA button.

Setting up PCA

PCAs are usually commenced in theatre by the anaesthetist. If a PCA needs to be set up on the ward the anaesthetist or pain team will come to the ward to assess the child and assist ward staff. The PCA pumps and giving sets will be kept on ward 16.

Drug concentration

Make up 1 x body weight in milligrams of morphine to 50 mL with sodium chloride 0.9%.

\[ \text{e.g. 35 kg child} = 35 \text{ mg morphine} \]
\[ \text{maximum dose} = 50 \text{ mg in 50 mL} \]

For children > 50 kg set 1 mL bolus, (1 mg) background 0.2 mL h\(^{-1}\).

**PCA Programme using the Hospira Blue PCA Pump only**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bolus dose</td>
<td>1 ml = 20 (\mu)g kg(^{-1})</td>
</tr>
<tr>
<td>Lockout time</td>
<td>5 minutes</td>
</tr>
<tr>
<td>Background infusion</td>
<td>0.2 mL h(^{-1}) = 4 (\mu)g kg(^{-1}) h(^{-1})</td>
</tr>
</tbody>
</table>
Pain management and postoperative care

Maximum 4 hourly dose 20 mL

The keypad on the pump will be locked to prevent tampering. The pump may be stopped and the history may be checked without unlocking the keypad. The HDU nurse, on-call anaesthetist and pain team will be able to unlock the keypad if required.

Prescriptions

1. Naloxone 4 µg kg\(^{-1}\) as a stat dose IV PRN. This dose is to reverse sedation, whilst maintaining analgesia and may be repeated.

2. Antiemetic – ondansetron 0.1 mg kg\(^{-1}\) (maximum dose 4 mg.) IV. Prescribe 8-hourly as needed for 48 hours.

3. Regular analgesia – paracetamol ± NSAID.

Complications

Both the surgical and the anaesthetic teams will be called. The nurses will give naloxone 4 µg kg\(^{-1}\) to an over-sedated child if prescribed.

Constipation, paralytic ileus, urinary retention, itching and muscle spasms can occur.

Antihistamines may be used for itching. Diazepam may be prescribed in small doses for muscle spasm in orthopaedic patients.

Trust guideline on the care of patients who have received intrathecal morphine or diamorphine

This guideline was last reviewed in 2009. Essential points are listed below.

Morphine and diamorphine will give prolonged analgesia after surgery but carry certain risks. Trainees who are not familiar with these techniques using morphine and diamorphine must not use them except under direct supervision.
**Definition**

Intrathecal analgesia is the injection of an opioid, usually preservative-free morphine, directly into the cerebrospinal fluid in the spinal canal. This is commonly a single injection only and will only be administered by an anaesthetist.

**Aim**

- To introduce new methods for pain control having due regard for patient safety.
- To provide nursing and medical staff with the relevant education in order to safely manage patients who have had intrathecal analgesia.
- To monitor and audit activity and effectiveness of the technique.

**Patient selection**

The anaesthetist will:

- Assess the patient for suitability for this method of pain relief and ensure that the coagulation status of the patient has been checked and is within normal limits.
- Educate the patient about this method of analgesia and any device that may be used with it e.g. PCA.
- Discuss the risks and benefits of the procedure with the patient.

**Patient safety**

- Following the injection of opiates into the intrathecal space by an anaesthetist, the prescription of supplementary opiate analgesia is the responsibility of the anaesthetist concerned or his deputy.
- The availability of a bed in the high dependency unit, PACU or other specifically designated area, is a pre-requisite for this analgesia technique.
Pain management and postoperative care

- Training and education of relevant nursing staff will be carried out by the Pain Management Team. Training will include the technique, care of the patient, possible side effects and explanation of the handover sheet.

The anaesthetist must:

Document the dose of drug and technique employed clearly on the anaesthetic chart and communicate this to the recovery staff.

- Ensure that the patient is nursed in a level 1 or level 2 area, or other specifically designated area for initial patient monitoring. This will usually be for 24 hours. The patient may be discharged to a general ward when his/her condition has been deemed stable by a senior medical practitioner.

- Ensure that the patient is not experiencing moderate or severe pain when discharged from theatre

- Review the drugs kardex and prescribe appropriate supplementary analgesia, anti-emetics and instructions clearly.

- Prescribe oxygen therapy for at least the first post operative night unless a medical contraindication exists.

- Ensure intravenous access is established and patent.

- Ensure intrathecal opiate analgesia transfer sheet has been completed and signed.

The qualified nurse responsible for the patient must:

- Not accept a patient from recovery who is experiencing moderate or severe pain

- Record and document respiratory rate, blood pressure and pulse rate, pain and sedation score at least hourly for the first 12 hours, 2 hourly for the next 12 hours and thereafter as dictated by the patient’s condition.

- Have knowledge of the pain and sedation scoring systems and be able to interpret and act upon observations.
Pain management and postoperative care

- Monitor the patient for nausea or vomiting and ensure anti-emetics are administered, if required, as prescribed.
- Monitor urinary function – retention is a possibility if the patient is not catheterised.
- Monitor for itching and if severe consider the use of naloxone 40 µg as prescribed. Inform the anaesthetist or the pain team.
- If sudden, severe pain or an increase in pain scores occurs inform medical staff so that an examination can be carried out to exclude surgical or medical complications.
- Seek immediate anaesthetic advice if cardio-respiratory depression occurs.
- Seek Anaesthetic / Pain Team advice if pain relief is inadequate.

Perioperative pain management in patients with chronic pain

[Dr Shyam Balasubramanian, December 2007]

Anaesthetists commonly come across patients with chronic pain on multiple medications including high dose opioids; these patients are in a hyperalgesic state making perioperative pain control challenging.

Key points

- Acute pain management in patients with chronic pain is different and difficult.
- Patients on high dose opioids require perioperative opioid supplementation to avoid withdrawal syndrome.
- Analgesic adjuncts such as antidepressants (amitriptyline) and anticonvulsants (gabapentin, pregabalin) are often overlooked and need to be continued.
- Consider regional blocks whenever surgical site permits.
Opioids

A significant number of patients are on high dose opioids (oral and transdermal) for managing pain or for de-addiction programmes.

1. Whenever possible, continue baseline opioid intake (oral and transdermal) in the perioperative period.

2. Additional analgesia will be required to cover acute surgical pain.

3. Take measures to minimise additional opioid consumption by judicious use of non-opioid medication and regional techniques.

4. In most instances, there is no need to interrupt transdermal opioids (fentanyl, buprenorphine).

5. In most instances, oral opioids can be continued uninterrupted in the perioperative period (morphine, oxycodone, methadone).

6. If oral intake is contraindicated for surgical reasons, convert to an alternate mode of opioid delivering (intravenous infusions in HDU and PACU; PCA and intramuscular injections in the wards)

7. If planning intravenous infusion, calculate the total amount of opioid taken from long acting (morphine sulphate, Oxycontin) and short acting (Oramorph, Oxynorm) forms over 24 hours. From this value calculate the hourly opioid consumption in morphine equivalents. Start the basal infusion as 50% of this amount. Intermittent boluses may be required and the dose can be titrated against response.

8. Alternatively, in the wards, choose a PCA strength (1 mg or 2 mg bolus in five minutes) that meets the basal requirements to avoid opioid withdrawal.

You should tailor individual analgesic requirement based on clinical circumstances, the nursing environment and the patient’s response to treatment.
Methadone

The L-enantiomer is the main opioid analgesic; the D-enantiomer is an antagonist at NMDA receptors. In the perioperative period, patients on methadone should continue the dose before and on the day of the surgery to avoid fluctuation of the drug level.

1. Patients taking more than 200 mg a day of methadone may have prolonged QT interval which could predispose to *torsades de pointes*. Baseline preoperative ECG is recommended.

2. When oral intake is interrupted for surgical reasons, plan an equianalgesic conversion to a parenteral form.

Antidepressants

Tricyclic antidepressants (TCA) such as amitriptyline and nortriptyline, and serotonin norepinephrine reuptake inhibitors (SNRI) such as venlafaxine are used in neuropathic pain management. They are used to treat pain rather than mood.

1. Studies have failed to confirm the association of risk of perioperative TCA usage with arrhythmia.

2. Preoperative discontinuation can cause delirium, depression and confusion.

3. Whenever possible continue oral medications; the benefits outweigh the risks.

Anticonvulsants

Gabapentin and pregabalin, apart from their use in treating neuropathic pain, are also used in managing acute postoperative pain.

1. Inappropriate cessation can lead to uncontrollable rebound pain.

2. These drugs should be maintained in the perioperative period for analgesic and opioid sparing effect.

3. If oral intake is interrupted, suitable alternative analgesics such as opioids may be necessary for effective pain management.
Ketamine

It is an antagonist at NMDA receptors; these receptors have a significant role in chronic pain.

1. Ketamine is not an ideal first line drug in postoperative pain management in patients with chronic pain because of the psychomimetic adverse effects.

2. There is no evidence that pre-emptive use of this medicine can prevent development of chronic pain.

3. In occasional opioid tolerant cases, low-dose ketamine (10-25 mg bolus or 0.50-1 mg kg\(^{-1}\) hour\(^{-1}\) infusion) has been used successfully.

Regional anaesthesia

Satisfactory postoperative pain relief in chronic pain patients is difficult exclusively with pharmacological means, because of neuronal changes resulting in hyperalgesia.

1. Single shot central neuraxial, paravertebral, peripheral nerve blocks, local infiltration and joint injections provide good pain relief in the immediate postoperative period. Ensure enough analgesics and normal medications are prescribed under ‘regular medications’ – otherwise patient will wake-up in the middle of the night with agonizing pain.

2. Continuous catheter infusions are especially helpful. Epidural mixtures of local anaesthetics and opioids provide superior postoperative pain control in chronic opioid dependent patients.

3. Although regional block can provide pain relief for acute surgical pain it is important to continue the background analgesic medications and adjuncts for managing underlying chronic pain and to prevent withdrawal syndrome.

Ineffective analgesia can lead to anxiety, distress, drug seeking behaviour and demands, as well as pain. It delays recovery and discharge.
Further reading


Treatment of PONV

This guideline for the treatment of postoperative nausea and vomiting in adult patients was last reviewed in 2006.

This is not the guideline for prophylaxis against PONV, which is on page 227.
Pain management and postoperative care

Administer cyclizine 50 mg i.m. (or i.v. in 10 mL given slowly), and review the effect after 60 minutes.

Satisfactory control of PONV?

Yes

Prescribe regular cyclizine 50 mg i.m. (or i.v. in 10 mL given slowly) for 24 hours and review.

No

Administer prochlorperazine 12.5 mg i.m. or 25 mg p.r., and review the effect after 60 minutes.

Satisfactory control of PONV?

Yes

Prescribe prochlorperazine 12.5 mg i.m. 8-hourly regularly for 24 hours and review.

No

Single intravenous dose of ondansetron 4 mg. Reconsider causes and seek further senior medical or pain team advice.
Managing opiate users

Guidelines on the management of opiate users admitted to hospital

Prescribing for drug users

In order to ensure safe prescribing for patients who are receiving methadone or buprenorphine (Subutex) for opiate dependency it is essential that communication with the Community Drug Team (CDT), GP, or dispensing community pharmacy is established when patients are admitted and discharged from hospital.

Emergency admissions

Doctors must ensure that the patient is a registered methadone or buprenorphine user and this must be confirmed with the CDT, GP or patient’s community pharmacy before methadone or buprenorphine is prescribed. If it is not possible to confirm this medication must not be prescribed and the guidelines should be followed for the management of opiate withdrawal symptoms.

Doctors must be satisfied that a full assessment of the patient, including drug history, has taken place and that the correct dose has been established and verified before prescribing methadone or buprenorphine. Doctors must also be aware of other substances of abuse that the patient may report to be taking. This also needs to be confirmed with the CDT, GP or community pharmacy. If this cannot be confirmed treat symptomatically.

If the patient requires analgesia for further advice contact the Pain Team on bleep 2492 or 2493 or ward pharmacist.

Planned admissions

Doctors and nursing staff must be satisfied that the dose and time of the last dose of methadone or buprenorphine taken by the patient has been confirmed by the CDT, prescribing GP or community pharmacy prior to administration of subsequent medication to the patient.
Pain management and postoperative care

If the patient requires analgesia for further advice contact the Pain Team on bleep 2492 or 2493 or ward pharmacist.

Discharge medication

Methadone or buprenorphine will not be supplied at discharge. Exceptions to this will be on the instruction of the CDT only and a maximum of 24 to 48 hours supply can be provided.

The CDT should be contacted by the medical or nursing team to ensure that the community supply and follow-up is resumed at discharge.

If the CDT is unavailable then contact the hospital pharmacy department for further advice.

Guidelines for the management of opiate withdrawal symptoms in hospital patients who are opiate users

Withdrawal syndromes differ according to the particular drugs involved, the daily amounts taken, the duration of use and individual sensitivity. Withdrawal from opiates is associated with a specific withdrawal syndrome. Assessment of withdrawal should be based on observable signs rather than subjective symptom reporting. The severity and management of withdrawal is greatly influenced by patient anxiety so informing patients about how their symptoms are likely to vary over time can help to reduce this.

The following treatments are recommended dependent upon the signs and symptoms.

<table>
<thead>
<tr>
<th>Signs and symptoms</th>
<th>Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nausea and vomiting</td>
<td>Prochlorperazine orally 5mg 8-hourly or 12.5 mg IM 8-hourly or cyclizine orally 50 mg 8-hourly</td>
</tr>
<tr>
<td>Diarrhoea</td>
<td>Oral loperamide 4 mg stat followed by 2 mg after each loose stool for up to 5 days. Max 16 mg daily dose.</td>
</tr>
<tr>
<td>Stomach cramps</td>
<td>Mebeverine 135 mg tds (oral).</td>
</tr>
<tr>
<td>Signs and symptoms</td>
<td>Treatment</td>
</tr>
<tr>
<td>------------------------------------</td>
<td>---------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Agitation, anxiety, tremors</td>
<td>Diazepam up to 5 - 10 mg orally QDS as required. Short course only (not to be prescribed at discharge).</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Sleeplessness</td>
<td>Zopiclone 7.5mg orally nocte. Short course only (not to be prescribed at discharge).</td>
</tr>
<tr>
<td>Generalised aches and pains</td>
<td>Oral paracetamol 1 g QDS and • oral ibuprofen 1.2 g – 1.8 g daily in 3 or 4 divided doses or • oral diclofenac 50 mg tds.</td>
</tr>
</tbody>
</table>

Untreated heroin withdrawal typically reaches its peak 36 to 72 hours after the last dose. Symptoms of withdrawal will usually have subsided significantly after five days.

For further information or advice contact Pharmacy or the Pain Team on bleep 2492 or 2493.

Coventry Community Drugs team can be contacted on 024 7655 3845 during normal office hours for advice.
Safer practice with epidural injections and infusions

[Dr Mark Porter, December 2007]

A trust policy on this was formulated in response to National Patient Safety Alert number 21. It is a summary of principles to be applied along with detailed information on treatment of local anaesthetic overdose.

The approved infusion is bupivacaine 1 mg per mL with fentanyl 2 microgrammes per mL. This is available in three forms. These solutions have no product licence and are therefore off label.

- 500 mL bags prepared in Pharmacy.
- 50 mL syringes supplied through Pharmacy.
- 10 mL ampoules supplied through Pharmacy.

Other fluid bags containing plain local anaesthetic solutions for epidural administration must not be stocked or used.

Other infusions may be made up by a doctor at the discretion of a responsible consultant but they not be handed over to non-medical staff for further care, until administration is finished and the patient is ready to recover from their epidural administration. Regular use must be supported through clinical governance mechanisms, via the clinical director for the area concerned.

Injections may be made up by a doctor at the discretion of a responsible consultant. Regular use must be supported through clinical governance mechanisms, via the clinical director for the area concerned.
Principles of good practice

Five professional organisations led by the Royal College of Anaesthetists published good practice guidelines in November 2004 – Good practice in the management of continuous epidural analgesia in the hospital setting [http://www.rcoa.ac.uk/docs/Epid-Analg.pdf]. While these are relevant to continuous epidural analgesia, the principles are sound and are endorsed by the trust. All local guidelines in clinical areas should be consistent with the principles in this document.

As a principle of good practice, clinicians who administer drugs by the epidural route should confirm the drug, the dose, and the correct identification of the epidural line connector with a second person before administering the dose. This includes bolus injections and commencement or continuation of infusions. Particular care must be taken when using epidural administration in a patient who has a central venous catheter as these lines may easily be confused.

Epidural infusions may only be administered using an infusion pump which is clearly identified as being used for the epidural route. Gemstar epidural pumps should be used on ward and critical care areas. Syringe infusion pumps may be used in labour ward and operating theatres but must be identified by the fixation of an adhesive label identifying them as being for epidural use only. This label must be applied to the infusion device directly in order to reduce the risk of inserting a syringe intended for epidural use into an infusion device connected to a vein.

Labels identifying machines, infusions and lines as being solely for epidural use are available from the Pharmacy department and must be used.

It is possible that national developments in medical devices will lead to line connectors and other devices that will only connect for epidural administration. If and when available, these should be used for epidural administrations. This policy will be revised at that time.
Infusions containing fentanyl are legally controlled drugs whatever the dilution and therefore must be stored in controlled drugs cupboards.

Clinical directors are responsible for putting adequate mechanisms in place to ensure that all staff involved in epidural therapy have received adequate training, and have the necessary work competencies to undertake their duties safely.

Treatment of local anaesthetic overdose

Epidural injections and infusions create serious risks for patients if given inadvertently through the intrathecal or intravenous routes. All epidural administrations must be given by doctors, nurses or midwives and in areas where there is immediate availability of an emergency team able to treat subsequent problems.

All local anaesthetic overdoses must be reported on clinical adverse event forms.

Intrathecal and subdural administration

An unrecognised ‘dural tap’ or a catheter that migrates subsequent to insertion may result in a high block leading to difficulty with breathing particularly if the block reaches cervical level and causes diaphragmatic impairment.

The clinician’s first concern should be to send for help and then to protect and secure the airway and prevent respiratory failure. High block can provoke great anxiety in the patient, which must not be confused with respiratory failure. Establish whether diaphragmatic weakness exists. If the diaphragm is not weak, then the patient will probably not need intubation. Advise them to take a breath in and out, and if they can do this counsel the patient that they are able to breathe.

In the event that intubation is needed, an appropriately trained clinician should intubate and ventilate the patient until the block has worn off, usually about two hours. Although muscle relaxation is not essential it is humane to provide amnesia and a routine rapid sequence induction of anaesthesia is the safest method of attaining
ideal intubating conditions. Sedation can be maintained by the use of propofol.

However, the situation may require immediate intubation or assisted ventilation. Be vigilant for and treat hypotension. Prevent aortocaval compression in pregnant patients.

See page 135 for management of high blocks that are not life-threatening.

**Intravenous administration or other systemic overload - toxicity**

There is scant high level evidence to support the use of any specific treatments for local anaesthetic toxicity. The most serious complications occur with bupivacaine but can arise with any local anaesthetic agent. The traditional treatment for bupivacaine-induced refractory ventricular fibrillation, bretylium, is no longer available and treatment guidelines centre around three available drugs. The lack of randomised controlled trial evidence requires clinicians treating local anaesthetic toxicity to take a pragmatic and expectant view.

The immediate management of severe local anaesthetic toxicity is detailed in the *Guidelines for the management of severe local anaesthetic toxicity* (Association of Anaesthetists of Great Britain and Ireland, 2007).

- Stop injecting the local anaesthetic.
- Call for help.
- Maintain the airway and, if necessary, secure it with an endotracheal tube.
- Give 100% oxygen and ensure adequate lung ventilation (hyperventilation and alkalosis may help by promoting protein binding of local anaesthetic).
- Confirm or establish intravenous access.
- Control seizures: give a benzodiazepine, thiopental or propofol in small increments.
Epidural anaesthesia and analgesia

- Assess cardiovascular and acid-base status throughout.
- Start cardiopulmonary resuscitation (CPR) using standard protocols.
- Consider specific treatment using lipid, magnesium or amiodarone as below.

Lipid rescue

The use of 20% lipid solution ‘lipid rescue’ has been reported in a small body of animal work and in two published case reports in humans, with apparently dramatic effect. The lipid solution used in the case reports was Intralipid; the effect is thought to be through a ‘lipid sink effect’ whereby the lipophilic local anaesthetic is removed from effector sites by the lipid. The lipid solution available in this trust is Clinoleic 20%. Dose recommendations are the same. A full description of evidence, cases and dose recommendations is at www.lipidrescue.org. It is not appropriate to use propofol or etomidate formulated in lipid.

Lipid rescue should be used only after standard resuscitation methods fail to re-establish sufficient circulatory stability. See the Association of Anaesthetists sheet attached to the lipid bag. Briefly, the recommended dose of 20% lipid is 1.5 mL kg\(^{-1}\) as an initial bolus over one minute, followed by 0.25 mL kg\(^{-1}\) min\(^{-1}\) for 30-60 minutes. The bolus could be repeated 1-2 times for persistent asystole. The infusion rate could be increased if the blood pressure declines. The maximum recommended dose is 8 mL kg\(^{-1}\).

Supplies for lipid rescue must be available in for emergency use. This will be in the same locations as used for storage of dantrolene (treatment for malignant hyperpyrexia). The Pharmacy department will maintain the supplies for stock rotation and ensure that the treatment bags have the recommended dose schedules attached.

Magnesium sulphate and amiodarone

Magnesium sulphate is readily available in labour ward, critical care and theatres. Indications and administration are as below. Amiodarone is also widely available.
Systemic toxicity to local anaesthetics leads to central nervous excitability and convulsions. Cardiotoxicity also occurs and usually involves *torsade de pointes* – a form of ventricular tachycardia characterised by a polymorphous electrocardiographic appearance, delayed repolarisation and a prolonged QT interval – or refractory ventricular fibrillation. Hypokalaemia and hypomagnesaemia are predisposing factors. Hypomagnesaemia is an occasional finding in late pregnancy.

*For life-threatening cardiotoxicity administer life support as necessary followed promptly by the specific treatment for local anaesthetic toxicity, magnesium sulphate.*

Rapid administration of magnesium can cause asystole.

*Torsade de pointes*
- Activate the emergency call and get someone to call a cardiologist.
- Apply basic and advanced life support as necessary.
- Use the standard labour ward magnesium mix, making up a 50 mL syringe containing 10 g MgSO₄.
- Give intravenous magnesium sulphate 2 g over 15 minutes (10 mL from 50 mL syringe).
- Follow with 1 g h⁻¹ (5 mL h⁻¹).

*Refractory ventricular fibrillation*
- This is in the context of ongoing ‘cardiac arrest’.
- Apply basic and advanced life support as necessary.
- Do not delay electrical defibrillation and intravenous adrenaline.
- Give magnesium as above.
- Intravenous amiodarone has been used successfully.

The adult dose of amiodarone is 300 mg made up to 20 mL with 5% glucose. A further dose of 150 mg may be given for recurrent or resistant VT/VF, followed by an infusion of 1 mg mL⁻¹ for six hours.
Clinical use of epidurals

[Epidural anaesthesia and analgesia

[Appraised by Sister Sue Millerchip, January 2010; guidelines supplied by Sister Sue Millerchip]

Epidurals are widely used for thoracic, abdominal and limb surgery.

The most common reasons for inadequate epidural analgesia are:

- Failure to site them in an appropriate place (at the midpoint dermatome of the surgery).
- Failure to manage poor analgesia properly (see page 132).

Epidural analgesia infusions are managed only in general and cardiothoracic critical care areas, and on the enhanced care unit (ECU) on ward 22. Hospira Gemstar electronic infusion pumps are available. Infusion bags are prepared by Pharmacy and kept in the controlled drugs cupboards. They contain bupivacaine 1 mg mL$^{-1}$ and fentanyl 2 µg mL$^{-1}$.

Effective use of epidurals

1. You should establish epidural blockade at an appropriate level for the surgical incision. Consult with the surgeon as to the expected extent of the incision.

2. If you cannot do this, consider using intrathecal morphine (see page Error! Bookmark not defined.).

3. Deal robustly with failure, including resiting the epidural or switching to systemic analgesia.

4. Do not send patients away from the theatre suite with a pain score of 2 or more.

Trust guideline

This guideline was written by Sue Millerchip and last reviewed in 2009. Pertinent points for anaesthetists are listed in the following sections, taken from the guideline.
Indications

- Laparotomy for any reason
- Midline vertical abdominal incision for any reason
- Total knee replacement
- Revision of total hip / knee
- Nephrectomy
- Cystectomy
- Thoracotomy
- Amputation of lower limb
- Multiple rib fractures

Ideally the epidural should be sited preoperatively and its function checked before the operation commences.

The epidural should be placed at an appropriate vertebral level i.e. thoracic epidural for abdominal incisions. The use of lumbar catheters for abdominal procedures is associated with a high failure rate.

Ideally epidurals should be sited with the patient awake to reduce the possibility of nerve or spinal cord damage.

Awake insertion allows the anaesthetist to check the epidural prior to induction and avoids the difficulty of a single anaesthetist monitoring an unconscious patient whilst also performing an epidural.

Some anaesthetists and patients, however, prefer epidural insertion to be carried out once the patient is asleep.

Management of hypotension

Hypotension may be defined as an unacceptable reduction in systolic or mean arterial blood pressure. This is usually a fall of over 20% from preoperative values or systolic pressure below the level expected for the age and condition of the patient.

The most common cause of hypotension in a surgical patient with an epidural is hypovolaemia. However, the local anaesthetic used in the epidural infusion can cause vasodilatation which can benefit the patient by improving blood flow to anastomoses / grafts and reducing
Epidural anaesthesia and analgesia

the risk of venous thrombosis. Hypotension secondary to vasodilatation usually responds to an increase in intravenous fluids.

Risks

- Prolonged hypotension may place newly formed anastomoses at risk of ischaemia
- In some patients excess intravenous fluid replacement may lead to pulmonary oedema.

IT IS NOT THE ROLE OF THE ACUTE PAIN TEAM TO INFLUENCE THE FLUID MANAGEMENT OF SURGICAL PATIENTS

Management options

1. Exclude all other causes of hypotension (e.g. haemorrhage, myocardial infarction) and check block height is not at T4 or above.

2. Administer IV fluids – this will usually be an initial bolus of 200 mL of maintenance fluid or a plasma expander as prescribed.

3. Consider use of a metaraminol infusion (see separate guidelines).

4. In some circumstances it may be necessary to stop or reduce the epidural infusion. This should only be done following anaesthetic or pain team review.

If the blood pressure fails to respond to the measures above or there is more urgent cause for concern seek immediate surgical and anaesthetic review.

Using metaraminol infusions

These may be used on the enhanced care unit on ward 22, with epidural analgesia after elective surgery.
Hypotension associated with epidural analgesia can have detrimental effects on the surgical anastomosis and in patients with cardiac, renal or cerebrovascular disease.

Metaraminol is a vasoconstrictor which can be administered by peripheral infusion in a low dose to partially reverse the vasodilatation caused by the epidural, decreasing the need for repeated fluid boluses and improving gut perfusion and therefore, the healing process.

Hypotension due to other causes such as bleeding and hypovolaemia will not be masked by a low dose infusion.

Patients who require infusions that deviate from these guidelines should usually be managed on HDU.

Administration guidelines

1. All infusions will be 20 mg metaraminol in 40 mL 0.9% normal saline given by infusion pump attached to a cannula with a running IVI which is protected from retrograde infusion by a one-way valve.

2. Infusions must not be given through a separate peripheral cannula, but may be given through a dedicated lumen of a central line. If the Venflon tissues, the infusion must be stopped and the Venflon resited urgently.

3. The infusion will usually be started by the anaesthetist in theatre or PACU who will determine the start rate – in the range 0-5 mL h\(^{-1}\).

4. The rate of the infusion and the volume remaining must be documented hourly on a pump infusion chart.

5. The infusion must be clearly prescribed on the reverse of the drug chart.

6. Glycopyrrolate 200 µg IV should be prescribed on the reverse of the drug chart to be used if the pulse rate falls below 40 bpm.
Epidural anaesthesia and analgesia

7. The patient's blood pressure should be monitored every fifteen minutes for one hour after any change in infusion, including cessation, hourly for the first 24 hours and two-hourly thereafter if stable.

8. The syringe must be changed every 24 hours.

9. Overall responsibility for the infusion remains with the initiating anaesthetist. The Acute Pain Team should be the initial contact between 8am and 5.30pm – bleep 2492/3 and outside those hours the on-call anaesthetist on bleep 2813.

Discontinuation Guidelines

1. The infusion will usually run for 24-48 hours at the direction of the anaesthetist.

2. The infusion should be stopped in two stages unless directed otherwise.

3. The rate should be halved and a stat bolus of gelofusine 250 mL given. This should be prescribed in advance by the initiating anaesthetist.

4. Two hours later stop the infusion and give a further 250 mL gelofusine.

5. If the epidural is stopped during the first 48 hours then the metaraminol should also be stopped as above.

6. Hypotension that persists after this should be treated by other means following medical review.

Management of inadequate epidural analgesia

Definition

Analgesia by any route is inadequate if the patient is uncomfortable and reporting a pain score of 2 or 3 (moderate or severe) or is unable to take a deep breath following abdominal or thoracic surgery.
Assessment and treatment options

1. Exclude any other cause of pain resulting from a post-operative complication for example – pain at sites distant to the incision and related to the surgery but not covered by epidural analgesia such as shoulder tip pain.

2. If pain appears to be related to the surgery the following procedures can be tried:
   - Measure height of epidural block to establish presence or absence of block – if greater than T4 do not proceed further.
   - Measure BP and pulse to ensure they are within normal limits – if not stabilise as required and seek further advice from the on-call anaesthetist / pain team.
   - Administer a 5 mL bolus of epidural mix via the infusion and check vital signs every 10 minutes for 30 minutes.
   - Consider increasing epidural rate within the prescribed limits.
   - Repeat 5 mL bolus ONLY ONCE MORE if moderate or severe pain persists and seek anaesthetic / pain team review.
   - Further boluses need to be prescribed by anaesthetic staff on the drug chart.

3. If the patient has a block on one side only this is called a unilateral block and occurs when the tip of the catheter exits the epidural space through an intervertebral foramen. This will require further anaesthetic / pain team review as it may be necessary to withdraw the epidural catheter, administer a larger bolus dose or convert the patient to an alternative form of analgesia.

4. Paracetamol and NSAIDs may be given regularly if appropriate in conjunction with epidural analgesia.
Management of suspected epidural haematoma

An epidural haematoma will usually cause severe back pain, where the haematoma is compressing the spinal cord. This pain will radiate around the body like a belt and below this level there may be a change in neurology. This means the patient may no longer be able to move or feel pressure or touch, when they could previously.

There may be some ‘normal’ block above this belt of pain.

An epidural haematoma is an emergency and must be decompressed as soon as possible or permanent paralysis will result and the following steps must be taken if this is suspected:

1. Immediately call the on-call anaesthetist and registrar of primary team.

2. Examine neurology.

3. Call on-call neurosurgical registrar and inform on-call consultant anaesthetist.

4. Arrange MRI scan.

5. If MRI scan confirms compression arrange theatre for decompression within four hours.

Securing a catheter

The secure fixation of an epidural catheter will reduce the risk of it falling out and reduce the risk of skin irritation.

1. Skin preparation should be with chlorhexidine in spirit. Iodine solutions are contraindicated if Opsite spray is being used as it may cause burns. Iodine solution is neurotoxic and may enter the spinal or epidural space on the epidural needle.

2. The solution should be allowed to fully evaporate to ensure asepsis.
3. Following successful catheter insertion a large area should be lightly sprayed with Opsite spray to make the skin tacky.

4. Apply a Tegaderm dressing over the insertion site. Do not cover the insertion site with gauze as this prevents adequate observation of the insertion site.

5. Apply a one-inch strip of Mefix or Sleek tape along the edges of the Tegaderm.

6. Use a one-inch strip of Mefix or Sleek to secure the free catheter to the patient’s back and continue it over the shoulder.

7. Use some gauze to make a cushion and place the epidural filter on top of it on the upper anterior chest wall and secure with Mefix.

High epidural block

Definition

A high block is defined as loss of cold sensation at or above the nipple line (T4). It may present with hypotension, nausea, sensory loss or paraesthesia of high thoracic or even cervical nerve roots (arms) and may endanger the patient by causing respiratory difficulty due to blockade of nerve supply to intercostal muscles.

Causes of a high block:

- Infusion rate too high.
- Recent bolus dose.
- Migration of epidural catheter into the CSF.

Signs and Symptoms:

1. Loss of cold sensation at or above the nipple line (T4).

Danger Signs:

2. Weakness or numbness in hands or arms, unable to perform a hand grip.
Epidural anaesthesia and analgesia

3. Severe hypotension (due to bradycardia or excessive vasodilatation).
4. Nausea (due to hypotension).
5. Shortness of breath.
6. Abnormal bradycardia.

**Action:**

If a high block is detected:

1. Stop the epidural infusion.
2. Administer oxygen.
3. Check and record pulse, blood pressure, respiratory rate and sedation score.
4. If any “danger signs” are present, contact the acute pain service or the on-call anaesthetist who must review the patient before the epidural infusion is recommenced.
5. All necessary emergency actions must be taken by the attending nurse / doctor whilst waiting for anaesthetic assistance.
6. Monitor patient observations, including block height measurement, every fifteen minutes.
7. When the block falls to a safe level (below T4) restart the infusion at the original rate minus 2 mL/h-1.
8. Continue the observations half-hourly for two hours and document on the chart.

**Management of acute confusion**

| In all cases of confusion give oxygen as the first line of treatment |

- Acute confusion may follow any operative procedure especially in the elderly.
• It is extremely unlikely to be due to epidural analgesia but may possibly be due to PCA morphine.

• If, following examination, no serious cause can be found then if at all possible management should be conservative. Reassurance, leaving room lights on and using cot sides may be sufficient.

• The use of sedative drugs is likely to add to confusional states and should not therefore be used.

Common causes of confusion:

<table>
<thead>
<tr>
<th>Cause</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blood Glucose</td>
<td>Hypoglycaemia or hyperglycaemia may cause confusion.</td>
</tr>
<tr>
<td>Hypoxia</td>
<td>Check with pulse oximetry. If oxygen saturation is less than 93% give O₂ immediately and summon medical assistance.</td>
</tr>
<tr>
<td>Hypoventilation</td>
<td>Check respiratory rate, if 8 or less give naloxone in 50 microgram increments and check arterial blood gases.</td>
</tr>
<tr>
<td>Hypercapnia</td>
<td>Often a consequence of hypoventilation. Check ABGs to confirm diagnosis. Likeliest cause is excess opiates and naloxone may be used again as above.</td>
</tr>
<tr>
<td>Hypovolaemia</td>
<td>Check fluid balance, drains and other losses. Give fluid challenge. If BP fails to respond to fluid consider myocardial insufficiency (e.g. MI) IF THERE IS AN EPIDURAL IN SITU DO NOT STOP THE EPIDURAL UNLESS THE BLOCK IS ABOVE T4 LEVEL.</td>
</tr>
<tr>
<td>Sodium</td>
<td>Check electrolytes. High or low sodium may cause confusion.</td>
</tr>
<tr>
<td>Uraemia</td>
<td>Check electrolytes.</td>
</tr>
<tr>
<td>Benzodiazepines</td>
<td>Diagnosed by giving intravenous flumazenil in</td>
</tr>
</tbody>
</table>
Epidural anaesthesia and analgesia

100 microgram increments up to 1 mg max. This works in 60 s and the patient may need a flumazenil infusion.

CVA Requires further medical examination.

Disorientation

Anticoagulation

The following guidelines are in accordance with international practice and should be followed in patients on anticoagulant medication and who require insertion and removal of epidural catheters.

If a patient has been on low molecular weight heparin or unfractionated heparin for more than 48 hours it may be necessary to do a platelet count prior to epidural insertion / removal.

The following regimes apply only to those patients on prophylactic anticoagulation.

Patients on subcutaneous unfractionated heparin

Insertion and removal should be greater than 4 hours after and not less than 2 hours before the next dose. In patients on 8-hourly heparin the above conditions mean that the dose after the procedure may have to be delayed.

Patients on low-molecular weight heparin e.g. enoxaparin (Clexane)

Once-daily dosing with administration in the evening is strongly recommended. Insertion and removal should be greater than 12 hours after and not less than 2 hours before next dose.

Patients on warfarin

The catheter may be removed within 12 hours of first dose. In all other situations; stop warfarin, measure INR and defer removal if possible until INR is less than 1.5.
**Antiplatelet drugs**

NSAIDS (including low dose aspirin): no restrictions.

However, in patients with platelet dysfunction, thrombocytopenia or in combination with any other anticoagulants, seek further medical advice.

**Clopidogrel**

For patients taking clopidogrel, an interval of 7 days should elapse before epidural catheterisation.

**Subsequent analgesia**

If the epidural infusion is abandoned, appropriate alternative analgesia must be prescribed and instituted. If the epidural has contained fentanyl it is usually safe to administer systemic opiates.

If morphine or diamorphine have been administered spinally or epidurally in the previous 24 hours, the patient must be given intravenous PCA morphine for analgesia and no other systemic opiates unless specifically directed by the consultant anaesthetist responsible for the patient.

The actions taken must be clearly documented in the case notes.

There should be an overlap of pain therapies so that the subsequent regimen has time to take effect before the first is withdrawn e.g.

1. Commence prescribed IV PCA.
2. Reduce rate of epidural by 50% for the next hour.
3. Reduce rate of epidural by a further 50%.
4. Stop epidural.

To increase the efficacy of intravenous PCA all patients should have regular paracetamol prescribed and a non steroidal anti-inflammatory where appropriate.
Epidural anaesthesia and analgesia

Patients who are nil by mouth may have rectal preparations as long as this has been authorised by the consultant responsible. The rectal route should only be used until patients are able to take oral analgesics.

Ward based epidurals

A ward based epidural service has been established on the enhanced care unit on ward 22. The lead consultant anaesthetist is Dr Krish Ramachandran; Sister Sue Millerchip of the pain management service is the lead nurse.

Suitable patients following either colorectal, vascular or upper gastrointestinal surgery with epidural analgesia may be transferred either directly from theatre recovery or following a period of assessment in general critical care.

The anaesthetist involved with the case will have responsibility for making sure the epidural is working. The pain team will also be assessing these patients whilst in PACU. All patients who are considered fit to go back to the ward (level 1) will be monitored in PACU for between two and four hours. Once stable they will be transferred to the ward (see below). Once discharged to the ward the pain team and the resident anaesthetists will be responsible for following up these patients. In particular, the anaesthesia residents are responsible for dealing with incidents and problems out of hours.

There is a clinical guideline covering ward based epidurals which will shortly be reviewed and updated. It is the responsibility of the ward nursing and medical staff to call the resident anaesthetists to attend at various appropriate points. If you are busy you must let the ward know approximately when you will be able to attend, along with any advice on the problem.

In particular, the ward staff must not leave hypotension untreated while awaiting an anaesthetist.
Guidelines for discharge from PACU to the ward for colorectal patients with epidural or intrathecal analgesia

Patients may be transferred to the enhanced care unit on ward 22 with epidural or intrathecal analgesia after a period in recovery as long as the following criteria are met.

- A minimum of two hours in recovery
- Review by anaesthetist or pain team whilst in recovery to ensure efficacy of analgesia, and respiratory and cardiovascular stability including signs of early surgical complications such as bleeding.
- Completion of medical notes to verify suitability for transfer
- The ward staff reserve the right to decline to take the patient back to the ward if they are not content with any aspect of the patient’s condition.
- If there are any causes for concern the responsible consultant surgeon and anaesthetist (or their deputy) should be contacted to review the patient in recovery.
- The Pain Team will continue to follow-up the patients on the ward.

If the patient does not meet the above criteria and requires level 2 or 3 critical care, the discussion must take place with the consultant intensivist on call as early as possible so that alternative arrangements can be made.

Prescriptions for ward based epidurals

[Dr A. Thacker, September 2009]

All patients with epidurals to be admitted to PACU or another area outside critical care must have the following correctly prescribed on the ‘as needed’ section of the drug chart:

1. Epidural infusion.
Epidural anaesthesia and analgesia

2. Metaraminol infusion – 20 mg made up to 40 mL with saline at a rate of 0-10 mL h\(^{-1}\) to maintain systolic BP above 100 mmHg. (Plus please fill in separate metaraminol infusion chart available in PACU.)

3. Glycopyrrolate – 0.2 mg if heart rate less than 40 bpm.

4. Morphine PCA for failure or step down from epidural.

5. Naloxone – 100 µg if respiratory rate less than 8 breaths per minute and sedation score = 3.

6. An antiemetic; also consider regular intravenous ondansetron 4 mg t.d.s.

In addition prescribe:

7. 500 ml of intravenous colloid for hypotension such as systolic below 80 mmHg.

8. Regular oral or intravenous paracetamol 1 g q.d.s unless contraindicated.
Allergies and adverse drug reactions

[Appraised by Dr Falguni Choksey, January 2010]

Give appropriate treatment according to the relevant guidelines of the Association of Anaesthetists. Clinical guidelines are available in each operating theatre area. After you have resuscitated the patient and sent for senior help, a number of follow-up actions are needed for diagnosis and further management.

Good record-keeping of the chain of events, clinical features and treatment given in chronological order is essential. The anaphylaxis forms are kept in the guidelines folder on the anaesthesia machine.

Anaphylaxis

Three blood samples (yellow top or EDTA) are taken in the first 24 hours (immediate, one hour and between 6-24 hours). Samples are sent from the UHCW laboratory to the UK national centre at Sheffield along with a complete drug history.

Malignant hyperpyrexia

The Malignant Hyperpyrexia Hotline is at 079 4760 9601 for emergencies. Their advice and assistance should be sought immediately after contacting the on call consultant.

Suxamethonium apnoea

A single blood sample (yellow top) is sent to Leeds for pseudocholinesterase assay. You should expect results in about three weeks and make sure that you follow up the results yourself.

Practical actions

Call 26266 (specimen reception) and state the diagnosis and ask which tests and measurements are currently used (see below). Currently about half of such cases have an inadequate diagnosis, usually due to failure to follow advice on the specimens needed from the patient. Follow laboratory instructions as closely as possible.
Allergies and adverse drug reactions

Contact Dr Steve Smith (senior biochemist) on bleep 2665 or phone 25477, if you need specialist advice and assistance.

Investigations for suspected drug allergy

Dr Falguni Choksey has a special interest in drug allergy and can advise on arrangements for a patient to be referred for further investigations. Contact her for advice on patients who may be allergic to certain drugs and need definitive investigation.

The AAGBI-recommends a clinic covering this area:

Dr Mike Duddridge and Dr Alex Croom
Allergy Department
Glenfield Hospital
Groby Road
Leicester
LE3 9QP
0116 287 1471

Dr Krishna from Birmingham Heartlands Hospital works in UHCW on a weekly basis.

Dr Richard Walker may be able to offer skin testing for suspected allergy.

It is your responsibility to inform the patient and their GP about the suspected allergy and to coordinate further investigation for a definitive answer. It takes about two weeks to get the results back. You should check on CRRS to see if they are back. It is a good idea to request a copy of results to the named consultant anaesthetist on the blood sample request form – this will help to ensure follow up.

When a definitive risk is diagnosed you should arrange for a clinical alert to be placed on the patient’s record on CRRS. This could be through the surgeon’s secretary for a surgical patient.

Latex allergy

A comprehensive UHCW policy covers all aspects of the management of patients who have an allergy to latex. Dr Andrew
Thacker is the lead clinician for latex allergy and anaesthesia, and he has drawn up guidelines listing equipment that is safe to use. This equipment is available in theatre suites.

You should seek senior advice on any patient with a history of latex allergy who is drawn to your attention (see page 43) and proceed with extreme caution. Notify the relevant nurse in charge who should be able to provide a copy of the anaesthesia guidelines. These copies are held in the departmental information file and in each theatre suite.

**Suxamethonium problems in the family history**

[Authors: Dr S. Radhakrishna and Dr L. Leong, March 2004. Appraised by Dr S. Radhakrishna, February 2007]

Key points to look for in the history:

- Cardiac arrest after suxamethonium – anaphylaxis.
- Stopped breathing for a longer time than usual – suxamethonium apnoea.
- Unexpected ICU stay.
- Family history of abnormal reactions to volatile agents – malignant hyperpyrexia.

There could be three major reactions:

- Suxamethonium apnoea.
- Anaphylaxis to suxamethonium.
- Malignant hyperpyrexia.

Malignant hyperpyrexia and suxamethonium apnoea are genetically transmitted and patients and their families need to be investigated to establish their susceptibility to suxamethonium.
Allergies and adverse drug reactions

Suxamethonium apnoea:

The test to be conducted is the dibucaine number.

Please send blood sample in yellow top Vacutainer to the biochemistry lab at the University Hospital. This is then relayed to Leeds by post and the results may take two to three weeks. Do not request the dibucaine number in pregnancy – the level will be artefactual.

Suxamethonium allergy:

Test to be conducted is the Suxamethonium Antibodies IgE. Collect blood in yellow top Vacutainers or EDTA bottles. Send the samples to biochemistry at the University Hospital. The sample is then sent to Leicester or Sheffield and takes two to three weeks for results.

Malignant hyperpyrexia

Patients need to be referred to the MH investigation unit at Leeds. This is the only unit in the UK that provides a database and advisory service as well as in vitro contracture testing by muscle biopsy of new patients as well as their families.

See page 143 for emergency clinical management.

Address: The MH Investigation Unit
The Clinical Sciences Building
St. James’s University Hospital
Leeds
LS9 7TF

Telephone: 0113 206 5274
Fax: 0113 206 4140
Email: P.J.Halsall@leeds.ac.uk

Before referring patients please take a detailed history, which should include details of last anaesthetic of the patient and their relatives, the exact nature of the reaction, any uneventful anaesthetics that might have followed the reported reaction. Also obtain any written
documentation detailing the date and place where the reaction took place. Once these details are available, please contact the MH unit at Leeds to discuss referral.

Urgent cases

In case of emergencies where you cannot rule any of the three conditions, avoid suxamethonium, consider TIVA and use a breathing circuit that is free of volatile agents.

For any queries please contact the anaesthesia on call team.
Awareness during anaesthesia

You must report all instances of anaesthesia awareness on a clinical adverse event form.

There have been at least three recent instances of awareness during anaesthesia. The points below will help in prevention and management of this major complication.

Pre-operative visit

• Talk to your patient.
• Allay anxiety.
• Build up rapport.

Explanation

• Describe the anaesthetic technique.
• Explain invasive monitoring and intravenous access.
• If using muscle relaxants tell the patient.
• Answer all questions truthfully.

Forewarn susceptible groups

• Cardiovascular instability requiring light anaesthesia.
• Open-heart surgery.
• Caesarean section.
• Trauma surgery.
• Obesity.
• Alcoholism.
Awareness during anaesthesia

Prevention

- Check equipment, be familiar with the ventilator.
- If prolonged intubation attempts, maintain anaesthesia.
- Avoid mismatch of inexperienced anaesthetist with sick patient.

Professionalism

- When the patient is anaesthetised avoid derogatory remarks.
- Avoid personal comments.
- Maintain vigilance in monitoring physiological parameters.

Damage limitation

- If awareness is suspected during the operation talk to the patient immediately.
- Reassure them and apologise.
- Maintain reassurance in recovery and on the ward.

Debriefing

- Visit the patient with another senior anaesthetist.
- Believe the patient.
- Be frank, be open and apologise.
- Try and explain the cause of the awareness.
- Listen to the patient’s account of events.
- Validate every aspect of the account putting the events into context.
- Get the patient to write down their experience before the next visit.
Awareness during anaesthesia

Intervention

• Immediate referral to a psychologist or psychiatrist with the relevant expertise – do this through Dr Clayton or the clinical director.

• Maintain contact with the patient during the hospital stay and beyond, if necessary.
Fractured neck of femur: management guidelines

[Dr Anne Scase, Dr Fateh Shekhawat and Dr Matthew Wyse, 2003-05; appraised by Dr Scase, January 2010]

These guidelines have been agreed with the orthopaedic surgeons. They have been issued to all the surgeons and you should work with them.

Patients with fractured neck of femur should be listed on the trauma list in the morning before any other cases, including children. The only exceptions to this are for life- or limb-threatening surgery.

Aims:

- Reduction in starvation time.
- Time from admission to theatre less than 24 hours.
- Improved planning of trauma lists.

Fluid management

1. Cannulas (at least 18 SWG) must not be sited in the antecubital fossa.

2. Patients with intracapsular fracture will need maintenance fluid only (e.g. Hartmann’s solution). This includes making up the fluid missed since their fall.

3. Patients with extracapsular fractures will have lost approximately 1000 mL blood and require fluid resuscitation as well as maintenance fluid.

4. Give 500 mL colloid (e.g. Gelofusine) at least, before starting maintenance fluid of 2000 mL isotonic crystalloid in 24 hours unless contraindicated.

5. If in doubt about the fluid management, contact the trauma anaesthetist.
Fractured neck of femur

If the patient fulfils the following criteria they are **unfit** and should **not** be starved and scheduled for surgery

- **Uncontrolled blood pressure:**
  - Systolic > 200 mmHg
  - Diastolic > 100 mmHg
- **Uncontrolled heart rate once resuscitated (100 bpm)**
- **Electrolyte derangement:**
  - Sodium < 127 mmol L\(^{-1}\)
  - Potassium < 3.2 mmol L\(^{-1}\)
  - Potassium > 5.6 mmol L\(^{-1}\)
- **Anaemia:**
  - Hb < 8 g dL\(^{-1}\) (and no evidence of ischaemic heart disease)
  - Hb < 10 g dL\(^{-1}\) (with evidence of ischaemic heart disease)
- **Uncontrolled hyperglycaemia:** glucose > 16 mmol L\(^{-1}\)
- **Evidence of severe aortic stenosis or acute myocardial infarction**
- **Acute embolic disease:** PE, CVA, fat embolism

Patients fulfilling the following criteria should be discussed with the anaesthetic team who will decide when they should be starved and scheduled for theatre

- **Raised INR** (FFP may be required for the scheduled theatre time)
- **Severe chronic airways disease** (ensure arterial blood gas results available)
- **Renal or cardiac failure**

For the management of patients with diabetes mellitus see page 155.
Guidelines for management of fractured neck of femur

A&E
(ECG, CXR, FBC, INR, U&E, IV)

Patient admitted to the ward and clerked

Give colloid and maintenance fluids

Decide if fit or unfit

Fit
Allocate to morning theatre list
Food and drink and IV fluids
Starve from 0400 only

Give routine cardiac drugs and analgesia

Unfit
Do not starve

Start appropriate medical treatment.
Refer to trauma list consultant at 08:00 meeting
Postoperative analgesia after fractured neck of femur

[Dr John Elton, February 2006; revised, January 2010]

This guideline has been revised following a clinical audit project. The results were that these patients received prescriptions that varied widely and were not based on sound principles. The aim of this agreed analgesia guideline is to ensure that each patient suffers no more than mild postoperative pain, is able to cooperate with physiotherapy, and has minimal side effects from the medication.

Intraoperative analgesia

- A form of lumbar plexus block (anterior or posterior).
- Intravenous paracetamol 1 g (if not already commenced).
- Opiate analgesia as required.

Regular postoperative analgesia

- Paracetamol 1 g oral or intravenous q.d.s.
- Codeine phosphate 30 mg oral or i.m. q.d.s.: eight doses
- Lactulose 20 mg oral b.d.
- Oxygen 2 L min$^{-1}$ by nasal cannulae for 48 hours.

As required analgesia

- Oramorph 10 mg every two hours.
- Buccal prochlorperazine (Buccastem) 6 mg b.d.

AVOID

- Morphine by injection and cyclizine.
Management of patients with diabetes mellitus

Patients on the surgical day unit

[Dr Robin Correa, Sonya West and Sandy Nightingale; appraised by RC, January 2010]

According to the British Association of Day surgery (BADS) diabetic patients have historically been excluded from day surgery because of fears regarding control of their blood glucose levels during the perioperative period. The fact that the patient will be fasting and then undergoing anaesthesia which was associated with postoperative nausea and vomiting led to the belief that patients can become destabilised and are at risk. However there have been changes in the modern day way of thinking and BADS are quoted with the following:-

- “Modern day surgery anaesthesia is associated with faster recovery so that oral intake is usually rapidly re-established.
- Postoperative emetic symptoms are now uncommon.
- More patients are able to monitor their own blood sugar and take an active part in managing their own diabetes.

These considerations mean that many diabetic patients can now be treated safely on a day basis” (BADS 2005).

Criteria for the treatment of diabetic patients on the Surgical Day Unit

1. All patients to be pre-assessed
2. Optimized glycaemic control (HbA1C level < 8)
3. No history of
   - Angina, myocardial infarction.
   - Renal failure.
Management of patients with diabetes mellitus

- Strokes (CVA)
- Autonomic neuropathy (suggested by dizzy / fainting spells, irregular heartbeat, postural hypotension – see below).

4. Other day surgical criteria to be fulfilled (see page 190).

5. Investigations.
- Urea and electrolytes.
- HbA1C levels.
- ECG.
- Blood pressure – lying down and standing (a drop in systolic blood pressure of > 20 mm Hg on standing is indicative of postural hypotension).

Guidelines for the management of diabetic patients on the surgical day unit

All diabetics to be scheduled first on their respective am or pm list.

Aim to maintain blood glucose levels between 4-10 mmol L\(^{-1}\) throughout the perioperative period.

Measure capillary blood glucose levels on admission, intraoperatively and postoperatively on the ward area.

If the blood glucose is above 10 mmol L\(^{-1}\) on more than two occasions start insulin sliding scale in accordance with Trust Clinical Guidelines for the management of Diabetic Patients undergoing Surgery (UHCW 2005).

Encourage oral intake as soon as possible. In case of 23-hour surgery, delayed oral intake or postoperative nausea and vomiting (PONV), monitor blood glucose hourly till patient is eating and drinking normally.

Patient to take normal dose of insulin / OHA prior to evening meal.
Patients who take insulin

For morning surgery, omit the morning dose of insulin. For afternoon surgery, take half the morning dose with breakfast.

Patients who do not take insulin

For morning surgery, omit the morning oral hypoglycaemic agent. For afternoon surgery, take the morning dose with breakfast.

Inpatients

[Guidelines devised by Dr Carol Ray (anaesthetic SpR), Dr A. Anwar (consultant diabetologist), Dr S. Radhakrishna (consultant anaesthetist), 2003; last revised January 2005; appraised by Dr S. Radhakrishna, February 2007].

Good perioperative control of blood glucose reduces the risk of infection and promotes wound healing. Blood glucose levels should be maintained between 4-7 mmol L\(^{-1}\) whenever possible.

Flow chart for managing diabetic patients undergoing surgery

Exclusions: cardiothoracic surgery, and eye surgery under local anaesthesia.

See next page for flow charts.
Management of patients with diabetes mellitus

Do they take insulin?

YES  NO

Prior to day of surgery, monitor blood glucose before meals & at 10pm or 4-hourly if fasted

MINOR SURGERY? (ie. Expected to eat within 4 hours of operation). Check with Anaesthetist if unsure.

Do they take tablets – oral hypoglycaemic agents (OHAs)?

YES  NO

NO

YES

Omit usual OHA tablets on day of surgery

First on AM or PM list.
Monitor blood glucose 2-hourly from 06:00 (AM list) or 10:00 (PM list) until they have eaten. If blood glucose persistently above 10, start an insulin sliding scale regime.

Prior to day of surgery, monitor blood glucose before meals & at 10pm or 4-hourly if fasted

Next page
Management of patients with diabetes mellitus

AM or PM theatre list?

AM

First on theatre list. No diet from midnight.

Usual insulin or OHA tablets should not be given. At 07:00 commence insulin sliding scale regime. If blood glucose is above 10 at any time prior to 07:00 start sliding scale immediately.

Insulin Sliding Scale Regime (Surgical team responsible for setting up.)

PM

First on theatre list. No diet following an early light breakfast.

Previous page
Insulin sliding scale regime

- Prescribe IV infusion of 50 units Human Actrapid in 50 mL with normal saline, (1 unit mL<sup>-1</sup>).
- Prescribe IV fluid: 5% dextrose unless otherwise indicated. Add potassium chloride if indicated.
- Commence insulin infusion rate according to result of capillary blood sample.

<table>
<thead>
<tr>
<th>Test stick glucose</th>
<th>Insulin infusion rate in units h&lt;sup&gt;-1&lt;/sup&gt;</th>
<th>Fluid Regimen</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;5.0</td>
<td>0.5</td>
<td>Give 20 mL of dextrose 50% if symptomatic (incoherent or unrousable), or increase the dextrose 5% infusion rate by 50 mL h&lt;sup&gt;-1&lt;/sup&gt;. i.e. to 135 mL h&lt;sup&gt;-1&lt;/sup&gt;. Re-check blood glucose in 30 minutes.</td>
</tr>
<tr>
<td>5.1-7.0</td>
<td>1</td>
<td>1000 mL 5% dextrose with 40 mmol L&lt;sup&gt;-1&lt;/sup&gt; KCl</td>
</tr>
<tr>
<td>7.1-10.0</td>
<td>2</td>
<td>Start and continue infusion at 125 mL h&lt;sup&gt;-1&lt;/sup&gt; (1000 mL in 12 hours) until insulin infusion ceases.</td>
</tr>
<tr>
<td>10.1-14.0</td>
<td>3</td>
<td>Prescribe additional fluid requirements separately.</td>
</tr>
<tr>
<td>14.1-17.0</td>
<td>4</td>
<td>1000 mL of 0.9% normal saline with 40 mmol L&lt;sup&gt;-1&lt;/sup&gt; KCl</td>
</tr>
<tr>
<td>&gt;17</td>
<td>6</td>
<td>Start and continue infusion at 85 mL h&lt;sup&gt;-1&lt;/sup&gt; (1000 mL in 12 hours) until insulin infusion ceases.</td>
</tr>
</tbody>
</table>
Management of patients with diabetes mellitus

- Call doctor if blood glucose is persistently less than 4 or greater than 17 mmol L\(^{-1}\).
- Measure blood glucose every hour and adjust infusion accordingly.
- Check urea and electrolytes daily and adjust potassium chloride dose accordingly.
- Caution should be exercised with fluid administration to patients with heart failure.

**Intravenous fluid giving sets**

- The safest way to deliver insulin and IV fluids simultaneously to diabetics is via a set incorporating anti-reflux valves, through a single cannula. These valves allow flow in one direction only.
- Ordinary three way taps do not, and so should not be used.
- IVAC pumps should be used to control IV fluid infusion rate and alert when the fluid bag needs replacing.

**Postoperative management**

*When and how to stop a sliding scale regimen*

Generally, a sliding scale regimen should be stopped when the patient is eating and drinking normally and nausea / vomiting are controlled.

If the patient was not previously using insulin therapy, the insulin can be stopped at any time and the usual therapy started at the time it is usually given.

If the patient was previously using insulin therapy, the insulin, dextrose potassium regimen should only be stopped at meal time:

- Provide the meal.
- Give the pre-meal insulin.
- Stop the insulin, dextrose, potassium regimen one hour later.
Management of patients with diabetes mellitus

- Ensure the meal was eaten, if not be vigilant for hypoglycaemia.
- Institute finger stick glucose monitoring pre meal and pre bed.

Contact the Diabetic Team (bleeps 1243 or 4086; extension 25567) in the normal working day or the on call medical registrar for advice if you have ANY concerns.
Preoperative assessment and investigations

[Appraised by Dr John La Rosa, January 2010]

The Pre Anaesthetic Assessment Centre (PAAC) has been established as part of the Surgical Patients’ Pathway Program (SPPP). The PAAC is there to assess fitness for anaesthesia. It is not there to assess or action any other aspects of preoperative assessment.

Appropriate tests – ECG, chest X-ray, and blood tests etc. – are ordered as appropriate when they attend. Anaesthetists are available for:

- Final decision-making.
- Providing anaesthetic information.
- Advice on patient optimisation, further tests and referral to other specialists.

Eventually, all elective patients will be assessed in this way. PAAC currently covers orthopaedic surgery, general surgery, urology, day surgery and neurosurgery. Check the notes for pre-screening forms.

The lead consultant anaesthetist is Dr John La Rosa. The PAAC is in the main outpatients department on the ground floor – clinic 4.

Operational policy

The operational policy was written by Dr Glynn Evans (clinical director) and Dr John La Rosa, with Mr Paul Steel (outpatient services manager) in January 2007. Relevant sections are reproduced below revised for practice changes in 2008.
1. **Operational Policy**

The Pre Anaesthetic Assessment Centre (PAAC) is an integral part of all divisions encompassing many specialties within University Hospitals Coventry and Warwickshire NHS Teaching Trust.

The definition of the Pre Anaesthetic Assessment Centre’s role is:

“To ensure the generic fitness of patients undergoing elective general or regional (spinal) anaesthesia”

**Location**

The service at the University Hospital site is conducted within the various outpatient areas, where patients are initially assessed in order to identify those who subsequently require a further extended anaesthetic assessment within the PAAC at present situated on the ground floor in outpatients clinic 4. The service at the Hospital of St Cross site, Rugby, is conducted within outpatients and combines its role with that of the orthopaedic specific pre-operative service as well as assessing patients from other surgical specialties.

**Patient Selection**

It is intended that all outpatients over the age of 18 years who have agreed and consented to having surgical intervention and require general or regional anaesthesia will be seen and generically assessed by the Pre Anaesthetic Assessment Centre staff on the same day that the decision for surgical intervention is made between the individual and the clinician. This is however, subject to referral (either written or in some cases verbal) by the surgical team.

**Contact Details**

Telephone number 024 7696 6379

**Specialties using the PAAC**

The centre is open to all specialties that choose to refer their patients for anaesthetic assessment.
Preoperative assessment and investigations

Specialty specific review

In the event that any specialty wishes to undertake any specialty specific activity prior to the patient’s TCI date, they are free to do this. Any member of staff who can access CRRS will be able to access the Pre Anaesthetic Assessment Centre Assessment within the “Other Clinical Events” element of CRRS. Specialty specific information and documentation can be recorded within this element of CRRS.

2. Objectives of the Pre Admission Anaesthetic operational policy:

- Ensure the patient is medically fit to undergo an elective general or regional anaesthetic

- Identify patients as temporarily unfit for general or regional anaesthesia. The PAAC anaesthetist will refer the patient back to their GP with a letter detailing the reason for referral, and a request to return the patient to the PAAC after treatment whether that treatment be by the GP or by further referral.

- The PAAC anaesthetist will also inform the consultant who made the decision for treatment that the patient is deemed unfit and that once fit and stable, the patient will be reassessed by the PAAC anaesthetist.

- The PAAC registered nurse responsible for the patient will also notify the consultant and their secretary by e-mail of the above decision. If the patient has a TCI within seven days the waiting list office should also be notified that the patient may be cancelled and that they should confirm with the operating consultant.

- If the PAAC anaesthetist feels that the patient is likely to represent special risks, the patient may be discussed directly with the referring surgeon.

- Identify patients who need investigations, such as an echocardiogram, that cannot be obtained on the day in order to determine fitness for anaesthesia and to arrange and interpret the results.
• Meet clinical governance requirements through reducing variation in Pre Anaesthetic Assessment practice

• Reduce hospital led cancellations through the effective management of identifying patients who are unfit for general or regional anaesthesia.

• Identify preventable problems by providing a framework to monitor the provision of services

• Ensure all documentation is clear, accurate, up to date and available electronically on PAS and CRRS

3. Further relevant matters

Available documentation

The Pre Anaesthetic Assessment Centre will not be able to offer a full anaesthetic assessment in the absence of relevant medical notes and associated documentation available on the day of anaesthetic assessment. The Pre Anaesthetic Assessment Centre and reviews will be carried out and documented on the Patient Administration System (PAS) and on CRRS.

DNA at Pre Anaesthetic Assessment Centre

All patients who DNA for pre anaesthetic assessment clinics will be offered an alternative date for assessment. In the event of a second DNA, the PAAC anaesthetist will be requested to advise on the future management of the patient involved, and the referring surgeon advised accordingly.

Medical Accountability

All pre anaesthetic assessments are conducted under the auspices of the anaesthetic department, and responsibility for decisions rests with the consultant anaesthetic body and ultimately with the clinical director for anaesthesia.
**Indications for investigations**

**Full blood count indications**

Full blood count is only indicated in patients having one or more of the following:

- Recent major surgery
  - Scheduled major surgery with anticipated major blood loss.
  - Chronic disease e.g. rheumatoid, renal or liver disease.
  - High alcohol intake.
  - History of heavy periods.
  - Cardiovascular conditions.
  - Respiratory conditions (exceptions: asthma, TB, hay fever).
  - History of anaemia (including sickle cell disease).
  - Bleeding conditions or strokes.
  - Chronic vomiting or diarrhoea.
  - Diet low in red meat, or dark green vegetables.

- Medication: NSAIDs, anticoagulants, rheumatoid drugs, steroids.

**Urea & electrolytes indications**

- Symptomatic patients e.g. diabetes, vomiting, diarrhoea, renal disease, hepatic disease.
  - Patients taking relevant drugs e.g. diuretics, digoxin, and other cardiac drugs.
  - Patients over 50 years having major surgery unless otherwise agreed with the relevant anaesthetist.

**Electrocardiography (ECG) indications**

See pathway below.

**Glycosylated haemoglobin (HbA₁C) indications**

- Diabetes mellitus.
Preoperative assessment and investigations

Coagulation pathway indications

- Scheduled cardiac surgery.
  - Anticoagulant medications.
  - Hepatic impairment.

Chest X-ray indications

- Symptomatic patients e.g. cardiac or respiratory diseases.
  - Chronic renal or hepatic disease.
  - Scheduled cardiothoracic surgery.

If any doubt exists concerning any of these investigations, you should contact a more senior anaesthetist.

Obesity

The PAAC staff can refer patients with a body mass index greater than 40 to Professor Kumar's metabolic clinic for supervised weight loss.
Preoperative assessment and investigations

ECG and echocardiography pathway

AGE OVER 60

ECG

NORMAL

PREOPERATIVE ASSESSMENT CLINIC
If murmur heard and it is of significance refer to echo, or seek cardiology opinion.

Admit patient for theatre

ABNORMAL as decided by anaesthetist

DIRECT REFERRAL

2D ECHO CLINIC

Patients respond positively to cardiac or respiratory questions (Except TB, asthma, hay fever). Patients with an ECG or echo within one year if symptoms not changed do not require further ECG
Respiratory function test pathway for pre-screening

Patients answer positively to respiratory questions or any cardiothoracic patient.

Patients who have had previous RFT in previous 2 years with no change in symptoms do not routinely require testing. Note on form reason for previous referral.

Direct referral

Patient has basic spirometry.

FEV₁ / FVC < 70% without inhalers.

Patient referred to stage two preoperative assessment for anaesthetic opinion, prior to ordering full RFT testing.
Sevoflurane

[Dr Mark Porter, October 2005; appraised by Dr John Elton, January 2008]

Sevoflurane is twenty-one times more expensive than isoflurane. Think before using it and use it on low flow – less than 500 mL per minute. (Desflurane costs twenty-five times as much as isoflurane and should be used with similar attention to economy.)

Clinical pharmacology

The advantage of sevoflurane may be lost if using opiates or midazolam, as these and other agents may cause postoperative sedation. Using a good regional block for analgesia instead of sedative drugs will enable faster recovery.

Where the duration of anaesthesia will exceed two hours, sevoflurane will not give a different recovery profile to isoflurane.

While rapidity of recovery can be proven when comparing sevoflurane with isoflurane in shorter cases, it rarely has any significant effect on clinical outcomes, length of stay or list turnover. Do you really have to use it?

Sevoflurane inhalational induction is about the same cost as an ampoule of propofol, especially where nitrous oxide is used to increase potency, and cardiorespiratory parameters may be better maintained. However, consider whether inhalational induction is necessary in each case.

Clinical indications

Anaesthetists should consider the clinical indications for using sevoflurane in every case. Where a specific indication is not apparent, anaesthetists should use isoflurane or another agent.

1. Inhalational induction of anaesthesia.
2. Maintenance of anaesthesia.
Sevoflurane

a. After inhalational induction.
   i. Consider switching to another volatile agent after induction as soon as the airway is secured.
   ii. Reduce fresh gas flows to a maximum of one litre per minute.

b. For patients whose clinical condition or surgical procedure requires preservation of systemic vascular resistance more than can be achieved with other agents. (Sevoflurane may depress SVR to a lesser degree than isoflurane or desflurane.)

c. For patients with ischaemic heart disease, in whom isoflurane at more than one MAC for ischaemic preconditioning can produce coronary steal, hypotension and reflex tachycardia.

d. Where the patient’s clinical condition or surgical procedure indicates that postoperative recovery be as accelerated as possible.
   i. During spontaneous ventilation only.
   ii. During IPPV, use desflurane or propofol TIVA if accelerated recovery is indicated.

Acceptable use policy

1. Every bottle of sevoflurane used will be signed out to an operating theatre by the ODP.

2. Theatre usage will be monitored and reported regularly to the Divisional Pharmacy Forum.

3. An individual anaesthetist’s use of sevoflurane will not be restricted by this policy. However, all anaesthetists using sevoflurane will be responsible for knowing about this policy and considering their usage of sevoflurane. Each use of sevoflurane
Sevoflurane

must be considered on its clinical indications and merits, rather than because sevoflurane is an automatic choice.

4. Sevoflurane may not be used with Bain circuits or other Mapleson ‘D’ type circuits.

5. Paediatric T-piece circuits, Lack circuits (Mapleson type ‘A’) or circle absorbers may be used for induction – the fresh gas flow rate should not normally exceed six litres per minute.

6. Inhalational induction should be followed immediately by low-flow anaesthesia or preferably switching to another agent such as isoflurane.

7. A circle absorber must be used for maintenance of anaesthesia with sevoflurane.

8. Fresh gas flows must be reduced immediately after induction of anaesthesia and no later than ten minutes into the case. The maximum fresh gas flow with sevoflurane maintenance is one litre per minute.

If you use sevoflurane, use it on low flow
Gabapentin has an established role in chronic pain management. There is growing evidence for its use in acute pain as well. Although the precise molecular mechanism is unclear, it could be explained by prevention or reduction of the development of central neuronal hyperexcitability induced by the surgical procedure.

**Clinical information**

**Indications**

1. Resistant postoperative pain unresponsive to conventional management.
2. Background history of chronic pain (e.g. fibromyalgia) experiencing exaggerated perception of acute pain.
3. Sensitivity to opioids (anaphylaxis, severe PONV etc.).
4. Procedures which can predispose to neuropathic pain (e.g. amputation, ‘abnormal’ pain behaviour following hernia, breast surgery etc.).
5. Post-dural puncture headache.

**Advantages**

1. Opioid-sparing effect.
2. Reduced PONV.
3. Reduction in pain associated with movements.
4. Anxiolysis
Gabapentin in acute pain

Side-effects

Mild to moderate somnolence.

Caution

In patients with significant renal or hepatic impairment.

Recommended dose

Gabapentin is presented as capsules of 100 mg, 300 mg and 400 mg; also tablets of 600 mg and 800 mg.

A single dose of oral gabapentin 600 mg to 1200 mg one or two hours before surgery has been shown to significantly reduce postoperative opioid consumption.

A useful regime from the University of Western Ontario, Canada is oral gabapentin 300 mg three times a day, preferably to be started preoperatively. The duration of treatment can be three to seven days depending on the surgery and intensity of pain.

There is no need for gradual weaning of GBP when used to treat acute pain.

Conclusion

Perioperative gabapentin is a useful adjunct for the management of acute pain. It provides analgesia through a different mechanism than opioids and other analgesics. It is generally well tolerated with minimal drug interactions.

Further reading


Gabapentin in acute pain


Blood and blood products

Blood transfusion – indications

[Dr Mark Porter, January 2006; appraised by Dr Keith Clayton, January 2010]

Blood transfusion can bring benefit but also has significant risks and complications. Each unit of blood is a scarce resource. In cases of significant expected or actual haemorrhage, arrange for haemoglobin monitoring to be available using in-theatres testing with HemoCue or arterial blood gas analysis. Remember that there are significant dilutional and rebound effects on the measured haemoglobin level.

Do not attempt to manage massive haemorrhage on your own. Discuss potential cases with a senior colleague and call for help if it happens.

In case of acute haemorrhage or when you expect cross-matched blood to be exhausted: call for senior help, then telephone blood bank to discuss the patient’s needs. There is emergency ‘O Rh(D) negative’ blood available. Group specific blood (‘red label blood’) will always arrive more quickly than cross-matched blood.

YOU MUST CHECK ALL BLOOD PRODUCTS AGAINST THE PATIENT’S IDENTITY.

The identity is recorded on the patient’s armband. You should confirm the armband information with the patient on admission to theatres if possible. Remember to identify the patient positively – ask them to state their name, date of birth and address, rather than just asking, for example, “Are you Mr Fred Jones?”

The following guidelines are appropriate to elective surgery. They may be appropriate to urgent surgery but you should consider carefully how the urgent situation could change appropriate management.

- Where possible, anaemia should be corrected prior to major surgery to reduce exposure to allogeneic transfusion.
• The MSBOS guideline on the intranet details the indicated availability of cross-matched concentrated red blood cells.

• Transfusion is unlikely to be justified at haemoglobin levels >10 g dL\(^{-1}\).

• Transfusion is almost always required at haemoglobin levels <7 g dL\(^{-1}\).

• Patients with cardiovascular disease, or those expected to have covert cardiovascular disease (e.g., elderly patients or those with peripheral vascular disease) are likely to benefit from transfusion when their haemoglobin level falls below 9 g dL\(^{-1}\).

• Transfusion at levels between 7 g dL\(^{-1}\) and 10 g dL\(^{-1}\) is at the discretion of the clinician, and should take into account any postoperative symptoms such as tachycardia, dyspnoea and failure to mobilise. You should also consider the preoperative haemoglobin level and all other relevant factors.

• Red cells also contribute to haemostasis by their effect on platelet margination and function. The optimal haematocrit to prevent coagulopathy is unknown, but experimental evidence suggests that a relatively high haematocrit, possibly 35%, may be required to sustain haemostasis in patients with massive blood loss.

• Transfusion of leucodepleted allogeneic blood should not be limited by concerns over increased cancer recurrence or perioperative infection.

• Intraoperative cell salvage is used in maternity and cardiac theatres and may be available elsewhere in main theatres by special arrangement.

• UHCW does not offer a preoperative autologous donation service. The NBS guidelines advise against this technique. Only acute normovolaemic blood transfusion is allowed.

You should make a record of a valid, defined and justifiable indication for every blood transfusion.
When the unit of blood or blood product is being transfused the unit number must be recorded on the anaesthetic chart, fluid chart and the new blood pathway form – the recording of the unit number is mandatory.


[Trust wide Policy for the Transfusion of Blood and Blood Products, 1 June 2004]


Ordering and giving blood

[Appraised by Mr John Hyslop, December 2008]

Phone 25322 for blood bank
(in emergency: 25398 or bleep 2169)

Two people must always check human blood products against the paperwork and against the patient’s armband before transfusion.

A Armband
B Blood label
C Compatibility form
D Double check with someone else

Record the blood unit number on the patient records.

The number of units of blood cross matched for elective surgery is governed by MSBOS (Maximum Surgical Blood Ordering Schedule). This document is available on the intranet.
Blood and blood products

Emergency O-negative blood

Several units are maintained in the blood fridges (see page 186). You must inform blood bank when these units are removed from the fridge.

Electronic issue of blood (EIB)

This is a recent development. To be suitable for electronic issue of blood, a patient has to fulfil all the following criteria:

1. Two plasma samples processed by blood bank, at least one within the previous month. The BAN can be used as a reference sample but the valid sample must be a valid G+S tested here at UHCW within the last month. There is no restriction on the time between the two samples.

2. Both samples to agree with each other on blood group.

3. Antibody screen negative.

In practice, if a recent GA (group and save) sample and a BAN or second GA sample are on CRRS without an antibody flag then the patient is suitable for EIB. However, this is dependent on their recent history of any blood transfusion.

Blood requested for electronic issue will usually be released within ten minutes. If you are unsure whether a patient is suitable for EIB or not contact the Blood Bank on 25322 for advice and guidance on how to proceed.

Group specific blood

This is supported by a single plasma sample. ABO Rhesus compatible blood is issued on a red label (no black matching label; see page 187) as it has not been cross matched and so there is a higher risk of incompatibility. Blood requested as urgent group specific will usually be released within five minutes. The requesting doctor is responsible for the decision to use group specific blood, and the justification must be written in the medical records.
**Blood and blood products**

*Cross matched blood*

This is supported by a single plasma sample and each issued unit is cross matched against the patient’s sample. Blood requested for urgent cross match will usually be released within forty minutes. Patients known to have atypical blood group antibodies will always require a serological cross-match prior to the issue of blood.

*Other blood products*

Platelets are usually available but depending on the blood group a delivery from Birmingham may be required.

Fresh frozen plasma (FFP) is available from blood bank and is not released until it has thawed. This can take up to twenty-five minutes plus transport time. It is advised that you consider FFP when six units of blood have been transfused.

Cryoprecipitate is available to treat hypofibrinogenaemia; this product also requires thawing.

*Intraoperative cell salvage*

UHCW has cell salvage machines in cardiothoracic theatres and in the labour ward. Use these only with experienced staff who can operate the machine.

*Hospital transfusion information*

[Circulated by Hospital Transfusion Team, August 2006; appraised and revised by Mr John Hyslop, January 2008]

**Blood Storage**

Under NO circumstances must blood or blood components be stored in a refrigerator other than those specifically approved for blood / component storage.

**Fatal reactions can result from incorrect storage. Do not use ward fridges for storage purposes under any circumstances.**
Blood and blood products

Blood Storage Refrigerators

Only blood issued by the Blood Bank may be stored in the following designated blood and satellite blood storage facilities. When blood or blood products are received with a patient transferred to UHCW, Blood Bank must be informed immediately. This is to ensure that transferred blood and blood products have been stored correctly in transit and the cool chain has been maintained.

University Hospital Blood Bank - Located on the fourth floor, West wing, University Hospital site: Ext 25322. There is also an Emergency telephone 25398.

Satellite blood storage refrigerators are located as follows:

- Rugby Blood Bank - Located opposite Cedar Ward, within the laboratory foyer at the Hospital of St Cross.
- Arden Cancer Centre: Ground Floor, West Wing, University Hospital.
- Obstetrics/Gynaecology: Obstetric Theatres, First Floor, West Wing, University Hospital.
- Central Theatres: First floor, Central, University Hospital.
- Cardiothoracic Theatres: First Floor, Central, University Hospital.
- Cardiothoracic Critical Care Unit: First Floor, East wing, University Hospital.
- Haematology Day Unit: Ward 34, Third floor, West wing, University Hospital.
- Haematology/Oncology Ward: Ward 34, Third Floor, West Wing, University Hospital.
- BMI Meriden Hospital: Operating Theatres on 1st Floor.
Blood Cool Boxes

Blood issued from the Blood Bank can be transported in approved cool boxes. Blood must not be allowed to stay in a cool box for longer than four hours. When cool boxes are packed with blood/components for delivery, the time and date packed will be indicated on the cool box.

In which fridge will I find the Blood for my patient?

For the vast majority of wards (exceptions are dealt with below) blood issued by the laboratory will be placed into the main Blood Bank issue fridge on 4th floor. Black copy reports (ward copies) will be filed alphabetically in a box beside the fridge labelled cross match reports. Red copies (lab copies) will be filed in a box labelled Red copies in drawer order i.e. A to G.

When blood is required clinical areas are to send a member of staff to collect blood following the procedure laid out in ‘Collecting blood for transfusion’. Normally only one unit at a time is to be taken. Where staff are requested to collect more than one unit at a time they MUST transport the blood in a cool box. These can be obtained from Blood Bank.

FFP must be administered as soon as possible after defrosting, and always within 4 hours. FFP is always issued defrosted from Blood Bank. The time the product was thawed is printed on the black laboratory ‘cross match’ form.

Cryoprecipitate must be administered as soon as possible following receipt.

All blood products are entered on the AUTOFATE system to keep track of the chain from donor to recipient. This is a legal requirement of the European Union Directive on Blood Safety.

When products are delivered to the clinical area and the patient is unlikely to be transfused then advice must be sought from Blood Bank.
Blood and blood products

Arden Cancer Centre:

Blood issued for patients in this location will have their blood sent to this fridge

Obstetrics/Gynaecology:

Blood issued for patients on Ward 23, Ward 24, Ward 25, Labour Ward and SCBU will have their blood sent to this fridge

Central Theatres:

This fridge contains an Emergency Blood Supply for use by all of the operating theatres, intensive care units and the Emergency department

Only blood for patients at a high risk of bleeding or patients who are actively bleeding is to be stored in this fridge. When surgery is completed and the patient is transferred out of the theatres blood is to be returned to the Blood Issue fridge on the 4th floor

Blood for patients undergoing low risk routine surgery is NOT to be removed from the 4th floor fridge and stored in this fridge

Cardiothoracic Theatres:

Prior to surgery taking place blood for patients is to be transferred from the 4th floor issue fridge to this fridge. Following surgery the blood is to transferred with the patient into the fridge in the Cardiothoracic Critical Care Unit

Cardiothoracic Critical Care Unit:

Blood issued for patients in this location will have their blood sent to this fridge.

Haematology Day Unit:

Blood issued for patients in this location will have their blood sent to this fridge
Haematology/Oncology Ward:

Blood issued for patients on Ward 34 and Ward 35 will have their blood sent to this fridge

BMI Meriden Hospital:

Blood issued for patients in this location will have their blood sent to this fridge

Satellite Fridge Temperature Monitoring

Eventually all satellite blood fridges will be wired into; and monitored by, the Buildings Management System which is part of SRW. Until this work has been undertaken by SKANSKA all satellite fridges cannot be fully commissioned. Fridges which cannot be checked every 30 minutes will have to be emptied at times when staff are unavailable to undertake the checks necessary to ensure blood safety.

In these cases blood will have to be returned to the Blood Bank on the 4th floor where it can be stored safely

Blood delivered which cannot be transfused

Blood that is collected but which cannot start to be transfused within 30 minutes must be returned to the Blood Bank or satellite refrigerator within that 30 minute period. The returnee must scan the unit into the fridge using BloodTrack and document legibly the time returned to refrigerator on the red cross match slip. If concerned or unsure, the healthcare person must seek advice from a member of the Blood Bank team. At this point a unit of blood may still be reissued.

Blood which has been out of the refrigerator longer than 30 minutes and will not be transfused within 4 hours must be returned to the laboratory immediately.
Blood and blood products

Emergency Administration of Blood

Requesting Emergency Blood

Only a member of the UHCW medical staff can request emergency blood. A dialogue must occur with Blood Bank. A normal cross match sample and request form must be sent to the Blood Bank before administering ‘Emergency blood’. Emergency blood can be obtained in two ways: ‘Emergency Blood Supply’ (immediate use) or ‘Red Label’ (when the cross match is partially completed).

Emergency Blood Supply (O Negative ‘Flyers’)

The ‘Emergency Blood Supply’ is group O Rh(D) Negative, which is suitable for most, but not all, recipients. The ‘Emergency Blood Supply’ is NOT inert and patients with atypical red cell antibodies (e.g. Kell, Duffy) may still react to O Rh(D) Negative blood. Group O Rh(D) Positive blood is also kept available, and may be used in situations where large volumes of blood may be required and insufficient O Rh(D) negative blood is available. This blood is always available for immediate clinical use in the locations listed below.

Blood Bank: Fourth floor West Wing: Staff sent to collect Emergency Blood should go directly into Blood Bank where the issue will be processed immediately.

Obstetric Theatres: First Floor, West wing: Emergency Blood is always available in the fridge in the Theatre area by labour ward. Staff removing blood from this fridge MUST inform Blood Bank on extension 25322 so that replacement units can be sent at the earliest opportunity.

Central Theatres: First Floor, Central: Emergency Blood is always available in the fridge in the Central Theatres in the Theatre entrance area. Staff removing blood from this fridge MUST inform Blood Bank on extension 25322 so that replacement units can be sent at the earliest opportunity.

Hospital of St Cross: Emergency Blood is always available in the refrigerator in the pathology laboratory foyer. Staff removing blood from this fridge MUST inform the Blood Bank at UHCW on extension
25322 so that replacement units can be sent at the earliest opportunity.

**Documentation of use of Emergency Blood supply**

Each unit of blood designated in the blood fridges for use as emergency blood supply has a white form wrapped around it. Following the emergency, ensure that this paperwork is completed and returned to Blood Bank. It is imperative white forms are returned to Blood Bank so traceability is maintained at all times.

Record the details of the Emergency Blood units used in the patient’s medical notes and upon the Intravenous Infusion Prescription Chart. This should include the unit/donation number and blood group. Blood is to be checked against whatever patient details are available at the time.

**‘Red Label’ Blood**

‘Red Label’ blood is blood issued by the laboratory before the cross match process has been fully completed. Responsibility for use of ‘Red Label’ blood lies with the requesting clinician.

‘Red Label’ blood can be obtained ONLY from the University Hospital site following a dialogue between the requesting clinician and a senior MLSO in Blood Bank.

Where blood is issued on a ‘Red Label’ basis by the laboratory no black cross match form will be available. However the unit of blood will have a red label with the patient’s name, hospital number and blood group fixed to it.

Record the details of the ‘Red Label’ units used in the patient’s medical notes and on the Intravenous Infusion Prescription Chart. This must include the unit/donation number and blood group. Blood is to be checked against whatever patient details are available at the time.

**Disposal of Red Label Bags**

There is no need to send used Red Label bags back to Blood Bank because Blood Bank already have details of the blood issued.
Blood and blood products

For further information please contact the Hospital Transfusion Team:

- John Hyslop  
  Blood Bank Manager  
  Ext: 25322

- Janine Beddow  
  Transfusion Coordinator  
  Ext 25470 Bleep: 1287

- Angela Sherwood  
  Transfusion Liaison Nurse  
  Ext: 25469: Bleep 2280

Dr Falguni Choksey is the department’s representative on the hospital transfusion committee.

Refusal of consent for transfusion

There is a UHCW policy concerning patients refusing consent for the use of blood products (current issue expires July 2010).

In an emergency, you are obliged to care for a patient in accordance with the patient’s wishes. **You must refer all such cases to the appropriate consultant on call.**

The trust is currently rolling out a cell salvage programme using Dideco machines. Some people who refuse consent for blood transfusion are content to receive salvaged blood, whether in a continuity circuit or a separate bag. Check availability with the theatre team.

The policy has been ratified by representatives from the Jehovah’s Witness community. You can read the policy by accessing intranet / departments / blood transfusion / clinical guidelines. There are also hard copies in a Transfusion Manual located on all clinical areas.

Whilst Jehovah’s Witnesses do not accept the use of whole blood, red blood cells, white blood cells, plasma and platelets, the use of any derivatives of these is an individual decision: a matter of patient choice. Many Witnesses consent to the use of albumin, clotting
Blood and blood products

factors, haemoglobin-based oxygen carriers, immunoglobulins, interferon and the like. It is therefore important to discuss with each Witness patient whether or not these products are acceptable.

Whilst the views and wishes of an adult Jehovah’s Witness patient with regard to blood transfusions must always be absolutely respected, this is not always the case where children and young people are concerned, and the wellbeing of the child must be paramount. It is in such circumstances that the greatest difficulties in managing the medical care of Jehovah’s Witness patients can arise.

Referral to a consultant, and close reading of the UHCW guideline, is essential.

If you need advice:

- In hours – contact Transfusion Team, bleep 1287 or 2280.
- Out of hours – contact consultant haematologist on call.

See also Management of Anaesthesia for Jehovah’s Witnesses, second edition, AAGBI, November 2005.
Day case anaesthesia

[Appraised by Dr Robin Correa, January 2010]

The lead clinician for day case anaesthesia is Dr Robin Correa. The surgical day unit on the ground floor offers care for a variety of day patients (discharge on the same day) and 23-hour stay patients (discharge before 24 hours elapse).

Criteria for day case anaesthesia

The following criteria are in place to determine suitability for day case anaesthesia. If as a trainee you are faced with a patient who has already been admitted and who you do not believe fits within the criteria, you should follow the advice on page 46 before cancelling or postponing a patient.

All patients who are ASA grade 3 or have insulin-dependent diabetes mellitus should be pre-assessed to determine their suitability for admission to the surgical day unit (day stay or 23-hour care). See page 155 for diabetic patients on the surgical day unit.

Day stay

1. The procedure will not normally be associated with significant postoperative pain or bleeding.
2. There is no upper age limit. The lower age limit is one year.
3. Maximum ASA class 2 (except as above).
4. Maximum BMI 35. Obesity is no longer of itself a contraindication to general anaesthesia in the surgical day unit. However, the clinical guideline in the surgical day unit defines the acceptable upper limit of body mass index as 35 kg m$^{-2}$. You should seek senior advice (see page 43) if presented with this situation.
5. Patients who give a history of anaesthetic misadventure or who pose potential airway management issues will not be accepted.
6. Social criteria for discharge will be that the patient must be accompanied home; a responsible adult must be present for the first postoperative night; there must be access to an inside toilet and telephone; they must have the telephone numbers of their general practitioner and the emergency admissions unit.

7. The following medical conditions preclude day stay for general or regional anaesthesia:

- Uncontrolled hypertension: systolic over 200, diastolic over 100 or on treatment for this for less than three months.
- Clotting disorders.
- Sickle cell disease (trait is acceptable).
- Pregnancy (except for local anaesthesia, or for pregnancy-related procedures).
- Epilepsy – if on medication or has had fit in last one year

23-hour stay

1. The procedure will not normally be associated with significant postoperative pain or bleeding.

2. There is no upper age limit. The lower age limit will be determined by the nursing staff available.

3. Maximum ASA class 3.


5. Patients who give a history of anaesthetic misadventure or who pose potential airway management issues will not be accepted. (This may change if equipment levels increase).

6. Social criteria for discharge will be the same as for ward patients.

7. The following medical conditions preclude 23-hour stay for general or regional anaesthesia:

- Uncontrolled hypertension: systolic over 200, diastolic over 100 or on treatment for this for less than three months.
- Clotting disorders.
Day case anaesthesia

- Sickle cell disease (trait is acceptable).
- Pregnancy (except for local anaesthesia or for pregnancy-related procedures).

Spinal anaesthesia in day surgical patients

Spinal anaesthesia in day surgical patients is associated with a high incidence of post dural puncture headache and urinary retention. Apart from delaying discharge this can cause undue distress and result in significant morbidity to the patient.

You should only use spinal anaesthesia if there is a strong clinical indication and only after discussion with a consultant anaesthetist.
ENT anaesthesia

{Dr Cyprian Mendonca and Mr Darius Rejali, July 2007; appraised by Dr Mendonca, January 2010]

These are guidelines for management of pain and prevention of postoperative nausea and vomiting in patients undergoing tonsillectomy and adenotonsillectomy.

Tonsillectomy is the most commonly performed ENT procedure in children. There is a high incidence of postoperative pain, nausea and vomiting (as high as 54%) and post-operative pain following tonsillectomy varies with the method of surgery, administered analgesics and individual patient factors. Previous audit (no. 356) has revealed that 37% of patients suffer from moderate pain during the postoperative period on return to the ward. Optimising perioperative antiemetic prophylaxis and analgesia are important factors in preventing morbidity, prolonged hospital stay and enhancing patient satisfaction.

Paediatric tonsillectomy

For paediatric tonsillectomy, use your familiar anaesthetic technique with the following modifications.

Preoperative

- Clear fluids allowed up to two hours preoperatively (a child can have a drink of clear fluid ~10 mL kg\(^{-1}\), maximum 100 mL two hours preoperatively).

- Consider premedication with paracetamol (20 mg kg\(^{-1}\) oral) + ibuprofen (5 mg kg\(^{-1}\)).

Intraoperative

- Induction: propofol (or inhalational induction if indicated) + fentanyl (suggested dose is 0.5 –1.0 µg kg\(^{-1}\)).

- Dexamethasone 0.1 mg kg\(^{-1}\) (intravenous).
**ENT anaesthesia**

- Ondansetron 0.1 mg kg\(^{-1}\) (intravenous).
- Rectal paracetamol 40 mg kg\(^{-1}\) or intravenous paracetamol 15-20 mg kg\(^{-1}\) to a maximum of 1 g. (if not given as premedication).
- Rectal diclofenac 1 mg kg\(^{-1}\) (if NSAIDs are not administered as premedication).
- Intramuscular codeine phosphate 1 mg kg\(^{-1}\) administered intraoperatively.
- Intravenous infusion of crystalloids 10 ml kg\(^{-1}\) intraoperatively.

**Postoperative**

- Return to ward with free fluids and food on demand.
- Regular oral paracetamol 15 mg kg qds.
- Regular oral Ibuprofen 5 mg kg\(^{-1}\) tds (codeine phosphate 1 mg kg\(^{-1}\) if NSAIDs are contraindicated).
- Oral morphine 0.2-0.3 mg kg\(^{-1}\) every three hours as needed.
- Intravenous ondansetron 0.1 mg kg\(^{-1}\) every eight hours as needed.

**Discharge medications**

Parents are requested to have their own supply of paracetamol and ibuprofen.

- Regular oral paracetamol 15 mg kg\(^{-1}\) qds for five days.
- Regular oral ibuprofen 5 mg kg\(^{-1}\) tds for five days.

**Adult tonsillectomy**

**Preoperative**

- Consider premedication with paracetamol 1 g + NSAIDs (ibuprofen 600mg or diclofenac 100mg).
Intraoperative

- Induction: use propofol and fentanyl.
- Dexamethasone 4-8 mg (intravenous).
- Ondansetron 4 mg or cyclizine 50 mg (intravenous).
- Paracetamol 1g intravenous (if not administered in the preferred route, oral premedication).
- NSAIDs: intravenous or rectal (if not administered in the preferred route, oral premedication).
- Morphine 0.1 mg kg\(^{-1}\) intravenous.
- Intravenous infusion of crystalloids ~10 ml kg\(^{-1}\) intraoperatively.

Postoperative

- Return to ward with free fluids and food on demand.
- Regular oral paracetamol (soluble tablets) 1 g qds.
- Regular oral codeine phosphate 30 mg qds.
- Regular oral Ibuprofen 400mg tds.
- Oral morphine 10-20 mg, three-hourly as needed.
- Cyclizine 50 mg or ondansetron 4mg, eight-hourly as needed.

Discharge medications

- Oral paracetamol 1 g qds for five days.
- Oral ibuprofen 400 mg tds for five days.
- Oral codeine phosphate 30-60 mg qds for five days.
References


Miscellaneous issues

‘Bare below the elbows’

The dress code and uniform policy is being revised at present following change throughout the NHS. You should bear the following in mind:

- Do not wear wristwatches, long sleeves or long ties on clinical duties.
- No white coats.
- Corporate and professional identity is important. Wear your name badge at all times when working so that it is visible to patients, including on your theatre scrubs.

Cardioversions

[Appraised by Dr F Choksey, January 2010]

Urgent cardioversions may be called for the emergency assessment unit, coronary care unit, or cardiothoracic critical care or ward areas. If asked to anaesthetise for urgent cardioversion, treat it as a full anaesthetic. Take an Operating Department Practitioner to assist and perform the anaesthetic with full AAGBI-standard monitoring. If the facilities are not appropriate at the patient’s location, use an anaesthetic room in the cardiothoracic or general theatre suite. Speak to the nurse in charge of theatres (bleep 2597) to organise a technician. Be aware that the doctor performing the cardioversion may not be as capable as you at diagnosing and treating post-cardioversion complications.

These patients are often on warfarin and the INR is maintained around 2. Patients whose INR is higher than 4 are considered unsuitable for cardioversion due to the potential for haemorrhage. Preoxygenation is essential and propofol is the induction agent of
choice. Etomidate may be considered in certain patients with poor cardiovascular reserve.

Central line insertion

[Dr Cyprian Mendonca, January 2009]

NICE recommends that two-dimensional (2-D) imaging ultrasound guidance should be the preferred method for elective internal jugular vein catheterisation in adults and children [Technology Appraisal number 49, 2002]. This was considered at a clinical audit meeting in 2006.

2-D ultrasound machines for inserting central venous lines are available in all theatre areas, the emergency department and the critical care units.

You should learn landmark techniques in order to retain important skills. When using the landmark technique, the department advises that you verify the anatomy of neck by performing an ultrasound scan before insertion of the catheter.

Contact Dr Mendonca if you need to arrange training.

Clopidogrel and surgical patients

[Dr S. Radhakrishna, August 2007; appraised January 2008]

These guidelines are based on current evidence. Decisions on clopidogrel usage should be taken in conjunction with surgeons and the responsibility for cancelling clopidogrel prescriptions rests with the surgeons.

(There is a guideline in the cardiology folder on the intranet dealing with anticoagulation or antiplatelet treatment for cardiac patients undergoing non-cardiac surgery.)

Elective Cases:

1. Patients who are on clopidogrel and who have had a coronary artery stent inserted within the year: the clopidogrel should
ideally be continued and surgery should be deferred till the patient has had the full one year course of clopidogrel. If the surgery cannot wait, refer the patient to the cardiologist for an opinion.

2. Patients who have not received a coronary artery stent in the past year: clopidogrel should be stopped between five and seven days preoperatively. This helps to replenish half the platelet pool reducing the chances of bleeding. After five days of abstinence from clopidogrel, patients can receive general anaesthesia or a regional technique.

3. If in doubt consult the cardiologists or the physicians responsible before stopping clopidogrel.

**Emergency Cases:**

1. Patients for emergency surgery who are on clopidogrel are at increased risk of bleeding as the platelet dysfunction is irreversible. Bleeding could be 30% to 100% more than normal.

2. These patients are best dealt with by senior surgeons and anaesthetists. Blood transfusions and cell salvage may be indicated.

3. Platelet transfusion may help to control bleeding but may predispose to thrombus formation in narrowed arteries. Defer transfusion as long as possible and use cautiously only if bleeding is otherwise not controlled.

4. In difficult cases the drug may have to be discontinued in consultation with the cardiologists. Stopping clopidogrel even for a day can reduce blood loss as long it is not given on the day of surgery.

5. Aprotinin: randomised controlled trials have shown that administration of aprotinin limits blood loss. The benefits of Aprotinin should be weighed against the risk of serious anaphylaxis and renal damage. Aprotinin has now been temporarily withdrawn by Bayer pending further trials.
6. The patient should be informed of the high surgical risk and consequences of bleeding and possible cardiac complications.

Dental damage during anaesthesia

[Appraised by Dr Edwin Borman, January 2010]

Damage to teeth and crowns can occur during anaesthesia despite your best efforts to avoid it. The usual immediate action is to apologise to the patient who has suffered such damage.

Then:

• Make a note of the nature and extent of damage and agree this with the patient if possible. The maxillofacial unit may be able to assist in this; they may be able to repair damage such as avulsed teeth. Please keep the avulsed tooth in a small beaker of normal saline and seek assistance as soon as possible.

• Advise the clinical director and the divisional operations director of the patient details (see page 251).

• Complete and submit a clinical adverse event form.

• Prepare the first draft of a letter, stating the damage sustained and that UHCW will cover the cost of repair. Show the letter to the clinical director before giving it to the patient, (the clinical director will assist with writing such a letter if required). Then give the letter to the patient, and advise them to attend their own dentist and make arrangements for repairs. Note that the dentist may need to refer the patient on to a restorative dentist.

• The invoice should be sent to the divisional operations director who will arrange for payment to be made directly to the dentist concerned.

Teeth guards are available if you ask. You should also consider the routine use of a bite block while being aware of the balance between protection of teeth, support and protection of the airway device, and the possibility that the block may itself cause airway obstruction if accidentally retained in the patient. Note for example that the
instruction manual for laryngeal mask airways requires the use of gauze pads rolled into a cylindrical bite block to be inserted before fixation (except ProSeal which has a built-in bite block).

Drugs and prescribing

[Appraised by Dr Mark Porter, January 2010]

Emergency boxed syringes

Boxed syringes are available in all theatres for emergency use:

- Suxamethonium 100 mg in 2 mL.
- Atropine 600 µg in 1 mL.
- Ephedrine 30 mg in 10 mL.

Supplies will be ordered by theatre staff. These boxes cost up to ten times the price of the equivalent ampoules. They are provided for emergency use so you should not have to draw up the drugs ‘just in case’ for each operating list. The boxes are opened by grasping the two ends and twisting; the box will then spring open. Do not open the box and break the seal except in emergency.

If you use these drugs in non-emergency cases you should use the ordinary ampoules.

Trust formulary

You should use the UHCW local formulary in general prescribing. Prescribing in anaesthesia is consultant-led. The UHCW local formulary therefore does not list anaesthesia drugs. If you are unsure whether a particular drug is in use by the consultant anaesthetists, ask senior advice.

Off label use of drugs

This occurs when product licences do not cover drugs used for anaesthesia. This could be for the patient, the indication, or the route of administration. Off label use occurs in a number of areas – for
example, central neuraxial opioids. Off label use is not forbidden so long as consultants lead it. If in doubt, ask.

Use of drugs in more than one patient

Containers whose contents are designed to be used for more than one patient are clearly marked as such. You must not use the contents of any other type of ampoule to treat more than one patient, in line with the Association of Anaesthetists advice.


Controlled drugs

It is good practice to adhere to the recommendations of the Association of Anaesthetists as above and the Department of Health (Safer management of controlled drugs: a guide to good practice in secondary care (England), October 2007).

1. Sign for the controlled drugs received in the operating theatre controlled drugs register.

2. Note in the register, the amount by mass of drug that you have administered and the amount by mass that you have discarded.

3. Record in the patient’s records (anaesthesia chart or drug chart as appropriate) the amount by mass of drug administered.

4. Return any unopened ampoules.

5. Safely dispose of any unused controlled drugs that remain in an open ampoule or syringe. Any drug discarded should be into emptied into a sharps box pending a trust-wide review of disposal arrangements. Do not put any drug into a sink waste.

You should not leave drugs at the end of a case or list, and you should not bring suspicion on yourself by removing any syringes or ampoules from a theatre for use elsewhere. Any drug syringes passed to recovery staff for postoperative analgesia must be clearly labelled and explicitly passed between two professional staff.
Remifentanil

Remifentanil costs a lot more than other potent opiates. The commonest mistake is to use remifentanil but ignore its advantages and disadvantages. The key point is that it is very potent and wears off very quickly; it is therefore suited to those procedures where deep intraoperative reflex suppression is necessary followed by rapid return to full consciousness following a procedure with little postoperative pain. Before using it, think whether fentanyl, alfentanil or morphine would make more sense.

Electroconvulsive therapy

[Appraised by Dr Falguni Choksey, January 2010]

ECT sessions take place in the Lakeview Clinic, in the Caludon Centre. Post-fellowship StRs are introduced to the ECT suite during a supervised session before anaesthetising for ECT without direct supervision. Anaesthesia facilities are provided to an appropriate standard although there is no anaesthesia machine in the ECT suite. An infusion pump is available if needed for transfer.

We provide the service for all of Coventry and Warwickshire. Patients admitted as day case are done earlier and are discharged as per day case discharge criteria.

If the patient is having his first treatment ensure that you have documented the preoperative assessment section including the ASA grade. Make sure to document all the fields on the anaesthetic chart which forms part of the ECT treatment booklet.

The agent of choice in Coventry is propofol. It is important to use this consistently where not contraindicated as differing anaesthetic agents can affect the efficacy of the ECT. Where there was inadequate seizure activity a second attempt may be made which may need further propofol.
Miscellaneous issues

**Emergency calls while you are anaesthetising**

[Appraised by Dr Edwin Borman, January 2010]

Your anaesthetised patient is your prime responsibility and you should not leave them. This includes regional anaesthesia.

Emergency calls are usually resolved by the summoning of other doctors who have emergency resuscitation skills. Have them called, along with the relevant consultant on call.

Remember, you will never be the only anaesthetist in the hospital.

**Infection control policies**

[Appraised by Dr Keith Clayton, January 2010]

Dr Andy Phillips is the infection control representative.

These techniques are appropriate to protect you, your patient and other patients from infection risks.

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Infection Control Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peripheral intravenous cannulation.</td>
<td>Handwash, non-sterile gloves, skin prep</td>
</tr>
<tr>
<td>Peripheral regional blocks.</td>
<td>Handwash, sterile gloves, small drape, skin prep</td>
</tr>
<tr>
<td>Arterial line insertion.</td>
<td>Handwash, sterile gloves, small drape, skin prep</td>
</tr>
<tr>
<td>Peribulbar and sub-Tenon’s blocks.</td>
<td>Handwash, sterile gloves, skin prep</td>
</tr>
<tr>
<td>Insertion of CVP line.</td>
<td>Handwash, sterile gloves, gown, cap, mask, large sterile drape, skin prep</td>
</tr>
<tr>
<td>Epidural.</td>
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<td>Spinal.</td>
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<tr>
<td>Caudal.</td>
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</tbody>
</table>
**Miscellaneous issues**

**Central neuraxial blocks**

You must not use open vessels of antiseptic skin preparation agents on your sterile trolley. There is a risk of splash contamination of needles.

The department recommends the use of 0.5% chlorhexidine in alcohol (e.g. Hydrex) sprayed to the skin and allowed to dry. The ODP will spray the skin on request.

2% chlorhexidine gluconate in 70% isopropyl alcohol (ChloraPrep) is indicated for CVP catheters and dressing changes only; do not use it for central neuraxial blocks.

**Inotrope infusions**

[Dr Glynn Evans, February 2007; appraised by Dr Edwin Borman, January 2010]

Patients who are hypotensive in recovery sometimes can benefit from inotrope or vasoconstrictor infusions such as metaraminol or noradrenaline (norepinephrine), even without invasive haemodynamic monitoring. It is inappropriate to return such patients to their normal ward while such infusions are in progress. Instead discuss the patient’s needs with a supervising consultant and consider the need for critical care.

**Intravenous cannulas**

[Dr Edwin Borman, January 2010]

Safety cannulas are to be used in all clinical areas. They are being introduced over the period of January to March 2010. This is a health and safety measure designed to help to reduce the number of needle-stick injuries.

The technique for these cannulas is slightly different to that for traditional cannulas and you will need to take care if using them for the first time.
Miscellaneous issues

Recognising that the method required to insert these new cannulae precludes certain techniques (such as ‘through and through puncture and withdrawal’), which are particularly important for patients with very difficult peripheral venous access, or in paediatric patients, there will continue to be available a small number of non-safety cannulas for use in clinically indicated situations. Should you need to use a non-safety cannula ensure that you comply with all relevant guidance on the disposal of your sharps.

Laparoscopic cholecystectomy

[Dr Robin Correa, appraised January 2010]

This guideline applies where the patient is either an inpatient or receiving 23-hour care.

Premedication

Consider:

- Paracetamol 2 g orally.
- Gabapentin 600 mg orally (shown to decrease postoperative analgesic requirements).
- H₂-receptor antagonist or proton pump inhibitor (if needed).

Induction and maintenance

**Induction agent**

Propofol 2.5 – 3 mg kg⁻¹

**Muscle relaxant**

Any short acting non-depolarising muscle relaxant

**Maintenance**

Oxygen + nitrous oxide + isoflurane or desflurane or sevoflurane (remember increased risk of PONV with sevoflurane).
## Miscellaneous issues

### Analgesia

Fentanyl 2 µg kg⁻¹ intravenously at induction + paracetamol 1 g intravenously (if not given as premed) intraoperatively.

Morphine 0.2 mg kg⁻¹ titrated to response intraoperatively if required.

Ketorolac 30 mg during closure (if not contraindicated and in the absence of excess oozing from liver bed).

### Antiemetics

Cyclizine 50 mg (intramuscular at induction or slow intravenous) + ondansetron 8 mg + dexamethasone 8 mg.

### Intravenous fluids

Hartmann’s solution (15 mL kg⁻¹ – 1000 mL in the average adult).

### Local anaesthesia

Ensure that the surgeon uses local anaesthetic infiltration.

Levobupivacaine 0.5% to a maximum dose of 2 mL kg⁻¹ should be used. The quality of pain relief is the same if the port sites are infiltrated before or after the incision.

### Recovery

Morphine 2 mg intravenous as needed every five minutes to a maximum of 10 mg (for pain score 2 or greater).

The dose of morphine should be carefully titrated so as to provide adequate analgesia while minimising side effects such as nausea, respiratory depression and sedation.

Systemic opioids should generally not be required beyond the first few hours of recovery; oral analgesics will then usually be sufficient.
PONV as per ward protocol.

Postoperative analgesia

Co-codamol 30/500 two tablets orally four times a day.

plus Diclofenac 50 mg three times a day or ibuprofen 400 mg three times a day (if not contraindicated).

plus Oral morphine 10 mg every two hours for breakthrough pain (pain score 3 only).

Lower limb arthroplasty – postoperative analgesia

This agreed guideline is displayed in the orthopaedic operating theatres at Coventry and Rugby and covers hip and knee replacements.

Premedication:

- Oral paracetamol 1.5 g (or paracetamol 1 g iv during case).

Postoperative prescription:

(Irrespective of intraoperative technique used the anaesthetic technique should include a femoral nerve block.)

Once only (front of drug chart):

- MST: 10-20 mg when patient returns to the ward. Halve the dose if returning to the ward after 4 pm.

Regular

- Paracetamol 1 g qds.
- MST 10-20 mg b.d at 10:00 and 22:00 (dose dependant upon age, current co-existing morbidities and any concurrent opiate use).
**Miscellaneous issues**

- Diclofenac 50 mg tds or ibuprofen 400 mg qds (unless contraindicated).
- Lactulose 10 mL at 22:00.
- Senna 1-2 tabs at 22:00.
- Ondansetron 4 mg i.v. or i.m. t.d.s.

**As needed prescriptions**

- Oral morphine (Oramorph) 10-20 mg hourly.
- Buccal prochlorperazine 6 mg b.d.
- Cyclizine 50 mg i.v. or i.m. t.d.s.
- Naloxone 80 µg i.v. if respiratory rate < 8 and repeat.

If the patient is in severe pain in the recovery area and requires ≥ 10 mg intravenous morphine, consider the femoral nerve block to have failed and commence PCA.

Consultant anaesthetists who regularly practice intrathecal opioid techniques may elect to alter MST prescriptions and femoral nerve blocks.

**Major head injury**

[Appraised by Dr Glynn Evans, January 2009]

Patients with major head injury arrive at the resuscitation room in the emergency department. The trauma team will care for these patients. The resident intensive care doctor is a member of the core trauma team – the senior resident anaesthetist is a member of the extended trauma team which is called for theatre cases.

A Guideline for the Management of Adult Head Injuries is displayed in the Resuscitation Room, which you should follow. A brief extract is given below to aid your initial involvement.
**Miscellaneous issues**

Most delays occur during preparation for transfer – whether inter-departmental or inter-hospital – and must be avoided.

**Extracts from the Guideline**

The maximum allowable time from injury to removal of intracranial haematoma must not exceed four hours. Delays in the management of intracranial haematoma are either disabling or fatal.

**Assessment and clarification**

Resuscitation and assessment is the first priority and should involve the Airway, Breathing, Circulation approach (ABC) as described in Advanced Trauma Life Support (ATLS). The airway should be managed by the most experienced clinically trained person (Anaesthetist / Intensivist / ED Consultant), supported by a suitably trained assistant.

**Ventilated patients**

If the patient requires intubation and ventilation then an anaesthetist should be contacted to undertake this procedure; suitably trained emergency room staff may intubate if an anaesthetist cannot be present immediately.

**Indications for intubation and ventilation after head injury**

- Coma - not obeying commands, not speaking not eye opening (i.e. GCS ≤ 8).
- Loss of protective laryngeal reflexes.
- Abnormal ventilation.
- Hypoxaemia (PaO2 < 13 kPa on oxygen) SpO2 < 94%.
- Hypercarbia (PaCO2 > 6 kPa).
- Hypocarbia (causing PaCO2 < 3.5 kPa).
- Respiratory arrhythmia.
- Possible aspiration.
- Continuing seizures.
• Associated injuries which may compromise airway or breathing (e.g. maxillofacial injury).
• Very aggressive behaviour.

CT scanner

The University Hospital is a tertiary referral centre for neurosurgery. The neurosurgeon on call accepts the patient. The ICU resident and consultant intensivist should be alerted if the patient is to be transferred to critical care in Coventry, whether before or after surgery. The senior resident anaesthetist should be called if the patient requires urgent surgery. If called, you should attend the CT scan suite and take handover from the transferring team as soon as possible.

MRI scans

[Sarah Wayte, March 2008]

Introduction

This procedure explains the steps which should be taken when scanning a ventilated critical care patient.

Anaesthetist preparation

• If you are not familiar with the MRI monitoring and anaesthetic equipment or the MRI environment, you should look at the equipment before the patient is brought down to MRI.
• Ask a radiographer to go through the MRI safety points with you.
• Facilities for induction of general anaesthesia are not present in the MRI department. If the patient is not already adequately sedated or anaesthetised then you should do this in an appropriate location prior to them being brought down.
Miscellaneous issues

MR safety of staff escorting the critical care patient and the anaesthetist

- The MRI scanner has a very powerful magnetic field, which is strong enough to pull scissors, pens etc out of pockets and into the scanner at high speed. The scanner will also interfere with electrical equipment (e.g. syringe drivers).

- Nothing ferromagnetic (including oxygen cylinders and the patient trolley) can be taken into the MRI scanner room.

- Anyone needing to enter the scanner room will need to fill out a screening questionnaire, and remove all loose metallic objects, bleeps, credit cards and analogue watches before entering the scanner room.

Patient preparation

- Only the arterial line monitor is compatible with MRI; all other monitoring and gas delivery will need to utilise MRI department lines and equipment.

- Disconnect syringe drivers if possible. If you require that they are not disconnected they can be placed just inside the scanner room door. Be aware that they are a projectile risk and could malfunction if moved closer to the scanner.

MRI monitoring and anaesthetic equipment

- Talk to the radiographer about what you want monitored and the most appropriate place for the monitoring unit.

- Decide whether you wish to stay in the scanner with the patient during scanning (recommended unless you are pregnant) or wish to leave the room. You may wish to use the patient headphone (and the patient earplugs) so you can talk to them during scanning.

- Set up the MRI anaesthetic unit as you require.
Miscellaneous issues

- Everyone will need to consider the best way to transfer the patient from standard monitoring and ventilating to the MRI monitor and gas supply, and back again.

Neuraxial opiates

[Appraised by Dr Edwin Borman, January 2010]

Neuraxial opiates are a common component of good anaesthetic techniques. Fentanyl has a risk/benefit balance that favours its use when the patient returns to an acute ward after administration. For morphine and diamorphine, see page Error! Bookmark not defined.

You may use intrathecal fentanyl in a dose of up to 25 µg as part of a spinal anaesthetic, or epidural fentanyl in a dose of up to 100 µg as part of an epidural anaesthetic.

The usual guidelines for monitoring recovery from anaesthesia on acute wards apply with no further precautions required due solely to the use of fentanyl.

Neuroradiological coiling procedures

[Appraised by Dr Edwin Borman, January 2010]

We offer three sessions per week for neuroradiological procedures. We do not currently offer emergency anaesthesia services for aneurysm coiling as the intention is to treat such patients during the routine day on a dedicated list.

If a request for such a procedure is made of the emergency team, refer it to the general consultant on call.

Obesity guideline

[Dr Madhu Srivastava, 2009]

This guideline is firmly based on the AAGBI clinical guideline Perioperative management of the morbidly obese patient, June 2007.
Miscellaneous issues

All patients with body mass index (BMI) of more than 40 (or BMI > 35 with obesity related co-morbidities) should be seen by an anaesthetist in the pre-anaesthetic assessment clinic (PAAC) four weeks before surgery.

History

Particular attention should be given to co-morbidities:

- Cardiovascular: IHD, hypertension, symptoms of heart failure.
- Respiratory: asthma, COPD, obstructive sleep apnoea (OSA).
- Diabetes.
- Hiatus hernia or gastric reflux.
- Immobility.

Examination

All patients should have their height and weight measured, BMI calculated and recorded in PAAC.

Besides routine systemic examination attention should be given to the following:

- Venous access.
- Airway assessment.
- Examination of back for regional block if possible.
- Prepare patient for both GA/RA.
- Previous anaesthetic chart should be checked for airway management problem or any other critical incidents.

Investigations

According to NICE guidelines as for routine surgery.

- Check random blood sugar. If it is >5.5 mmol L⁻¹ then check fasting blood sugar.
Miscellaneous issues

- If fasting blood sugar is >7 mmol L$^{-1}$, treat the patient as diabetic.

- If OSA is diagnosed (snoring, daytime somnolence, apnoea witnessed), GP should be asked to assess and refer to the sleep clinic according to agreed referral guidelines.

- Arterial blood gas: indicated if $S_pO_2$ is < 96% on air in sitting position, or history of respiratory problems.

- Patient should be advised to stop smoking.

- Patients with cardio-respiratory disease, OSA having major surgery may need referral to a cardiologist or respiratory physician and HDU/ITU bed booked for post-operative period.

These patients should be highlighted on the theatre list by PAAC nurses.

Premedication

- Patient should continue with regular medication for cardio-respiratory disease as for other patients.

- Antacids: ranitidine or omeprazole.

- Prokinetic drug: metoclopramide.

- Non-opioid analgesics as pre-emptive analgesia.

Intraoperative care

- Sufficient theatre staff should be available to move and position the patient.

- In some cases it may be safer to anaesthetise on the operating table in the theatre.

- Appropriate size of gown, operating table and equipments e.g. BP cuff, tourniquet should be available.

- Invasive (arterial) BP monitoring may be indicated, if non-invasive monitoring is difficult.
Miscellaneous issues

- Pressure points should be protected.
- For GA preoxygenation is almost always indicated and is more effective in the reverse Trendelenburg position.
- Difficult intubation equipment should be at hand and anaesthetist should be familiar and skilled with their use.
- Patients with predicted difficult airway should be anaesthetised in the University Hospital.
- For super-obese (BMI >50) patients a second anaesthetist should assist.
- Regional technique should be preferred whenever possible to avoid postoperative respiratory complications.

Recovery and the postoperative period

- If possible, all patients should be recovered in the semi-recumbent or sitting-up position.
- Postoperative oxygen therapy should be continued as long as needed and pulse oximetry may be advised for 24 hours.
- It is advisable to avoid opioids and use non-opioid analgesics, nerve or regional block and local infiltration for pain management.

Obstetric anaesthesia – new registrars and locums

[Appraised by Dr John Elton, January 2008]

All non-consultant anaesthetists must spend at least one supervised session in the labour ward with a consultant anaesthetist or a post-fellowship trainee before working without direct supervision as the on call labour ward anaesthetist. Service lists may be cancelled to allow this introduction to working facilities, practices and duties.

Locum anaesthetists are not normally employed in obstetric anaesthesia. If employed, they should not commence work as the
labour ward anaesthetist until approved by the general consultant on call for the day, and they have been instructed on accessing the Obstetric Anaesthetists Handbook on the intranet or been given a personal copy, even if they have previously worked in this hospital's labour ward. This consultant should satisfy himself or herself that the locum understands their responsibilities and duties, and the path of referral for help and advice.

Operating Department Practitioners (ODPs) and anaesthetic nurses

[Appraised by Dr Edwin Borman, January 2010]

Competency

These persons are employed as Medical Technical Officers in UHCW. We also have some anaesthetic nurses working with us. The term ODP used here encompasses all MTOs, people known as ODPs or ODAs, and anaesthetic nurses.

The ODP’s activities are undertaken at the direction of the relevant anaesthetist. The responsibility for any actions undertaken by the ODP thus lies with the relevant anaesthetist. You must therefore exercise reasonable judgment in what you ask the ODP to do. ODPs do not require certification to perform actions directed by an anaesthetist.

Requests for presence to assist with resuscitation

The decision to ask for an ODP’s assistance in the Emergency Department is a clinical one, based on the skill mix among staff present at the resuscitation and the clinical needs of the patient. The decision will be taken by the senior anaesthetist present. As a clinical decision, the request will be respected.

The request should be made, in the first instance, to floor control in theatres (25959). All possible efforts will be made to supply an ODP as soon as possible. Unfortunately, it is not possible to guarantee one will always be immediately available, but we will try.
Miscellaneous issues

- If you are in theatre and a request for ODP assistance comes through, please remember it is a colleague in difficulty who is asking, and please release your ODP if it is safe and appropriate to do so.

- If you are the anaesthetist in the Emergency Department, you should release the ODP back to theatre as soon as possible. A colleague in theatre released their ODP from their regular duties to help you and they are waiting for the ODP to return.

Ophthalmic anaesthesia

[Appraised by Dr Falguni Choksey, January 2010]

Dr Choksey is the lead clinician for ophthalmic anaesthesia.

Assessment

You must not perform local eye blocks without direct supervision until you have been assessed as competent by one of the ophthalmic anaesthesia consultants. A list of such anaesthetists is held in the departmental office. You should have a proactive approach and seek to complete your assessments so that you can be approved for this.

Investigations

Most patients scheduled for procedures under regional block have no investigations done except INR where appropriate. If a patient on the ophthalmic day unit needs an ECG, it will be done in the holding bay area on the trolley. The ECG machine is kept in recovery.

Preoperative starvation

This guideline is appropriate for patients undergoing anterior chamber procedures (e.g. cataract, trabeculectomy etc) under regional block. The following procedures are specifically excluded and should be fasted as per normal (see page 225):

- Sedation.
- General anaesthesia.
- Vitreoretinal procedures.
Miscellaneous issues

There is no clinical indication to withhold food or drink from patients who are scheduled for operations in the anterior chamber (cataract and trabeculectomy)). These patients should be offered a drink (tea, coffee, juice, water) while they are waiting on the ward for their operation.

Checking the side

There is a departmental procedure for checking the operative side in ophthalmic anaesthesia.

It is the responsibility of the anaesthetist to carry out two checks when administering local anaesthetic before ophthalmic surgery.

1. A check of the consent form and the operative side must be made before instillation of eye drops.

2. A repeat check of the operative side must be carried out immediately before injection of local anaesthetic.

Oxygen prescription

[Appraised by Dr Alistair Brookes, January 2009]

UHCW provides Intersurgical venturi oxygen facemasks in a range of concentrations;

- Blue 24% (minimum oxygen flow rate 2 L min\(^{-1}\))
- White 28% (minimum oxygen flow rate 4 L min\(^{-1}\))
- Yellow 35% (minimum oxygen flow rate 8 L min\(^{-1}\))
- Red 40% (minimum oxygen flow rate 10 L min\(^{-1}\))
- Green 60% (minimum oxygen flow rate 15 L min\(^{-1}\))

Nasal cannulas and non-rebreathe reservoir oxygen masks are also provided.

Only the 40% (red) or 60% (green) venturi masks should be used for postoperative recovery, unless there is a strong clinical indication to use a lower concentration. These are fixed performance devices;
increasing the flow rate will not increase the delivered oxygen concentration. The non-rebreath masks can be used to deliver greater than 60% oxygen with flow rates of 10 – 15 L min$^{-1}$.

Should you require a patient to have supplemental oxygen administered, you must prescribe it on the drug chart. Oxygen may not be administered if not prescribed. You should prescribe the appropriate oxygen percentage. Alternatively, prescribe nasal cannulas with a flow rate (usually 2 L min$^{-1}$).

**Paracetamol loading doses**

Paracetamol is an effective perioperative analgesic agent. Where practicable oral administration is preferred – the intravenous preparation is many times more expensive and the total cost pressure of using intravenous paracetamol is high. Ward nurses will give oral premedicants if you prescribe them, especially if you tell the nurses that you have prescribed premedicants.

The following statement was agreed at the anaesthesia department meeting in January 2009 and at the trust’s Drugs and Therapeutics Committee in December 2009:

“Paracetamol is an effective and safe analgesic widely used in perioperative care. Where indicated for prophylaxis or treatment of surgical pain, prescriptions for oral administration can consist of a loading dose (where the patient is not consuming regular paracetamol) followed by regular dosing or treatment as required by the patient. An appropriate oral loading dose is a single dose of 30 mg kg$^{-1}$ or less, usually to a maximum dose of 2 g. This will lead to the following dose recommendations:

Patient 70 kg or over. 2 g Leading to 5 g in the first 24 hours.

Patient under 70 kg but over 50 kg. 1.5 g Leading to 4.5 g in the first 24 hours.

“As with all prescriptions, the responsibility for adapting it to unusual circumstances lies with the prescriber.”
Patient monitoring in and out of theatres

[Appraised by Dr Liz Summ, January 2009]

Patient monitoring must conform to Association of Anaesthetists standards – both clinical and instrumental. The monitoring used should include ECG, pulse oximetry, non-invasive blood pressure, inspired oxygen and gas analysis. In the event of intubation being necessary, capnography must be used. In prolonged surgery, temperature should be monitored.

A few years ago anaesthetists were occasionally faced with dilemmas about conducting patient care when the required standard of monitoring was not available. The facilities and equipment are so improved today that there should be no reason to accept low standards.

However: if monitoring equipment in the anaesthetic room is insufficient, then either:

- Induction must take place in the theatre, or
- Full monitoring equipment must be brought to the patient on a trolley.

In the event of capnography or capnometry being unavailable where a patient requires intubation, you must inform the general consultant on call.

Monitoring patients from theatre to recovery

A high standard of monitoring should be maintained until the patient is fully recovered from anaesthesia. If the recovery area is not immediately adjacent to the operating theatre, or if the patient's general condition is poor, adequate mobile monitoring will be needed during transfer (pulse oximetry and NIBP as a minimum). This is available within the theatre suite using the Dash monitors. These can be removed from the docking station in theatre and swapped with the one in the recovery or PACU bay to which the patient is transferred.
Miscellaneous issues

The anaesthetist is responsible for ensuring that this transfer is accomplished safely.

Induction of anaesthesia in emergency department

Save in the direst life-threatening circumstances such as acute airway obstruction, induction of anaesthesia in the emergency department is to be conducted to the same high standards as in any other setting. This mandates the following:

- The anaesthetist or emergency physician is to have a dedicated competent assistant (ODP, ED nurse or ED paramedic).

- Induction takes place after establishing appropriate monitoring (In ED this should include ECG, $S_pO_2$ and NIBP/ABP as a minimum).

- Immediately after intubation, tube position is to be checked by capnography or capnometry and auscultation. (In ED, capnography is available in all resuscitation bays, but takes a few minutes to warm up. Capnometry is available as “Easycap” whilst capnography is warming up).

Failure to adhere to these very simple principles could be construed as falling below minimum accepted AAGBI standards and would automatically lead to interview with one of the clinical directors.


Perioperative fluid management

[Dr Soorly Sreevathsa, June 2009]

This guideline is based on the GIFTASUP recommendations. You will need to read the full guideline, but the basic philosophy is not to use normal saline (or colloids made up in normal saline) unless specifically indicated.

Traditional practice carries the risk of inducing hyperchloreaemic acidosis. GIFTASUP recommends use of balanced salt solutions
such as Hartmann’s solution when crystalloid resuscitation or replacement is indicated, except in hypochloraemia. When colloids are indicated for resuscitation or replacement, low sodium load preparations such as Volulyte (6% hydroxyethylstarch) or Isoplex (succinylated gelatine 4%) should be considered.

Principles

In the absence of complications, oliguria occurring soon after operation is usually a normal physiological response to surgery. This is commonly interpreted as hypovolaemia and infusion of more sodium-containing fluids leads to expansion of the interstitial fluid volume, causing oedema and weight gain as well as haemodilution.

Solutions such as dextrose 4% / saline 0.18% and dextrose 5% are important sources of free water for maintenance, but should be used with caution as excessive amounts may cause dangerous hyponatraemia, especially in children and the elderly. These solutions are not appropriate for resuscitation or replacement therapy except in conditions of significant free water deficit e.g. diabetes insipidus.

For many surgical procedures, the assessment of fluid requirements will be straightforward. In high risk surgical patients, intravenous fluid and inotropes should be aimed at achieving predetermined goals for cardiac output and oxygen delivery (goal directed therapy).

In high risk surgical patients, fluid management should be based on goal-directed fluid therapy whenever possible.

Recommendations for preoperative fluid management

Preoperative or operative hypovolaemia should be diagnosed by flow-based measurements where possible.

When crystalloid resuscitation or replacement is indicated, use Hartmann’s solution. Exceptional use of 0.9% saline is indicated in hypochloraemia or diabetic ketoacidosis.

When colloid resuscitation or replacement is indicated, use one constituted in a balanced electrolyte solution e.g. Volulyte or Isoplex.
Miscellaneous issues

Hypovolaemia due predominantly to blood loss should be treated with either a balanced crystalloid (Hartmann’s solution) or a balanced colloid (Volulyte or Isoplex) until packed red cells (allogeneic or autologous) are available.

Excessive losses from gastric aspiration or vomiting should be treated preoperatively with balanced crystalloid solutions with an appropriate potassium supplement. Hypochloraemia is an indication for the use of 0.9% saline, supplemented with potassium. Take care not to produce sodium overload.

Losses from diarrhoea, ileostomy, small bowel fistula or ileus should be replaced volume for volume with Hartmann’s solution.

‘Saline depletion’ due to excessive diuretic exposure should be managed with Hartmann’s solution.

Mechanical bowel preparation is not indicated in elective colorectal operations, unless there are anticipated problem with faecal overloading that might create technical difficulties with the procedure, e.g. laparoscopic colectomy and low rectal carcinoma. When it is indicated, Hartmann’s solution should be started evening before the day of the surgery (one litre every 8-12 hours).

Care should be taken in patients with impaired renal function and hyperkalemia while using balanced solutions containing potassium.

Recommendations for intraoperative fluid management

In patients undergoing major abdominal, orthopaedic surgery, intraoperative treatment with intravenous fluids to achieve an optimal value of stroke volume should be used where possible as this may reduce postoperative complication rates and duration of hospital stay.

LiDCO™ (Lithium indicator dilution calibration system) haemodynamic monitor should be used where possible when stroke volume measurements are indicated during the preoperative, intraoperative and postoperative periods.

Indications for stroke volume measurement:

- High risk surgical patients.
Miscellaneous issues

- Abdominal and thoracic surgery involving significant fluid shifts.
- Acute renal failure patient.
- Sepsis.
- Acute heart failure.
- Severe hypovolaemia.
- Complex circulatory situations.

Recommendations for postoperative fluid management

No intravenous infusion should be continued simply because it is a ‘routine’ component of clinical care. Intravenous fluids are prescription-only medicines and must have clinical indications. Food and fluids should be provided orally or enterally; intravenous infusions should be discontinued as soon as possible.

In patients requiring continuing intravenous maintenance fluids, these should be sodium-poor and of low enough volume until the patient has returned their sodium and fluid balance over the perioperative period to zero. When this has been achieved the intravenous fluid volume and content should be those required for daily maintenance and replacement of ongoing losses.

Nutritionally depleted patients need cautious refeeding orally, enterally or parenterally, with feeds supplemented in potassium, phosphate and thiamine. If oedema is present, reduced water and sodium load should be considered.

While prescribing postoperative intravenous fluids, the prescriber must take care to assess patient’s sodium, chloride, potassium and water requirements for the next 24 hours.

Preoperative fasting times

[Appraised by Dr Edwin Borman, January 2010]

The department has agreed the following as standards applying to all patients (other than in obstetrics; see the Obstetric Anaesthetists Handbook for times appropriate to obstetric patients and the free water policy). Exceptions must be discussed with a consultant.
Miscellaneous issues

<table>
<thead>
<tr>
<th>Elective patients</th>
<th>2 hours for clear fluids and water.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3 hours for milk.</td>
</tr>
<tr>
<td></td>
<td>4 hours for solids.</td>
</tr>
<tr>
<td>Urgent patients</td>
<td>4 hours for clear fluids and water.</td>
</tr>
<tr>
<td></td>
<td>6 hours for food.</td>
</tr>
<tr>
<td>Children (elective and emergency)</td>
<td>2 hours for clear fluids.</td>
</tr>
<tr>
<td></td>
<td>4 hours for breast milk.</td>
</tr>
<tr>
<td></td>
<td>6 hours for solids or formula milk.</td>
</tr>
</tbody>
</table>

Preoperative patient assessment and time keeping

[Appraised by Dr Edwin Borman, January 2010]

You are expected to see patients preoperatively whether on an accompanied or an unaccompanied list. Adequate time is allowed for preoperative assessment. Lists should therefore start on time unless by prior arrangement with the surgeon and the theatre sister.

The traditional list start times are 09:00 and 14:00. The Theatre Management Board issued instructions in 2004 that list times will be as follows:

- Morning list 08:30 to 12:30
- Afternoon list 13:30 to 17:30
- All day list 08:30 to 16:30

Many consultants have agreed in their job plans to work these times.

Following a clinical adverse event in 2004 the clinical director has instructed that you should not anaesthetise a patient before you have seen the surgeon in the operating theatre suite.
Prevention of postoperative nausea and vomiting

[Dr John La Rosa and Dr Krish Ramachandran, May 2006; appraised by Dr La Rosa, January 2010]

Anaesthetists should consider the likelihood of postoperative nausea and vomiting (PONV) in all their patients, and give consideration to reducing the probability that PONV will occur. This may be by a combination of general measures that should be considered for all patients and specific prophylactic drug therapy for those patients at higher than minimal risk.

The routine use of granisetron for every patient is not appropriate. (Granisetron was withdrawn from trust purchasing from November 2006).

The individual professional anaesthetist holds responsibility for appropriate prescription and administration to patients.

General measures to consider

Not all these measures will be appropriate in all cases.

- Avoid volatile anaesthesia and use IVA instead.
- Give postoperative supplemental oxygen.
- Avoid nitrous oxide where not specifically indicated.
- Use local anaesthetics either to reduce opiate use or in place of general anaesthesia.
- Give intravenous fluids to reduce the effect of preoperative dehydration.
- Limit periods of preoperative fasting.
- Avoid neostigmine – give only when indicated.

Count the risk factors

One point for each of the following:
Miscellaneous issues

- Female gender.
- Non-smoker.
- History of PONV or motion sickness.
- Perioperative use of opioids.
- Oral or ENT surgery.
- Laparoscopic surgery.
- Squint surgery.
- Prolonged surgery (> 60 minutes).

<table>
<thead>
<tr>
<th>Low-risk (0-2 points)</th>
<th>Medium risk (3 points)</th>
<th>High risk (&gt; 3 points)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>General measures only.</strong></td>
<td><strong>General measures plus...</strong></td>
<td><strong>General measures plus...</strong></td>
</tr>
</tbody>
</table>
| If harm may result from PONV e.g. craniotomy, jaw wiring, vascular surgery, then give dexamethasone 4-8 mg i.v. | Dexamethasone 4-8 mg i.v.  
Cyclizine 50 mg i.v.  
(Use granisetron or ondansetron where sedating antihistamines are contraindicated.) | Dexamethasone 4-8 mg i.v.  
Ondansetron 8 mg i.v. |

Records

[Appraised by Dr Falguni Choksey, January 2010]

It is a normal professional requirement to keep medical records and in particular complete an anaesthesia record sheet (the ‘pink chart’).
Different clinical areas might have different records needing to be completed.

We are continually audited against chart standards for CNST purposes. You should make sure that your name, grade and GMC number are legibly printed on every patient record that you complete.

Repeated audits have shown that records are completed poorly with mandatory items often omitted. This leaves you open to criticism and vulnerable to a potential court case.

Items that are often missed out are:

- Using black ink.
- The name and grade of the anaesthetist in block letters.
- **Estimated blood loss.**
- Intraoperative and postoperative fluids.
- Postoperative oxygen prescription.
- Postoperative instructions for recovery staff.
- Details of handover to another anaesthetist.

Remember to include on the record details of:

- Your GMC number.
- Any discussion with senior colleagues and their names.
- Care discussed with StR3+ if ASA 3, or consultant if ASA 4 or ASA 5.
- Name of responsible consultant.
- Discussion and decisions about levels of monitoring.
- Discussion and decisions about postoperative care.

Please make sure that you are aware of the standard of record keeping expected of you (based on RCA & AAGBI guidelines).

We audit anaesthesia records on a random basis. The results are a regular item in clinical audit meetings.
**Miscellaneous issues**

The following represent data items that are audited for CNST purposes. Only two of them were present on all anaesthesia charts in an audit in 2008. Please help us to do better.

- Patient name in full.
- PID.
- Clinical history (past medical history etc.).
- Drug history.
- ASA grade.
- Allergies.
- Results of pre-operative investigations.
- Anaesthetic risk.
- Name of anaesthetist.
- Signature of anaesthetist.
- Surgery performed.
- Urgency of procedure.
- Drugs (with doses) given during anaesthesia.
- Monitoring data.
- Blood loss (or "nil").
- Urine output (or "nil").
- IV fluid (or "nil").
- Use of specialised equipment.
- Method used to secure and maintain airway.
- Patient positioning.
- Post-anaesthetic instructions.
- Date of event.
- Time anaesthesia started.
- Time into theatre.
- Time of incision.
- Time surgery finished.
- Time anaesthesia finished.
- Pre-medication.
- Cannulation.
- Record of vital signs.
- Anaesthetic technique used.
- Recovery observations.
- Recovery drug record.
Recovery and patient handover

Patients that you have left in a recovery area remain your responsibility until handed over to another clinician. At the Hospital of St Cross, you may not leave a patient in recovery and then leave the hospital without handing over your patient to another anaesthetist.

Renal patients – clinical guideline

[Appraised by Dr Andrew Phillips, January 2010]

*Anaesthesia for patients with renal dysfunction*

Dr Ravi Joshi and Dr Anne Scase devised this guideline in 2002. The renal teams apply it on the renal wards (usually ward 50) and you must be aware that staff will give care according to these principles.

Patients suffering from chronic renal failure (CRF) and end stage renal disease (ESRD) often tend to have multiple organ dysfunctions. Naturally they pose high risks for anaesthesia and surgery.

Introduction

Patients with renal dysfunction may require anaesthesia for procedures to improve and support existing renal function or other coincidental surgery. The risks are increased if the patients present in suboptimal clinical condition. It is important to understand the pathophysiology that has a direct bearing on the safe and successful outcome following anaesthesia and surgery.

At the University Hospital, surgical renal replacement therapy (RRT) is offered to appropriate patients with CRF and ESRD. This could be:

- Insertion of CAPD.
- Creation of vascular fistula.
- Renal transplantation.

Preoperative period

The operation list is normally published on CRRS several days before surgery. The majority of the renal patients have detailed clinical
Miscellaneous issues

letters and results of investigations which can be reviewed within CRRS. In the event that no list has been published, please confirm with the nurse in charge of ward 50 that no surgical procedures are planned for that theatre session.

Attempts to arrange to admit patients the day before surgery are often constrained by availability of beds. This often results in patients being admitted the evening prior to surgery or the morning of surgery. To allow sufficient time for optimisation, and to check the relevant investigations, admissions from home will be reviewed by the renal team the days prior to surgery when patients attend for dialysis or surgical assessment. The renal team are appreciative of the anaesthetic support provided at UHCW and will update you on clinical developments if you inform them of your role in the patients’ pathways. If required additional bloods could be analysed and appropriate referrals made to minimise cancellations.

A full set of medical notes should be available to the anaesthetist for review. Notes should include previous anaesthetic and surgery, the status of renal function, (or degree of dysfunction), and current medications that the RRT patient is currently receiving. Comprehensive clinic letters and discharge summaries will be available on CRRS.

Preoperative investigations should include FBC, coagulation screen, urea and electrolytes, liver function, ECG and chest X-ray (recent unless clinical changes have occurred since the CXR).

Patients should continue to receive their usual medication the night before anaesthesia, and antihypertensives, other cardiac and respiratory medications on the morning of anaesthesia. If a pre-anaesthetic medication is prescribed, it should be administered at the time requested.

Fasting

For patients scheduled to receive general anaesthesia, regional nerve plexus block or local anaesthesia with sedation the following recommendations must be observed.

For morning list (am)  Overnight fast
Clear water until 6.00am

For afternoon list (pm) Light breakfast at 6.00am
Clear water until 11.00am

Diabetic Patients:

- Insulin sliding scale and glucose infusion to commence prior to surgery: 6.00am for morning list; after light breakfast for afternoon list.

- Both intravenous fluids and insulin pump should accompany the patient to theatre.

Scheduling

As far as possible patients requiring general anaesthetic should be given priority over those requiring regional or local anaesthetic.

Postoperative care

The patients are usually observed in the recovery room after surgery and anaesthesia to ensure that they are stable before transfer to the ward.

Appropriate analgesia, intravenous fluids, cardiac medication and oxygen therapy are prescribed to achieve as near normal condition as possible for the patients. Oxygen therapy has been shown to have positive benefits reducing the risk of perioperative infarction in those with a history of cardiac disease, and should be continued even after local anaesthetic.

On the ward vigilant postoperative care is expected to ensure safety and minimise morbidity.

Guidelines

1. Scheduling

   - Printed list submitted to theatres
   - Patients are admitted by early afternoon at the latest
   - Patients for GA get priority over others
Miscellaneous issues

2. Preoperative

   Full set of medical notes should be available including:

   • Previous surgery/anaesthetics
   • Details of current medication
   • Current renal replacement therapy

3. Patients should be optimized and have the following investigations

   • FBC, coagulation
   • Urea and electrolytes, LFT
   • ECG
   • Chest X-ray
   • Echocardiogram if appropriate

4. Premedication

   Check with the anaesthetist

5. Starvation

   For all patients scheduled for general anaesthetic, regional block or local anaesthetic.

   Morning list
   Overnight fast
   Water until 6.00 am

   Afternoon list
   Light breakfast at 6.00 am
   Water until 11.00 am

6. Postoperative care

   • Vigilant monitoring
   • Oxygen therapy

Safer surgery checklists

The trust is currently undertaking the introduction of the safer surgery checklists in all surgical areas. This means that you will be asked to
take part in the ‘sign in, time out and sign out’ steps. You must set a professional leadership example on this.

**Sedation requests for diagnostic imaging**

[Appraised by Dr Edwin Borman, January 2010]

You may receive occasional requests to sedate patients for diagnostic CT or MRI scans. We do not offer such a service as a matter of routine.

Refer the person making such a request to the Anaesthesia Office so that the case can be handled on a planned basis, usually by a consultant.

For ICU patients see page 49; for major head injury see page 208.

**Sharps injury (exposure to potential contamination)**

[Appraised by Dr Edwin Borman, January 2010]

See page 205 for information about safety cannulas.

There is a UHCW policy on this matter. Essential points are that you should take immediate action where you may have been contaminated: wash the injury with soap under running water, encourage bleeding, cover the wound with a waterproof dressing and report it without delay.

Every patient is regarded as contaminated with blood-borne viruses. A cross-contamination injury will be treated as a medical emergency. You must contact the senior nurse or manager for the unit immediately if you sustain a contamination injury.

During normal working hours, injuries should be reported to the nurse in charge of the relevant area and the Occupational Health department. Out of normal working hours, injuries should be reported to the nurse in charge of the relevant area, and you should also report injury to the Emergency Department or the Emergency Assessment Unit. You will be asked to make a decision whether or
Miscellaneous issues

not to receive a first dose of post exposure antiviral prophylaxis and then the rest of the policy will be activated. A consultant genitourinary physician or microbiologist is always on call to discuss occupational exposure. Referral to the Occupational Health department should be made the next day.

Theatre wear

[Appraised by Dr Edwin Borman, January 2010]

The Theatre Management Board has issued a policy on theatre wear, prohibiting its use outside theatre except in cases of clinical emergency or in the course of one’s clinical duties. Pragmatically, you should make sure that if there is any visible soiling on your theatre scrubs, you change them immediately. While wearing scrubs, you may not be served in canteens.

Trauma lists

[Appraised by Dr Anne Scase and Dr Matthew Wyse, January 2010]

This guideline outlines the organisational arrangements for trauma anaesthesia at the University Hospital. It has been devised in consultation with the Department of Orthopaedic Surgery.

The consultant anaesthetist allocated to the trauma list, or the general consultant anaesthetist on call, has responsibility for supervising trauma anaesthesia.

The trauma anaesthetist allocated to the morning session should attend a meeting in the seminar room on ward 53 at 08:00 each day, to finalise arrangements for starting the list.

There have been problems with the late start of trauma lists during weekdays. The first patient on the list will be sent for at 07:45 and reviewed in holding bay or the anaesthetic room. You should ensure that operative surgery commences at 08:30 unless there is a major problem for which you need to seek senior help.
See page 37 for a description of the duties of the trauma anaesthetist.

Weekdays

The trauma list should usually start promptly with a patient who has been assessed in the holding bay.

The long-day anaesthetist comes on duty at 13:00 (08:00 on Fridays).

A second trauma theatre may only be opened if the consultant anaesthetist on call is in agreement.

If the trauma cases finish within list times, the trauma anaesthetist should assess the next day’s cases and plan the list. See ‘Fractured neck of femur: management guidelines’ on page 151.

The trauma list finishes with the patient handed over by the anaesthetist to recovery by 21:00 (19:00 on Friday). The trauma list anaesthetist goes off duty at 21:00 (19:00 on Friday). Any patients who may require review in recovery once the trauma anaesthetist leaves must be handed over to the resident anaesthetists on call.

Operative trauma cases may be done after 21:00 (19:00 on Friday) but they should be emergency cases that would involve serious and permanent harm if left until the morning. Each case should be discussed with the senior resident anaesthetist. Earlier delays are not a reason to overrun the trauma list.

Weekends and bank holidays

The trauma anaesthetist comes on duty at 08:00.

If the resident or senior resident anaesthetists do not have cases, they should work cooperatively with the trauma anaesthetist to make sure that the trauma patients are treated in a timely fashion.

A second trauma theatre may only be opened with the agreement of the consultant anaesthetist on call.
Miscellaneous issues

The trauma list finishes at 20:00, with the after hours arrangements being identical.

Ultrasound guided nerve blocks

[Appraised by Dr Shyam Balasubramanian, January 2010]

We have recently acquired several ultrasound machines designed for use in the placement of regional nerve blocks. While this will remain under continuous scrutiny it is not yet a requirement of placing nerve blocks that you use an ultrasound machine. If you would like training in its use please contact Dr Hillerman, Dr Balasubramanian or another consultant interested in this area.

1. All the ultrasound machines are parked in a designated area – the anaesthetist taking it out should log the detail in a notebook kept in that designated area. This will help avoid looking for the machine in every anaesthetic room every day.

2. When the machine is unused please plug it to continue charging. The battery in the machine can discharge easily without adequate charge and this may affect the longevity of the machine.

3. Do not use the gel provided with the ultrasound machine (in a white container) for nerve blocks; it is for diagnostic scanning purposes and for preprocedural screening only. The sterile 10 g sachet of Aquagel used for lubricating ETT cuffs is good.

4. The transducer probe will be damaged if cleaned with alcohol wipes. Sani-cloth disinfection wipes (green lid container) do not contain alcohol and are very effective.

5. A size 8 sterile glove can be used as a sterile condom for the probe to prevent cross infection.
Waiting list initiatives

[Appraised by Dr Edwin Borman, January 2010]

Specialist anaesthetists needing advice about patients on such lists should call the general on call consultant anaesthetists for the site, as they would for patients on regular NHS lists.

Working with other clinicians

[Appraised by Dr Edwin Borman, January 2010]

Anaesthetists have to foster and maintain good working relationships with clinicians from a variety of other disciplines. These relationships should not be abused and if you are aware of such abuse it should be brought to the attention of a senior anaesthetist immediately.

In particular, you should contact the Anaesthesia Office, the clinical director or the appropriate consultant on call if you feel that pressure is being applied to you to perform tasks that it is not appropriate for you to perform, or to allow the inappropriate over-running of operating lists. Neither of these situations will be condoned.
A major incident is any occurrence that presents a serious threat to the health of the community, disruption to the service, or causes (or is likely to cause) such numbers of types of casualties as to require special arrangements to be implemented by hospitals, ambulance services or health authorities.

UHCW has a Major Incident Procedure (MIP 12.0, published 15 April 2009) and the following is extracted from it, augmented for the Department of Anaesthesia. The Major Incident Procedure published on the intranet remains the definitive source document.

Locations

Major Incident Control Centre, University Hospital

This is the location of the Hospital Major Incident Controller, in the seminar room AEY10124, emergency department administration.

Communications Centre

Consultants’ office, emergency department, first floor.

Extensions 26253, 226254, 26256, 26259, 26260 (DDI on these lines or 024 7662 2387).

Incident Support Room, St Cross Hospital

Consultants’ secretaries’ office, Emergency Department.

01788 545294.

Immediate priority 1 assessment area – adult and paediatric

Resuscitation room, emergency department, extensions 26988 and 26987.
Staff assembly point

Dermatology department, lower ground floor; extensions 26308 and 26307.

Triage category definitions

Immediate P1  Casualties with life threatening conditions. These casualties will be taken to Resuscitation.

Urgent P2  Casualties who need to be seen within 30 minutes. These casualties will be taken to majors. Children will go to the paediatric observation area.

Delayed P3  Casualties with conditions which are less severe; the ‘walking wounded’. These casualties will be taken to Minors waiting area/cubicles. Children will go to the paediatric waiting area.

DOA  Dead on Arrival.

Expectant  The expectant category represents patients who will die even if they receive optimal treatment. To be transferred to the Day Surgery Unit to be cared for. Children will go to ward 16.

Senior resident anaesthetist (action card 17)

On being advised, ‘Major incident standby’ you will:

- Personally acknowledge receipt of message by talking to Switchboard at University Hospital.

- Contact the Major Incident Control Centre at University Hospital and receive a briefing with regard to the incident. Extension 26253 or DDI 024 7696 6253.

On being advised, ‘Major incident declared – activate plan’ you will do the above and:

- Assess the situation and coordinate with the general consultant on call the workload and allocation of staff during the incident.
Major Incident Procedure

- Assist in the reception of casualties within the Emergency Department and help coordinate theatre cases as prioritised by the general consultant on call.
- Remain on site at the University Hospital until advised to ‘Stand down’ by the Major Incident Control Centre.

General consultant on call (action card 16)

On being advised, ‘Major incident standby’ this consultant will:

- Personally acknowledge receipt of message by talking to Switchboard at University Hospital.
- Report in person to the Major Incident Control Centre at University Hospital and receive a briefing with regard to the incident.

On being advised, ‘Major incident declared – activate plan’ this consultant will do the above and:

- Contact the second on call consultant anaesthetist and ask them to contact as many consultant colleagues as are appropriate, starting with the cardiac anaesthetist on call.
- Liaise with the senior resident anaesthetist.
- Attend University Hospital Emergency Department.
- In co-ordination with the Hospital Major Incident Controller, determine the requirements for further anaesthetists at the University Hospital and contact the second on call consultant anaesthetist again to update them.
- Liaise with the consultant intensivist on call to determine the intensive care capacity of UHCW. If necessary, determine the need to transfer intensive care patients in order to create additional capacity on site.
• In cooperation with the consultant orthopaedic and general surgeons, prioritise those patients requiring surgery and help to create surgical lists for theatre.

• Remain on site at University Hospital until advised that ‘Stand down’ has been declared and confirmed by the Major Incident Control Centre.

Consultant intensivist on call (action card 18)

On being advised, ‘Major incident standby’ this consultant will:

• Personally acknowledge receipt of message by talking to Switchboard at University Hospital.

• Report in person to the Major Incident Control Centre at University Hospital and receive a briefing with regard to the incident.

• Determine the present capacity of the critical care units at the University Hospital and report back to HMIC. Extension 26253 or DDI 024 7696 6253.

On being advised, ‘Major incident declared – activate plan’ this consultant will do the above and:

• Attempt to move patients out of the critical care units to increase available capacity.

• Liaise with the ICU bed bureau and attempt to arrange transfers.

• Liaise with the general consultant anaesthetist with regard to likely requirements for critical care beds.

• Keep the Hospital Major Incident Controller continually informed of the current critical care capacity.

• Remain available until advised that ‘Stand down’ has been declared and confirmed by the Major Incident Control Centre.
Major Incident Procedure

All medical staff on duty (action card 26)

Please only attend if you are requested to do so.

On being advised, ‘Major incident standby’ this doctor will:

- Personally acknowledge receipt of message by talking to Switchboard at University Hospital.
- Contact the staff assembly point in the hospital of your normal place of work to receive a briefing and await further instructions.

On being advised, ‘Major incident declared – activate plan’ this doctor will do the above and:

- Report in person to the staff assembly point in the hospital of your normal place of work and then wait for allocation of duties.
- Liaise with your on call consultant colleague with regard to your role in the major incident.
- Remain available until advised to stand down by the Hospital Incident Controller.

Staff assembly points:

University Hospital

Extensions 26308 and 26307.

Hospital of St Cross

Lecture Theatre, Octopus Centre: 01788 545175.
The main building is divided into three wings, the West Wing (on the northeast end), the Central Wing and the East Wing (on the southwest end of the building).

The hospital street (easily spotted with a fake wooden floor) runs the entire length of the building on every floor towards the front of the building, and all wards and departments are accessible from it.

<table>
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<tr>
<th>West Wing</th>
<th>Central Wing</th>
<th>East Wing</th>
</tr>
</thead>
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<tr>
<td>5</td>
<td>Orthopaedic wards 52 and 53.</td>
<td>Ward 50, dialysis unit, audit department.</td>
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<tr>
<td>4</td>
<td>Neurosciences wards 42 and 43.</td>
<td>Medical wards 40 and 41.</td>
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<tr>
<td>3</td>
<td>General surgery and urology ward 33, head and neck ward 32, executive suite.</td>
<td>Cardiology and respiratory wards 30 and 31.</td>
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<tr>
<td>2</td>
<td>Gynaecology ward 23, general surgical ward 22 (SAU).</td>
<td>Gastroenterology and endocrine wards 20 and 21.</td>
</tr>
<tr>
<td>1</td>
<td>Main theatres, general critical care, anaesthesia dept., emergency dept., children’s emergency dept.</td>
<td>Cardiothoracic theatres, critical care and wards; cardiology; SODA.</td>
</tr>
<tr>
<td>Ground</td>
<td>Pharmacy, endoscopy, surgical day unit, outpatients, diagnostic imaging.</td>
<td>Rheumatology, rehabilitation, diabetes.</td>
</tr>
</tbody>
</table>
Site descriptions

Centre for Reproductive Medicine

This is at first floor level as a separate building off the West Wing. Continue down the hospital street and cross to the next building.

Clinical Sciences Building

The postgraduate centre, meeting rooms, lecture theatre and library are in this building joined to the East Wing of the University Hospital. There is a connecting bridge at the first floor level of the hospital street.

Caludon Centre

This is the mental health unit and is operated by the Coventry and Warwickshire Partnership NHS Trust at the Clifford Bridge Road entrance to the University Hospital campus.

The Hospital of St Cross, Rugby

[Appraised by Dr Robin Correa, January 2008]

This is part of the University Hospitals Coventry & Warwickshire NHS Trust. Trainee anaesthetists do not work there on call but the Postgraduate Medical Education and Training Board (PMETB) have approved their attendance at training lists in orthopaedic surgery and ophthalmic surgery under direct consultant supervision.

If you find yourself rostered either to do a solo list or to hold the on call bleep while at the Hospital of St Cross please contact the theatre access manager – Charlene Allen – or one of the college tutors immediately.

The anaesthesia departments

The University Hospital department is located between the hospital street and the theatre suite. You will need an identity card to get through the front door. Areas on the left of the central corridor are:

- Pain management administrative office.
- On call rooms (four).
- Meeting rooms (two).
Site descriptions

- Coffee room.
- Quiet room (five workstations).
- WC (two).
- College tutor offices (two).

On the right of the corridor are:
- Pain management clinicians’ office.
- Management offices (six).
- Supporting professional activity barn (fourteen workstations).
- Seminar room (with gas supplies for equipment inductions).

The anaesthesia department is joined at the back to the theatre suite. Infection control have confirmed that we can enter the department wearing theatre clothing but you must remember that it is a carpeted area and you should not come in wearing clothes or shoes that are stained with blood or other substances.

There is a smaller anaesthesia department at the Hospital of St Cross. It is located inside the main theatre suite on the right as one goes through the main entrance.
Anaesthesia department lead clinicians

There are a large number of areas for which certain consultants and specialty doctors take a lead role. This is an informal professional mechanism as agreed at job planning. The list changes from time to time but is as follows:

- **Air ambulance liaison:** Wyse
- **Airway:** Mendonca, Radhakrishna
- **Allergy and anaphylaxis:** Choksey, Thacker
- **Anticoagulation:** Mendia
- **Audit:** Krishnamoorthy (new appointment February 2010)
  - Choksey (mortality reviews)
- **Cardiothoracic:** Jayaratnasingam
- **CEAs / OPs:** Porter, Summ
- **Chairman of department:** Wyse
- **Clinical director:** Borman
- **Clinical governance:** Borman
- **Clinical guidelines:** Porter
- **College tutors:** Ruhnke, Ramachandran
- **Complications debriefing:** Borman, Clayton, Danha, Evans, McCulloch, Mead, Scase, Srivastava
- **Day surgery:** Correa
- **Dental:** Danha
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<td><strong>ECT:</strong> Choksey, Sathyanarayana</td>
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<td><strong>Echocardiography:</strong> Srinivas</td>
</tr>
<tr>
<td><strong>Equipment:</strong> Joshi R</td>
</tr>
<tr>
<td><strong>Examinations:</strong> Hillerman, Mendonca</td>
</tr>
<tr>
<td><strong>Handbooks:</strong> Porter</td>
</tr>
<tr>
<td><strong>Head and neck:</strong> Beamer, Danha</td>
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<td><strong>ICT and intranet:</strong> Porter</td>
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<td><strong>Lean ways of working:</strong> Phillips, Scase, Choksey</td>
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<tr>
<td><strong>Linkman AAGBI:</strong> Mead</td>
</tr>
<tr>
<td><strong>Linkman ACTA:</strong> Echebarria</td>
</tr>
<tr>
<td><strong>Low flow:</strong> Johnson</td>
</tr>
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<td><strong>Major incidents:</strong> Phillips, Wyse</td>
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<td><strong>Morbid obesity:</strong> Srivastava, Suryavanshi</td>
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<td><strong>Neurosurgery:</strong> Tripathy</td>
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<td><strong>Obstetrics:</strong> Elton, Porter</td>
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<td><strong>Ophthalmics:</strong> Choksey, Shekhawat</td>
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<td><strong>Paediatrics:</strong> Chari, Danha</td>
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<td><strong>Pain, acute/epidurals:</strong> Johnson, Ramachandran</td>
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<td><strong>Pain, chronic:</strong> Krishnamoorthy</td>
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<td><strong>Pain outreach:</strong> Millerchip</td>
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<td><strong>Paramedics:</strong> Kumar</td>
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<td>Plastic surgery:</td>
<td>Kazmi</td>
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<td>Preoperative clinic:</td>
<td>La Rosa, McCulloch</td>
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<td>Recovery, PACU:</td>
<td>Amutike, Porter, Summ, Tripathy, Ziauddin</td>
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<td>Regional anaesthesia:</td>
<td>Ramachandran, Ruhnke, Ziauddin</td>
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<td>Patteril</td>
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<td>Brookes</td>
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<td>Rugby:</td>
<td>Mead</td>
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<td>Kothare, Joshi R</td>
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<tr>
<td>Simulators:</td>
<td>Hillerman, Mendonca, Ruhnke</td>
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<tr>
<td>TIVA/TCI:</td>
<td>Amutike</td>
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<tr>
<td>Transfusion and blood products:</td>
<td>Clayton, Choksey</td>
</tr>
<tr>
<td>Trauma and orthopaedics:</td>
<td>Hillerman, Scase</td>
</tr>
<tr>
<td>Urology:</td>
<td>Joshi P</td>
</tr>
<tr>
<td>Vascular:</td>
<td>Dudkowsky, Borman</td>
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Trust organisational structure

Division and service unit

UHCW is currently organised into three clinical divisions and one non-clinical division. We are in the:

Diagnostics and service division

- Divisional medical director: Dr Andrew Phillips.
- Acting operations director: Malcolm Hunter.

Managerial responsibility for services is held by:

Clinical directors:

- Dr B. Murthy (critical care).
- Dr Edwin Borman (anaesthesia and pain management).
- Dr Matthew Patteril (deputy clinical director for anaesthesia and pain management).
- Theatres are currently outside this management structure. The clinical director for theatres is Mr Steve Parker.

General managers:

- Donna Fox (anaesthesia, theatres & pain services).
- Neil Griffin (critical care).

Department of anaesthesia

Traditionally, a meeting of the medical staff in the department has been held regularly. The department chairman (Dr Richard Johnson) chairs the department meetings. Consultants, specialist anaesthetists and specialty registrars (year 5 upwards) are invited and welcome to attend department meetings, which are usually held at 12.30 pm on the day of the monthly audit meeting, in the seminar room of the anaesthesia department.
Telephone numbers

Emergency 2222
Urgent clinician-to-clinician calls 27027
024 7696 7027

There is a full telephone directory on the intranet. Anaesthetists’ bleep numbers are listed on the ‘staff list’ pages on the intranet.

University Hospital 024 7696 4000
Direct lines for 2xxxx numbers 024 7696 xxxx

See Anaesthesia office and administration numbers on page 62.

Anaesthesia coffee room 25901
Seminar room 25852
Informal meeting room 25899
On call room 1 25895
On call room 2 25896
On call room 3 25897
On call room 4 25898
College tutor (Dr Correa) 25909
College tutor (Dr Ruhnke) 25908

Main theatre reception 25959 / 25924
PACU 25938
Gynaecology theatres 26692
Surgical day unit reception 26826 / 26827
SDU recovery (general) 26853
SDU recovery (orthopaedic) 26870
SDU ward 26851
Preoperative assessment clinic 26837
Critical care 26556 / 26900
Cardiac critical care 25794

Main reception 28215 / 28216
CSB reception 28973
Maternity reception 27421 / 27422
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<td>Anaesthetists’ office, labour ward</td>
<td>26646</td>
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<td>Children's emergency department</td>
<td>26929 / 26930</td>
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<tr>
<td>Emergency Department reception</td>
<td>26200</td>
</tr>
<tr>
<td>ED resuscitation room</td>
<td>26989 / 26987 / 27125</td>
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<tr>
<td>ED resus CT scanner</td>
<td>26986 / 26985</td>
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<tr>
<td>Blood bank</td>
<td>25322 / em. 25398</td>
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<tr>
<td>Blood tests reception</td>
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<tr>
<td>Pharmacy stores</td>
<td>26789</td>
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<td>Pharmacy inpatients</td>
<td>26785</td>
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<tr>
<td>Pharmacy outpatients</td>
<td>26045</td>
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<tr>
<td>CT/MRI reception</td>
<td>27090</td>
</tr>
<tr>
<td>Eye Unit</td>
<td>26602 / 26607</td>
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<tr>
<td>Fracture clinic</td>
<td>26262</td>
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<tr>
<td>Maxillofacial unit</td>
<td>26500 / 26607 / 26607</td>
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<tr>
<td>Gynaecology and antenatal clinic</td>
<td>27350</td>
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<tr>
<td>Ward 1 Rehabilitation Ward</td>
<td>28218 25738</td>
</tr>
<tr>
<td>Ward 2 Rheumatology Medical</td>
<td>28217 25745</td>
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<tr>
<td>Ward 3</td>
<td>25732</td>
</tr>
<tr>
<td>Ward 10 Cardiothoracic Ward</td>
<td>28227 / 25637</td>
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<tr>
<td>Ward 11 Cardiology Ward</td>
<td>28226 / 25800</td>
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<tr>
<td>Ward 12 Observation/Assessment Ward</td>
<td>26264 / 26265</td>
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<td>Ward 14 Adolescent Ward</td>
<td>27348</td>
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<td>Ward 15 Infant’s Ward</td>
<td>27006</td>
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<td>Ward 16 Children’s Ward</td>
<td>27224 / 28224</td>
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<td>Ward 20 Gastroenterology &amp; Endocrine</td>
<td>28233 / 25561</td>
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<td>Ward 21 Gastroenterology &amp; Endocrine</td>
<td>28232 / 25773</td>
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<td>Ward 22 General Surgical Ward</td>
<td>28231 / 25757</td>
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<td>Ward 23 Gynaecology Unit</td>
<td>28230 / 26589</td>
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<td>Ward 24 Obstetric Ward (antenatal)</td>
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<td>28238 / 27680</td>
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<tr>
<td>Ward 32 Head and neck surgery</td>
<td>28236 / 27831</td>
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<tr>
<td>Ward 33 General Surgery &amp; Urology</td>
<td>28235 / 25380</td>
</tr>
<tr>
<td>Ward 34 Haematology Unit</td>
<td>25390 / 25391</td>
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| Ward 35 Oncology                        | 28234 / 25528 |
| Ward 40 Med ward Stroke and age related | 28244 / 28328 |
| Ward 41 Med ward Stroke and age related | 28243 / 27817 |
| Ward 42 Neurosciences - Neurology/Rehab | 28241 / 27798 |
| Ward 43 Neurosciences - Neurosurgery    | 28240 / 25330 |
| Ward 50 Renal Haemodialysis Unit        | 28259 / 28258 |
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