ADULT INTENSIVE CARE
ORIENTATION BOOKLET

Adult Intensive Care Unit, John Radcliffe Hospital
Churchill Intensive Care Unit, Churchill Hospital

NOVEMBER 2017
INTRODUCTION

Welcome to Intensive Care.

This booklet is to help orientate you to the Adult Intensive Care Unit (AICU) of the John Radcliffe Hospital and the Churchill Intensive Care Unit (CICU) of the Churchill Hospital. It aims to introduce you to some of the working policies, people and educational resources that will enable you to make best use of your attachment.

On your first day it is important to:

1. Find your way around the unit (checklist in Appendix A)
2. Acquaint yourself with the various emergency procedures (see later sections)
3. Receive training on CareVue, the ICU Clinical Information System

The Adult Intensive Care Unit has 16 beds, the Churchill Intensive Care Unit 8 beds.

Together, the two units are funded to care for 18 level 3 patients at any one time. The medical, nursing and other staff rotate between the two units flexibly to achieve this.

There are approximately 1300 admissions per annum, with a range of primary diagnoses.

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>%</th>
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<tbody>
<tr>
<td>General Surgical</td>
<td>17%</td>
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<tr>
<td>Vascular</td>
<td>17%</td>
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<tr>
<td>Trauma</td>
<td>11%</td>
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<tr>
<td>Respiratory Failure</td>
<td>10%</td>
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<tr>
<td>Post Arrest</td>
<td>8%</td>
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<tr>
<td>Sepsis</td>
<td>7%</td>
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<tr>
<td>Renal Failure</td>
<td>6%</td>
</tr>
<tr>
<td>Overdose</td>
<td>5%</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>5%</td>
</tr>
<tr>
<td>Cardiac Surgical</td>
<td>3%</td>
</tr>
<tr>
<td>Primary Cardiac</td>
<td>3%</td>
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<tr>
<td>Maxillofacial</td>
<td>2%</td>
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<tr>
<td>Meningitis</td>
<td>2%</td>
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<tr>
<td>Other Neurological</td>
<td>2%</td>
</tr>
<tr>
<td>Asthma</td>
<td>2%</td>
</tr>
<tr>
<td>Obstetric</td>
<td>1%</td>
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</tbody>
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The severity scores (e.g. APACHE II) of patients admitted are generally high but the overall mortality has fallen in recent years to ~14%.
STAFF

CONSULTANTS

Dr Elaine Armstrong
Dr Graham Barker
Dr Stuart Benham
Dr Henry Bettinson
Dr Jonathan Chantler
Dr Claire Colebourn
Dr Peyton Davis (Clinical Lead)
Dr James Day
Dr Oliver Dyar
Dr David Garry
Dr John Griffiths
Dr Stuart McKechnie
Dr Julian Millo
Dr Jon Salmon
Dr Peter Watkinson
Dr Douglas Wilkinson
Dr Adrian Wong

One consultant is on duty at each site at all times. There is a list of bleep and contact numbers for the consultants at each of the nursing stations or they can be contacted via switchboard.

OTHER MEDICAL STAFF

There are three trainee duty groups - AICU 1, AICU 2 and CICU. The trainees work a full shift system. The duty groups consist of anaesthetists from the Nuffield Department of Anaesthetics (NDA), who normally do a three-month module of intensive care medicine (ICM) during their ST3 year. Physicians are allocated to the ICU by the Nuffield Department of Medicine (NDM), for three or four month periods. Five trainees are appointed to advanced training posts in ICM as part of a dual-CCT training programme. Six 12-month FTSTA posts are also appointed annually. One further post is part of the regional chest medicine rotation. The composition of the duty groups is variable, but usually includes a number of physicians and emergency medicine trainees. Two foundation doctors are also attached to AICU at any one time.
NURSING STAFF

Matt Holdaway  Matron & Clinical Director
Lorna Gale    Deputy Matron
Lyn Bennett   Deputy Matron
Clare Williams CareVue Lead Nurse

There is approximately 140 nursing staff, divided into 5 teams. A senior sister/charge nurse leads each team.

Nursing staff work flexibly between both AICU and CICU, but typically one team rotates to CICU for eight weeks at a time. Nurses work 12-hour shifts (07:30-20:00 & 19:30-08:00), with the ratio of nurses to patients being 1:1 for level 3 patients, and 1:2 for level 2 patients. Every patient will have a named nurse responsible for his or her care each shift. In addition to the bedside nurses, there is a ‘nurse in charge’ on duty every shift.

OTHER KEY PERSONNEL

Eli Terziu    Unit secretary & PA to the consultants  Ext 20621
Bridget Blyth Secretary to the outreach team  Ext 40397
Gill Warmington Unit Administrator  Ext 28960
Zuzana Lovas  Ward Clerk CICU  Ext 35084
Anoska Ward   ICNARC data collector  Ext 21998
Mark Borthwick ICU Consultant pharmacist  bleep 4017
Michelle Rutledge ICU dietician  bleep 4008
Owen Gustafson Senior physiotherapist, AICU  bleep 1900
Alex Wilson   Senior physiotherapist, CICU  bleep 5006

There is a team of Clinical Support Workers to support the nursing staff.

Eli Terziu (ext 20621) is a useful first point of contact for general enquiries.

Fiona Wallace is currently the Intensive Care Society (www.ics.ac.uk) Linkperson and trainee representative. This is changing Nov 14th.

ON CALL ROTA

The rotas are currently written by Dr Graham Barker. AICU and CICU rotas will show any last minute amendments and are visible on the web accessible service HealthRoster. Please book holiday and study leave via the HealthRoster system in the first instant. Acceptance or explanation (if rejected) will be offered on this system. You will receive a password and username six weeks before starting. If you have any queries regarding the rota, please contact Eli Terziu via email at eli.terziu@ouh.nhs.uk. Urgent problems should be discussed with Eli and the Consultant in charge that day.

EMERGENCY COVER AND SWAPS

A doctor with appropriate training must always be available to deal with emergencies both at the JR and Churchill sites. Trainees are expected to manage their own rotas, including emergency cover. Please email Eli in advance.
with your organised swaps so that the master rota can be updated. Care is needed with swaps between rotas as adequate airway cover for both AICU and CICU must be maintained at all times. Please see the section on ON CALL RESPONSIBILITIES for more details.
**LEAVE**

To ensure fair play with your colleagues, you should not normally take more than 5 days private exam study in a three-month module, and **no more than 12 working days total leave** (combining annual, study, and private exam study leave) in a 3 month module (*pro rata*). All requests for leave should be discussed and approved by the rota coordinator – usually a minimum of 6 weeks prior to the proposed leave and before the rota is issued. Study leave funding is claimed via a [form on the intranet](#). Private study leave must be requested formally (i.e. an email giving dates and reasons to Eli) and approved prospectively.

Anaesthetists - please book your holiday and study leave in the NDA diary as normal - but please ensure that Eli Terziu is informed of all your holiday and study leave requests as well. The NDA training committee has agreed that a maximum of two ST3 anaesthetists can be on annual/study leave at any one time, including during the intensive care module.

**SHIFTS AND ABBREVIATIONS EXPLAINED**

<table>
<thead>
<tr>
<th>Shift</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Day</td>
<td>08:30 - 18:00</td>
</tr>
<tr>
<td>Long Day</td>
<td>08:30 - 21:00</td>
</tr>
<tr>
<td>Night</td>
<td>20:30 - 09:00</td>
</tr>
<tr>
<td>Seminar</td>
<td>13:00 - 14:00</td>
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</tbody>
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Annual Leave = **AL**; Study Leave = **SL**; Zero Hours Day = **ZH**; Prefix by Churchill shift **CICU** or for the JR; **AICU**.

**SICKNESS AND ANNUAL LEAVE**

If you are unable to work you must inform your colleagues with as much notice as reasonably possible. Please also notify Eli Terziu and complete the appropriate paperwork on your return to work. Be realistic about when you will be fit to return to work. Trainees are expected to provide cover for unexpected short-term illnesses affecting their colleagues. FirstCare must also be informed (telephone: 0333 321 8086). Eli Terziu is obliged to keep records of annual, study and sick leave.

**STRESS**

ICU can be a dramatic place and, for a variety of reasons, trainees occasionally find working on ICU overly stressful. This can adversely impact both work and life at home. Keeping difficulties to yourself rarely helps in the long run, and trainees are encouraged to approach any of the senior doctors or nurses for an informal confidential meeting when a solution can usually be found or an alternative counselling source arranged. Your module supervisor and/or the Faculty Tutor, Graham Barker, are alternative sources of support.

**BULLYING & WHISTLEBLOWING**

We strive to have a productive, supportive, friendly and educational environment. We would hope you come to us as soon as possible if this is not the case so that we can continue to run an excellent department. If you are concerned don’t hesitate to contact your educational supervisor. Should you feel the issues are beyond this or there are other problems you can use the [Raising Concerns at Work](#) link or call the Speak Up Lead Guardian (Jane Herve) on 07500 107 889.
TRAINING & EDUCATIONAL SUPERVISION

APPRAISAL AND ASSESSMENT

Appraisal and assessment are complementary. You will be allocated a consultant educational (or module) supervisor by Dr Barker (Dr Benham for Foundation program trainees).

During an initial appraisal meeting with your educational supervisor, training objectives should be identified and agreed jointly. This should take place at the beginning of your module and takes ~30 minutes. You should agree and sign a learning contract or educational agreement at this meeting.

The Faculty of Intensive Care Medicine (FICM) has a downloadable Educational Training Record (ETR) that contains a template for an Educational Agreement – see the section on training documents at the end of this booklet.

You should aim to have your initial appraisal meeting by the end of your second or third week of the module.

You should meet with your educational supervisor at least once more, towards the end of your 3-month module, to assess your progress. Your educational supervisor will ensure that the necessary competencies have been signed off and the requisite number of workplace-based assessments (WPBAs) completed. They should provide you with collated feedback from the consultant body and the results of your multi-source feedback (MSF) if completed. Basic, intermediate and/or advanced competencies should be signed off at this meeting and if necessary a Completion of Unit of Training form signed. Your educational supervisor will (with your guidance) also complete any specific documentation or reports required by your primary speciality.

Please note: It is your responsibility to make arrangements to meet with your allocated educational supervisor and ensure that the paperwork required for satisfactory progression through your ARCP process is signed off. Failure to have sufficient competencies signed off and/or complete the agreed number of WPBAs is likely to result in refusal to sign off the ICM module of training.

COMPETENCY BASED ASSESSMENT

During your module you must get a list of competencies signed off as determined by the Faculty of Intensive Care Medicine (FICM) (formerly the Intercollegiate Board for training in Intensive Care Medicine (IBTIICM)). The relevant competency based training (CBT) documentation is complex and has undergone a number of revisions recently (2007 & 2010).

For NDA ST3s, the relevant (2010 curriculum) intermediate ICM competencies are embedded within the Oxford Deanery Intermediate Level (ST3/4) training manual.

For everyone else (both anaesthetists and non-anaesthetists), we currently ask that the relevant (2007 curriculum) CBT booklets be completed during your attachment:

- If you are new to ICM, complete the Basic competencies (CBT booklet III).
- Trainees with previous ICM experience complete the Intermediate competencies (CBT booklet IV). NOTE For intermediate training to count towards a dual-CCT programme, 10 enhanced case summaries must be completed BEFORE the start of the advanced training year.
- Trainees in the dual-CCT programme complete Advanced competencies (CBT booklet V).
If in doubt about which CBD documentation to complete, please ask your educational supervisor, the Faculty Tutor (Graham Barker), or Regional Advisor (Ian Rechner based in RBH Reading), to clarify this at an early stage of your attachment.

Individual competencies can be signed off by anyone who is competent. Anyone in advanced training can sign off intermediate competencies and, similarly, anyone in intermediate training can sign off basic competencies. Each group (page) of competencies is then signed off by your educational supervisor.

Trainees are expected to get their competencies signed off contemporaneously during their module. This involves actively looking for opportunities to get competencies signed off (e.g. by the consultant the morning after an admission during a night shift). With this in mind, we suggest that you leave your competency booklet on the unit so that it is always available. If you forget about it until the end of the module you will find it quickly becomes a time-consuming worry. Your competencies will be formally reviewed annually.

Please note that the “Communication skills, attitudes and behaviour” sections of the 2007 curriculum CBT booklets are an exception to the above. Assessment is completed by the consultants as a group during your module. When you bring your CBT booklet to your consultant supervisor at the end of your attachment he/she will sign the whole of this section off. It is rare to identify any problem areas, and any perceived problems should have been brought to your attention early on in your module, certainly before the signing off process.

**Multisource Feedback (MSF)**

The intensive care module is a good time to perform a multisource feedback (MSF). It is best to do this about two-thirds of the way through your attachment, or after two months. As part of your postgraduate medical education, and to allow your revalidation by the General Medical Council, you must be able to demonstrate your general compliance with the standards of professional behaviour set out in the GMC document “Good Medical Practice”. In order to confirm this, MSF seeks the views of professional colleagues. Request MSF from co-workers of your choice as long as:

- You think they can make an adequate assessment of your performance over time
- At least 5 are consultants
- At least 3 are other doctors
- At least 3 are non-medical such as nurses
- Other forms can be to anyone you like

An example of the form is given in the appendices. At your appraisal meeting your consultant supervisor will give you a resume of the results. You will not normally be told who gave which opinion. In practice the process often results in gratifying praise for trainees from their fellow workers. This can then build into your portfolio for ARCP and perhaps in the future for revalidation. However, you may occasionally discover an unexpected weakness. You will have the chance to discuss this with your consultant supervisor and / or Tutor.

**Workplace Based Assessment**

Workplace based assessments (WPBA) are now mandatory for most trainees. It is expected that all trainees will carry out WPBAs during their ICM attachment and the FICM has stipulated the minimum it expects during basic, intermediate and advanced levels of training. Completion of the requisite number of WPBAs is a pre-condition of a successful completion of module sign-off.
### WPBAs REQUIRED

<table>
<thead>
<tr>
<th>Programme Component</th>
<th>Minimum Number of Assessments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Basic training</strong></td>
<td>MSF x1</td>
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<tr>
<td></td>
<td>DOPS x3</td>
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<tr>
<td></td>
<td>ICM-CEx x2</td>
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<tr>
<td></td>
<td>CbD x1</td>
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<tr>
<td></td>
<td>MSF x1</td>
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<td></td>
<td>DOPS x2</td>
</tr>
<tr>
<td></td>
<td>ICM-CEx x2</td>
</tr>
<tr>
<td><strong>Intermediate training</strong></td>
<td>CbD x2</td>
</tr>
<tr>
<td></td>
<td>ACAT x1</td>
</tr>
<tr>
<td><strong>Advanced training</strong></td>
<td>MSF x1</td>
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<tr>
<td></td>
<td>DOPS x1</td>
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<tr>
<td></td>
<td>ICM-CEx x2</td>
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<tr>
<td></td>
<td>CbD x3</td>
</tr>
<tr>
<td></td>
<td>ACAT x2</td>
</tr>
</tbody>
</table>

MSF Multi-source feedback; DOPS Direct Observation of Procedural Skills; ICM-CEx Intensive Care Medicine Mini-clinical Evaluation Exercise; CbD Case-based discussion; ACAT Acute Care Assessment Tool

ICM-specific WPBA forms are also available for download from [http://www.ficm.ac.uk/for-trainees/assessments.ashx](http://www.ficm.ac.uk/for-trainees/assessments.ashx). Note that there is a greater emphasis on DOPS at the beginning of ICM training. As for the CBT booklets, DOPS forms can be signed off by anyone who is already competent. WBPA (i.e. for the UK Diploma in ICM and other speciality training) are not mutually exclusive. Cases presented at the unit’s weekly seminar could also be signed off as CbDs.
WEEKLY SCHEDULE AND TEACHING

Clinical ward rounds are held twice a day seven days a week. The ward round includes the consultant on call and the nurse co-ordinating the unit. Consultants maintain a 24-hour involvement, seven days a week and are happy to consulted with any concerns. The consultants work Monday to Thursday or Friday to Sunday.

There is a microbiology ward round lunchtime each day.

Weekly seminars are held in the AICU seminar room at 13:00 on Fridays. The seminar is a multidisciplinary, open door meeting. Trainees are encouraged to be active participants and present at some point during their attachment. A review of morbidity, mortality and critical incidents is included on a regular basis.

There is a weekly journal club which takes place at 07:30am on Fridays in the AICU seminar room.

Medical, surgical, microbiological and cardiology grand rounds are advertised in the unit and you are encouraged to attend these as appropriate.

There is weekly Tuesday afternoon teaching for NDA ST3 anaesthetists. This is compulsory and is included in your working hours. You will not be required to work on the unit until teaching has finished.

Other educational opportunities include the BASIC course for trainees with little or no previous ICM experience, a bimonthly transfer course, regular simulation, 6 monthly FICE course, monthly consultant delivered training for the CCT trainee group, and the biannual Oxford Region Intensive Care Society (ORICS) meetings.

We would expect as many of you as possible to undertake FICE (Focused Intensive Care Echo) training. Many of the senior doctors in the department are trained and will assist you in your learning. Talk to your educational supervisor near the beginning, you should be allocated a trainer. There is on line learning, 10 supervised cases and self study that is assessed after that.

DAILY ROUTINE

The rota is a full shift system, with the following shift patterns. Nomenclature used on the rota in parenthesis.

- **Day (Day)** 08:30 - 18:00
- **Long Day (LD)** 08:30 - 21:00
- **Night (Night)** 20:30 - 09:00
- **Seminar (Seminar)** 13:00 - 14:00

This section describes the routine activity of the unit, and in particular how the shift system works. Emergency work is discussed in the next section "On call responsibilities and guidelines".

If an on call is changed, it is the responsibility of the doctor on duty to ensure that switchboard knows.

NIGHT SHIFT REGISTRAR/S

- Arrive and receive a handover from the long day or late shift trainee at 20:30.
- All duty trainees are expected to know the key diagnoses and current state of all patients on the unit.
- A full clerking of each patient is necessary on admission – regardless of the time of admission.
- Please perform a short night round at around 23:00 with the co-ordinating nurse.
- Blood tests (FBC, U&E, LFTs, PT and APTT) are sent by the nurses routinely on all patients daily at 05:30. The night shift trainees ensure that these and any other investigations (such as drug levels) are sent.
- CXRs are performed only when clinically indicated.
The rota calculation of hours and pay assumes that you do not sleep during night shifts. At all times you should be on the unit or contactable by bleep. However, it is expected that suitable breaks occur during the shift for meals etc. We suggest that you consult the co-ordinating nurse to arrange a period of an hour or so during the night when bleeps can be kept to a minimum. A logical time for this is after the night round.

The handover sheet is prepared by the night registrar and copied for the day team (10-15 copies). The format is standardised and in general “less is more”. Be very careful not to put sensitive information on the handover sheet, including patient names (patients should be identified by initials). In particular, do not summarise notes on treatment limitation or withdrawal as e.g. “NFR” as in isolation, a brief note is meaningless. A reference such as “See notes 22/6” is sufficient and preferable. Please include important warnings eg difficult airways and allergies.

Please careful to dispose of the handover sheets appropriately – either by shredding or placing in confidential waste at the end of each shift.

At the morning handover (08:30) a succinct review of each patient stressing night events and plans for the day is required. The handover should last until 0855, which means that 90-120 secs is available for each patient. This means a certain amount of stage presence and “control of the masses” is required to keep to time. The aim is that by the end of the handover the team knows which patients are well and can be discharged, and which are particularly ill and need to be prioritised on the ward round. At the end of the handover the night registrar is free to go home.

**All shifts/on calls starting at 08:30**

- Handover 08:30 - 09:00
- Perform a safety briefing prior to the ward round – where difficult airways, new risks and immediate actions have to be quickly prioritised.
- Ward round, daily reviews and allocation of tasks 09:00 onwards

Each patient is reviewed daily. This includes physical examination, review of the prescription chart and reviews of, at the very least, the most important and/or new clinical signs (e.g. abdominal examination, new murmurs, changes in neurology) and radiology. You will develop your own style for documenting the daily review. At first, the quantity of information seems daunting. A systematic approach is required. A suggested system is:

- a list of diagnoses and/or problems
- a short (one-word can be enough) note to say if the patient is improving or deteriorating
- a systematic review of both physiological systems and treatments (including nutrition, medications, lab data, lines and relevant microbiology)
- your plan

**Please note:** ALL patients must have a VTE assessment completed on admission and reviewed every 72 hours. Compliance with this must be checked as part of the daily review.

Occasionally patients are not fully clerked on admission due to on-going resuscitation or competition for attention from other, sicker, patients. In these circumstances a “primary survey” approach is taken not only to the examination but to the history as well. At the first opportunity, a full clerking, including review of all potentially relevant imaging, is expected.

From around 16:30 each patient’s progress is reviewed on the afternoon ward round.
**Handover of Patients Discharged from ICU**

With the exception of AICU to CICU transfers, **ALL** patients discharged from AICU/CICU (including deceased patients) **MUST** have an electronic discharge summary completed through CareVue. As the discharging doctor, you are responsible for the final content. This may require updating an incomplete summary commenced by a colleague in anticipation of a patient’s discharge.

1. Normal discharges to the ward in daylight hours are handed over to the relevant ward doctor who is invited to attend ICU to get briefed about his/her patient in a systematic way. Don’t forget that patients discharged from intensive care can be particularly demanding for a ward-based doctor.

2. Out of hours discharges are handed over to a named ward doctor whose identity is documented in the notes. Patients should not be discharged after 16:00 unless approved by a consultant.

3. If there is particular anxiety about the patient, particularly if frequent review will be required or if decisions about re-admission are complex, the RMO and/or the primary consultant should be called as well as the ward-based officer.

4. At weekends, the same process applies but all patients remain on **Follow Up’s books** until Monday. If Outreach then discovers that no one has reviewed the patient, this triggers appropriate action!

5. All patients discharged to CCU overnight (and only CCU) remain our responsibility until after 0830/face-to-face handover to relevant team the next day.
ON CALL RESPONSIBILITIES AND GUIDELINES

At the John Radcliffe, the senior AICU trainee on call normally carries the ‘airway’ page (Bleep 4138). The second trainee on call for AICU carries the arrest bleep for the hospital (Bleep 1418). Both bleeps are tested in the morning with a 2-part test (speech and text). The bleep holders should ring the number in the text test to respond. Both bleeps 4138 and 1418 receive the same emergency bleeps: adult resuscitation, paediatric resuscitation & trauma teams.

At the Churchill site there is only one emergency pager (bleep 5505) carried by the senior trainee. The JR Hospital AICU trainee carrying bleep 4138 and the CICU trainee carrying bleep 5505 must be competent in airway management.

WHEN TO CALL A CONSULTANT

The senior duty trainee should discuss all uncertainties with the on call consultant. In general, all admissions refused admissions and requests to transfer a patient into ICU from another hospital should be discussed. For immediate life threatening problems obviously the priority is to stabilise the patient, but if required one of the nursing staff will ring the consultant on the trainee’s behalf. In the evenings contingency plans are always made to deal with any new admissions that occur overnight. The senior trainee should be aware of these plans.

REFERRALS FROM INSIDE THE HOSPITAL

Life-threatening emergencies need to be dealt with immediately, and the consultant informed at the earliest opportunity afterwards. If assistance is required urgently you should deputize one of the nursing staff to ring the consultant on call who will attend immediately. For urgent, but not life-threatening problems, it is quite often possible to make an assessment of the patient and ring the consultant from the ward after the assessment has been made. A decision can then be made on the appropriate treatment. Out of hospital referrals are usually made from one of the surrounding district general hospitals. You should collect the history, including a contact name and telephone number, and then ring the consultant for advice.

PATIENTS ON THE UNIT REQUIRING ANAESTHESIA AND SURGERY

Anaesthesia in theatre for patients on the ICU requiring operations is provided by the on call anaesthetic service. This is because if we use the ICU on call service we will leave the emergency airway service uncovered. The ICU on call staff undertake most transfers of the critically ill patients. It is important to leave an “airway capable” trainee on site at the John Radcliffe Hospital. If the only anaesthetist on call for the ICU has to do the transfer, options to ensure that the hospital is covered include calling in the consultant, or arranging cross cover from other on call anaesthetists if they are not involved in a case in theatre. It is usually relatively easy to ensure there is appropriate cover available.

AIRWAY/ANAESTHETIC COVER FOR THE OXFORD HEART CENTRE

Whilst you may be involved in the initial stabilisation and transfer of critically ill patients requiring primary percutaneous coronary intervention (pPCI) or other cardiological intervention (e.g. survivors of out of hospital cardiac arrest in the Emergency Department), there is a dedicated Cath Lab Response Team who should take over the care of these patients following arrival in the Cardiac Angiography Suite.

There is an algorithm on the wall outside Eli’s office to guide the delivery of care to such patients.
CARDIOVERSIONS AND MRI
The JR2 theatre anaesthetist (bleep 4321) arranges for the most appropriate person to cover. If it is one of our admitted patients we may be asked to perform this.

CROSS COVER WITH OTHER ICUS
Very occasionally the ICU anaesthetist is asked to cross cover either the Paediatric ICU or the cardiothoracic critical care unit (CTCC) for airway emergencies. This usually occurs either because of staff sickness on the other units or because the staff are away on transfers. Please ensure that you bleep one of the CareVue team in good time to get your passwords rights extended to cover PICU and CTCC should cross site cover be necessary.

SPECIFIC GUIDELINES
There are a wide range of guidelines covering different treatments for ICU patients in a series of folders in the seminar room and, increasingly, on AICU.net, the department’s intranet site. In addition standard drug infusions and drug infusions rates are programmed into the CareVue clinical information system. Several guidelines are included as appendices to this booklet.
**EMERGENCIES**

If you are new to Oxford, you need to know where the following areas are:

- Emergency Department (esp. Resuscitation Area)
- Emergency Assessment Unit (EAU)
- Surgical Emergency Unit (SEU)
- CT Scan
- CCU & Cardiothoracic Critical Care (CTCC)
- Cardiac Cath Labs
- MRI Scanner
- Main theatres (including the location of the stock of O negative blood)

When you start doing on calls, you need to know how to get hold of appropriate help urgently. The consultants are happy to be contacted at any time. There is a list of consultant contact numbers in the intensive care and via switchboard.

You will be given a tour of the ICU on your first day (see Appendix A). This tour includes all the main items of emergency equipment.

The following list is not comprehensive, but you should know where the following equipment is located:

- An intubation trolley is located in each unit. There is also a difficult intubation trolley in each unit.
- **Code 6789**
- Anaesthetic drugs: These are kept on the intubation trolleys, muscle relaxants are kept in the drug fridge, fentanyl is kept in the controlled drugs cupboard (NB for rapid sequence inductions, do not use suxamethonium on ICU - use rocuronium 1mg per kg (10 ml for a 100 kg patient), B bay basic airway trolley only has sugammadex and bronchoscopy equipment. The Bronchoscope is in B sluice.
- There is a defibrillator in each Unit, one of which can be used for external pacing. NB The resuscitation officers are very happy to organise training sessions in the use of this. See "Educational Resources”
- Intercostal drains - pre-packaged packs contain everything needed (in A Bay on AICU).
- You should know how to inflate and deflate low loss air beds in the event of an arrest.
PATIENT TRANSFER
Several identical orange shoulder bags are kept in the unit. They contain transfer equipment for both in-hospital transfers and out-of-hospital transfers. Check it before you leave (checklist in document pack which is attached to trolley handle).

- Take your mobile phone, wallet, something warm to wear, have a full stomach and an empty bladder.
- You will need to take extra equipment (e.g. if retrieving a patient, pumps for inotropes).
- You will also need to take a portable monitor; portable ventilator and portable suction.
- In particular, check the ventilator that you are taking before leaving to pick someone up from another hospital.
- Make sure all electrically powered items are kept on charge until just before you leave.
- Take additional batteries for the monitors and ventilators.
- Ensure that they are put back on to charge when you return.
- Take care to use a heat and moisture exchanger (HME filter) whenever you use a portable ventilator.
- Special transfer charts are available in the packs.
- Observations are completed by the nursing staff.
- File the completed form in the case notes after the transfer.
- When you return, restock any items you have used.

To retrieve a patient, you can ask the porters to order an urgent docket taxi (you will be asked for your ID badge number) to take you to, for example, the Churchill. Order an ambulance to return once the patient is stable and ready to transfer – the contact number is in the transfer document pack.

Physicians should go on one or two routine transfers with an anaesthetist so that they can transfer solo suitable cases around the hospital during their time on the unit. FTSTAs are encouraged to start becoming involved with transfers at an appropriate stage. Transfers vary in complexity. We are fairly good at anticipating difficulties but an extra pair of hands is always welcome.

The STaR (Safe Transfer and Retrieval) manual is recommended reading. The regional transfer course teaches the ACCEPT approach to transfers:

- Assessment
- Control
- Communication
- Evaluation
- Preparation/packaging
- Transport

All transfers are to be completed with a debrief.
CAREVUE
CareVue is the Philips Clinical Information System (CIS) which records and stores physiological data, laboratory results, medical and nursing interventions and drug prescriptions. There is a workstation at every bed space as well as central workstations. In addition, there is a central workstation where vital sign instabilities can be reviewed and documented.

The CareVue Lead Nurse is Clare Williams. She will manage your access to the system and trains all new doctors in the use of CareVue. All requests for data from CareVue for medical audit/research purposes must be approved by one of the ICU Consultants before approaching the CareVue team.

All prescribing, documentation of lines, significant events/procedure time lines and medical discharge summaries are completed using CareVue. Therefore, it is essential you get familiar with the basics of CareVue within your first week. The CareVue team will be on hand to help you.

Clare will provide mandatory training sessions on a group or individual basis but you MUST contact her directly by email (clare.williams@ouh.nhs.uk or ext 22876 or alternatively through Eli.Terziu@ouh.nhs.uk) BEFORE your first shift. She will provide availability for training sessions BEFORE or ON your first shift on AICU or CICU. It is your responsibility to book a time/date.

NB: If you are starting on nights or any weekend shift it is imperative that you have had CareVue training BEFORE your first shift as NO TRAINING MEANS NO PASSWORD and therefore no access to the system. In extenuating circumstances please contact Clare Williams and Eli Terziu.

Your password is the equivalent of your signature and therefore must remain confidential. If you are experiencing problems with your password or have forgotten it please get in contact with one of the CareVue team on Bleep 1271 or IT helpdesk 22822 immediately during office hrs. It is NOT acceptable to lend or borrow colleagues’ passwords.

Once you have familiarised yourself with the basics of CareVue, the following list is a guide to things that you should know how to do:

- Prescribe individual drugs using the pre-configured lists, documenting appropriately and considering
  - Type and method of administration
  - Dose
  - Timing of administration (schedule)
  - Duration
  - Contraindications
- Appropriately select only the applicable drugs from “Order Sets” (e.g. when a patient is admitted)
- Prescribe a drug that is not available on a pick list
- Copy a prescription to amend an existing regime
- Sign for a prescription
- Discontinue a prescription
- Document/amend a patient’s allergies
- Acknowledge red flags (these indicate a new/altered/discontinued prescription).

The prescription chart must be reviewed daily. This is the responsibility of the doctor completing the daily review. Discontinue drugs that the patient is no longer receiving.

- Complete a VTE assessment form using CaseNotes and prescribe a 72hrly reminder on CareVue.
- Navigate to:
  - Invasive Monitoring Flowsheet
- Adult Flowsheet
- MDT Forms
- Medication Overview
- Lab Data
- AICU.net – in house website detailing drug and procedural protocols.

- Create and accurately complete a Medical Discharge Summary
COMMUNICATION

DOCUMENTATION

• Any events/procedures are entered contemporaneously in the patient’s medical notes and in chronological order.
• Sign and print your name to all entries.
• Visiting teams are encouraged to communicate via the patient case notes.
• It is important that any tests/samples taken are recorded so that investigations are not lost or forgotten.
• At the end of each day a précis of the day’s events is added to the progress notes
• Please also ‘endorse’ the lab blood test results on CareVue to prove the results have been seen.

Note, we will be moving to an entirely online system in early 2018.

CARE OF RELATIVES

Please ask the patient’s nurse to accompany you when interviewing relatives and document key points of the interview in the notes (staff and relatives present, explanation given, decisions reached). On most occasions, relatives are seen by the consultant but you should try to accompany them whenever possible.

Please note: The Admin office is in use from 0800 – 1600. It is not to be used by the medical staff to see relatives.
DISCHARGE OF A PATIENT
All patients leaving the unit must leave with a clear, comprehensive and succinct discharge summary. This is generated using CareVue. If a patient dies an appropriate summary is required (see “Death of a Patient” below). The summary is printed, signed, and one copy is filed in the patient’s notes.

A person in the team that will be responsible for the patient once they are discharged should be named in the summary and contacted for at least a verbal handover. A ward drug chart must be written, with specific treatment plans recorded in the notes and on the discharge summary where appropriate (e.g. planned stopping date for antibiotics). Oxygen should be prescribed specifying a target range e.g. “90-94%” rather than simply “>90%”. A summary of the previous seven days investigations is also produced using CareVue.

DEATH OF A PATIENT
In all cases, the attending doctor confirms that the patient has died and notes the time of death. If the death is to be referred to the Coroner, ensure that the relatives understand that the medical certificate of cause of death (death certificate) will not be available for collection in the normal way. If you are unsure whether a death should be referred to the Coroner, or you are unsure what to put on the medical certificate of cause of death, please discuss with a senior.

The cause(s) of death need to be recorded in three places
1. The medical notes
2. CareVue Summary (see “Discharge Summaries” in “Communication” section, page 9)
3. Medical Certificate of Cause of Death

The Patient’s Affairs staff (x20110 or x20111) are very helpful.

If you do need to discuss a case with the Coroner’s officer, they are available from 08:00 (number on list by nurses’ station). In some circumstances (e.g. consideration for organ donation) a Coroner’s officer can be contacted out of hours. This remains the responsibility of the medical staff. The bereavement office will guide you through online coroner referrals from 0830 - 1700.
MICROBIOLOGY

GENERAL POINTS
The Intensive Care Unit enjoys an excellent working relationship with the Microbiology Department. Lunchtime ward rounds take place seven days a week. Each day a plan will be made for antibiotic therapy for the next 24 hours. Push for a backup plan if the patient develops sepsis in the intervening period. It is important that this plan is clearly documented. This plan and other microbiology issues should form part of the structured presentation on routine ward rounds. This information must be communicated to the night shift registrar. Out of hours, always discuss urgent requests (e.g. CSF) with the duty microbiology SpR but they do not have access to the pathology system from their beds.

NON-DIRECTED BRONCHIAL LAVAGE
Frequently referred to as "BAL", this procedure will be shown to you and an easy-to-follow guide is available on the ICU intranet. It involves obtaining a lavage using 20ml of saline and a 14 Fr suction catheter. Results from semi-quantitative bacterial culture help to guide patient management. The BAL protocol is being reviewed – it used to be performed routinely Monday, Wednesday and Friday on all ventilated patients (Appendix I) however more commonly follows respiratory deteriorations and as a part of a septic screen.

CENTRAL LINE POLICY
Antibacterial impregnated central lines are used. The default is to use quad-lumen catheters. Normally these central lines are resited after eight days. Haemofiltration lines are changed when clinically indicated but when lines are changed because of suspected or proven sepsis, it is normal to change all lines in one swoop. Central and haemofiltration lines should be inserted using the OUH custom pack. Full aseptic technique is mandatory, including a large drape for the patient, with the operator wearing a sterile gown, gloves and a mask. Alcoholic chlorhexidine (2%) is applied using two ChloraPrep applicators for 30 seconds each.

ANTIBIOTIC POLICY
Antibiotics may be started or changed when clinically indicated, but appropriate cultures must always be taken. Blood cultures should always be taken from a clean venepuncture site (the femoral site is often a good choice in the sicker patients), or when inserting a new central line under aseptic conditions. A suitable empirical regime is often defined on the microbiology ward round, but a microbiologist is always available out of hours if advice would be helpful.

You can find a copy of the Trust’s antibiotic policy on the hospitals intranet and on the App called Microguide.

Aminoglycosides are frequently used as an adjunct to empirical antibiotic therapy in haemodynamically unstable patients suspected of having sepsis. This is usually used for short periods until the microbiology of the episode has been defined (24-48 hours). Once daily dosing is used with infusions of 5 mg/kg\(^1\) given over 60 minutes.

INFECTION CONTROL
The commonest way organisms spread from patient to patient is on the hands of those who are caring for the patients. Despite this medical compliance with hand hygiene is poor (65-70%). Hand hygiene is a key performance indicator for the Trust and is regularly audited. The following infection control measures are mandatory for all staff:

- Hands must be washed (soap & water) or decontaminated (alcohol-based hand gel) before and after each patient contact
Wear gloves and plastic aprons for all patient contact.
If contaminated with blood or secretions, hands must be washed with soap and water.
Following contact with patients suspected of having *Clostridium difficile* hands should be washed with soap and water.

**DRESS CODE**
Trainees tend to wear scrubs. Please also adhere to the Trust guidelines below.
- Shirts should be short sleeved, or long sleeves should be rolled up above the elbow
- Wristwatches should be removed
- White coats should not be worn
- If worn, neckties should be restrained by a tie-clip so that they cannot come into contact with the patient
- Rings with faceted stones or ridges should not be worn while in contact with patients

**MRSA AND OTHER RESISTANT BACTERIA**
The commonest multiresistant bacterium in the ICU is MRSA. All patients have a nose and throat swab taken for MRSA screening on admission for surveillance purposes and to help in choice of empirical therapy (lower threshold for giving vancomycin if MRSA colonised). Patients transferred from other hospitals have a higher risk of carrying the organism and should be barrier nursed in a side room (if available) until the result of the admission MRSA screen is known (result takes 3 days).

**ISOLATION POLICY**
Patients known to be colonised with MRSA or other multiresistant organisms (VRE, ESBL) should be managed in a side room if available and barrier nursed.

Patients with open (smear-positive) pulmonary TB or Chickenpox should be managed in a single room. If you have not had Chickenpox ask Occupational health to check your VZV antibody status. If you are non-immune you must not care for patients with Chickenpox or Shingles.

If demand for side rooms exceeds supply, side rooms should be allocated according to the risk to other patients. Always seek advice from Microbiology or the Infection Control nurses about prioritisation but in general the following rank order will be used starting with those with highest priority:
1. Open pulmonary TB
2. Chickenpox / Disseminated Zoster
3. Zoster in the immunocompromised
4. ESBL Gram negatives
5. MRSA
6. VRE and others

When there are insufficient side rooms and there are patients who share the same organism, cohorting may be required – seek advice from the Microbiologist or the Infection Control Nurse.

The side rooms cannot be controlled for negative or positive pressure. Neutropaenic patients are put in side rooms preferentially to protect from infection from human factors.

**INFECTION CONTROL NURSES AND POLICY**
The Microbiologists will keep the Infection Control Nurses (ICNs) up to date on a daily basis with any results or diagnoses that have a bearing on infection control issues in ICU. This is important because the ICU nurses will usually seek advice on such matters from the ICNs.
There is very comprehensive Infection Control guidance in the Trusts Infection Control Manual. This has a yellow cover and can be found on the Unit.
PHARMACY

There are several clinical pharmacists who support critical care across the Trust. The team currently consists of:

Mark Borthwick, Consultant Pharmacist, Critical Care (Bleep 4017)
Olivia Moswela, Specialist Pharmacist, Neuro Critical Care (Bleep 6274)
Katharina Floss, Specialist Pharmacist, Theatres and Anaesthetics (Bleep 4516)
Tracy Percival, Specialist Pharmacist, Churchill ICU (Bleep 4371)

There are often other visiting pharmacists on the unit to support specific teams such as the Nutrition Team, Microbiology and the Acute Pain Service. Other pharmacists are present on the unit on a rotational basis in order to receive training.

INFORMATION SOURCES

e-BNF
Get the apps NICE BNF and NICE CHILDRENS BNF on your phone. They update frequently, usually during an emergency.
There is access to the e-BNF through the Trust’s website and through CareVue. It is searchable using keywords and a degree of built in editing has allowed the Trust to add comments about the use of certain medications. Entries also indicate whether a drug is on the hospital formulary or not. Non formulary drugs are not routinely stocked by the pharmacy and there may be a delay in obtaining such items.

MILs
Medicine Information leaflets are available through the Trust’s website (on the banner on the left hand side of CaseNotes under “Therapeutics”). These are the Trust’s policy statements on the use of certain drugs, or management of certain conditions. Examples include “Bacterial Meningitis: Steroids and Antibiotic Therapy”, “Prescribing Proton-Pump Inhibitors and Helicobacter Pylori Eradication - Guidelines for Adults” and “Guidelines for Treating Status Epilepticus”. They are written by clinicians with specific expertise in the area in partnership with pharmacy. They are approved by the Trust’s Drug and Therapeutics Committee (known as MAC) before publication.

CareVue
There is a wealth of information available on the local critical care intranet site that can be accessed alongside CareVue at the patient’s bedside. Useful information for the prescriber includes documents outlining doses of drugs in different stages of renal impairment, a minimum dilutions document (useful for fluid restricted patients), a document that gives information on the management of delirious patients and protocols for the care of specific patients, such as kidney-pancreas transplant patients.

HIGH RISK DRUGS

Whilst all drugs are inherently risky, local experience has thrown up particular issues with specific medications and these are listed here:

<table>
<thead>
<tr>
<th>Drug</th>
<th>Drug</th>
<th>Drug</th>
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</thead>
<tbody>
<tr>
<td>Digoxin</td>
<td>Insulin</td>
<td>Anticoagulants</td>
</tr>
<tr>
<td>Carbamazepine</td>
<td>Phenytoin</td>
<td>Sodium Valproate</td>
</tr>
<tr>
<td>Opiates</td>
<td>Gentamicin</td>
<td>Aminophylline</td>
</tr>
<tr>
<td>Lithium</td>
<td>Cytotoxics</td>
<td></td>
</tr>
</tbody>
</table>

24
Extreme care must be taken, particularly when admitting patients from other wards or care providers. The altered pharmacokinetics frequently found in the critically ill and the potential for information being poorly transmitted from one team to another during handover can have disastrous consequences.

Ensure that all pertinent information is recorded (historical and current) and accessible to the rest of the critical care team, highlighting specific dangers where identified. Pay particular attention to:

- Loading doses
- Drugs with a narrow therapeutic index
- Patient allergies
- Drug dosage forms (modified release vs. quick release)

Chemotherapy is often prescribed on a computer system that may not be accessible to the critical care team. Paper copies can sometimes be found in the medical notes. If receiving a patient from a haematology or oncology team, specifically ask if there are any medications prescribed on an electronic system and so do not appear on the paper ward charts.

**ROUTINE PRESCRIBING**

**Sedation Practice**
The mainstay of sedation / analgesia is with propofol / fentanyl. Sedation practice is under review with the aim of maintaining lighter sedation, appropriate analgesia and minimising delirium. The Richmond Agitation Sedation Scale (RASS) is in use, the default RASS target is 0 (calm and alert), although in some cases other targets may be chosen. This will only be done on the ward round and the decision will be documented in the notes. Sedation holds are mandated in all patients, unless a specific exclusion has similarly been identified during the ward round and documented in the medical notes.

**VTE prophylaxis**
Dalteparin 5000 units once daily at 18:00 by subcutaneous injection. Evening doses allow procedures to take place during the day (such as line insertion). Risk stratification for venous thromboembolism creates two dose bands; the vast majority of critically ill patients are high risk but occasionally the lower dose of 2500 units daily is acceptable in relatively simple cases. A VTE risk assessment tool is in use throughout the trust and must be completed for each patient. The tool must be completed within 6 hours of hospital admission and reassessed within 24 hours. It is revisited if the patient’s clinical state changes. This means that all new admissions to critical care require a VTE risk assessment. The tool is located on Casenotes under each patient’s individual record.

**Stress Ulcer Prophylaxis**
Ranitidine 50 mg three times daily by intravenous injection or 150 mg twice daily enterally is routinely prescribed for ventilated patients on admission. Change to enteral at the earliest opportunity. There are many identified risk factors for bleeding from stress ulceration, but the two cardinal factors are invasive ventilation for greater than 48 hours and coagulopathy. That said, the incidence of stress ulceration is much less than in years gone by. Ranitidine is usually stopped when a patient is tolerating enteral feed. There is a unit protocol but in general a specific indication is needed such as shock, coagulopathy, pertinent past medical history, treatment with e.g. steroids. H2 receptor antagonists may be linked to acquisition of *C. difficile*. As the incidence of *C. difficile* related disease is increasing in recent years (there have been a small number of deaths in this Trust), only use stress ulceration prophylaxis when indicated and stop promptly. Dose reduction is required with renal impairment (50 mg bd rather than tds). Intravenous omeprazole is subject to a MIL and should not be routinely used. Omeprazole 40 mg daily by intravenous infusion may be used where patients have evidence of GI bleeding despite ranitidine. PPI’s are also linked to *C. difficile* acquisition.
**Laxatives and Motility Stimulants**
The use of routine laxatives is governed by a “Bowel Policy” found on CareVue. Motility stimulants are often required. Metoclopramide 10mg three times daily is first line. Erythromycin 250mg twice daily is a common regimen for second line. Various methods to provide post-pyloric feeding are available.

**Antimicrobial Dosing**
There are standard doses of most antimicrobials unless otherwise directed by microbiology for specific infections. The doses may be modified to take into account renal or liver function. Meropenem is given at 500mg tds for the majority of infections. 2g tds is used where assured penetration of the CNS is indicated and 500mg qds is used for neutropenic sepsis. Vancomycin is given by continuous infusion, following a loading dose. The patient is switched to teicoplanin when they leave critical care. Clearly if the patient is due to be discharged from critical care less than 24 hours from initiation of therapy, teicoplanin should be used.

In almost all cases, enteral antibiotics are considerably cheaper than intravenous, switch to enteral ASAP. (200mg IV fluconazole, £23.79 cf 200mg capsule, 14 pence. 400mg IV ciprofloxacin, £27.73 cf 500mg ciprofloxacin tablet, 3 pence)

**Amiodarone**
Intravenous amiodarone is loaded by giving 300mg over an hour followed by two infusions of 450mg, each lasting 12 hours. This gives an initial dose of 1200mg and is followed by a daily dose of 300mg intravenously. If at all possible, load enterally with the conventional load of 200mg tds for a week, bd for a week and daily thereafter as maintenance. Amiodarone has a different pharmacological action given IV cf when given enterally. Accelerated loads and other regimens may well be advocated by cardiology.
NUTRITION
There are two Dietitians who support critical care across the Trust:

Michelle Rutledge, Senior Critical Care Dietitian, JR site (Bleep 4008)
Karen McDermott, Senior Critical Care/Nutrition Team Dietitian, CH site (Bleep 5010)

The Dietitians cover ICU Monday to Friday. All patients requiring enteral nutrition are individually assessed. Patients who are eating and drinking are not routinely seen by the Dietitian unless they are highlighted as a high nutritional risk.

For ICU specific protocols/policies/guidelines see CareVue;

- Starter NG feeding flowchart
- Starter NJ feeding flowchart
- Starter PEG feeding flowchart
- Starter JEJ feeding flowchart
- Guidelines for NG position checking

There are hospital-wide enteral and parenteral feeding guidelines which are available on the Trust Intranet A-Z under Dietetics:

- Adult Refeeding Syndrome Guidelines
- Adult Enteral Tube Feeding Guidelines
- TPN Guidelines and information
- PEG insertion request form

The majority of ICU patients are enterally fed and the aim is to initiate enteral nutrition within 24hrs of admission if possible.

Patients that may require Parenteral Nutrition (PN) should be discussed with the unit Dietitian as early as possible and a line on their CVC dedicated for PN. The Nutrition Team will then come to the unit to assess the patient. From Monday to Friday all PN should be ordered before 11am. All PN provided in our Trust is made offsite. The daily ordering deadline is to give the company sufficient time to compound the bag in order for the bag to reach the unit that evening. As per NCEPOD recommendations PN is never an emergency and is therefore not available out of hours. The long bank holiday weekends are an exception to this rule, where PN is available by calling the on call Dietitian via switchboard.

If NJ feeding is indicated please discuss with the unit Dietitian, who will liaise with the enteral nutrition nurse to arrange NJ placement. Single lumen NJ tubes can be placed endoscopically by the Gastro SpR or using Cortrak by an Enteral Nutrition CNS. Double lumen NG/NJ tubes are also available should concurrent drainage of gastric aspirates be required.

Hypernatraemia is more likely due to water deficit than excessive sodium administration and is most commonly corrected by giving an appropriate quantity of water. Check if sodium intake from other sources can be altered (certain medications contain a significant amount of sodium). If you have a concern about an enteral feed please liaise with the unit Dietitian.
CLINICAL GOVERNANCE
Mortality and Morbidity meetings occur every Friday as part of the weekly meeting (details below). All ICU
deaths, significant morbidity and/or near misses should be discussed at these meetings. Your participation in this
process is important and is actively encouraged.

Reporting of Critical Incidents is essential. If in doubt about whether an incident should be reported, please
discuss with the Consultant on call. Incidents should be reported using the Trust Datix system.

Involvement with incident resolution and system design is actively encouraged. Please contact Dr Wong or Special
interest nurses Cherry and Olivia to find out more.
EDUCATIONAL RESOURCES

WEEKLY LUNCHTIME SEMINARS (FRIDAY 13:00-14:00)
Topics of general clinical interest, interesting cases and basic science topics are presented. A section of these meetings are dedicated to a review of Morbidity & Mortality. Seminars take place on Fridays at 13:00 in the ICU seminar room. You are expected to attend >75% of these seminars and are encouraged to present.

JOURNAL CLUB
There is an active journal club. This currently runs fortnightly on Fri mornings at 07:30 in the AICU seminar room. Attendance and presentation at the journal club is encouraged, particularly for those with a career interest in ICM, but voluntary. Papers for presentation will be forwarded to you the week prior to read in the bath. If you are presenting there is a standardised format to make you think more widely around the subject. Raja (raja.jayaram@ndcn.ox.ac.uk) curates and sends out exquisite papers; beg Helen (hcronshaw@doctors.org.uk) to let you present; talk to Dr McKechnie for further guidance. Bring your best chat and a coffee.

JOURNALS
The major ICM journals are "Critical Care Medicine", the journal of the (American) Society of Critical Care Medicine (SCCM), "Intensive Care Medicine", the journal of the European Society of Intensive Care Medicine (ESICM) and JICS, the Journal of the Intensive Care Society (ICS). Articles relevant to ICM also frequently appear in the mainstream medical literature – NEJM, The Lancet, JAMA & BMJ.

ELECTRONIC RESOURCES
The (UK) Intensive Care Society website (www.ics.ac.uk) is a good starting point. The FFICM syllabus (Fellowship exam of the Faculty of Intensive Care Medicine) is a good structure to learning. You may want to join the European Society of Intensive Care Medicine for their excellent resources. Or Go Aussie, Crit-IQ if you are hard enough, Critical Care Reviews is good.

Other old favourites are UptoDate – available on the intranet; extensive and brilliant - and LifeInTheFastlane is great for mortals.
ACKNOWLEDGEMENTS
Parts of this booklet were written by Stuart Benham and Tim Ringrose. Helen Dewar and Gina Tomlin wrote the first section
on Nutrition, revised by Michelle Routledge. The section on Microbiology was written with Ian Bowler and Chris Conlon. Other
contributions were made by Duncan Young and Jonathan Chantler. The first edition was written by Julian Millo in 2000. The
booklet was reviewed and updated in 2009 by Julian Millo, Jane Wollard, Jonathan Chantler, Stuart Benham, Mark Borthwick
and Lynne Nairn; revised again in Jan 2012 by Stuart McKechnie, Matt Holdaway, Mark Borthwick, Clare Williams and Hanna
Chin; and updated in November 2017 by Barnaby Lewin.
APPENDIX A - INITIAL ORIENTATION CHECKLIST
The following is a checklist to be used on a guided tour of the unit on your first day.

Standard bed space / section
- Puritan Bennett Ventilator
- Philips monitor
- CareVue workstation
- Drug information (AICU.net)
- Defibrillator (including external pacing)
- Intubation trolley (includes drugs and selected equipment for failure of conventional intubation)
- Procedures trolley
- General disposables
- Neuro exam equipment
- Blood bottles (guidance on clinical intranet)
- Drug cupboard
- Transfer bags (nb monitoring charts)
- Inability to Consent forms

Blood gas room
- Blood gas analyser
- Bronchoscope, intubating fibroscope

Respiratory Storeroom
- Non-invasive ventilation equipment
- Cricothyrotomy equipment

Storage racks
- Chest drain packs
- PACing equipment
- ICP monitoring equipment
- Blood culture bottles
- Quad lumen lines (default choice)
- Vascaths
- Pigtail drains

Transfer equipment and PACS viewer
- SonoSite ultrasound (for lines)
- Esaote ultrasound (pleural effusion research and ECHO)

Store Rooms
- Oesophageal Doppler monitor
- Haemofiltration machines
- Forced air warmers and fluid warmers
- Intubating fibroscope

Relative’s room
Major incident cupboard (opposite Consultant Office)
Equivalent equipment is available in the Churchill ICU
APPENDIX B- EQUIPMENT

VENTILATORS
Our mainstay ventilator is the Puritan Bennett. The latest version is the 840. The Breas ventilator or the Draeger Oxylog 3000 is used to transfer patients who are difficult to ventilate. Non-invasive ventilatory support can be undertaken on the unit using a Respironics Vision or the LTV ventilator.

BRONCHOSCOPE
Instructions for cleaning the bronchoscope are attached to the cupboard on a laminated card. The bronchoscope should be cleaned in Endoscopy (level 2) during office hours. If you use it you must make sure it goes with a patient label. A label should also be put in the bronchoscope log (attached to the trolley).

It is the duty trainee's is to check that the scope is ready to use immediately in case of emergency.

HAEMOFILTERS
The Renal Team will be happy to demonstrate how to set up a haemofiltration circuit. This is usually carried out by the nursing staff.

OESOPHAGEAL DOPPLER
We have two machines; the nursing or medical staff can demonstrate their use.

ULTRASOUND DEVICES
Used for line placement. It is useful to learn to use this on easy cases first.

AIRWAY EQUIPMENT
In AICU, additional equipment for airway management is kept in Unit B. Equivalent equipment is available at the Churchill.
APPENDIX C - MAJOR INCIDENT FIRE AND INTERNAL DISASTER PROCEDURES

**MAJOR INCIDENT PROCEDURE**

The Major Incident Procedure has two levels of activation, stand-by and declared. The bleep holders are the first to be called so it is important that all those carrying the bleep are aware of the procedure.

The procedure is detailed on a series of cards in the major incident cupboard located next to the ICU consultant’s offices, which also contains additional equipment.

Once a major incident is activated the Consultant is to be informed and they will come into the hospital if it is out of hours.

Contact the duty consultant, liaise with the nurse in charge of the unit and follow the procedure cards.

If the unit cannot take the required number of ventilated patients, we would use Neuro ICU, Recovery, Theatres and Cardiac ICU.

**FIRE PROCEDURE**

Fire evacuation plans are shown on the unit (currently wall mounted behind the desks in each unit). In the event of a fire, smash the glass of a fire alarm box.

There are CO₂ and H₂O extinguishers located in the unit and in the corridor.

An intermittent alarm sounding means the fire is on your level, but not in your immediate area.

A continuous alarm sounding means the fire is within your area,

Wherever possible patients should be evacuated within the hospital building.

Piped oxygen and electricity may be cut off, even if the fire is not in the unit. Every bed space has an emergency oxygen cylinder and a self-inflating resuscitation bag.

**INTERNAL DISASTER PROCEDURE**

Procedures for internal disaster, i.e. oxygen and electricity failure are detailed in a folder located in the major incident cupboard.
APPENDIX D - THE RECOGNITION AND MANAGEMENT OF A DISPLACED TRACHEOSTOMY

These guidelines apply to a ventilated patient managed in an intensive care unit in the OUH. Be aware cuffs can herniate, tubes can become blocked.

Make sure a tracheostomy returning from theatre has had:

1. A bronchoscope down the tracheostomy lumen and
2. A bronchoscopic view for position via the standard oral route.

**Recognition**
- Ventilator alarm: low exhaled tidal volume
- Reduced chest wall movement
- Reduced breath sounds
- Resistance to the passage of a suction catheter
- Reducing SpO2
- Loss or reduction in CO2 Trace
- Cyanosis
- Loss of consciousness
- Bradycardia
- Hypotension
- Cardiac arrest: PEA or asystole

**nb** wave form capnography is the NAP4 gold standard on every intubated or tracheostomised patient

**Action**
- Call for help
- Deflate the tracheostomy tube cuff
- Ventilate with 100% oxygen via a facemask
- Remove the tracheostomy tube
- Occlude the stoma with a gloved finger
- Intubate using an oral endotracheal tube
- Consider decompression of pneumothorax

Dr Julian Millo, 2007 – updated in 2017 by Dr Barnaby Lewin

**References**
APPENDIX E - INFORMATION FOR ANAESTHETISTS ASSISTING WITH A PATIENT IN THE ED

Before induction of general anaesthesia, the anaesthetist will select and prepare the appropriate ETT for the patient. Once positioned the anaesthetist will inflate the cuff, tie the tube and connect the ETT to the anaesthetic machine (Oxylog) as necessary.

When time is short, the anaesthetist can expect the following of the ED nurse (remembering that they may need prompting and direction given that this is a subsidiary role):

- That the intubation Check List is available and being followed (in a heart-beating, ventilatable case)
- That equipment has been checked and is ready to use
- That anaesthetic drugs will be retrieved from the fridge and cupboard, and handed unopened to the anaesthetist. Drugs should be drawn up by the person administering them. RSI boxes are prepared with all non-controlled drugs.
- Familiarity with the use and assembly of a BVM and the Oxylog
- Ability to ventilate patient using BVM as a 2 person technique
- Connecting up ET CO2 detector prior to intubation
- Preparing nasal prong O2 for diffusive apnoeic ventilation
- Getting out ETT, laryngoscopes and boogie
- Checking of ETT cuff
- Application of aquagel on ETT
- Cricoid pressure (*Nurses may wish to check correct position in some patients*)
- Passing ETT, laryngoscope and boogie to anaesthetist
- Assisting in use of the boogie (loading tube etc)
- Inflate ETT cuff
- Tying ETT

There are two nurses allocated to work in the resuscitation room on each shift. Therefore at times there may only be one nurse assisting with a patient due to departmental pressures. In this situation the nurse will manage the airway with the anaesthetist until the airway is secured, but after this point there will not be a dedicated nurse assistant to the anaesthetist.

Remember, there is a video laryngoscope available in ED and in AICU. Call for senior help early. Theatre anaesthetists should be available too. There are spare scrub bottoms in theatre.

*Jonathan Chantler, Andrea Hill, Sept 2006; updated by Barnaby Lewin in 2017*
APPENDIX F - SPINE CLEARANCE POLICY FOR TRAUMA PATIENTS ADMITTED TO ICU

The protocol only applies to trauma patients who cannot be assessed clinically due to reduced level of consciousness.

Introduction

Patients who are unconscious following trauma need to have the spine cleared to allow optimum management on ICU.

Clearance of the spine is based on a good quality thin slice CT and is the responsibility of the radiologists.

All patients who are admitted unconscious with trauma, where there is a risk of spinal injury, will undergo:

1. A thin section CT from C0 to T4 (C0 to T1 if chest CT is also being performed). This should be performed whether or not the patient has had an initial lateral cervical spine radiograph. The scan should be performed at the same time as the first head scan if the latter is required.
2. The thoracic and lumbar spine should be cleared either by plain radiographs or by reconstruction of the chest and abdominal CT provided the image quality is satisfactory.

As with other investigations these tests should be set up by the junior SpR radiologist on call and images should be reviewed immediately by the senior radiology SpR. The radiology senior SpR will report the scan.

The consultant musculoskeletal radiologist (or fellow) will review the scans that day or evening or the next morning if the scan is performed late at night.

Clearing the spine for ICU nursing care

The senior radiology SpRs will be trained in ‘clearing’ the spine on CT and radiographs. Once trained, that SpR has the authority to clear the whole spine. They will then verbally inform the ICU medical team and write in the medical records (timed and dated) the elements of the spine (cervical, thoracic, lumbar) that are cleared and by what investigation.

For audit purposes all scans will be checked the next day by the consultant or fellow in musculoskeletal radiology.

There is 24 hour Consultant musculoskeletal radiology cover. If the SpR requires advice it must be remembered that radiology works an on call and not a shift system. Unnecessary disturbance at night may result in an unacceptable disruption of work schedule the following day. If the spine cannot be cleared by an SpR during the night then the spine should be considered unstable until the next morning. A consultant is on call through the night and is available for an opinion in exceptional circumstances.

Please refer to the guidance from the Intensive Care Society.

A Spinal Proforma should be filled out ASAP after admission or come with the patient from theatre after spinal surgery. This will advise on what the patient can do and how the patient is to be nursed. This Spinal Proforma is filled out either by the spinal team or trauma team responsible for spine at night. Efforts must be made to have the care plan in place. Without it maximum nursing care (logrolling precautions) must be taken.

Dr Simon Ostlere Consultant Musculoskeletal Radiologist
Keith Willett Professor of Orthopaedic Trauma Surgery
Julian Millo Consultant in Intensive Care
Updated by Dr Barnaby Lewin 2017
APPENDIX G - CENTRAL VENOUS CATHETER PLACEMENT

1. **Choose** central venous catheter (CVC) length is standardised, putting in less than a quad lumen CVC will complicate nursing management. Consider a trialysis line (Vascath with extra lumen for drugs) should you think it would avoid inserting a second CVC.

2. **Insert** CVC to the insertion depth there is no strong evidence about where the tip should be but we aim for the SVC. Through a valve is too far. In the atria is probably ok.

3. **Secure** CVC by stitching to the skin (do not forget to stitch BOTH the wings AND catheter clamp when catheter is not inserted to its full length).

4. **Review** CVC tip position on chest X-ray (and document it in the notes).

5. **Reposition** left sided CVCs if tip does not appear in Zone A, that is between 5 cm above and 5 cm below the carina, with angle < 40° to the SVC long axis. (Remember that you can pull CVC back, but it is not acceptable to push it further in – this requires insertion of new CVC.)

6. US guidance is the gold standard. Subclavians are a good skill to maintain if you are already trained.

<table>
<thead>
<tr>
<th>CVC type</th>
<th>Insertion site</th>
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<tbody>
<tr>
<td></td>
<td>RIJ</td>
</tr>
<tr>
<td>Vascath</td>
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<tr>
<td>Catheter Length (cm)</td>
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<td>Insertion depth (cm)</td>
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<tr>
<td>Multi-lumen central line</td>
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<td>Catheter Length (cm)</td>
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</tr>
<tr>
<td>Insertion depth (cm)</td>
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</tr>
</tbody>
</table>

RIJ – right internal jugular vein, RSV – right subclavian vein, LIJ – left internal jugular vein, LSV – left subclavian vein
APPENDIX H - Epidurals on AICU (adapted from the Acute Pain Service Guidance)

Patient Controlled Epidural Analgesia (PCEA) is most commonly used on patients from theatre following major abdominal/thoracic operations, particularly after elective surgery.

There are a variety of different mixtures of local anaesthetic with or without fentanyl.

Essentially:

1. Plain local anaesthesia mixtures (0.125% (levo)bupivacaine) is used when opiates are contraindicated, usually because systemic opiates are in use, sometimes via PCA when plain epidural has been insufficient or there is pain in an area not covered by the epidural.

2. In addition to the bupivacaine either 2 or 4 micrograms fentanyl per ml is added for comprehensive block. There is little evidence on one dose regime being better than the other.

A standard prescription is 4-12 ml/hour with a patient bolus available of 3 mls (with a 30 minute lockout to prevent the patient receiving an unsafe number of boluses).

Transferring the prescription to the ward drug chart when the patient leaves the ICU is particularly important. It has been the source of several prescription errors so please take heed of the following:

When transferring the patient to the ward you will be duplicating your work by copying it from CareVue to the EPR system. On EPR a prescription package (called Power Chart) is available- ensure oxygen and naloxone are prescribed.

The Acute Pain Nurses (via switch) can be contacted for further information.

Reviewed 2017
APPENDIX I - BAL (bronco-alveolar lavage) Guidelines

Indications – currently under review, some people perform this Monday, Wednesday and Friday, other people only perform this when there is a clinical deterioration. However indications include:

- Patients who are likely to be ventilated for > 5 days.
- All such patients have alternate day BALs as routine microbiological surveillance for VAP
- For diagnostic purposes in the event of clinical deterioration

Cautions

- Patients who are hypoxic and may deteriorate following BAL
- Patients with raised ICP may need a bolus of sedation and/or neuromuscular blockade
- Patients with uncleared spinal injury require in-line stabilisation

Check with nurse looking after patient re:

- Is this a convenient time for a BAL?
- Is there any patient instability?
- If patient prone to desaturation on suction
- If ABG is required before BAL

Check

- Ventilation settings and Oxygen saturations
- Check suction system is working

Equipment List

- 20ml syringe
- 20mls Normal Saline
- Size 14 (green) suction catheter
- Bronchoscopy swivel connector if patient on high PEEP (>10) or FiO2 (>0.6)
- Inco-pad (to cover patients’ chest)
- Pair of non-sterile gloves and apron
- Facial visor or glasses and mask to protect against spray/droplets
- Specimen container and microbiology card

Preparation

- Pre-oxygenate the patient with 100% O2 (most ventilators on the unit have a pre-oxygenation mode) for 2 minutes.
- Draw 20mls N/Saline into the syringe.
- Remove (pull off) green ‘hub’ of suction catheter and attach catheter to syringe (do not remove catheter from outer packaging yet).
- Inform patient that about to do BAL, place inco-pad on patient’s chest.
- If clinically indicated attach bronchoscopy swivel connector to ETT.
- Ensure Oxygen saturations adequate before commencing BAL.
- Just prior to BAL, inject the N/Saline through the dead space of the suction catheter to the tip. This acts to lubricate the catheter.

BAL sampling

- Silence the ventilator alarm.
- Disconnect patient from ventilator (unless using bronchoscopy swivel connector).
- Place suction catheter into ETT/Trache to the carina and inject the 20mls N/Saline over approx 2 seconds.
- Withdraw suction catheter slightly and then aspirate the secretions (not too rapidly) at this position.
• The full volume of saline is unlikely to be aspirated back (typically only 2-10mls of aspirate is retrieved).
• Monitor heart rate, rhythm and O2 saturations whilst performing procedure.
• Do not continue to aspirate on withdrawal of the suction catheter as it is only the distal secretions that are sought.
• Reconnect patient to ventilator and if necessary suction patient again using the in line suction catheter. Oro-pharyngeal secretions may also need to be suctioned.

Post BAL care
• Reassure patient.
• Check patients O2 saturations are satisfactory - they may need 100% O2 for a further period of time.
• Ensure ventilator alarms are switched back on.
• Ensure patient is stable before leaving their bedside.
• Remove suction catheter from syringe and instil sample into pot.
• Samples must be labelled BAL (not sputum) for C&S.
• Document on CareVue in the Respiratory section that you have taken a BAL and in patient’s medical notes.

Reviewed Barnaby Lewin 2017
APPENDIX J - Patient Safety Group

Current infection rates suggest that the level of performance required to avoid HCAI (Health Care Acquired Infection) is not maintained consistently. The aspects of care that cause infection are at the heart of our most fundamental elements of clinical practice, and we must strive to perform these activities correctly every time.

To support the delivery of evidence-based practice, staff need to be clear about the elements that are required to perform safe care and have a method of being able to measure performance. Clinicians require the necessary training, skills and competence to undertake these activities and, importantly, the desire to constantly ‘self audit’, reflect on practice and ask for advice if uncertain.

On AICU, the Patient Safety Group has been set up to audit, educate and fundamentally improve/standardise patient care.

This group is comprised of senior nurses who have an active interest in improving patient care within the working environment.

As part of the unit/trust wide Patient Safety initiative, the group will:
- actively audit
- collaborate results
- challenge substandard practice
- enforce gold standards of care
- provide education as required
- feedback results and highlight performance

The following areas of Saving Lives Campaign and Essence of Care that are being audited are:
- Hand Hygiene
- Non touch technique
- Urinary Catheter insertion and ongoing care
- Central line insertion and ongoing care
- VasCath insertion and ongoing care
- Tracheostomy care
- Ventilator Acquired Pneumonia prevention
- Eye Care
- Mouth Care
- Prevention of C.Diff infection

The tools used by the Patient Safety Group are designed specifically to ensure that services are delivered with minimum variation and designed to make it easy for everyone to do the right thing for patients in every procedure.

All of these standards and the tools used to audit are available electronically, via the CareVue system under the folder 'Patient Safety Group'.

Therefore please be aware that your practice will be audited and that results will be fed back to yourself, senior staff members and trust board of directors.

We appreciate your co-operation in raising our standards to increase patient safety on AICU.

Patient Safety Group
**Generic template of educational opportunities available at the Oxford Adult Critical Care Units**

*This document lists the educational opportunities open to all trainees rotating through the Adult Intensive Care Unit at the John Radcliffe and Churchill Hospitals. This document lists ALL the educational opportunities open to our trainees and therefore requires tailoring for each individual trainee. This will be done at your initial meeting with your educational supervisor who will have a copy of this document in word format for alteration according to your needs.*

*This document can be used as your PDP and represents a learning agreement between you and your educational supervisor who is responsible for ensuring you have access to the following learning opportunities at a reasonable frequency during your attachment here with us.*

<table>
<thead>
<tr>
<th>Please complete details</th>
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<tbody>
<tr>
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<td><strong>Length of attachment with ICM:</strong></td>
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<td><strong>Curriculum:</strong></td>
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<td><strong>Name of ES (CS) for ICM block:</strong></td>
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<td><strong>Main curriculum mapped aims of placement:</strong></td>
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<tr>
<td><strong>Key clinical skills to acquire/maintain during placement:</strong></td>
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<td><strong>WPBAs expected in placement to demonstrate achievement of the above curriculum aims:</strong></td>
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<td><strong>ACATs</strong></td>
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<td><strong>Mini-Cex</strong></td>
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<td><strong>CBDs</strong></td>
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<td><strong>DOPS</strong></td>
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<td><strong>MSF if due (should be annual)</strong></td>
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<tr>
<td><strong>Reflective practice (six pieces annually)</strong></td>
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<td><strong>Others specific to speciality</strong></td>
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<tr>
<td><strong>Weekly generic training opportunities:</strong></td>
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<tr>
<td><strong>Clinical meeting: 1pm Friday (JR site)</strong></td>
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<td><strong>Weekly journal club</strong></td>
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<td><strong>Monthly/less frequent training</strong></td>
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opportunities:

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<th>Activity</th>
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<td>Stage III teaching</td>
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<tr>
<td>Acute Structured Approach Sim training</td>
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<td>Airway Simulation Sim training</td>
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<tr>
<td>Other programme specific training eg. Chest medicine</td>
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Planned presentations:

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<th>Event</th>
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<tr>
<td>Trust level (Grand Round)</td>
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<tr>
<td>Regional (ORICS)</td>
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<tr>
<td>National (SoA/other forum)</td>
<td>Agreed/not relevant</td>
</tr>
</tbody>
</table>

Placement review:

| Points of view form completed | Completion mandatory for sign off |

Formal course attendance planned:

| Mandatory to training stage (different from those listed above) | Optional |

QuIP/Audit opportunities:

| QuIP/Audit opportunities: Please be specific about your intended quality improvement contribution/outcomes/completion and presentation dates | | |

Management opportunities:

<table>
<thead>
<tr>
<th>Management opportunities: Please list intended aims below</th>
<th>Supervisor/Timeline:</th>
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<tbody>
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<td>Current</td>
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<tr>
<td>Planned</td>
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<tr>
<td>Teaching/training opportunities:</td>
<td>Supervisor/Timeline:</td>
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<td>---------------------------------</td>
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<tr>
<td>For example: FICE mentoring</td>
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<tr>
<td>Simulation training for induction</td>
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Current
Planned
Date of completion

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<tr>
<th>e-portfolio PDP</th>
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<tbody>
<tr>
<td>e-portfolio learning contract</td>
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</table>

This completed document represents our commitment to you as a trainee to provide you with relevant and high quality learning opportunities. It can uploaded into your e-portfolio library and be used as the basis for your e-portfolio PDP.

Educational supervisor’s signature indicating a commitment to provide access to the above resources at a reasonable frequency (or as agreed at Deanery/programme level), and to address any issues arising with respect to accessing these opportunities:

Sign and Date:

Trainee’s signature indicating a commitment to achieving these aims and to constructively reporting access issues through their educational supervisor in the first instance:

Sign and Date:

CC April 2017: review date April 2018