Revisions and comments:
Comments on the training programme are welcome from all, and should be directed to the Chair of the IBTICM. It will be kept under review and any changes to be implemented will come into effect six months following their publication.

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The Handbook
Preface

This, the 2nd edition of *The CCT in Intensive Care Medicine*, replaces *The CCT Intensive Care Medicine* Edition 1. It has been revised to align with *Standards for Curricula and Assessment Systems*, GMC, London, 2010.

In 2007 the titles of trainees changed with the introduction of Modernising Medical Careers [MMC] and they changed again in 2008. The term Specialty Registrar [Str] is used throughout this curriculum to encompass trainees who may still be in Fixed Term Specialty Training Appointments [FTSTA] and those with contracts as Core Trainees [CT] and Specialist Registrars [SpR].

\[
\begin{align*}
\text{Str1} & = \text{CT1} = \text{FTSTA1} \\
\text{Str2} & = \text{CT2} = \text{FTSTA2} \\
\text{Str3} & = \text{SpR1} = \text{FTSTA3} \\
\text{Str4} & = \text{SpR2} \\
\text{Str5} & = \text{SpR3} \\
\text{Str6} & = \text{SpR4} \\
\text{Str7} & = \text{SpR5}
\end{align*}
\]

**Abbreviations**

A list of commonly used abbreviations is provided in Appendix 3.

**Advice**

The first point of contact for information concerning a trainee’s training or career planning is this curriculum and the IBTICM website [www.ibticm.org](http://www.ibticm.org).

The next point of contact is the Board Tutor of the department in which the trainee is working. If the Board Tutor is unable to give the necessary guidance then the Regional Adviser should be asked for advice.

Only if the Board Tutor or Regional Adviser cannot help should a trainee contact the Board directly for advice because inevitably the Board will have no knowledge of the trainee’s personal circumstances.
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Overview of the CCT in Intensive Care Medicine

These documents are entitled *The CCT in Intensive Care Medicine*, but the principles described apply to all training undertaken for the purpose of programmes supervised by the Intercollegiate Board, whether Basic, Intermediate or Advanced Training, or training intended to lead to the award of the CCT in ICM with a CCT in a specialty of primary appointment.

This is a multidisciplinary training programme which has been developed by the Intercollegiate Board for Training in Intensive Care Medicine [IBTICM] in conjunction with the parent Royal Colleges, Regional Advisors and trainees in ICM, and many other contributors. It is a programme in evolution; revisions will be published when required.

The Intercollegiate Board will acknowledge satisfactory completion of all of the components of Intermediate or Advanced training formally by letter. Appointment to an approved programme in a post designated for CCT training, followed by satisfactory completion of the training programme and the assessments of competence to Advanced level will permit trainees to acquire a CCT in ICM awarded with the CCT in the specialty of primary appointment.
1. Introduction

1.1 Aim

This document identifies the aims and objectives, content, experiences, outcomes and processes of postgraduate specialist training leading to a CCT in Intensive Care Medicine. It defines the structure and expected methods of learning, teaching, feedback and supervision.

It sets out what knowledge, skills, attitudes and behaviours the trainee will achieve. These are identified as learning outcomes that are specific enough to be a precise guide for trainers and trainees. A system of assessments is used to monitor the trainee’s progress through the stages of training.

1.2 The scope of Intensive Care practice

Intensive Care Medicine has one of the broadest scopes of practice within the field of Medicine. Whilst practitioners may be based in Intensive Care and High Dependency Units their range of referral practice includes most of the modern acute hospital. Within a single day, Intensivists may find themselves involved in the care of patients ranging from the young to the very old; encompassing locations as diverse as the Emergency Department and the day case surgery unit.

The training requirements of ICM reflect both its historic origins and subsequent developments. Intensive Care grew out of two basic patient based needs. Firstly, it was recognised during the polio epidemics of the late 1950s and early 1960s that the management of large numbers of patients with acute respiratory failure was best managed in dedicated areas of the hospital. Secondly, the increasing complexity of surgical practice, again beginning in the 1960s, necessitated the creation of units which could offer more than limited recovery care. More recently the UK ICU Modernisation Agency programme recognised that severely ill patients were best cared for by multi-disciplinary, medical led teams that had expertise in ICM.

This need for a large breadth and depth of Medical, Anaesthetic and Surgical knowledge and skills distinguishes ICM from its parent disciplines. This also explains the need for multiple entry points to ICM training as defined in this curriculum. The close working relationship between ICM and its parent disciplines remains vital to successful practice. It has undoubtedly contributed to the recently documented success of ICM in improving both the process and outcome of care in severely ill patients in the UK.¹

1.3 Curriculum design and development

This curriculum represents a revision and rewrite of the previous curriculum documents taking into account guidance from the following two authorities:

a. The General Medical Council [GMC] has developed and published a schedule of seventeen specific standards with which a postgraduate medical curriculum must comply. The IBTICM

fully accepts these as representing good practice in curriculum and assessment development and this document fully reflects these principles.

b. The NHS Litigation Authority [NHSLA] is a Special Health Authority responsible for handling negligence claims made against NHS bodies in England\(^2\). The NHSLA has published standards expected of Trusts. *For training these emphasise the need for appropriate supervision and assessment, and the documentation of competencies.* To assist employers, trainees and trainers to comply with this, the curriculum defines the competencies that have to be achieved and completed satisfactorily at each stage of training. Importantly, this Edition includes reference to minimum clinical learning outcomes that all trainees must achieve before progression to the next stage of training.

1.3.1 The development process

The development of the syllabus for the CCT in ICM has drawn extensively on the CoBaTrICE syllabus created under the auspices of the European Society of Intensive Care Medicine. The IBTICM acknowledges the vital role that the CoBaTrICE project group’s work has played in designing this curriculum.

1.3.2. Description of CoBaTrICE methodology\(^3\)

Consensus techniques (modified Delphi and nominal group) were used to enable interested stakeholders (health care professionals, educators, patients and their relatives) to identify and prioritise core competencies. Online and postal surveys were used to generate ideas. A nominal group of 12 clinicians met in plenary session to rate the importance of the competence statements constructed from these suggestions. All materials were presented online for a second round Delphi prior to iterative editorial review. The initial surveys generated over 5,250 suggestions for competencies from 57 countries.

Preliminary editing allowed the original European working group to encapsulate these suggestions within 164 competence stems and 5 behavioural themes. For each of these items the nominal group selected the minimum level of expertise required of a safe practitioner at the end of their specialist training, before rating them for importance. Individuals and groups from 29 countries commented on the nominal group output; this informed the editorial review. These combined processes resulted in 102 competence statements, divided into 12 domains. Using consensus techniques core competencies were generated which are internationally applicable but still able to accommodate local requirements. This provided the foundation upon which this competency based training programme for Intensive Care Medicine was built.

Following the adoption of the CoBaTrICE competency approach a UK expert group, constituted by the IBTICM and including lay representation, further refined the competencies. This included their division into competencies best achieved during Basic, Intermediate and Advanced training in ICM. In a few cases, the practice of Intensive Care has moved on since the CoBaTrICE document was written and this is reflected in this curriculum.

\(^2\) The Welsh Risk Pool and the Scottish Clinical Negligence and Other Risks (Non-Clinical) Indemnity Scheme (CNORIS) fulfil similar roles to the NHSLA. In Northern Ireland each Trust has its own risk assessment and negligence scheme.

1.4 Ongoing curriculum review

The curriculum will be reviewed regularly with an implementation date for any changes being not less than six months after their publication date. Minor changes will be inserted in the online manuals immediately and will be collectively submitted to the GMC for approval once a year. Major changes, such as a new unit of training, will be submitted to the GMC for approval as and when necessary and will be inserted into the curriculum when approval has been granted. Summaries of changes are listed on the training pages of the IBTICM website as they occur.

Occasionally the Board has to take decisions that may affect the immediate interpretation or application of specific items in this manual. These will be published on the website and circulated to Regional Advisors.

1.5 Structure of the curriculum manual

The document has three parts:

- **Part I** is the Handbook, an overview of competency-based training in ICM. It includes background information, current criteria and standards for training and assessment methods.
- **Part II** is the Educational Training Record
- **Part III** is the Syllabus for the training programme. This is divided into Basic, Intermediate and Advanced training sections. Each section defines the training objectives and defines the competencies required to fulfil those training objectives. These are presented within themed domains with mapping to assessment tools and GMP requirements.
2. **Principles of the training programme**

2.1  **Underlying principles**

The principles of the UK CCT in Intensive Care Medicine training programme are that it:

- Is outcome based
- Is planned and managed
- Does not jeopardize safe practice
- Is delivered by appropriately trained and appointed trainers
- Allows time for study
- Includes core professional aspects of medical practice, that are essential in the training of all doctors
- Meets the service needs of the NHS
- Is prepared with input from the representatives of patients
- Accommodates the specific career needs of the individual trainee
- Is evaluated
- Is subject to review and revision

2.2  **Training concepts**

2.2.1  **“Spiral” learning**

The training programme is based on this concept which ensures that the basic principles learnt and understood are repeated, expanded and further elucidated as time in training progresses; this also applies to the acquisition of skills, attitudes and behaviours.

To facilitate this, the programme is divided into Basic, Intermediate, and Advanced levels, each consisting of a core of essential units of training which the trainees return to at each level, as well as specialist areas of practice which are introduced from the Intermediate level onwards. The outcome is such that mastery of the specialty to the level required to commence independent practice in a specific post is achieved by the end of training as knowledge, skills, attitudes and behaviours metaphorically spiral upwards.

2.2.2  **Common competencies of medical practice required by all doctors**

The trainee must also develop general professional knowledge, skills, attitudes and behaviours required of all doctors. The common competencies in the core aspects of medical practice [identified from the AoMRC Common Competencies and Medical Leadership Curriculum Frameworks] are as important as the clinical competencies identified and they should be attained seamlessly during clinical training. The specific areas identified are as follows:

- Time management and decision making
- Decision making and clinical reasoning
- Therapeutics and safe prescribing
- Patient as a central focus of care
- Learning, teaching and training
- Medical Leadership
• Principles of quality and safety improvement
• Principles of medical ethics and confidentiality
• Relationships with patients and communication within a consultation
• Breaking bad news
• Complaints and medical error
• Legal framework for practice
• Audit

2.3 Training environments

The training of Intensivists will occur in UK posts and programmes approved by the GMC, or in other posts and programmes for which prospective approval has been given. Departments in which training occurs must comply with the regulations and recommendations of the relevant national Departments of Health, the GMC and the IBTICM.

2.4 Trainers

Doctors responsible for training have to comply with the GMC generic standards for training\textsuperscript{4}. The IBTICM Criteria for the Appointment of Trainers can be found in Appendix 4.

2.5 Out of hours commitments

Most ICM work is unscheduled and at least 50\% of admissions to Critical care Units occur “out of hours”. In view of this it is essential for trainees to gain experience outside routine working hours. This provides:

• An opportunity to experience and develop clinical decision making, with the inevitable reduction in out-of-hours facilities, under distant supervision
• An opportunity to learn when to seek advice and appreciating that, when learning new aspects of emergency work as trainees, they require close clinical supervision
• A reflection of professional ICU practice, as in most hospitals patients are admitted 24 hours a day, seven days a week, so requiring dedicated out-of-hours emergency facilities; there is thus a service commitment
• In view of these training needs at least 12.5\% of time should be spent on ICU outside of 08:30 to 18:30 daytime hours at Intermediate and Advanced levels. Cover of other areas may be allowed provided the trainee is rapidly available for ICU at all times. Immediate cover for emergencies outside ICU is acceptable but there should be arrangements in place to ensure that ICU cover is not compromised.

2.6 Less than full-time [LTFT] trainees

After appointment in open competition any trainee, with Deanery agreed eligibility, can request to train less than full time. The training programme will be delivered on a pro rata basis for those who are eligible and have Deanery support. Each region has a LTFT training adviser who

\textsuperscript{4} Generic Standards for Training. General Medical Council, April 2010
works with the RA and the local Deanery to ensure that the needs of those trainees are met. General advice on LTFT training is contained in the “Gold Guide”\(^5\).

Finally, the European Medical Directive states that:

“Part-time training shall meet the same requirements as full-time training, which shall differ only in the possibility of limited participation in medical duties to a period of at least half that of full-time trainees, including on-call duties.”

This is interpreted to mean that LTFT trainees should, *pro rata*, undertake the same out-of-hours work as full-time trainees, including weekend on-call duties.

### 2.7 Supervision

The critical nature of ICU work necessitates very close supervision of trainees. However, this must be balanced against the need for trainees to develop towards independent, expert practitioners. As always patient safety is the most important priority and must override any other apparent training needs.

#### 2.7.1 Clinical supervision

Every trainee must, at all times, be responsible to a nominated consultant. The consultant must be available to advise and assist the trainee as appropriate. Sometimes this will require the consultant’s immediate presence but on many occasions less direct involvement will be needed. Supervision is a professional function of consultants and they must be able to decide what is appropriate for each circumstance in consultation with the trainee. The safety of an individual hospital’s supervision arrangements is the concern of the local department in conjunction with the hospital management; it is necessary for them to agree local standards and protocols that take account of their particular circumstances.

#### 2.7.2 Educational supervision

Every trainee must have a nominated educational supervisor to oversee their individual learning.

### 2.8 Responsibility for training in the workplace

Competency based training relies on WPBA’s made during clinical service. The responsibility for the organisation, monitoring and efficacy of this training and assessment is shared by a variety of authorities:

- **The GMC** is responsible for approving programmes of training and training capacity
- **The IBTICM** is responsible for:
  - Advising the GMC on the competencies/learning outcomes in training
  - Advising the Postgraduate Deans on the arrangements for organising and monitoring the in-service training provided by schools and hospitals

---

Evaluating the training of individual trainees and recommending them to the GMC for the award of CCTs

- **The Postgraduate Dean** is responsible:
  - To the GMC for the quality management of the training programme
  - For the overall training arrangements in each Trust. The Clinical Tutor/Director of Medical Education acts as the Dean’s officer within the trust and has overall responsibility for the educational environment
  - For ensuring that the ARCP process is organised correctly

- **Schools of Anaesthesia, Medicine, Emergency Medicine and Surgery** in conjunction with **local Specialty Training Committee** are responsible for:
  - The administrative organisation of trainee placements/rotations in the training programme
  - Monitoring the training programme
  - Providing Annual Reports to the Postgraduate Dean
  - The administrative organisation of ARCPs
  - Working with CDs to ensure satisfactory local arrangements are in place to ensure in-service training is delivered in accordance with the principles adopted by the DH [in regard to rota compliance], the GMC, the IBTICM and the Postgraduate Dean

- **TPDs** organise the rotations to ensure that all units of training are covered
- **RAs** are responsible for representing the policies and views of the IBTICM in all relevant matters within their region
- **Board Tutors** are responsible, ultimately, for the overall training and assessment arrangements in their hospitals, working in conjunction with the individual educational supervisors.
- **Educational Supervisors** are responsible for ensuring an individual trainee has an agreed educational plan, that this is delivered, that the appropriate assessments are carried out and that the trainee receives regular educational and workplace appraisals
- **Clinical Supervisors** are trainers who are selected and appropriately trained to be responsible for overseeing a specified trainee’s clinical work and providing constructive feedback during a training placement.
- **Consultant/SAS trainers**: All consultants/SAS Intensivists who have any contact with trainees [which includes providing senior support and cover for out of hours duties] have a responsibility for providing appropriate training, supervision and assessment. They must comply with the GMC regulations for trainers.

### 2.9 Accommodation for training and trainees

Any hospital with trainees must have appropriate accommodation to support training and education; this may be in the Department of Anaesthesia or elsewhere in the hospital e.g. the Postgraduate Teaching Centre. This accommodation should include:

- A focal point for the ICU staff to meet so that effective service and training can be co-ordinated and optimal opportunities provided for gaining experience and teaching
- Adequate accommodation for trainers and teachers in which to prepare their work
- A private area where confidential activities such as assessment, appraisal, counselling and mentoring can occur
- A secure storage facility for confidential training records
- A reference library where trainees have ready access to bench books [or an electronic equivalent] and where they can access information at any time
• Access for trainees to IT equipment such that they can carry out basic tasks on a computer, including the preparation of audio-visual presentations; access to the internet is recognised as an essential adjunct to learning
• A suitably equipped teaching area and a private study area
• An appropriate rest area whilst on shift
3. Objective, entry criteria and structure of the ICM CCT programme

3.1 Objective of the programme

The objective of the programme leading to the award of a CCT in Intensive Care Medicine is to produce high quality patient-centred doctors skilled in ICM as well as their specialty of primary appointment with appropriate knowledge, skills and attitudes to enable them to practise at consultant level in both ICM and their primary specialty.

3.2 Entry criteria for the programme

Entry to the ICM CCT programme is by competitive appointment to nationally advertised posts. Applicants must already have a National Training Number (NTN) in one of the following acute specialties.

- Anaesthesia
- Medicine
- Emergency Medicine
- Surgery

Trainees must enter the CCT programme by appointment in open competition as laid down by national regulations. Trainees may be appointed to advertised CCT training posts in Intensive Care Medicine early in Specialty Training, and normally no later than two years before the end of their primary specialty training programme.

It is permitted for trainees with an NTN in one Deanery to apply for training in ICM in a different Deanery. Trainees will retain their primary specialty NTN following appointment to the ICM training programme.

Before CCT entry, it is desirable, but not essential, that trainees have 3 months experience of Intensive Care Medicine (Basic training) in a pattern defined by the Intercollegiate Board obtained in whole or in part during the following postgraduate training stages: Acute Care Common Stem (ACCS) Programme at the start of Specialty Training, as part of a Specialty Training Programme in one of the above primary specialties or in any other post recognised for training in ICM at Basic level. Trainees who enter the ICM CCT programme without Basic ICM training will need to complete this block before undertaking Intermediate training.

3.3 Structure of training

The interaction between the primary specialty programme and the ICM programme is necessarily complex and requires close cooperation in planning by the Programme Directors and Regional Advisers in both specialties. The ICM programme will continue to deliver training in the generic aspects of the primary specialty and where appropriate will arrange joint assessments and ARCP processes. As trainees will usually leave their primary specialty training programme to acquire ICM training, it is essential that Regional Advisors plan the appointments process and the individual training programmes as far in advance as possible, and that they maintain close
communication with the relevant primary specialty training committees. A lead-in time of six months between appointment and taking up the appointment is desirable.

During the blocks of Intensive Care Medicine training in both Intermediate and Advanced levels, the trainee’s duties will be exclusively dedicated to the practice of Intensive Care Medicine throughout the hospital.

All training in ICM will take place within the United Kingdom, in GMC-approved units, with the exception of any proportion of Advanced training undertaken in suitable overseas centres with prior approval by the GMC, the Intercollegiate Board and the appropriate Postgraduate Medical Dean. Basic and Intermediate training must be acquired in the United Kingdom (UK).

Once training in all programmes is completed to the satisfaction of the Intercollegiate Board and the College of the primary specialty, and accepted by the GMC, the CCTs in the primary specialty and ICM will be awarded. Trainees who are unsuccessful at gaining entry to an ICM CCT programme but gain the relevant competencies in the required format may still have their ICM training recognised by the IBTICM at either Intermediate or Advanced level. Trainees are encouraged to discuss this with the Regional Advisor in ICM as early as possible.

### 3.4 Components of the ICM CCT programme

[See Table 1, below]

#### 3.4.1 Basic Training in ICM

The indicative minimum basic requirement is 3 months training in ICM. To allow immersion in the specialty this training must be undertaken as a single block. All trainees in anaesthesia and some in acute medicine will obtain Basic training in ICM in years one or two of their primary specialty. All ACCS trainees will also obtain Basic ICM training during their rotations. Although the indicative requirement is for 3 months, those posts which offer longer periods of continuous training in ICM provide better opportunities for reinforcement of learning, improved continuity of clinical care, and more effective integration of the trainee in the ICU team and the activities of the unit.

#### 3.4.2 Complementary Specialty Training

Complementary specialty training comprises 6 months in anaesthesia and 6 months in medicine. The medicine module may include a maximum of 50% of Emergency Medicine (EM). Complementary specialty training may be acquired in the following circumstances:

- **Acute Care Common Stem Training**
- **Specialty Training years 1-3**
- **Fixed Term Specialty Training Appointments**

It can also be offered as part of ICM CCT training programmes. It is usual for a proportion to form part of primary specialty training in anaesthesia or general internal medicine — thus anaesthetic trainees will need medicine as the complementary specialty and physicians will need anaesthesia, while surgical trainees must acquire both.

Training in the care of the acutely ill patient, and the ‘Initial assessment of competence in the management of the acutely ill patient’ will occur during the Foundation Programme. However,
for trainees appointed to specialty training programmes prior to 2007 this training and assessment may be conducted at any time during Basic training in ICM or GIM.

3.4.3 Intermediate Training in ICM

This consists of 6 months dedicated education and training in ICM at ST3 level or above following the acquisition of Basic ICM competencies. This may be taken as either one continuous block or two blocks of approximately equal duration.

Intermediate competencies can also be acquired outside the ICM CCT programme provided that training has been undertaken in accordance with the guidance issued by the IBTICM.

In order to obtain IBTICM recognition of completion of an Intermediate level of ICM training then the trainee must have undertaken 6 months Intermediate ICM training, 6 months complementary training as defined in section 3.4.2, completed the 10 case reports and gained the appropriate competencies and educational sign-off.

3.4.4 Advanced Training in ICM

This consists of a further continuous block of ICM, in addition to the prior acquisition of Intermediate competencies. Although the block of training should be continuous trainees may rotate to different units in order to increase their experience. The expected duration required to achieve the competencies is 12 months. For the purpose of the CCT programme, Advanced training can only be acquired following competitive entry to an approved CCT programme of training in ICM. Up to 6 months of Advanced training may be undertaken in approved units overseas, given prior approval by the Board and the GMC.

3.4.5 Summary of indicative duration of components of the ICM CCT

The total duration of the programme for any particular trainee will vary with the specialty of primary appointment, how much of the primary specialty programme is allowable for training in ICM and how much of the ICM programme is allowable for training in the primary specialty. The components that must be carried out to meet the requirements of the ICM CCT are summarised in the table below in months:

<table>
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<th>Normal duration (Months)</th>
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<td>Complementary Anaesthesia</td>
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<td>Complementary Medicine</td>
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<td>Intermediate ICM</td>
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<td>Advanced ICM</td>
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### Table 1

**Summary of Requirements for Training in Intensive Care Medicine**

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<tr>
<td><strong>Basic ICM Training</strong></td>
<td>3 months ICM training in</td>
<td>Must be taken as a continuous block. Time may be extended if competencies are not acquired in 3 months.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>educationally approved posts</td>
<td></td>
<td>It is desirable but not essential to undertake Basic training before appointment to an ICM CCT post. It may be undertaken as part of ST training in the primary specialty, during ACCS training or in an FTSTA prior to entry to the ICM CCT programme. Intermediate training cannot commence without successful completion of Basic training.</td>
</tr>
<tr>
<td><strong>Complementary Specialty Training</strong></td>
<td>6 months of Anaesthesia and 6 months of Acute Medicine (of which up to 50% may be Emergency Medicine).</td>
<td>The period may vary according to rate at which competencies are acquired.</td>
<td>Competencies may be acquired after ICM CCT appointment, but must be satisfactorily completed before starting Advanced training.</td>
</tr>
<tr>
<td><strong>ST post in primary specialty</strong></td>
<td>Essential prior requirement for ICM CCT training.</td>
<td>None.</td>
<td>Specialty Registrar training programme in Emergency Medicine, Anaesthesia, Medicine or Surgery.</td>
</tr>
<tr>
<td><strong>Competitive entry to ICM CCT programme</strong></td>
<td>Competitive application to ‘open’ ST post in ICM. The trainee must already have a National Training Number in a primary specialty.</td>
<td>None.</td>
<td>Training post must be open to applicants from Anaesthesia, Internal Medicine, Surgery and Emergency Medicine. Closed or specialty-specific posts cannot be used for ICM CCT training. It is desirable (but not essential) that trainees have gained Basic level competencies before appointment to an ICM CCT post.</td>
</tr>
<tr>
<td><strong>Intermediate ICM Training</strong></td>
<td>6 months of ICM, generally taken in the first 3 years of primary specialty training. Trainees must have completed Basic ICM training</td>
<td>Minimum blocks of one half of projected duration of module Intermediate level ICM training (outside the CCT ICM programme) can be counted towards the ICM CCT programme provided it is to the standard required by the IBTICM. If the trainee elects not Trainees wishing to undertake Intermediate training within their primary specialty must discuss this with their own Regional Advisors and the RA in ICM. Trainees should be supervised by the IBTICM as well as the primary specialty. They must register with the IBTICM to receive recognition of Intermediate training, even if they do not intend to progress to Advanced level Training.</td>
<td></td>
</tr>
</tbody>
</table>
All trainees must complete the Educational Training Record, including 10 expanded case summaries.

| Advanced Training | 12 months ICM training in a single block, taken in the later stages of primary specialty training. | Trainees who enter the ICM CCT programme without having done more than Basic ICM training may complete the requirements for the ICM CCT in a single continuous module. | Trainees who undertook Intermediate training outside the CCT ICM programme must undergo a competitive allocation process for entry to Advanced Training. Advanced level Training taken outside the CCT ICM programme will not count towards a CCT in ICM. Advanced level training must be undertaken in the final 2 indicative years of the ICM CCT programme. Maximum of 6 months prospectively approved and satisfactorily completed overseas ICM training may be counted. |
| ICM CCT plus CCT primary specialty | Awarded as dual CCTs to trainees who have satisfactorily completed training in both primary specialty and ICM. | None. | None. |

All specialist training in ICM must be undertaken in units that have been approved by the GMC.
4. Assessment

4.1 Annual Review of Competence Progression [ARCP]

Award of the CCT depends on having completed a recognised programme of training and having demonstrated key knowledge and capabilities in the course of assessments. Trainee progress through the curriculum is monitored by a scheme of assessments.

This evidence is reviewed at an ARCP and this determines the learner’s further progress.

It is primarily the responsibility of the trainee themselves both to understand what evidence will demonstrate appropriate progress and to accumulate and tabulate this evidence. Inability to collect and organise the evidence is itself taken to be a significant failing which is likely to be reflected in other aspects of professional life.

The ARCP is organised and operated by Postgraduate Deans. Its general principles are laid down by the GMC and are described in the ‘Gold Guide’. The IBTICM is responsible for advising on the specific evidence that is required in its specialty training programme.

The Trainee will work with their educational supervisor to develop evidence of satisfactory progression through their agreed learning. A summary of this evidence will then be presented by the educational supervisor to the ARCP.

4.1.1 Evidence for the Annual Review of Competence Progression [ARCP]

A wide variety of information is available as evidence for the annual review. It is deemed to be the learner’s responsibility to present their reviewers with evidence of satisfactory progress. This will be in the form of the learners ‘Portfolio of Learning’. Sources of information are:

- Evidence of performance in professional examinations – if applicable
- A log of clinical work undertaken
- A reflective diary of learning experiences
- The results of WPBA’s: DOPS, mini-CEX, CBD and ACAT’s
- The Clinical Supervisors end of unit Assessment Form[s] [CSAF]
- A record of agreed targets and outcomes from interviews with their educational supervisor
- A multi-source feedback if appropriate
- Specific evidence of performance in areas such as research and education

It is accepted that there is no good evidence of the validity and reliability of any of these evidences. The process of reviewing them is not arithmetic. The educational supervisor must seek to use these evidences to answer four questions:
Table 2

<table>
<thead>
<tr>
<th>Questions for ARCP Panels</th>
<th>Domains in GMP</th>
<th>Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Has the learner undertaken a clinical workload appropriate in content and volume to the acquisition of the learning outcomes?</td>
<td>1,2,3</td>
<td>Logbook; CSAF; Appraisal</td>
</tr>
<tr>
<td>2. Has the learner met the general educational objectives of the curriculum and personal and specific objectives agreed with their educational supervisor or as a previous remedial programme?</td>
<td>1,2,3</td>
<td>Log-book; Educational supervision reports; Appraisal</td>
</tr>
<tr>
<td>3. Do the learners' supervisors believe that they have performed satisfactorily in their clinical work, as judged by their reports and the workplace-based assessments?</td>
<td>1,2,3,4</td>
<td>Log-book, WPBAs; educational supervision; CSAFs</td>
</tr>
<tr>
<td>4. Is there evidence that the learner performs satisfactorily as a member of a clinical team including teamwork and a focus on safe practice?</td>
<td>2,3,4</td>
<td>Multi-source feedback; CSAFs; Appraisal</td>
</tr>
</tbody>
</table>

Table 3

<table>
<thead>
<tr>
<th>Domains of Good Medical Practice</th>
</tr>
</thead>
<tbody>
<tr>
<td>Domain</td>
</tr>
<tr>
<td>--------</td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>2</td>
</tr>
<tr>
<td>3</td>
</tr>
<tr>
<td>4</td>
</tr>
</tbody>
</table>

4.2 Workplace-Based Assessments [WPBA]

The IBTICM has developed an integrated set of workplace-based assessments [WPBA], which are to be used throughout the entire postgraduate training programme. They are blueprinted against, and support, the curriculum and every learning outcome that is identified in the curriculum is matched to at least one possible assessment. WPBAs must only be undertaken by those who are appropriately trained; if they are performed by others than consultants in Intensive Care, a consultant must take ultimate responsibility for the assessment outcome.

The assessment system is available for download from the IBTICM website. It is also available in paper format from the Board, for which a charge is made on application.

4.2.1 Choosing Appropriate Assessment Instruments

The curriculum was reviewed and the cognitive, psychomotor and behavioural learning outcomes have been allocated to appropriate instruments for WPBA. As an outcome-based
curriculum identifies very large numbers of items, a strategy of sampling assessments has been selected in order to make the assessment task manageable and to minimise the disruption of normal work and the possibility of increased risk to patients.

An assessment instrument has been identified for every competency in the curriculum. Where possible, more than one methodology is identified so that it is possible to triangulate performance. It is intended that a sample of these assessments will be undertaken by each learner.

The choice of which outcomes to assess is left to the learner and their educational and clinical supervisors. This will depend on the opportunities that the clinical work presents and the learner’s needs.

### 4.2.2 The Available Assessment Methodologies

A pragmatic approach to the choice of assessment methods has been adopted. Many Consultants are familiar with Foundation Programme assessment methods, and are trained in their use. It was therefore decided to continue with these same systems throughout CT and ST training. These are the ICM mini-CEX [ICM-CEX], DOPS and CBD. In addition these methodologies have a practical utility attested to by experience in their use and at least some objective evidence that correctly applied they have validity and reliability. We have added the ACAT test that is used in some other specialties for the assessment of larger segments of clinical work.

### 4.2.3 How many workplace-based assessments?

The purpose of the ICM WPBAs is not to tick off each individual competence but to provide a series of snapshots of work, from the general features of which it can be inferred whether the trainee is making the necessary progress, not only in the specific work observed, but in related areas of the application of knowledge and skill. The number of observations of work required will not be fixed but will depend on the individual trainee’s performance.

The IBTICM sets a minimum number of DOPS, ICM-CEX, ACAT’s and CBD’s for each training block (see below). Where a trainee performs unsatisfactorily more assessments will be needed. It is the responsibility of the trainee to provide sufficient evidence of satisfactory performance and satisfactory progress in their annual review. They will need evidence of performance in each block of training or section of the curriculum they have undertaken. This may increase the number of assessments they need. It is the educational supervisor’s responsibility to help the trainee to understand what that evidence will be in their specific circumstances. The educational supervisor will then write a summary of the learner’s performance for the ARCP.

Once again it must be stressed that there is no single, valid, reliable test of competence and the ARCP will review all the evidence, triangulating performance measured by different instruments, before drawing conclusions about a trainee’s progress.
<table>
<thead>
<tr>
<th>IBTICM Level</th>
<th>Minimum Number of WBPA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic ICM</td>
<td>MSF x 1</td>
</tr>
<tr>
<td></td>
<td>DOPS x 3</td>
</tr>
<tr>
<td></td>
<td>ICM-CEX x 2</td>
</tr>
<tr>
<td></td>
<td>CBD x 1</td>
</tr>
<tr>
<td>Intermediate ICM</td>
<td>MSF x 1</td>
</tr>
<tr>
<td></td>
<td>DOPS x 2</td>
</tr>
<tr>
<td></td>
<td>ICM-CEX x 2</td>
</tr>
<tr>
<td></td>
<td>CBD x 2</td>
</tr>
<tr>
<td></td>
<td>ACAT X1</td>
</tr>
<tr>
<td>Advanced ICM</td>
<td>MSF x 1</td>
</tr>
<tr>
<td></td>
<td>DOPS x 1</td>
</tr>
<tr>
<td></td>
<td>ICM-CEX x 2</td>
</tr>
<tr>
<td></td>
<td>CBD x 3</td>
</tr>
<tr>
<td></td>
<td>ACAT X 2</td>
</tr>
</tbody>
</table>

4.2.4 CBD, DOPS, ICM-CEX and ACAT

Example forms appear on the IBTICM website, [www.ibticm.org](http://www.ibticm.org).

Assessment by the direct observation of work is based on the belief that an expert is able to make a judgement about the quality of an expert process by watching its progress. This is the methodology of the motor vehicle driving test and there is a long history of the use of observational assessment in the accreditation of practice.

4.2.5 Scoring observational assessments

The primary question on the IBTICM assessment form is whether the observer considers the performance satisfactory or not. The threshold for this decision is part of the observer’s judgement, as an expert in the field. This criterion has been adopted by the Board rather than marking against a scale, because of the difficulty in defining other grades of performance.

If the assessor believes the performance to be satisfactory they are asked to offer feedback; both positive and negative.

If the observer rates the performance unsatisfactory they must complete a grid, which tabulates the specific areas for concern.

The feedback given to learners who perform satisfactorily is less structured. This is not believed to be very significant in the context of our training practices. The advantage of presenting an assessment that is easy to complete when work is satisfactory is overwhelming in improving compliance, and engagement with the testing regime.

4.2.6 Case-based Discussion [CBD]

The IBTICM has defined topics for CBD that are appropriate to all the contexts of training. Assessments should not be made using other topics without checking that they are appropriate i.e. the issue is in the curriculum for the trainee’s present state of training.
CBD can be used for a variety of training and assessment purposes as indicated in the curriculum section of this document. It will often focus on patient management. CBD is also used for assessing the more generic, and less clinical, knowledge and skills needed for effective practice. e.g. evidence based practice, maintaining safety, teamwork, clinical research methodologies etc.

4.3 Logbook and Portfolio

Trainees are required to keep a record of the cases that they undertake. The trainee must have had a significant input into the care and management of the patient and this input should be mapped onto the major domains of the curriculum. Brief diagnostic information should also be included preferably using the ICNARC diagnostic criteria which are used by the majority of units. There is also an opportunity to place reflective comments in the case record. The case logbook will be part of the portfolio of evidence that the trainee will collect to demonstrate their experience and competence. In the event that assessments indicate underperformance in an area of practice the first response is to check from the logbook that the learner has had sufficient exposure to it. Incompetence in the face of what is usually sufficient exposure is a cause for concern.

The portfolio of learning is more than a logbook. It will include reflections on learning and a record of other teaching and of discussions with the educational supervisor.

4.4 Expanded case summaries

At Intermediate training level the trainee is required to submit 10 expanded case summaries at local level. More information on the case summaries can be found on the IBTICM website, www.ibticm.org. These are designed to assess the trainee’s depth of knowledge in a particular area of practice and will also assess their ability to practice evidence based medicine and communicate written information in a succinct manner. They may also be used as the basis for CBDs.

4.5 Evidence of participation and attendance at training events

Until recently evidence of attendance at a learning session was taken to be the standard for accumulation of credits in continuing medical education. Attendance does not assure that learning has occurred but it does signify compliance with an appropriate learning plan. There are a number of aspects of training that lie on the periphery of practice such as Research Methods, Management, Teaching and Assessment. At present there is little focussed assessment in these areas and significant practical difficulties lie in the way of introducing summative assessment.

The IBTICM has at present adopted the middle ground in these areas and requires that evidence of participation in learning is presented to the ARCP. These include attendance at specific courses, evidence of presentation at local audit and research meetings and records, and feedback from teaching the trainee has delivered.
4.6 **Examinations**

Currently the ICM CCT programme has no compulsory written or oral examination as part of its assessment. The IBTICM believes that external examinations do have an important role in a balanced portfolio of assessment tools. It therefore strongly encourages ICM trainees to take the UK Diploma in ICM. The European Diploma in ICM and the Irish DIBICM are alternative examinations. However, possession of such qualifications is not currently necessary for the award of the ICM CCT.

More information on the UK Diploma in ICM can be found at [www.ibticm.org](http://www.ibticm.org).

4.7 **Independent Appraisal**

Evidence to inform the ARCP must include an appraisal. The organisation of this process will depend on local arrangements and the primary specialty of the trainee.

4.8 **Trainees in difficulty**

Doctors in training can encounter either personal or professional problems which may affect their performance. With the introduction of personal development plans, appraisal, annual assessment, learning agreements and clinical governance, trainees who struggle to achieve their goals within the expected timescale can be more easily identified and may require support during their career. *Whatever the reason for difficulty it should be identified as early as possible.*

Deaneries will have a clear strategy for dealing with such situations encompassing the spectrum of performance difficulties. Depending on the level of risk the educational supervisor will require a variable degree of support. It is highly recommended that all those involved in the education and clinical supervision of trainees are aware of their local strategy to ensure appropriate support can be provided to the trainee and that patient safety is maintained. In situations where trainees appeal against assessment or other decisions, and informal resolution is not possible then the process described in the Gold Guide will be followed.

4.9 **The Educational Training Record: establishing a framework for individual learning**

The Educational Training Record [ETR] forms Part II of this curriculum. All trainees must maintain an Educational Training Record as part of their Portfolio. When they start a training module in ICM they should:

- complete an educational agreement or equivalent method for assessing training needs within the first two weeks
- attend to self-directed learning
- arrange dates for regular review of their progress at least every three months
- recognise that assessment will involve the professional judgement of the assessor

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• recognise that assessment is a continuous process especially that of behaviour and attitudes
• arrange for appropriate and relevant documentation to be available for the ARCP process to demonstrate satisfactory progress
• maintain a portfolio of educational activities within their ETR.

Tutors must communicate closely with the primary specialty College Tutor. There should be an initial assessment at the start of training (within the first few days), and an outline educational agreement must be established between trainer and trainee within the first two weeks. This should be reviewed regularly. Progress should be assessed at least every three months, and should be based on the educational contract.

4.10 Assessors

The IBTICM, in collaboration with the Deaneries recruits, appoints and trains both Board Tutors and Regional Advisors. Their roles include assessment of trainees and an assurance that trainee assessments are being undertaken to a uniform standard. Assessments within the ICM programme are conducted by consultants, specialty doctors and trainees. All assessors are required to have completed training in the use of the workplace based assessment tools. Training in using the assessment tools is provided by deaneries, locally within Trusts and when necessary from the Colleges as part of their Educator programmes.
5. **Out of Programme**

For the award of a CCT, trainees must complete the GMC approved Intensive Care Medicine programme in its entirety. There are opportunities for trainees to undertake approved periods of time outside of the approved programme as experience, research or training. When contemplating undertaking a period out of programme, trainees should discuss the options and consequences of taking time out of programme with their Educational Supervisor, College Tutor and TPD.

### 5.1 Out of Programme Clinical Experience [OOPE]

OOPE is defined by the GMC as:

“Out of programme clinical experience’ that does not count towards the award of a CCT.”

OOPE may be obtained in clinical or research posts in the United Kingdom or overseas that have not received prospective approval from the GMC.

Although IBTICM approval is not required for this out of programme experience, it is essential that trainees inform the Board and the Training Department of their respective parent college of the dates of all OOPE so that prospective completion dates can be revised.

### 5.2 Out of Programme Experience for Training [OOPT]

OOPT is clinical training, taken out of programme that will count towards the CCT provided certain conditions and requirements are met. They are:

- On commencing OOPT the trainee must be in a GMC approved training programme having completed the Basic and Intermediate levels of training in their entirety. This does not preclude setting up and planning OOPT during Intermediate level training
- Only 6 months in total during Advanced training can be taken as OOPT – OOPT cannot be counted towards Basic or Intermediate level ICM
- The OOPT programme must map to Advanced level competencies identified in the ICM CCT programme
- The OOPT post must be prospectively approved by the GMC with support from the Postgraduate Dean and respective parent college [At least six months should be allowed for the approvals process]
- OOPT may be in appropriate Advanced level clinical posts in the UK or overseas
- The last 6 months of the overall CCT training programme normally should be in the UK
- The trainee on his/her return must complete a report on the time spent on OOPT and submit it, together with an assessment report from the local supervisor, to the Deanery, the Board, and their respective parent college

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5.3 Out of Programme Experience for Research [OOPR]

OOPR is a research post or experience taken out of programme. Due to the time constraints of the ICM CCT programme, the Board cannot allow this time to count toward the ICM CCT. However, trainees can apply to the GMC for OOPR to count toward their parent specialty training programme; trainees should consult the relevant parent specialty CCT curriculum for details on how much research can be counted toward it.

5.4 Applying for OOPT

It should be made clear to trainees that any proposed period of OOPT must be arranged at the earliest opportunity. Gaps created within the rotation will need to be filled and if the OOPT is to be spent overseas, the acquisition of visas and the necessary licensing documentation for clinical work may be lengthy and difficult.

It is the responsibility of the trainee to provide all necessary information in their applications to the Deanery. An application form and checklist can be downloaded from the training pages of the Board’s website, www.ibticm.org.

5.5 Secondment between Schools and Deaneries

Secondment of a trainee to an approved training or research post in another School or Deanery [e.g. to obtain training not available in the “home” School or Deanery, such as Complementary Specialty training] is not regarded as OOPT; the secondment is an integral part of that individual’s training programme.

5.6 Maternity leave and sick leave

The Board allows maternity and/or sick leave to count toward the ICM CCT, on a pro rata basis in conjunction with the trainee’s parent specialty. For example, a trainee is permitted to have up to 3 months of maternity and/or sick leave counted toward the CCT programme in anaesthesia, which runs for an indicative timeframe of approximately 60 months, ie 5% of the programme. The Board will permit trainees to count the same time toward their ICM training programme on a pro rata basis – this would equate to approximately 3 weeks for Advanced level training.

Anything up to and including this time frame can be taken as maternity leave and/or sick leave without necessarily delaying the expected CCT date. This will require the trainee concerned to make efforts within the remaining training period to make up the specific elements of training which were missed in order to acquire the necessary competencies. The expected CCT date should be deferred if the period of maternity and/or sick leave results in a trainee missing a key component of the training programme which cannot be compensated for in the remaining period of the programme.

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8 Gold Guide, section 6.98
6. Equality and diversity

Equality of opportunity is fundamental to the selection, training and assessment of intensivists. It seeks to recruit trainees regardless of race, religion, ethnic origin, disability, age, gender or sexual orientation. Patients, trainees and trainers and all others amongst whom interactions occur in the practice of ICM have a right to be treated with fairness and transparency in all circumstances and at all times. Equality characterises a society in which everyone has the opportunity to fulfil his or her potential. Diversity addresses the recognition and valuation of the differences between and amongst individuals. Promoting equality and valuing diversity are central to the anaesthesia curriculum. Discrimination, harassment or victimisation of any of these groups of people may be related to: ability, age, bodily appearance and decoration, class, creed, caste, culture, gender, health status, relationship status, mental health, offending background, place of origin, political beliefs, race, and responsibility for dependants, religion and sexual orientation.

The importance of Equality and Diversity in the NHS has been addressed by the Department of Health in England in ‘The Vital Connection’\(^9\), in Scotland in ‘Our National Health: A Plan for Action, A Plan for Change’\(^10\) and in Wales by the establishment of the NHS Wales Equality Unit. These themes must therefore be considered an integral part of the NHS commitment to patients and employees alike. The theme was developed in the particular instance of the medical workforce in ‘Sharing the Challenge, Sharing the Benefits – Equality and Diversity in the Medical Workforce’\(^11\). Furthermore, Equality and Diversity are enshrined in legislation enacted in both the United Kingdom and the European Union. Prominent among the relevant items of legislation are:

- Disability Discrimination Act 1995
- Disability Discrimination Act 2005
- Disability Discrimination (Public Authorities)(Statutory Duties)(Amendment) Regulations 2008
- Employment Act 2002
- Employment Equality (Age) Regulations 2006
- Employment Equality (Age) (Consequential Amendments) Regulations 2007
- Employment Equality (Age) Regulations 2006 (Amendment) Regulations 2008
- Employment Equality (Sexual Orientation) Regulations 2003
- Employment Equality (Religion or Belief) Regulations 2003
- Employment Equality (Religion or Belief) (Amendment) Regulations 2004
- Employment Relations Act 1999
- Employment Rights Act 1996
- Equality Act 2006
- Equal Pay Act 1970
- Equal Pay Act 1970 (Amendment) Regulations 2003

\(^9\) The Vital Connection: An Equalities Framework for the NHS: DH, April 2000
\(^10\) Our National Health: A Plan for Action, A Plan for Change: Scottish Executive, undated
Appendix 1: Summary of the training process and Assessments of competence

**Basic level ICM**

**Training requirements**
- Undertake Basic training, following the Basic ICM curriculum, in approved posts for ICM

**Assessments to be completed**
- Be supervised jointly by the primary specialty tutor and the ICM Tutor
- Initial assessment of competence in the management of the acutely ill patient (if not completed in the Foundation programme)
- CPR skills (if not already assessed in anaesthetic or internal medicine modules, or no ALS course in preceding 12 months)
- WPBA’s covering the Basic curriculum

**Documentation to be available at ARCP**
- ETR
- Workplace based assessments

**Conditions to be met to move on to next training level**
- Successful ARCP
- Completed Basic training documentation

**Complementary Anaesthesia and Medicine**

**Training requirements**
- Undertake Complementary Anaesthetic or Medicine Training (if required), following the ACCS, Anaesthesia, GIM or EM curriculum, in approved posts

**Assessments to be completed**
- As documented in the ACCS, Anaesthesia, GIM or EM training programme

**Documentation to be available at ARCP**
- ETR
- Workplace based assessments

**Intermediate level ICM**

**Training requirements**
- Be in an approved numbered ST post in a primary-specialty
- Have undergone competitive entry to specialty training in ICM if following the ICM CCT programme
- Have completed the Basic level competencies and requirements
- To undertake Intermediate ICM training following the Intermediate ICM curriculum
Assessments to be completed
- Be supervised by the ICM Tutor and RA-ICM in conjunction with the primary specialty
- WPBAs covering the Intermediate curriculum
- For complementary specialties see above

Documentation to be available at ARCP
- ETR
- Workplace based assessments
- 10 expanded case summaries
- Case logbook

Conditions to be met to move on to next training level
- Successful ARCP
- Completed Intermediate training documentation
- Completed complementary training

Advanced level ICM

Training requirements
- Have completed Basic and Intermediate level assessments of competence and requirements
- Have undergone competitive entry to a specialty training post in ICM if Intermediate training was completed outside an ICM CCT training post
- To undertake Advanced ICM training following the Advanced ICM curriculum

Assessments to be completed
- Be supervised by the Board Tutor and RA-ICM
- Complete the Intermediate ICM competency assessments
- WPBAs covering the above areas

Documentation to be available at ARCP
- ETR
- Workplace based assessments
- Case logbook

Conditions to be met to complete the CCT
- Successful ARCP
- Complete the Advanced assessments of competence and requirements

All the assessment forms, clinical log book, ETR and records of meeting documentation are available for download on the IBTICM website at www.ibticm.org.
### Appendix 2: Indicative durations of ICM CCT programmes

<table>
<thead>
<tr>
<th>CCT</th>
<th>Expected Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>ICM + Anaesthesia</td>
<td>Time required by specialty of primary appointment less recognised ICM time plus 21 months ICM plus 6 months acute medical specialty</td>
</tr>
<tr>
<td>ICM + Medical Specialties</td>
<td>Time required by specialty of primary appointment less recognised ICM time plus 21 months ICM plus 6 months anaesthesia</td>
</tr>
<tr>
<td>ICM + Surgical Specialties</td>
<td>Time required by specialty of primary appointment less recognised ICM time plus 21 months ICM plus 6 months anaesthesia plus 6 months acute medical specialty</td>
</tr>
<tr>
<td>ICM + Emergency Medicine</td>
<td>Time required by specialty of primary appointment less recognised ICM time plus 21 months ICM plus 6 months anaesthesia plus 3 months acute medical specialty</td>
</tr>
</tbody>
</table>

* In all cases time required is time required to obtain competencies
# Appendix 3: Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Term</th>
</tr>
</thead>
<tbody>
<tr>
<td>ICM</td>
<td>Intensive Care Medicine</td>
</tr>
<tr>
<td>IBTICM</td>
<td>Intercollegiate Board for Training In Intensive Care Medicine</td>
</tr>
<tr>
<td>ICU</td>
<td>Intensive Care Unit</td>
</tr>
<tr>
<td>StR</td>
<td>Specialty Registrar</td>
</tr>
<tr>
<td>HDU</td>
<td>High Dependency Unit</td>
</tr>
<tr>
<td>CCT</td>
<td>Certificate of completion of training</td>
</tr>
<tr>
<td>WPBA</td>
<td>Workplace based assessment</td>
</tr>
<tr>
<td>GMC</td>
<td>General Medical Council</td>
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</tbody>
</table>
Appendix 4: Criteria for the appointment of trainers

This document sets out criteria for the appointment of trainers, including extending recognition as trainers to those who have been appointed other than by standard NHS Advisory Appointments Committees (AAC). It also takes into account that some postgraduate training may have to be delivered in hospitals outside the NHS.

Training in the NHS

The GMC is responsible for approving post and programmes for training. Clinical training is ordinarily delivered in NHS hospitals by consultants, approved staff and associate specialist (SAS) grades, and by senior trainees. Senior educators/clinicians with responsibility for education and training are joint appointments by the IBTICM and Deanery. Trainers are supported by RAs and Board Tutors appointed with input from the Deanery and hospital management by the IBTICM and by educational supervisors appointed locally.

The example of trainers and teachers has a powerful influence upon the standards of conduct and practice of trainees. It follows that all those involved in training and teaching should recognise and meet their responsibilities. In particular:

- Consultant and SASG doctors involved in the training or education of trainees should be aware of the objectives of the training programme and participate in its optimal construction and delivery
- Consultants, SAS grades and others involved in teaching must fulfil the CPD requirements for the clinical appraisal process
- Trainers and teachers should take steps to acquire the skills of a competent teacher
- All should fulfil the essential and fulfil or at least aspire to the desirable criteria [see below]

Consultant trainers

- The AAC committee at which the Colleges are represented is a check on the suitability of a consultant as a trainer
- Consultant trainers in the NHS must be listed in the Specialist Register and have been appointed to a substantive NHS consultant, University, or Defence Medical Services post by a properly constituted AAC. Subject to the local College Tutor’s agreement, expressed by matching trainees to the consultant’s training capacity, recognition of such appointees as trainers is automatic
- Consultant trainers should comply with the GMC Standards for Trainers that come into effect in February 2010

SAS trainers

The IBTICM encourages Board Tutors to identify SAS doctors with aptitude and to nominate them as teachers, specifying their areas of expertise. Those who undertake teaching must have opportunity to acquire the skills of a competent trainer.

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12 Non consultant career grade doctors. RCoA College Bulletin 2001: 9;407
13 Good medical practice, Teaching and training, appraising and assessing, GMC 2006, paragraph 15
14 Ibid, paragraph 16
15 Ibid
Trainees as trainers

By the time they complete their CCT programme trainees must have learnt to assume responsibility for the supervision of more junior trainees. As part of their preparation for becoming a consultant, senior trainees should have the opportunity to contribute to the organisation and delivery of formal training under the supervision of the Board Tutor or other designated trainers as identified in this curriculum.

Trainers in NHS Foundation Hospitals and the Independent Sector

NHS consultants and SAS doctors who have been recognised as trainers, as described above, carry their personal recognition when working outside their NHS base.

Consultants and SAS doctors appointed to posts in Foundation Trusts that do not use College representation for AACs, to Independent Sector Treatment Centres or to Independent Hospitals do not have automatic recognition as trainers. In such instances the Board will offer recognition in a personal capacity:

- **Foundation Trusts**: In the case of Foundation Trusts when no College representation has been used during selection, the Board delegates its authority to the local Board Tutor.
- **ISTCs**: In ISTCs, private hospitals or any other institution without a Board Tutor, the Board delegates this authority to the local RA or Deputy.

In both instances the following criteria should be used as guidance for recognition, which should follow a meeting between the Board Tutor or RA and the consultant.

**Criteria for appointment as a trainer**

**Essential criteria**

- The trainer’s employing institution must be integrated into the local Schools of Anaesthesia, Medicine, Emergency Medicine and Surgery
- Willingness to teach and commitment to deliver ‘hands on’ teaching and training including preoperative and postoperative care
- Regular clinical commitment [e.g. in operating theatres, clinics, critical care units]
- Listing in the GMC Specialist Register
- Compliance with current GMC revalidation requirements
- Successful completion of annual assessment or appraisal by a consultant anaesthetist
- Robust evidence of recent continued CPD normally based on the previous two years
- Being up-to-date and supported in a post with protected time for further CPD
- Familiarity with the assessment procedures and documentation of the knowledge, skills, attitudes and behaviour components of competency based training
- Willingness to assess continuously the trainee throughout the appointment, and to complete trainees’ assessment forms on a regular basis as necessary
- Participation in audit
- Safeguarding trainees’ attendance at core curriculum teaching meetings
- Ability to detect the failing trainee

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36 The criteria are common to all trainers; those who have already gained recognition should use them as a guideline for maintaining their skills as trainers.
Desirable criteria

- Successful completion of a ‘Training the Trainers’ course or equivalent
- Ability to use educational technology
- Familiarity with teaching evidence-based medicine
- Ability to provide remedial support to the trainee in difficulty
- Willingness to guide and stimulate trainees to carry out audit and if appropriate clinical research
- Willingness to ensure that the volume and content of training lists and other sessions reflect the additional time required for training
- Willingness to mentor individual trainees
Appendix 5: Curriculum development working group

The IBTICM wishes to acknowledge the helpful input of the Anaesthesia curriculum writing group in producing the Part I document. In particular Part I draws heavily on that group’s Educational expertise and understanding of the Education process. The group also drew on the expert assistance of James Goodwin, the IBTICM Senior Administrator.

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Dr Anna Batchelor Chair and curriculum lead
Dr Simon Baudouin Chairman, IBTICM
Dr Charles Gillbe Past Chairman, IBTICM
Mr James Goodwin Senior Training Administrator, IBTICM
Dr David Greaves Assessment lead, RCoA
Dr Peter MacNaughton Consultant ICM
Dr Ramani Moonesinghe Consultant ICM
Dr Peter Nightingale Past Chairman, IBTICM
Dr Graham Nimmo IBTICM member, Consultant ICM
Dr Alison Pittard RA representative, Consultant ICM
Dr Louie Plenderleith Consultant ICM
Dr Laura Price Trainee ICM
Dr Hannah Reay Senior Research Nurse ICM
Dr Andy Tomlinson Chair and curriculum lead, RCoA
Mr Barry Williams Lay member, IBTICM
Mr Craig Williamson Training Manager, RCoA
Part II

The Educational Training Record

Name: 

NTN: 
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1. Introduction

This Educational Training Record is for the use of both the trainee and the trainer.

The aim of the Educational Training Record [ETR] is to provide a record of training in Intensive Care Medicine [ICM] and all trainees in ICM must maintain it. It complements the formal workplace-based assessments of trainees by their Educational Supervisors and ensures that adequate documentary evidence is obtained.

The Intercollegiate Board for Training in Intensive Care Medicine [IBTICM] will not approve training unless this record is properly completed. The ETR should be incorporated into a training portfolio which will inform the annual RITA /ARCP process. The trainee should begin to fill in the ETR as soon training in ICM commences.

An educational agreement should be drawn up with the trainer within the first two weeks of starting a new attachment. This is a collaborative document, in which the trainer and trainee agree specific educational goals that are appropriate, achievable and measurable. At Intermediate level, it should include a clear idea of which topics to cover in the expanded case summaries. These should be chosen to demonstrate reasonable breadth of experience within the curriculum. The agreement may need to be revised if progress is not satisfactory, the goals cannot be met, or the trainee’s objectives change. It is therefore important that the trainee has regular reviews with the trainer and that the ETR is kept up to date.

The end-of-attachment assessment form describes the trainee’s performance during a specific attachment and must be completed in addition to the workplace based assessment documents. A copy of each educational agreement and end-of-attachment assessment should be included in the ETR, together with other documents describing educational and professional development such as weekly meetings attended or organised, lectures and other presentations given, audit projects and any other material of educational value to the trainee. Examples of an educational agreement and end-of-attachment assessment are included in this document.

2. Workplace Based Assessments

The Curriculum documents include examples of appropriate tools to assess each competence. The Handbook describes the number of assessments normally required at each level of training. All the assessment tools can be downloaded from www.ibticm.org. It is important to ensure that assessments sample a variety of Domains.

It is the trainees’ responsibility to ensure that the required number of assessments are performed at each level of training and that they are evenly spread throughout the attachment. The expanded case summaries, required for satisfactory completion of Intermediate Training, can be used as the basis for case based discussion.

3. Logbook

The trainee should keep a logbook of practical procedures. The IBTICM has produced an e-Logbook which can be downloaded via www.ibticm.org. It is also important to retain a record of the case-mix and degree of involvement of the trainee. See The Handbook for more on logbooks and portfolios.
4. Expanded case summaries

These case summaries should be completed by the end of Intermediate training.

A total of 10 case summaries are required. They should be discussed with the Educational Supervisor/Board Tutor and should cover a broad range of topics relevant to Intensive Care practice. They could be selected either to complement areas of particular interest or to help develop areas of weakness identified by the trainee or the trainee’s supervisor, or simply to illustrate the learning points from a clinical case. Each expanded case summary should be between 750 and 1500 words long with a minimum of 4 and a maximum of 10 references and should be prepared on separate sheets using the following subheadings as a guide:

1. Clinical problem
2. Relevant management
3. Further information and discussion
4. Learning points from this case
5. References

The Board Tutor or Educational Supervisor must sign to confirm that each case summary is of an acceptable standard. They will be used as topics for discussion during Module 2 of the oral examinations if the UK Diploma in ICM is taken.

Guidance on expanded case summaries, along with a submission example, can be found at [www.ibticaim.org](http://www.ibticaim.org). More examples are available on the trainee division of the Intensive Care Society website: [www.ics.ac.uk](http://www.ics.ac.uk).

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<tr>
<th>Title of expanded case summary</th>
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</table>

**Educational Supervisor:**

I certify that these case summaries have been completed to an acceptable standard.

Name: ........................................................................................................ Signature: ........................................................................................................
EDUCATIONAL AGREEMENT

Trainee: ............................................................. Educational Supervisor: .............................................................

Attachment

Hospital & ICU: ..........................................................................................................................................................

Level of Training aiming towards: .............................................. Date: ........../........../........

Objectives

Clinical management:

Practical procedures:

ICU management:

Examinations:

Audit, research, presentations:

Teaching:

Number of assessments during attachment: ..............................................................

I agree to complete and keep up to date the appropriate training documents relevant to this ICM attachment and that the result of any assessment of this attachment can be passed on to my next training supervisor.

Date of review of progress in achieving educational goals: ........../........../........

Signature Trainee: ............................................................. Signature Trainer: .............................................................
Name: ………………………………………………………………………………………………….. Date: ……… / ……… / ………

Attachment

Hospital & ICU: ……………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………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<td>3. Disease Management</td>
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<td>5. Practical procedures</td>
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<td>6. Perioperative care</td>
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<td>7. Comfort and recovery</td>
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<td>Sign</td>
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<tr>
<td>8. End of life care</td>
<td>Sign</td>
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<td>Sign</td>
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<tr>
<td>9. Paediatric care</td>
<td>Sign</td>
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<td>10. Transport</td>
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<tr>
<td>11. Patient safety and health systems management</td>
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<tr>
<td>12. Professionalism</td>
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Competency Domains covered during attachment to be signed by supervising consultant. Please refer to IBTICM competency document.
Part III

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1. **Introduction**

The development of the syllabus for the CCT in ICM has drawn unashamedly and gratefully on the CoBaTrICE syllabus developed under the auspices of the European Society of Intensive Care Medicine. It is central to the development of the CCT Curriculum that it should be a valid and accepted qualification for the professional practice of Intensive Care Medicine throughout Europe.

A full description of the CoBaTrICE methodology can be found in *Part I* of this curriculum.

1.1 **Competencies**

Due to the nature of ICM training in the UK, the competence statements for **Basic**, **Intermediate**, and **Advanced** level intensive care are presented separately below for ease of reference, broken down by Domain. This serves as an overview of the competencies required at each stage, however it must be emphasised that this is an additive, spiral curriculum. A great deal of knowledge must be acquired during Basic training to enable the trainee to understand and function within a critical care unit. During Intermediate and Advanced training the competencies gained during Basic training will be developed and reassessed so trainees can demonstrate their achievement of expertise in the specialty.

It is important to view the curriculum as a whole; whilst an individual competence might be in the Basic curriculum, not all syllabus elements will be appropriate to Basic training. These can be considered when the competence is revisited at higher levels of training.

Conversely a competence, for example **1.5 Assesses and provides initial management of the trauma patient**, should be acquired during Intermediate training; however some syllabus elements may be appropriate to Basic trainees, for example undertaking a primary survey.

1.2 **Assessment Tools Key**

Each competence is mapped to the relevant assessment tools as follows:

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<tr>
<td>D</td>
<td>Direct Observation of procedural Skills (DOPS)</td>
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<td>M</td>
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<tr>
<td>T</td>
<td>Acute Care Assessment Tool (ACAT)</td>
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<td>S</td>
<td>Simulation</td>
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</table>
### 1.3 Good Medical Practice

Each competence is also mapped to the four domains of Good Medical Practice:

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<tr>
<th>Domain</th>
<th>Descriptor</th>
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<tr>
<td>1</td>
<td>Knowledge, skills and performance</td>
</tr>
<tr>
<td>2</td>
<td>Safety and quality</td>
</tr>
<tr>
<td>3</td>
<td>Communication, partnership and teamwork</td>
</tr>
<tr>
<td>4</td>
<td>Maintaining trust</td>
</tr>
</tbody>
</table>
Training objectives:

During Basic training in ICM the trainee will be working under direct supervision for the majority of the time, being introduced to the knowledge and skills required for ICM. A broad-based outline knowledge of the wide range of problems which are seen in ICM is necessary at Basic level. Greater understanding and expertise can be built upon this during higher stages of training so the trainee can become a progressively more autonomous practitioner.

The composite competencies for Basic level ICM are outlined here by Domain, mapped to the relevant assessment tools and Good Medical Practice. The components that make up each competence are listed in the full syllabus below.

After Basic level training (i.e. after 3 months of post-Foundation training) a trainee should:

- Appreciate the factors involved in the decision to admit to the ICU
- Identify a sick patient at an early stage
- Be able to undertake immediate resuscitation of patients with cardiac arrest and sepsis
- Have an outline understanding of the pathology, clinical features and the management of common problems which present to ICU
- Understand the principles and place of the common monitoring and interventions in ICU
- Be able to follow a management plan for common ICU problems and recognise developing abnormalities, but appreciate that they will need assistance in deciding on an appropriate action.
- Be able to continue the management, with distant supervision, of, for example:
  - a resuscitated patient
  - a stable post-operative patient
  - a patient established on non-invasive ventilation

<table>
<thead>
<tr>
<th>Competence</th>
<th>Description</th>
<th>Assessment Methods</th>
<th>GMP</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Domain 1: Resuscitation and initial management of the acutely ill patient</strong></td>
<td>1.1 Adopts a structured and timely approach to the recognition, assessment and stabilisation of the acutely ill patient with disordered physiology</td>
<td>I, C, M, T, S</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>1.2 Manages cardiopulmonary resuscitation</td>
<td>I, M, T, S</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>1.3 Manages the patient post resuscitation</td>
<td>I, M, T</td>
<td>1</td>
</tr>
</tbody>
</table>
### Domain 2: Diagnosis, Assessment, Investigation, Monitoring and Data Interpretation

<p>| | | | |</p>
<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>2.1</td>
<td>Obtains a history and performs an accurate clinical examination</td>
<td>I, M</td>
<td>1</td>
</tr>
<tr>
<td>2.2</td>
<td>Undertakes timely and appropriate investigations</td>
<td>I, C, M</td>
<td>1</td>
</tr>
<tr>
<td>2.3</td>
<td>Performs electrocardiography (ECG / EKG) and interprets the results</td>
<td>D, I, C</td>
<td>1</td>
</tr>
<tr>
<td>2.4</td>
<td>Obtains appropriate microbiological samples and interprets results</td>
<td>D, C</td>
<td>1</td>
</tr>
<tr>
<td>2.5</td>
<td>Obtains and interprets the results from blood gas samples</td>
<td>D, C</td>
<td>1</td>
</tr>
<tr>
<td>2.6</td>
<td>Interprets imaging studies</td>
<td>I, C</td>
<td>1</td>
</tr>
<tr>
<td>2.7</td>
<td>Monitors and responds to trends in physiological variables</td>
<td>I, T</td>
<td>1</td>
</tr>
<tr>
<td>2.8</td>
<td>Integrates clinical findings with laboratory investigations to form a differential diagnosis</td>
<td>I, C, T</td>
<td>1</td>
</tr>
</tbody>
</table>

### Domain 3: Disease Management

<p>| | | | |</p>
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<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>3.1</td>
<td>Manages the care of the critically ill patient with specific acute medical conditions</td>
<td>D, I, C, M, T</td>
<td>1</td>
</tr>
<tr>
<td>3.2</td>
<td>Identifies the implications of chronic and co-morbid disease in the acutely ill patient</td>
<td>C, E</td>
<td>1</td>
</tr>
<tr>
<td>3.3</td>
<td>Recognises and manages the patient with circulatory failure</td>
<td>I, C, T</td>
<td>1</td>
</tr>
<tr>
<td>3.4</td>
<td>Recognises and manages the patient with, or at risk of, acute renal failure</td>
<td>I, C, T</td>
<td>1</td>
</tr>
<tr>
<td>3.5</td>
<td>Recognises and manages the patient with, or at risk of, acute liver failure</td>
<td>I, C, T</td>
<td>1</td>
</tr>
<tr>
<td>3.6</td>
<td>Recognises and manages the patient with neurological impairment</td>
<td>I, C, T</td>
<td>1</td>
</tr>
<tr>
<td>3.7</td>
<td>Recognises and manages the patient with acute gastrointestinal failure</td>
<td>I, C, T</td>
<td>1</td>
</tr>
<tr>
<td>3.8</td>
<td>Recognises and manages the patient with acute lung injury syndromes (ALI / ARDS)</td>
<td>I, C, T</td>
<td>1</td>
</tr>
<tr>
<td>3.9</td>
<td>Recognises and manages the septic patient</td>
<td>I, C, T</td>
<td>1</td>
</tr>
<tr>
<td>3.10</td>
<td>Recognises and manages the patient following intoxication with drugs or environmental toxins</td>
<td>I, C</td>
<td>1</td>
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</tbody>
</table>

### Domain 4: Therapeutic interventions / Organ system support in single or multiple organ failure

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<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>4.1</td>
<td>Prescribes drugs and therapies safely</td>
<td>D, C, M</td>
<td>1</td>
</tr>
<tr>
<td>4.2</td>
<td>Manages antimicrobial drug therapy</td>
<td>I, C, M</td>
<td>1</td>
</tr>
<tr>
<td>4.3</td>
<td>Administers blood and blood products safely</td>
<td>D, C, M</td>
<td>1</td>
</tr>
<tr>
<td>4.4</td>
<td>Uses fluids and vasoactive / inotropic drugs to support the circulation</td>
<td>I, C</td>
<td>1</td>
</tr>
<tr>
<td>4.6</td>
<td>Initiates, manages, and weans patients from invasive and non-invasive ventilatory support</td>
<td>D, C, T</td>
<td>1</td>
</tr>
<tr>
<td>4.8</td>
<td>Recognises and manages electrolyte, glucose and acid-base disturbances</td>
<td>I, C, T</td>
<td>1</td>
</tr>
<tr>
<td>4.9</td>
<td>Co-ordinates and provides nutritional assessment and support</td>
<td>I, C, T</td>
<td>1</td>
</tr>
</tbody>
</table>

### Domain 5: Practical procedures

<p>| | | | |</p>
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<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>5.1</td>
<td>Administers oxygen using a variety of administration devices</td>
<td>D</td>
<td>1</td>
</tr>
<tr>
<td>5.2</td>
<td>Performs emergency airway management</td>
<td>D</td>
<td>1</td>
</tr>
<tr>
<td>5.4</td>
<td>Performs endotracheal suction</td>
<td>D</td>
<td>1, 4</td>
</tr>
<tr>
<td>5.7</td>
<td>Performs chest drain insertion</td>
<td>D</td>
<td>1, 4</td>
</tr>
<tr>
<td>5.8</td>
<td>Performs arterial catheterisation</td>
<td>D</td>
<td>1, 4</td>
</tr>
<tr>
<td></td>
<td>Activity</td>
<td>Domain</td>
<td>Level</td>
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</tr>
<tr>
<td>5.9</td>
<td>Performs ultrasound techniques for vascular localisation</td>
<td>D</td>
<td>1, 4</td>
</tr>
<tr>
<td>5.10</td>
<td>Performs central venous catheterisation</td>
<td>D</td>
<td>1, 4</td>
</tr>
<tr>
<td>5.11</td>
<td>Performs defibrillation and cardioversion</td>
<td>D</td>
<td>1, 4</td>
</tr>
<tr>
<td>5.14</td>
<td>Demonstrates a method for measuring cardiac output and derived haemodynamic variables</td>
<td>D, C</td>
<td>1</td>
</tr>
<tr>
<td>5.15</td>
<td>Performs lumbar puncture (intradural / 'spinal') under supervision</td>
<td>D</td>
<td>1, 4</td>
</tr>
<tr>
<td>5.19</td>
<td>Performs nasogastric tube placement in the intubated patient</td>
<td>D</td>
<td>1, 4</td>
</tr>
<tr>
<td>5.20</td>
<td>Performs urinary catheterisation</td>
<td>D</td>
<td>1</td>
</tr>
</tbody>
</table>

**Domain 6: Peri-operative care**

<table>
<thead>
<tr>
<th></th>
<th>Activity</th>
<th>Domain</th>
<th>Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.1</td>
<td>Manages the pre- and post-operative care of the high risk surgical patient</td>
<td>C, M, T</td>
<td>1</td>
</tr>
</tbody>
</table>

**Domain 7: Comfort and recovery**

<table>
<thead>
<tr>
<th></th>
<th>Activity</th>
<th>Domain</th>
<th>Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.1</td>
<td>Identifies and attempts to minimise the physical and psychosocial consequences of critical illness for patients and families</td>
<td>C, M</td>
<td>1, 3</td>
</tr>
<tr>
<td>7.2</td>
<td>Manages the assessment, prevention and treatment of pain and delirium</td>
<td>D, I, C, M, T</td>
<td>1</td>
</tr>
<tr>
<td>7.3</td>
<td>Manages sedation and neuromuscular blockade</td>
<td>D, I, C, M, T</td>
<td>1</td>
</tr>
<tr>
<td>7.4</td>
<td>Communicates the continuing care requirements of patients at ICU discharge to health care professionals, patients and relatives</td>
<td>M, T</td>
<td>3</td>
</tr>
</tbody>
</table>

**Domain 8: End of life care**

<table>
<thead>
<tr>
<th></th>
<th>Activity</th>
<th>Domain</th>
<th>Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.2</td>
<td>Discusses end of life care with patients and their families / surrogates</td>
<td>D, C, M</td>
<td>3, 4</td>
</tr>
</tbody>
</table>

**Domain 9: Paediatric care**

*See Intermediate level competencies, below*

**Domain 10: Transport**

*See Intermediate level competencies, below*

**Domain 11: Patient safety and health systems management**

<table>
<thead>
<tr>
<th></th>
<th>Activity</th>
<th>Domain</th>
<th>Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>11.2</td>
<td>Complies with local infection control measures</td>
<td>C, M</td>
<td>2</td>
</tr>
<tr>
<td>11.3</td>
<td>Identifies environmental hazards and promotes safety for patients and staff</td>
<td>C, M</td>
<td>2</td>
</tr>
<tr>
<td>11.4</td>
<td>Identifies and minimises risk of critical incidents and adverse events, including complications of critical illness</td>
<td>C, M</td>
<td>2</td>
</tr>
<tr>
<td>11.6</td>
<td>Critically appraises and applies guidelines, protocols and care bundles</td>
<td>C</td>
<td>1</td>
</tr>
<tr>
<td>11.7</td>
<td>Describes commonly used scoring systems for assessment of severity of illness, case mix and workload</td>
<td>C</td>
<td>1</td>
</tr>
</tbody>
</table>

**Domain 12: Professionalism**

<table>
<thead>
<tr>
<th></th>
<th>Activity</th>
<th>Domain</th>
<th>Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1</td>
<td>Communicates effectively with patients and relatives</td>
<td>D, M, T</td>
<td>3</td>
</tr>
<tr>
<td>12.2</td>
<td>Communicates effectively with members of the health care team</td>
<td>D, M</td>
<td>3</td>
</tr>
<tr>
<td>12.3</td>
<td>Maintains accurate and legible records / documentation</td>
<td>D, M, T</td>
<td>1</td>
</tr>
<tr>
<td>12.6</td>
<td>Respects privacy, dignity, confidentiality and legal constraints on the use of patient data</td>
<td>C, M</td>
<td>1, 4</td>
</tr>
<tr>
<td>12.7</td>
<td>Collaborates and consults; promotes team-working</td>
<td>M</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Description</td>
<td>Faculty</td>
<td>Year</td>
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</tr>
<tr>
<td>12.8</td>
<td>Ensures continuity of care through effective hand-over of clinical information</td>
<td>C, M, T</td>
<td>1</td>
</tr>
<tr>
<td>12.11</td>
<td>Takes responsibility for safe patient care</td>
<td>D, C, M, T</td>
<td>1, 3</td>
</tr>
<tr>
<td>12.13</td>
<td>Seeks learning opportunities and integrates new knowledge into clinical practice</td>
<td>M</td>
<td>1</td>
</tr>
<tr>
<td>12.14</td>
<td>Participates in multidisciplinary teaching</td>
<td>M</td>
<td>1</td>
</tr>
<tr>
<td>12.15</td>
<td>Participates in research or audit under supervision</td>
<td>M</td>
<td>1, 4</td>
</tr>
</tbody>
</table>
Training objectives:

During Intermediate training the trainee is gaining a more in depth knowledge of and skill set for intensive care, this acquisition is a continual process. It is not appropriate to attempt to complete intermediate level competencies immediately after Basic training; greater experience, time in training and maturity as a doctor are necessary to be able to take advantage of training at this level. At completion of Intermediate training and base specialty training the trainee would be able to undertake a consultant role with on-call commitment to an intensive care unit with support from colleagues for more complex problems.

The composite competencies for Intermediate level ICM are outlined here by Domain, mapped to the relevant assessment tools and Good Medical Practice. The components that make up each competence are listed in the full syllabus below.

After Intermediate level training (i.e. after completing 3 months Basic ICM, 6 months ICM training post-ST2, completing complementary specialty training, and reaching at least ST4 in their primary specialty, and completing 10 case summaries) a trainee should:

- Recognise and manage the factors which may lead to deterioration in sick patients
- Be able to undertake post-resuscitation management and be able to manage the initial resuscitation of more complex specialist patients.
- Have an understanding of the pathology, clinical features and prognosis of the majority of problems presenting to ICU, and be able to initiate management of them, with distant supervision.
- Be able to appropriately request and interpret (in discussion with appropriate specialists) investigations such as CT, ultrasound, and microbiology.
- Be able to make a critical appraisal of the evidence for treatment and investigations.
- Appreciate that ICUs are complex systems which require management and leadership skills.
- Be able to lead a ward round, planning care for the next 24 hours.

During Intermediate training the trainee will be expected to expand and develop competencies gained at Basic level.

<table>
<thead>
<tr>
<th>Domain 1: Resuscitation and initial management of the acutely ill patient</th>
<th>Description</th>
<th>Assessment Methods</th>
<th>GMP</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.4</td>
<td>Triages and prioritises patients appropriately, including timely admission to ICU</td>
<td>C, M, T</td>
<td>1</td>
</tr>
<tr>
<td>1.5</td>
<td>Assesses and provides initial management of the trauma patient</td>
<td>D, I, C, M, T</td>
<td>1</td>
</tr>
<tr>
<td>1.6</td>
<td>Assesses and provides initial management of the patient with burns</td>
<td>D, I, C, M, T</td>
<td>1</td>
</tr>
</tbody>
</table>

**Domain 2: Diagnosis, Assessment, Investigation, Monitoring and Data Interpretation**

*See Basic level competencies, above*

**Domain 3: Disease Management**

| 3.11 | Recognises life-threatening maternal peripartum complications and manages care under supervision | I, C | 1 |

**Domain 4: Therapeutic interventions / Organ system support in single or multiple organ failure**

| 4.7 | Initiates, manages and weans patients from renal replacement therapy | D, I, C, T | 1, 4 |

**Domain 5: Practical procedures**

| 5.3 | Performs difficult and failed airway management according to local protocols | D | 1, 4 |
| 5.5 | Performs fibreoptic bronchoscopy and BAL in the intubated patient under supervision | D | 1, 4 |
| 5.12 | Performs transthoracic cardiac pacing; describes transvenous | D, C | 1, 4 |
| 5.13 | Describes how to perform pericardiocentesis | C | 1, 4 |
| 5.16 | Manages the administration of analgesia via an epidural catheter | I | 1, 4 |
| 5.17 | Performs abdominal paracentesis | D | 1, 4 |
| 5.18 | Describes Sengstaken tube (or equivalent) placement | C | 1, 4 |

**Domain 6: Peri-operative care**

| 6.5 | Manages the pre- and post-operative care of the trauma patient under supervision | C, T | 1 |

**Domain 7: Comfort and recovery**

| 7.5 | Manages the safe and timely discharge of patients from the ICU | M, T, C | 1, 3 |

**Domain 8: End of life care**

| 8.1 | Manages the process of withholding or withdrawing treatment with the multidisciplinary team | C, M | 1, 3, 4 |
| 8.3 | Manages palliative care of the critically ill patient | C, M, T | 1, 3, 4 |
| 8.4 | Performs brain-stem death testing | D | 1 |
| 8.5 | Manages the physiological support of the organ donor | I, C | 1 |

**Domain 9: Paediatric care**

| 9.1 | Describes the recognition of the acutely ill child and initial management of paediatric emergencies | I, C | 1 |
| 9.2 | Describes national legislation and guidelines relating to child protection and their relevance to critical care | C | 1 |

**Domain 10: Transport**

| 10.1 | Undertakes transport of the mechanically ventilated critically ill patient outside the ICU | D, I, C, M | 1, 3 |

**Domain 11: Patient safety and health systems management**

<p>| 11.1 | Leads a daily multidisciplinary ward round | M, T | 1, 2, 3, 4 |
| 11.5 | Organises a case conference | M, C | 3 |</p>
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<tr>
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</thead>
<tbody>
<tr>
<td>12.4</td>
<td>Involves patients (or their surrogates if applicable) in decisions about care and treatment</td>
<td>C, M, T</td>
<td>3, 4</td>
</tr>
<tr>
<td>12.5</td>
<td>Demonstrates respect of cultural and religious beliefs and an awareness of their impact on decision making</td>
<td>C, M, T</td>
<td>3, 4</td>
</tr>
<tr>
<td>12.9</td>
<td>Supports clinical staff outside the ICU to enable the delivery of effective care</td>
<td>C, M, T</td>
<td>1</td>
</tr>
<tr>
<td>12.10</td>
<td>Appropriately supervises and delegates to others, the delivery of patient care</td>
<td>C, M, T</td>
<td>1</td>
</tr>
</tbody>
</table>
INTENSIVE CARE MEDICINE – ADVANCED LEVEL

Training objectives:

Advanced training is for clinicians who will take on a consultant role with a significant commitment to an intensive care unit. During this training they will be able to progressively increase their level of autonomy so they are capable of becoming an independent practitioner. Whilst knowledge and skills gained during Basic and Intermediate training will be consolidated, education of others, management and leadership assume a greater importance.

The composite competencies for Advanced level ICM are outlined here by Domain, mapped to the relevant assessment tools and Good Medical Practice. The components that make up each competence are listed in the full syllabus below.

After Advanced training (i.e. completing Intermediate training and a further 12 months of ICM and are thus in the last year of training in their primary specialty) a trainee should:

- Have a detailed knowledge of the majority of conditions presenting to ICU
- Have a wide experience of ICM in varied situations.
- Be able to manage initial resuscitation and stabilisation of any acutely ill patient, adult or child, prior to transfer to an appropriate specialist centre.
- Be able to operate unsupervised and take on a management and leadership role in an ICU.

During Advanced training the trainee will be expected to expand and develop competencies gained at Basic and Intermediate level.

<table>
<thead>
<tr>
<th>Competence</th>
<th>Description</th>
<th>Assessment Methods</th>
<th>GMP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Domain 1: Resuscitation and initial management of the acutely ill patient</td>
<td>1.7 Describes the management of mass casualties</td>
<td>C</td>
<td>1, 3</td>
</tr>
<tr>
<td>Domain 2: Diagnosis, Assessment, Investigation, Monitoring and Data Interpretation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Domain 3: Disease Management</td>
<td>See Basic level competencies, above</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Domain 4: Therapeutic interventions / Organ system support in single or multiple organ failure</td>
<td>4.5 Describes the uses of mechanical assist devices to support the circulation</td>
<td>C</td>
<td>1</td>
</tr>
<tr>
<td>Domain</td>
<td>Description</td>
<td></td>
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<td></td>
</tr>
<tr>
<td><strong>Domain 5: Practical procedures</strong></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>5.6</td>
<td>Performs percutaneous tracheostomy</td>
<td>D</td>
<td>1, 4</td>
</tr>
<tr>
<td><strong>Domain 6: Peri-operative care</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.2</td>
<td>Manages the care of the patient following cardiac surgery</td>
<td>C</td>
<td>1</td>
</tr>
<tr>
<td>6.3</td>
<td>Manages the care of the patient following craniotomy under supervision</td>
<td>C, T</td>
<td>1</td>
</tr>
<tr>
<td>6.4</td>
<td>Manages the care of the patient following solid organ transplantation</td>
<td>C</td>
<td>1</td>
</tr>
<tr>
<td><strong>Domain 7: Comfort and recovery</strong></td>
<td>See Basic and Intermediate level competencies, above</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Domain 8: End of life care</strong></td>
<td>See Basic and Intermediate level competencies, above</td>
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<tr>
<td>8.6</td>
<td>Manages non heart beating organ donation</td>
<td>C, T</td>
<td>1, 3, 4</td>
</tr>
<tr>
<td><strong>Domain 9: Paediatric care</strong></td>
<td>See Intermediate level competencies, above</td>
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<td><strong>Domain 10: Transport</strong></td>
<td>See Intermediate level competencies, above</td>
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<tr>
<td><strong>Domain 11: Patient safety and health systems management</strong></td>
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<tr>
<td>11.8</td>
<td>Demonstrates an understanding of the managerial and administrative responsibilities of the ICM specialist</td>
<td>C</td>
<td>1, 3</td>
</tr>
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<td><strong>Domain 12: Professionalism</strong></td>
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</tr>
<tr>
<td>12.12</td>
<td>Formulates clinical decisions with respect for ethical and legal principles</td>
<td>C, M, T</td>
<td>1</td>
</tr>
</tbody>
</table>
Domain 1: Resuscitation and initial management of the acutely ill patient

General Principles

The point of first contact with an acutely ill, deteriorating, or collapsed patient requires clinicians to take action to prevent or correct physiological deterioration despite uncertainty about causation and the precise underlying diagnosis in acutely ill patients. Meeting this challenge – action in uncertainty – demands a structured approach to patient management, as exemplified by the resuscitation algorithms. Although less well developed for the acutely ill patient, they are of equal importance.

A wide outline knowledge is expected even at an early stage of training; however the level at which a trainee would be expected to manage different problems is indicated in the text.

Features of competent performance may include:

- Recognition of presenting signs and symptoms
- Identification and rapid response to life-threatening complications
- Planning and prioritisation of investigations and monitoring – appropriate; timely
- Appropriate differential diagnosis
- Clear decision making and immediate management strategies (including application of relevant protocols / guidelines / care bundles)
- Effective team working and leadership – clear communication and instructions
- Appropriate referral / consultation
- Recognition of limitations (self and others)
- Attention to patient safety

Domain 1: Competencies

<table>
<thead>
<tr>
<th>Competence</th>
<th>Description</th>
<th>IBTICM level</th>
<th>Assessment methods</th>
<th>GMP</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1</td>
<td>Adopts a structured and timely approach to the recognition, assessment and stabilisation of the acutely ill patient with disordered physiology</td>
<td>Basic</td>
<td>I, C, M, T, S</td>
<td>1</td>
</tr>
<tr>
<td>1.2</td>
<td>Manages cardiopulmonary resuscitation</td>
<td>Basic</td>
<td>I, M, T, S</td>
<td>1</td>
</tr>
<tr>
<td>1.3</td>
<td>Manages the patient post resuscitation</td>
<td>Basic</td>
<td>I, M, T</td>
<td>1</td>
</tr>
<tr>
<td>1.4</td>
<td>Triage and prioritises patients appropriately, including timely admission to ICU</td>
<td>Intermediate</td>
<td>C, M, T</td>
<td>1</td>
</tr>
<tr>
<td>1.5</td>
<td>Assesses and provides initial management of the trauma patient</td>
<td>Intermediate</td>
<td>D, I, M, T, C</td>
<td>1</td>
</tr>
<tr>
<td>1.6</td>
<td>Assesses and provides initial management of the patient with burns</td>
<td>Intermediate</td>
<td>D, I, M, T, C</td>
<td>1</td>
</tr>
<tr>
<td>1.7</td>
<td>Describes the management of mass casualties</td>
<td>Advanced</td>
<td>C</td>
<td>1, 3</td>
</tr>
</tbody>
</table>

Domain 1: Syllabus

Knowledge, skills and attitudes common to all competencies

Knowledge

- Recognises the importance of ensuring physiological safety as a primary aim
- Recognises the importance of timely institution of organ-system support
- Recognises the need for supportive care for all organ systems whether failing / injured or not
- Principles of oxygen therapy and use of oxygen administration devices (see 5.1)
Skills
Recognise and manage emergencies; seek assistance appropriately
Order and prioritise appropriate investigations
Professional and reassuring approach - generates confidence and trust in patients and their relatives
Lead, delegate and supervise others appropriately according to experience and role
Clear explanations given to patient, relatives and staff
Consults and takes into account the views of referring clinicians; promotes their participation in decision making where appropriate

Attitudes
Patient safety is paramount
Rapid response and resuscitation
Determination to provide best and most appropriate care possible regardless of environment
Recognises personal limitations, seeks and accepts assistance or supervision (knows how, when and who to ask)

<table>
<thead>
<tr>
<th>1.1</th>
<th>Adopts a structured and timely approach to the recognition, assessment and stabilisation of the acutely ill patient with disordered physiology</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Basic</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Knowledge</strong></td>
<td></td>
</tr>
<tr>
<td>Early warning signs of impending critical illness</td>
<td></td>
</tr>
<tr>
<td>Causes of cardio-respiratory arrest, identification of patients at risk and corrective treatment of reversible causes</td>
<td></td>
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<tr>
<td>Clinical signs associated with critical illness, their relative importance and interpretation</td>
<td></td>
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<tr>
<td>Clinical severity of illness and indications when organ dysfunctions or failure are an immediate threat to life</td>
<td></td>
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<tr>
<td>Causes, recognition and management of:</td>
<td></td>
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<tr>
<td>• Acute chest pain</td>
<td></td>
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<tr>
<td>• Tachypnoea and dyspnoea</td>
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<tr>
<td>• Upper and lower airway obstruction</td>
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<tr>
<td>• Pulmonary oedema</td>
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<tr>
<td>• Pneumothorax (simple and tension)</td>
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<tr>
<td>• Hypoxaemia</td>
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<td>• Hypotension</td>
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<tr>
<td>• Shock states</td>
<td></td>
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<tr>
<td>• Anaphylactic and anaphylactoid reactions</td>
<td></td>
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<tr>
<td>• Hypertensive emergencies</td>
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<tr>
<td>• Acute confusional states and altered consciousness</td>
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<tr>
<td>• Acute seizures / convulsions</td>
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<tr>
<td>• Oliguria and anuria</td>
<td></td>
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<tr>
<td>• Acute disturbances in thermoregulation</td>
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<tr>
<td>Treatment algorithms for common medical emergencies</td>
<td></td>
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<tr>
<td>Immediate management of acute coronary syndromes</td>
<td></td>
</tr>
<tr>
<td>Peri-arrest arrhythmias and the principles of their management (bradycardia, broad complex tachycardia, atrial fibrillation, narrow complex tachycardia)</td>
<td></td>
</tr>
<tr>
<td>Methods for securing vascular access rapidly</td>
<td></td>
</tr>
<tr>
<td>Surface anatomy: structures in the antecubital fossa; large veins and anterior triangle of the neck; large veins of the leg and femoral triangle</td>
<td></td>
</tr>
<tr>
<td>Techniques for effective fluid resuscitation</td>
<td></td>
</tr>
<tr>
<td>Principles of emergency airway management (see 5.3)</td>
<td></td>
</tr>
<tr>
<td>Indications for, and methods of, ventilatory support</td>
<td></td>
</tr>
<tr>
<td>Indications for not starting resuscitation or ceasing an initiated attempt</td>
<td></td>
</tr>
<tr>
<td>Relevance of prior health status in determining risk of critical illness and outcomes</td>
<td></td>
</tr>
</tbody>
</table>

**Skills**
Considers legal and ethical issues: patient autonomy, appropriateness of resuscitation and ICU admission.
Conduct a primary survey: obtain relevant information rapidly and accurately
Assess conscious level, status of airway and cervical spine, and conduct careful systems review
Monitor vital physiological functions as indicated
Recognise and rapidly respond to adverse trends in monitored parameters
Recognise and manage choking / obstructed airway
Implement emergency airway management and ventilation under direct supervision
**Intermediate**

### Knowledge
- Measures of adequacy of tissue oxygenation, e.g. base deficit, lactate, central venous saturation
- Treatment strategies for abnormalities of fluid, electrolyte, acid-base and glucose balance
- Criteria for admission to, and discharge from ICU – factors influencing intensity and site of care (ward, high dependency unit (HDU), intensive care unit (ICU))

### Skills
- Examine and plan care for the confused patient
- Implement emergency airway management and ventilation

### 1.2 Manages cardiopulmonary resuscitation – ALS recommended

#### Basic

### Knowledge
- Causes of cardio-respiratory arrest, identification of patients at risk and corrective treatment of reversible causes
- Methods for securing vascular access rapidly
- Causes and recognition of acute airway obstruction
- Cardiopulmonary resuscitation
- The modification of resuscitation techniques in the special circumstances of hypothermia, immersion and submersion, poisoning, pregnancy, electrocution, anaphylaxis, acute severe asthma and trauma
- Risks to the rescuer during resuscitation and methods to minimise these
- Treatment (algorithm) of patients in ventricular fibrillation (VF) and pulseless ventricular tachycardia (VT)
- Treatment (algorithm) of patients with non-VT/VF rhythms (asystole / PEA)
- Tracheal route for drug administration: indications, contraindications, dosage
- Indications, dosages and actions of drugs used in the peri-arrest period
- Defibrillation: principles of monophasic and biphasic defibrillators; mechanism, indications, complications, modes and methods (manual and automated external defibrillators (AED)
- Indications and methods of cardiac pacing in the peri-arrest setting
- Effect of cardiorespiratory arrest on body systems
- Principles of emergency airway management (see 5.3)
- Audit of outcome after cardiac arrest
- Indications for not starting resuscitation or ceasing an initiated attempt
- Legal and ethical issues relating to the use of the recently dead for practical skills training, research and organ donation

### Skills
- Consider legal and ethical issues: patient autonomy, appropriateness of resuscitation and ICU admission.
- Conduct a primary survey: obtain relevant information rapidly and accurately
- Monitor vital physiological functions as indicated
- Check and assemble resuscitation equipment
- Demonstrate advanced life support skills (ALS standard or equivalent)
- Principles of emergency airway management (see 5.3)
- Recognise and manage choking / obstructed airway
- Implement emergency airway management and ventilation under direct supervision
- Act appropriately as a member or leader of the team (according to skills and experience)
- Respond to an emergency in a positive, organised and effective manner.
- Participate in timely discussion and regular review of ‘do not attempt resuscitation’ orders and treatment limitation decisions

---

**Demonstrate emergency relief of tension pneumothorax**

**Obtain vascular access sufficient to manage acute haemorrhage, rapid fluid infusion and monitor cardiovascular variables**

**Initiate emergency external cardiac pacing**

**Respond to an emergency in a positive, organised and effective manner.**

**Participate in timely discussion and regular review of ‘do not attempt resuscitation’ orders and treatment limitation decisions**

**Perform a comprehensive secondary survey; integrate history with clinical examination to form a differential diagnosis.**

**Evaluate evidence for diagnoses already made and search for other diagnoses.**

**Assess, predict and manage circulatory shock**

**Prescribe appropriate analgesia**

**Intermediate**

### Knowledge
- Measures of adequacy of tissue oxygenation, e.g. base deficit, lactate, central venous saturation
- Treatment strategies for abnormalities of fluid, electrolyte, acid-base and glucose balance
- Criteria for admission to, and discharge from ICU – factors influencing intensity and site of care (ward, high dependency unit (HDU), intensive care unit (ICU))

### Skills
- Examine and plan care for the confused patient
- Implement emergency airway management and ventilation

---

**Basic**

### Knowledge
- Causes of cardio-respiratory arrest, identification of patients at risk and corrective treatment of reversible causes
- Methods for securing vascular access rapidly
- Causes and recognition of acute airway obstruction
- Cardiopulmonary resuscitation
- The modification of resuscitation techniques in the special circumstances of hypothermia, immersion and submersion, poisoning, pregnancy, electrocution, anaphylaxis, acute severe asthma and trauma
- Risks to the rescuer during resuscitation and methods to minimise these
- Treatment (algorithm) of patients in ventricular fibrillation (VF) and pulseless ventricular tachycardia (VT)
- Treatment (algorithm) of patients with non-VT/VF rhythms (asystole / PEA)
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- Indications and methods of cardiac pacing in the peri-arrest setting
- Effect of cardiorespiratory arrest on body systems
- Principles of emergency airway management (see 5.3)
- Audit of outcome after cardiac arrest
- Indications for not starting resuscitation or ceasing an initiated attempt
- Legal and ethical issues relating to the use of the recently dead for practical skills training, research and organ donation

### Skills
- Consider legal and ethical issues: patient autonomy, appropriateness of resuscitation and ICU admission.
- Conduct a primary survey: obtain relevant information rapidly and accurately
- Monitor vital physiological functions as indicated
- Check and assemble resuscitation equipment
- Demonstrate advanced life support skills (ALS standard or equivalent)
- Principles of emergency airway management (see 5.3)
- Recognise and manage choking / obstructed airway
- Implement emergency airway management and ventilation under direct supervision
- Act appropriately as a member or leader of the team (according to skills and experience)
- Respond to an emergency in a positive, organised and effective manner.
- Participate in timely discussion and regular review of ‘do not attempt resuscitation’ orders and treatment limitation decisions
### Intermediate

#### Skills
- Protect a potentially unstable cervical spine
- Implement emergency airway management and ventilation

### 1.3 Manages the patient post-resuscitation

#### Basic

##### Knowledge
Causes of cardio-respiratory arrest, identification of patients at risk and corrective treatment of reversible causes

Causes, recognition and management of:
- Upper and lower airway obstruction
- Tachypnoea and dyspnoea
- Hypoxaemia
- Pneumothorax (simple and tension)
- Acute chest pain
- Pulmonary oedema
- Hypotension
- Shock states
- Anaphylactic and anaphylactoid reactions
- Hypertensive emergencies
- Acute confusional states and altered consciousness
- Acute seizures / convulsions
- Oliguria and anuria
- Acute disturbances in thermoregulation

Peri-arrest arrhythmias and the principles of their management (bradycardia, broad complex tachycardia, atrial fibrillation, narrow complex tachycardia)

Techniques for effective fluid resuscitation

Indications for and methods of ventilatory support

Indications, dosages and actions of drugs used in the peri-arrest period

Indications and methods of cardiac pacing in the peri-arrest setting

Effect of cardio-respiratory arrest on body systems

Principles and application of therapeutic hypothermia

#### Skills
- Implement emergency airway management and ventilation under direct supervision
- Assess conscious level, status of airway and cervical spine, and conduct careful systems review
- Monitor vital physiological functions as indicated
- Recognise and rapidly respond to adverse trends in monitored parameters
- Obtain vascular access sufficient to manage acute haemorrhage, rapid fluid infusion and monitor cardiovascular variables
- Demonstrate emergency relief of tension pneumothorax
- Respond to an emergency in a positive, organised and effective manner.
- Participate in timely discussion and regular review of ‘do not attempt resuscitation’ orders and treatment limitation decisions
- Assess, predict and manage circulatory shock

### Intermediate

##### Knowledge
Measures of adequacy of tissue oxygenation, e.g. base deficit, lactate, central venous saturation

Treatment strategies for abnormalities of fluid, electrolyte, acid-base and glucose balance

Criteria for admission to, and discharge from ICU - factors influencing intensity and site of care (ward, high dependency unit (HDU), intensive care unit (ICU))

#### Skills
- Consider the need for and implement pre-transfer stabilisation
- Implement emergency airway management and ventilation
### 1.4 Triages and prioritises patients appropriately, including timely admission to ICU

#### Basic

**Knowledge**
- Early warning signs of impending critical illness
- Causes of cardio-respiratory arrest, identification of patients at risk and corrective treatment of reversible causes
- Clinical signs associated with critical illness, their relative importance and interpretation
- Clinical severity of illness and indications when organ dysfunctions or failure are an immediate threat to life
- Indications for not starting resuscitation or ceasing an initiated attempt
- Relevance of prior health status in determining risk of critical illness and outcomes

**Skills**
- Consider legal and ethical issues: patient autonomy, appropriateness of resuscitation and ICU admission.
- Conduct a primary survey: obtain relevant information rapidly and accurately
- Assess conscious level, status of airway and cervical spine, and conduct careful systems review
- Recognise and rapidly respond to adverse trends in monitored parameters
- Respond to an emergency in a positive, organised and effective manner.
- Participate in timely discussion and regular review of ‘do not attempt resuscitation’ orders and treatment limitation decisions
- Consider legal and ethical issues: patient autonomy, appropriateness of resuscitation and ICU admission.

#### Intermediate

**Knowledge**
- Triage and management of competing priorities
- Criteria for admission to, and discharge from ICU - factors influencing intensity and site of care (ward, high dependency unit (HDU), intensive care unit (ICU))

**Skills**
- Assess and communicate effectively the risks and benefits of intensive care admission
- Take decisions to admit, discharge or transfer patients
- Explain life-sustaining therapies, in clear language, and describe the expected outcome of such therapies in view of the patient's goals and wishes.

#### Advanced

**Skills**
- Discuss treatment options with a patient or relatives before ICU admission
- Determine when the patient's needs exceed local resources or specialist expertise (requirement for transfer)

### 1.5 Assesses and provides initial management of the trauma patient

#### Basic

**Knowledge**
- Methods for securing vascular access rapidly
- Surface anatomy: structures in the antecubital fossa; large veins and anterior triangle of the neck; large veins of the leg and femoral triangle
- Intraosseous cannulation
- Causes, recognition and management of shock states
- Techniques for effective fluid resuscitation
- Principles of blood and blood component therapy; principles of massive transfusion
- Principles of emergency airway management (see 5.3)
- Indications for and methods of ventilatory support
- Management of severe acute haemorrhage and blood transfusion; correction of coagulation disorders
- Methods for assessing neurological function e.g. Glasgow Coma Scale
- Principles, including indications, limitations and therapeutic modalities of: Basic radiological methods, CT scanning, ultrasound
- Indications for and basic interpretation of chest radiographs: range of normal features on a chest x-ray; collapse, consolidation, infiltrates (including ALI/ARDS), pneumothorax, pleural effusion, pericardial effusion, position of cannulae, tubes or foreign bodies, airway compression, cardiac silhouette, mediastinal masses

**Skills**
- Conduct a primary survey: obtain relevant information rapidly and accurately
- Assess and document Glasgow Coma Scale (GCS)
- Obtain vascular access sufficient to manage acute haemorrhage, rapid fluid infusion and monitor cardiovascular variables
Implement emergency airway management and ventilation under direct supervision
Perform a comprehensive secondary survey; integrate history with clinical examination to form a differential diagnosis.
Review and refine diagnosis according to new information and the patient’s response to treatment.
Assess conscious level, status of airway and cervical spine, and conduct careful systems review
Assess, predict and manage circulatory shock
Monitor vital physiological functions as indicated
Demonstrate emergency relief of tension pneumothorax
Prescribe appropriate analgesia

### Intermediate

#### Knowledge
- Principles, including indications, limitations and therapeutic modalities of: MRI, ultrasound, angiography and radionucleotide studies) in the critically ill patient
- Performance and interpretation of a primary and secondary survey
- Environmental hazards and injuries: hypo- and hyperthermia, near-drowning, electrocution, radiations, chemical injuries, electrical safety/micro shock

#### Effects and acute complications of severe trauma on organs and organ systems:
- Respiratory – thoracic trauma; acute lung injury; tension pneumothorax
- Cardiovascular – hypovolaemic shock; cardiac tamponade
- Renal – acute renal failure; rhabdomyolysis
- Neurological – altered consciousness; traumatic brain injury; post-anoxic brain injury; coup and contra-coup injuries; extra-dural and sub-dural haematomas; intracranial haemorrhage and infarction; spinal cord injury
- Gastrointestinal – abdominal trauma; abdominal tamponade; rupture of liver or spleen
- Musculoskeletal system – soft tissue injury; short term complications of fractures; fat embolism; crush injury and compartment syndromes; maxillofacial injuries

#### Relevance of mechanism of injury to clinical presentation
- Secondary insults that potentiate the primary injury
- Immediate specific treatment of life-threatening injury
- Triage and management of competing priorities
- Management of cervical spine injuries
- Principles of management of closed head injury; coup and contra-coup injuries; methods of preventing 'secondary insult' to the brain; recognition and immediate management of raised intracranial pressure
- Principles of outcome prediction / prognostic indicators and treatment intensity scales; limitations of scoring systems in predicting individual patient outcome

### Skills
- Prioritise the order of investigations and interventions for individual injuries according to their threat to life
- Protect a potentially unstable cervical spine
- Implement emergency airway management and ventilation

### Advanced

#### Skills
- Determine when the patient's needs exceed local resources or specialist expertise (requirement for transfer)

---

1.6 **Assesses and provides initial management of the patient with burns**

#### Basic

#### Knowledge
- Causes, recognition and management of shock states
- Methods for securing vascular access rapidly
- Surface anatomy: structures in the antecubital fossa; large veins and anterior triangle of the neck; large veins of the leg and femoral triangle
- Techniques for effective fluid resuscitation
- Causes and recognition of acute airway obstruction
- Indications for and methods of ventilatory support
- Recognition and management of acute disturbances in thermoregulation

#### Skills
- Conduct a primary survey: obtain relevant information rapidly and accurately/
- Assess conscious level, status of airway and cervical spine, and conduct careful systems review
- Monitor vital physiological functions as indicated
- Causes and recognition of acute airway obstruction
### Intermediate

#### Knowledge
- Triage and management of competing priorities
- Performance and interpretation of a primary and secondary survey
- Environmental hazards and injuries: hypo- and hyperthermia, near-drowning, electrocution, radiations, chemical injuries, electrical safety/micro shock
- Relevance of mechanism of injury to clinical presentation
- Pathophysiology and medical/surgical management of the phases of a burn injury
- Calculation of area burned
- Principles of calculation of fluid losses and fluid resuscitation in the burned patient
- Treatment strategies for abnormalities of fluid, electrolyte, acid-base and glucose balance
- Signs, symptoms and causes of renal failure including acute kidney injury / chronic / acute on chronic and indications for intervention
- Respiratory complications of burn injuries (smoke inhalation, airway burns) - detection and management
- Management of difficult or failed airway management (see 5.4)
- The environmental control necessary for optimal care of the burned patient
- Prevention of infection in the burned patient
- Burn-related compartment syndrome and escharotomy
- Principles of outcome prediction / prognostic indicators and treatment intensity scales; limitations of scoring systems in predicting individual patient outcome

#### Skills
- Implement emergency airway management and ventilation
- Assess burn severity and prescribe initial fluid resuscitation
- Describe the endpoints of burn resuscitation and preferred fluids
- Recognise the potential for airway compromise in the burned patient
- Identification and management of carbon monoxide poisoning

### Advanced

#### Knowledge
- Estimate burn wound mortality from published data tables
- Determine when the patient’s needs exceed local resources or specialist expertise (requirement for transfer)

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<table>
<thead>
<tr>
<th>1.7</th>
<th><strong>Describes the management of mass casualties</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Basic</strong></td>
<td>Psychological support for patients and relatives</td>
</tr>
<tr>
<td><strong>Intermediate</strong></td>
<td>Local major incident plan - the role of the ICU in hospital/community disaster plans</td>
</tr>
<tr>
<td><strong>Knowledge</strong></td>
<td>Triage and management of competing priorities</td>
</tr>
<tr>
<td></td>
<td>Triage methods in use locally</td>
</tr>
<tr>
<td></td>
<td>Relevance of mechanism of injury to clinical presentation</td>
</tr>
<tr>
<td></td>
<td>Environmental hazards and injuries: hypo- and hyperthermia, near-drowning, electrocution, radiations, chemical injuries, electrical safety/micro shock</td>
</tr>
<tr>
<td></td>
<td>Principles of crisis management, conflict resolution, negotiation and debriefing</td>
</tr>
<tr>
<td><strong>Advanced</strong></td>
<td>Organisational principles for the coordination and management of mass casualties</td>
</tr>
<tr>
<td><strong>Knowledge</strong></td>
<td>Communication tasks and personal role in major incident / accident plan</td>
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<tr>
<td></td>
<td>Characteristics and clinical presentations associated with major incidents caused by natural or civilian disasters, infection, epidemics or terrorist attack</td>
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<td>Decontamination procedures</td>
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<td></td>
<td>Management of public relations and information</td>
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<td></td>
<td>Alternative forms of external communication</td>
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</tbody>
</table>
Domain 2: Diagnosis, Assessment, Investigation, Monitoring and Data Interpretation

General Principles

It is very easy to acquire large amounts of data in modern medical practice. The challenge is to acquire appropriate data and convert it into information, essential steps on the pathway to diagnosis and treatment. Monitoring devices combine the functions of clinical investigation with surveillance.

Clinical investigations are forms of hypothesis testing; they bring burdens and occasional risks for patients, as well as additional costs and work for the investigating clinician and laboratory staff. Their utility, safety and accuracy must be balanced against these factors.

Features of competent performance may include:

- Recognition of clinical signs and symptoms
- Planning and prioritisation of investigations and monitoring – appropriate; timely
- Safe use of equipment / devices
- Obtain data effectively
- Interpret data in clinical context
- Effective clinical decision making supported by critical thinking and reflection
- Accurate differential diagnosis on basis of information available: review in light of clinical changes
- Effective team-working: planning and interpretation of investigations
- Appropriate referral / consultation / further investigation
- Recognition of limitations (self and others)
- Attention to patient safety

Domain 2: Competencies

<table>
<thead>
<tr>
<th>Competence</th>
<th>Description</th>
<th>IBTICM level</th>
<th>Assessment methods</th>
<th>GMP</th>
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</thead>
<tbody>
<tr>
<td>2.1</td>
<td>Obtains a history and performs accurate clinical examination</td>
<td>Basic</td>
<td>I, M</td>
<td>1</td>
</tr>
<tr>
<td>2.2</td>
<td>Undertakes timely and appropriate investigations</td>
<td>Basic</td>
<td>I, C, M</td>
<td>1</td>
</tr>
<tr>
<td>2.3</td>
<td>Performs electrocardiography (ECG / EKG) and interprets the results</td>
<td>Basic</td>
<td>D, I, C</td>
<td>1</td>
</tr>
<tr>
<td>2.4</td>
<td>Obtains appropriate microbiological samples and interprets results</td>
<td>Basic</td>
<td>D, C</td>
<td>1</td>
</tr>
<tr>
<td>2.5</td>
<td>Obtains and interprets the results from blood gas samples</td>
<td>Basic</td>
<td>D, C</td>
<td>1</td>
</tr>
<tr>
<td>2.6</td>
<td>Interprets imaging studies</td>
<td>Basic</td>
<td>I, C</td>
<td>1</td>
</tr>
<tr>
<td>2.7</td>
<td>Monitors and responds to trends in physiological variables</td>
<td>Basic</td>
<td>I, T</td>
<td>1</td>
</tr>
<tr>
<td>2.8</td>
<td>Integrates clinical findings with laboratory investigations to form a differential diagnosis</td>
<td>Basic</td>
<td>I, C, T</td>
<td>1</td>
</tr>
</tbody>
</table>

Domain 2: Syllabus

Knowledge, skills and attitudes common to all competencies

Knowledge

Universal precautions and preventative infection control techniques (hand washing, gloves, protective clothing, sharps disposal etc.)

Principles of aseptic technique and aseptic handling of invasive medical devices
### Skills

- Acquire, interpret, synthesize, record, and communicate (written and verbal) clinical information
- Document investigations undertaken, results and action taken
- Order and prioritise appropriate investigations
- Develop a working, and limited differential diagnosis based on presenting clinical features
- Professional and reassuring approach - generates confidence and trust in patients and their relatives
- Lead, delegate and supervise others appropriately according to experience and role
- Consults, communicates and collaborates effectively with patients, relatives and the health care team

### Attitudes

- Responds rapidly to acute changes in monitored variables
- Considers patient comfort during procedures / investigations
- Avoids unnecessary tests
- Avoids extensive invasive procedures or monitoring which can not be adequately interpreted at the bedside
- Minimises patient discomfort in relation to monitoring devices
- Ensures safe and appropriate use of equipment
- Supports other staff in the correct use of devices
- Demonstrates desire to minimise patient distress
- Demonstrates compassionate care of patients and relatives
- Promotes respect for patient privacy, dignity and confidentiality
- Recognises personal limitations, seeks and accepts assistance or supervision (knows how, when and who to ask)

---

#### 2.1 Obtains a history and performs an accurate clinical examination

**Basic**

**Knowledge**

- Clinical signs associated with critical illness, their relative importance and interpretation
- Importance and principles of obtaining an accurate history of the current condition, co-morbidities and previous health status using appropriate sources of information
- Sources and methods of obtaining clinical information
- Relevance of prior health status in determining risk of critical illness and outcomes
- Significance and impact of co-morbid disease on the presentation of acute illness
- Impact of drug therapy on organ-system function

**Skills**

- Examine patients, elicit and interpret clinical signs (or relevant absence of clinical signs) in the ICU environment
- Obtain relevant information from the patient, relatives and other secondary sources.
- Review notes, investigations and prior events to confirm or refute working diagnosis.
- Listen effectively
- Recognise impending organ system dysfunction
- Integrate history with clinical examination to create a diagnostic and therapeutic plan

---

#### 2.2 Undertakes timely and appropriate investigations

**Basic**

**Knowledge**

- Indications for and the selection of suitable methods of monitoring or investigation taking into account their accuracy, convenience, reliability, safety, cost and relevance to the patient's condition.
- Sensitivity and specificity of the investigation as related to a specific disease
- Appropriate use of laboratory tests to confirm or refute a clinical diagnosis

- Indications, limitations and basic interpretation of laboratory investigations of blood and other body fluids (e.g. urine, CSF, pleural and ascitic fluids):
  - Haematology
  - Immunology
  - Cytology
  - Blood grouping and x-matching
  - Urea, creatinine, glucose, electrolytes and lactate
  - Liver function tests
  - Drug levels in blood or plasma
  - Tests of endocrine function (diabetes, thyroid disorders, adrenal failure)
Blood gas samples (arterial, venous and mixed venous)
Microbiological surveillance and clinical sampling

**Principles, indications, limitations and basic interpretation of:**
- Respiratory function tests
- Diagnostic bronchoscopy
- Diagnostic ECG (EKG)
- Echocardiography
- Electroencephalogram (EEG) and evoked potentials
- Intra-abdominal pressure monitoring
- Intrathoracic pressure (oesophageal pressure) measurements
- Fluid input-output monitoring

**Principles, including indications, limitations and therapeutic modalities of:**
Basic radiological methods, CT scanning, ultrasound

**Risks to patient and staff of radiological procedures and precautions to minimise risk**

**Skills**
- Recognise impending organ system dysfunction
- Evaluate benefits and risks related to specific investigations
- Interpret laboratory results in the context of the patient’s condition
- Identify abnormalities requiring urgent intervention
- Recognise significant changes and the need for repeated testing (i.e. that a single normal result is not as significant as identifying trends of change by repeated testing where indicated)
- Undertake further consultation / investigation when indicated

**Intermediate**

**Knowledge**
Principles, including indications, limitations and therapeutic modalities of:
MRI, ultrasound, angiography and radionucleotide studies in the critically ill patient

Invasive and non-invasive systems available for measuring cardiac output and derived haemodynamic variables, the principles involved and the type and site of placement of the monitoring device

### 2.3 Performs electrocardiography (ECG / EKG) and interprets the results

**Basic**

**Knowledge**
- Obtain and interpret data from ECG (3- and 12-lead)

Principles of ECG monitoring (heart rate, rhythm, conduction, ST segment change and QT interval) – indications, limitations and techniques. Advantages and disadvantages of different lead configurations
- Sensitivity and specificity of the investigation as related to a specific disease

**Skills**
- Identify deviations from normal range and interpret these in the context of the clinical circumstances
- Identify abnormalities requiring urgent intervention
- Differentiate real change from artefact and respond appropriately

### 2.4 Obtains appropriate microbiological samples and interprets results

**Basic**

**Knowledge**
- Types of organisms – emergence of resistant strains, mode of transfer, opportunistic and nosocomial infections;
difference between contamination, colonisation and infection
- Indications for microbiological sampling and interpretation of microbiological test results
- Sensitivity and specificity of the investigation as related to a specific disease
- Methods and routes of obtaining samples – associated indications and complications
- Appropriate use of laboratory tests to confirm or refute a clinical diagnosis
- Indications for and contraindications to lumbar puncture and CSF sampling; laboratory analysis of CSF samples

**Skills**
- Obtain blood cultures using aseptic techniques
- Interpret laboratory results in the context of the patient's condition
- Integrate clinical findings with results of investigations
- Communicate and collaborate effectively with all laboratory staff
Undertake further consultation / investigation when indicated

### Intermediate

#### Knowledge
- Epidemiology and prevention of infection in the ICU
- Local patterns of bacterial resistance and antibiotic policy
- Requirements for microbiological surveillance and clinical sampling

#### Skills
- Assemble clinical and laboratory data, logically compare all potential solutions to the patient's problems, prioritise them and establish a clinical management plan

### 2.5 Obtains and interprets the results from blood gas samples

#### Basic

#### Knowledge
- Indications for and interpretation of arterial blood gas samples
- Methods and routes of obtaining samples - associated indications and complications
- Pre-analytical errors of arterial blood gas sampling (choice of sample site, sampling device, heparin, mixing, storage and transport)

**Clinical measurement:**
- B(pH, pCO\textsubscript{2}, pO\textsubscript{2}, SaO\textsubscript{2}, FIO\textsubscript{2})
- I(CO\textsubscript{2} production, oxygen consumption, respiratory quotient)

**Sensitivity and specificity of the investigation as related to a specific disease**

#### Skills
- Obtain blood gas samples using aseptic techniques
- Interpret data from an arterial blood gas sample
- Interpret data from a central or mixed venous blood gas sample
- Identify deviations from normal range and interpret these in the context of the clinical circumstances
- Identify abnormalities requiring urgent intervention
- Confirm adequate oxygenation and control of PaCO\textsubscript{2} and pH

#### Undertake further consultation / investigation when indicated

### 2.6 Interprets imaging studies

#### Basic

#### Knowledge
- Principles, including indications, limitations and therapeutic modalities of:
  - Basic radiological methods, CT scanning, ultrasound
- Indications for and basic interpretation of chest radiographs: range of normal features on a chest x-ray; collapse, consolidation, infiltrates (including ALI/ARDS), pneumothorax, pleural effusion, pericardial effusion, position of cannulae, tubes or foreign bodies, airway compression, cardiac silhouette, mediastinal masses

**Basic interpretation of radiological investigations:**
- neck and thoracic inlet films
- x-rays of abdominal fluid levels / free air
- x-rays of long bone, skull; vertebral and rib fractures

**Risks to patient and staff of radiological procedures and precautions to minimise risk**

**Indications for and limitations of investigations**

**Sensitivity and specificity of the investigation as related to a specific disease**

**Effect of projection, position, penetration and other factors on the image quality**

#### Skills
- Interpret chest x-rays in a variety of clinical contexts
- Identify abnormalities requiring urgent intervention
- Identify deviations from normal and interpret these in the context of the clinical circumstances

#### Undertake further consultation / investigation when indicated

#### Intermediate

#### Knowledge
- Principles, including indications, limitations and therapeutic modalities of:
  - MRI, ultrasound, angiography and radionucleotide studies in the critically ill patient

**Basic interpretation of imaging investigations:**
- CT or MRI scans of head demonstrating fractures / haemorrhage
- Ultrasound of the abdomen (liver, spleen, large abdominal vessels, kidney, urinary bladder)
- Echocardiography (ventricular function, filling status, valve abnormality, size of the heart, any kinetic or dyskentic segments, pericardial effusion with or without evidence of tamponade)

**Skills**

Communicate effectively with radiological colleagues to plan, perform and interpret test results

### 2.7 Monitors and responds to trends in physiological variables

#### Basic

**Knowledge**

Indications, contraindications and complications associated with monitoring and monitoring devices; advantages and disadvantages of different monitoring systems / modalities taking into account their accuracy, convenience, reliability, safety, cost and relevance to the patient's condition

Interpretation of information from monitoring devices, and identification of common causes of error; principles of monitoring trends of change and their significance

Hazards of inappropriate monitoring including misuse of alarms; principles of disconnection monitors

Principles of invasive pressure monitoring devices: components and functions of an electromanometer system (catheter, tubing, transducer, amplifier and display unit); zero and calibration techniques; dynamics of the system - natural frequency and damping

Methods for measuring temperature

Principles, indications and limitations of pulse oximetry

Principles of ECG monitoring (heart rate, rhythm, conduction, ST segment change and QT interval) - indications, limitations and techniques. Advantages and disadvantages of different lead configurations

**Principles of monitoring ventilation:**

- significance of respiratory rate, tidal volume, minute volume, mean, peak, end expiratory and plateau pressure, intrinsic and extrinsic PEEP, inspired oxygen concentration, arterial blood gas and acid base status

Physical principles, indications and limitations of end tidal CO\(_2\) monitoring

Principles of fluid input-output monitoring

Methods for assessing pain and sedation

Methods for assessing neurological function e.g. Glasgow Coma Scale

**Skills**

Monitor vital physiological functions as indicated

Obtain and accurately record data from monitors

Differentiate real change from artefact and respond appropriately

Set and interpret data from ventilator alarms

Identify deviations from normal range and interpret these in the context of the clinical circumstances

Recognise and rapidly respond to adverse trends in monitored parameters

Recognise patterns in trends - early diagnosis and outcome prediction

Review the need for continued monitoring regularly

Obtain and interpret data from:

- invasive and non-invasive arterial blood pressure measurement
- ECG / EKG (3 and 12 lead)
- central venous catheters
- pulse oximetry
- FVC, spirometry and peak flow measurement

Set monitor alarms appropriately

Interpret data from scoring or scaling systems to assess pain and sedation

Assess and document Glasgow Coma Scale (GCS)

#### Intermediate

**Knowledge**

Relationship between end tidal CO\(_2\) and arterial pCO\(_2\) in various clinical circumstances

Principles of haemodynamic monitoring - invasive and non invasive methods, indications and limitations, physiological parameters and waveform interpretation

Invasive and non-invasive systems available for measuring cardiac output and derived haemodynamic variables, the principles involved and the type and site of placement of the monitoring device

Interpretation of, relationships between, sources of error and limitations of measured and derived cardiovascular variables including pressure, flow, volume and gas transport

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Principles of monitoring ventilation:
relationship between mode of ventilation and choice of parameters monitored; airflow and airway pressure waveforms

Principles, indications and limitations of intra-abdominal pressure monitoring

<table>
<thead>
<tr>
<th>Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>Obtain and interpret data from:</td>
</tr>
<tr>
<td>• pulmonary artery catheter or oesophageal Doppler</td>
</tr>
<tr>
<td>• inspired and expired gas monitoring for O₂, CO₂ and NO</td>
</tr>
<tr>
<td>• intracranial pressure monitoring</td>
</tr>
</tbody>
</table>

Recognise changes in intracranial pressure and cerebral perfusion pressure which are life threatening

Advanced

Knowledge
Systems available for intracranial pressure monitoring – indications, principles, type and site of placement of the monitoring device, data collection and trouble-shooting

Indications and techniques of jugular bulb oximetry

<table>
<thead>
<tr>
<th>Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>Obtain and interpret data from:</td>
</tr>
<tr>
<td>• Jugular bulb catheters and SjvO₂ monitoring</td>
</tr>
</tbody>
</table>

2.8 Integrates clinical findings with laboratory investigations to form a differential diagnosis

Basic

Knowledge
Sensitivity and specificity of the investigation as related to a specific disease

Appropriate use of laboratory tests to confirm or refute a clinical diagnosis

Interpretation of information from monitoring devices, and identification of common causes of error; principles of monitoring trends of change and their significance

Skills
Obtain relevant information from the patient, relatives and other secondary sources

Examine patients, elicit and interpret clinical signs (or relevant absence of clinical signs) in the ICU environment

Integrate clinical findings with results of investigations

Interpret laboratory results in the context of the patient’s condition

Identify abnormalities requiring urgent intervention

Communicate and collaborate effectively with all laboratory staff

Intermediate

Skills
In emergency situations, confirm or refute early diagnoses before data collection / analysis is complete - make contingency plans based on these diagnoses to combat further threats to the patient’s life

Assemble clinical and laboratory data, logically compare all potential solutions to the patient’s problems, prioritise them and establish a clinical management plan
Domain 3: Disease Management

General Principles

Diagnostic accuracy determines therapeutic specificity. Although in the early phases of managing an acutely ill patient, physiological safety and support are the main issues, making the correct diagnosis and providing the right treatment will determine the patient’s outcome. Disease management therefore requires skills in integrating clinical information with laboratory data, and applying ‘best practice’ guidelines promptly and effectively. It also involves regular clinical review with revision of diagnostic possibilities and modification of treatment according to patient response. The possibility of incomplete, partial or incorrect diagnosis should be borne in mind when reviewing and particularly if the patient is deteriorating alternative diagnoses should be sought.

Features of competent performance may include:

- Recognition of clinical signs and symptoms
- Identification of main acute complications and management
- Planning and prioritisation of investigations and monitoring – appropriate; timely
- Appropriate differential diagnosis with regular review and update
- Clear decision making and plan of management (including application of relevant protocols / guidelines / care bundles)
- Effective team-working: collaboration, communication and continuity of care
- Professional relationship with patient and relatives: communication; interpersonal skills; attention to patient comfort; ethical principles
- Appropriate referral / consultation
- Recognition of limitations (self and others)

Domain 3: Competencies

<table>
<thead>
<tr>
<th>Competence</th>
<th>Description</th>
<th>IBTICM level</th>
<th>Assessment methods</th>
<th>GMP</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.1</td>
<td>Manages the care of the critically ill patient with specific acute mental conditions</td>
<td>Basic</td>
<td>D, I, C, M, T</td>
<td>1</td>
</tr>
<tr>
<td>3.2</td>
<td>Identifies the implications of chronic and co-morbid disease in the acutely ill patient</td>
<td>Basic</td>
<td>C</td>
<td>1</td>
</tr>
<tr>
<td>3.3</td>
<td>Recognises and manages the patient with circulatory failure</td>
<td>Basic</td>
<td>I, C, T</td>
<td>1</td>
</tr>
<tr>
<td>3.4</td>
<td>Recognises and manages the patient with, or at risk of, acute kidney injury</td>
<td>Basic</td>
<td>I, C, T</td>
<td>1</td>
</tr>
<tr>
<td>3.5</td>
<td>Recognises and manages the patient with, or at risk of, acute liver failure</td>
<td>Basic</td>
<td>I, C, T</td>
<td>1</td>
</tr>
<tr>
<td>3.6</td>
<td>Recognises and manages the patient with neurological impairment</td>
<td>Basic</td>
<td>I, C, T</td>
<td>1</td>
</tr>
<tr>
<td>3.7</td>
<td>Recognises and manages the patient with acute gastrointestinal failure</td>
<td>Basic</td>
<td>I, C, T</td>
<td>1</td>
</tr>
<tr>
<td>3.8</td>
<td>Recognises and manages the patient with acute lung injury syndromes (ALI / ARDS)</td>
<td>Basic</td>
<td>I, C, T</td>
<td>1</td>
</tr>
<tr>
<td>3.9</td>
<td>Recognises and manages the septic patient</td>
<td>Basic</td>
<td>I, C, T</td>
<td>1</td>
</tr>
<tr>
<td>3.10</td>
<td>Recognises and manages the patient following intoxication with drugs or environmental toxins</td>
<td>Basic</td>
<td>I, C</td>
<td>1</td>
</tr>
<tr>
<td>3.11</td>
<td>Recognises life-threatening maternal peripartum complications and manages care under</td>
<td>Intermediate</td>
<td>I, C</td>
<td>1</td>
</tr>
</tbody>
</table>
Domain 3: Syllabus

### Knowledge, skills and attitudes common to all competencies

#### Knowledge
- Impact of occupational and environmental exposures, socio-economic factors, and lifestyle factors on critical illness
- Recognises the importance of timely institution of organ-system support
- Recognises the differences between organ system support and specific treatment

#### Skills
- Acquire, interpret, synthesize, record, and communicate (written and verbal) clinical information
- Order and prioritise appropriate investigations
- Develop a working, and limited differential diagnosis based on presenting clinical features
- Prioritise therapy according to the patient’s needs
- Define targets of therapy and review efficacy at regular intervals
- Consider modifying diagnosis and/or therapy if goals are not achieved or in light of new information
- Recognise and manage emergencies; seek assistance appropriately
- Critically appraise the evidence for and against specific therapeutic interventions or treatments
- Lead, delegate and supervise others appropriately according to experience and role
- Consults, communicates and collaborates effectively with patients, relatives and the health care team

#### Attitudes
- Adopts a problem solving approach
- Demonstrates compassionate care of patients and relatives
- Demonstrates desire to minimise patient distress
- Recognises personal limitations, seeks and accepts assistance or supervision (knows how, when and who to ask)
- Enquiring mind, undertakes critical analysis of published literature

### 3.1 Manages the care of the critically ill patient with specific acute medical conditions

#### Basic

**Knowledge**
- Pathophysiology, diagnosis and management of commonly encountered acute medical conditions including:
  - **Respiratory disorders:**
    - The unprotected airway; pneumonia, lung or lobar collapse, asthma, chronic obstructive airways disease, pulmonary oedema, pneumothorax (simple and tension), pulmonary embolus, pleural effusion
  - **Cardiovascular disorders:**
    - Common arrhythmias and conduction disturbances, shock states (anaphylactic, cardiogenic, hypovolaemic, septic); crescendo or unstable angina; acute myocardial infarction; left ventricular failure; hypotension and hypertension
  - **Neurological disorders:**
    - acute confusional states and coma; post-anoxic brain damage; intracranial haemorrhage and infarction; sub-arachnoid haemorrhage; cerebro-vascular accidents (CVA / stroke); convulsions and status epilepticus; meningitis and encephalitis
  - **Renal and genito-urinary disorders:**
    - Urological sepsis; acute kidney injury; chronic renal failure; nephrotoxic drugs and monitoring
  - **Gastrointestinal disorders:**
    - peptic/stress ulceration; upper GI haemorrhage; diarrhoea and vomiting;
  - **Haematological and oncological disorders:**
    - Disseminated intravascular coagulation (DIC) and other coagulation disorders, Massive blood transfusion, acute and chronic anaemia
  - **Infections:**
    - pyrexia and hypothermia; organ-specific signs of infection including haematogenous (venous catheter related, endocarditis, meningococcal disease), urological, pulmonary, abdominal (peritonitis, diarrhoea), skeletal (septic arthritis)
  - **Metabolic disorders:**
    - Electrolyte disorders; acid-base disorders; fluid-balance disorders; thermoregulation and associated disorders
  - **Endocrine disorders:**
    - critical illness-induced hyperglycaemia; diabetes mellitus; hypoadrenalism
- Treatment algorithms for common medical emergencies
- Multisystem effects of acute medical conditions and implications for clinical management
- Therapies available for the treatment of commonly encountered medical conditions, their efficacy and potential side-effects
### Skills
- Recognise impending organ system dysfunction
- Establish a management plan based on clinical and laboratory information
- Consider potential interactions when prescribing drugs and therapies

### Intermediate Knowledge
Pathophysiology, diagnosis and management of commonly encountered acute medical conditions including:

#### Respiratory Disorders:
- Acute lung injury (ALI) and acute respiratory distress syndrome (ARDS) and their causative factors; pulmonary haemorrhage, upper and lower airway obstruction including epiglottitis

#### Cardiovascular disorders:
- Valvular heart disease; vaso-occlusive diseases; pulmonary hypertension; right ventricular failure; cor pulmonale; malignant hypertension; cardiac tamponade; pacing box failure

#### Neurological disorders:
- Medical causes of raised intracranial pressure; acute neuromuscular diseases causing respiratory difficulty (e.g. Guillain-Barre, myasthenia gravis, malignant hyperpyrexia); critical illness polyneuropathy, motor neuropathy and myopathy

#### Renal and genito-urinary disorders:
- Renal manifestations of systemic disease including vasculitides; rhabdomyolysis

#### Gastrointestinal disorders:
- Acute pancreatitis; cholecystitis; jaundice; acute and chronic liver failure; fulminant hepatic failure; paracetamol (acetaminophen)-induced liver injury; inflammatory bowel diseases; peritonitis; ascites; mesenteric infarction; perforated viscus; bowel obstruction and pseudo-obstruction; abdominal trauma; intra-abdominal hypertension and compartment syndrome; short-bowel syndrome; rupture of liver or spleen.

#### Haematological disorders:
- Haemolytic syndromes, immune disorders. Lymphoproliferative disorders. High risk groups: the immunosuppressed or immunoincompetent patient, chemotherapy, agranulocytosis and bone marrow transplant patients.

#### Infections:
- Organisms causing specific infections: Gram positive and Gram negative bacteria, fungi, protozoa, viruses; nosocomial infections, pyometria; septic abortion

#### Endocrine disorders:
- Over- and under-activity of thyroid; adrenal and pituitary disorders; sepsis-induced relative adrenal insufficiency; endocrine emergencies

#### Definitive / Long term management of commonly encountered acute medical conditions
- Diagnosis and management of other acute medical conditions until appropriate specialist assistance is available
- Indications and contraindications for treatment; circumstances when treatment is unnecessary or futile
- Concept of risk: benefit ratio and cost effectiveness of therapies
- Complications of the disease processes; effects of disease and its treatments on other organ systems
- Effects of concomitant treatment and/or co-morbid conditions on an individual patient’s response to treatment
- Principles of outcome prediction / prognostic indicators and treatment intensity scales; limitations of scoring systems in predicting individual patient outcome
- Long term effects of acute medical conditions and late complications
- Risk factors, recognition and assessment of single or multiple organ failure

### Skills
- Identify and manage chronic co-morbid disease

### Advanced Knowledge
- Respiratory muscle disorders
- Cardiomyopathies

### 3.2 Identifies the implications of chronic and co-morbid disease in the acutely ill patient

#### Basic Skills
Pathophysiology, diagnosis and management of commonly encountered chronic medical conditions including:

#### Respiratory disorders:
- Asthma; chronic obstructive airways disease; pulmonary fibrosis; pulmonary thromboembolic disease; respiratory muscle disorders
### Cardiovascular disorders:
- Hypertension; angina; chronic heart failure (LVF / RVF); veno-occlusive disorders; cardiomyopathies; valvular heart disease and prosthetic valves; pulmonary hypertension; cor pulmonale; common arrhythmias and conduction disturbances; peripheral vascular disease

### Neurological disorders:
- Cerebro-vascular accidents (CVA / stroke); epilepsy; dementia; neuropathy and myopathy

### Renal disorders:
- Chronic renal failure; renal manifestations of systemic disease including vasculitides; nephrotoxic drugs

### Gastrointestinal disorders:
- Chronic pancreatitis; chronic liver failure; cirrhosis; inflammatory bowel diseases

### Endocrine disorders:
- Diabetes; thyroid, adrenal and pituitary disorders

Consider potential interactions when prescribing drugs and therapies

<table>
<thead>
<tr>
<th>Intermediate Knowledge</th>
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<tbody>
<tr>
<td>Haematological and oncological disorders:</td>
</tr>
</tbody>
</table>
| Coagulation disorders, hemolytic syndromes, platelet disorders; chronic anemia, immune disorders, malignancy including complications of chemotherapy and radiotherapy
Psychiatric disorders: depression; psychosis

Causes and consequences of decompensation in chronic organ failure; diagnosis and management of acute-on-chronic organ failure
Effects of concomitant treatment and/or co-morbid conditions on an individual patient’s response to treatment
Principles of outcome prediction / prognostic indicators and treatment intensity scales; limitations of scoring systems in predicting individual patient outcome

<table>
<thead>
<tr>
<th>Skills</th>
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</thead>
<tbody>
<tr>
<td>Identify and manage chronic co-morbid disease</td>
</tr>
<tr>
<td>Identify and evaluate requirements for continuation of chronic treatments during and after the acute illness</td>
</tr>
<tr>
<td>Evaluate the impact of chronic disease and prior health on outcomes</td>
</tr>
<tr>
<td>Take chronic health factors into account when determining suitability for intensive care</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Advanced Knowledge</th>
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</thead>
<tbody>
<tr>
<td>Implications of acute illness in patients with chronic respiratory failure requiring long term home ventilation</td>
</tr>
<tr>
<td>Use of home ventilators, cough assist devices and other aids to respiratory care in the community</td>
</tr>
</tbody>
</table>

#### 3.3 Recognises and manages the patient with circulatory failure

<table>
<thead>
<tr>
<th>Basic Knowledge</th>
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</thead>
<tbody>
<tr>
<td>Risk factors, recognition and assessment of circulatory failure</td>
</tr>
</tbody>
</table>

**Cardiovascular disorders:**
- Cardiac arrest; common arrhythmias and conduction disturbances, shock states (anaphylactic, cardiogenic, hypovolaemic, septic); crescendo or unstable angina; acute myocardial infarction; left ventricular failure; hypotension and hypertension; circulatory effects of pulmonary embolism & tension pneumothorax
Cardiopulmonary resuscitation

<table>
<thead>
<tr>
<th>Skills</th>
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</thead>
<tbody>
<tr>
<td>Identify patients at risk of developing circulatory failure</td>
</tr>
<tr>
<td>Assess, predict and manage circulatory shock</td>
</tr>
<tr>
<td>Establish a management plan based on clinical and laboratory information</td>
</tr>
<tr>
<td>Use fluids and vasoactive / inotropic drugs to support the circulation (see 4.4)</td>
</tr>
<tr>
<td>Consider potential interactions when prescribing drugs and therapies</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Intermediate Knowledge</th>
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</thead>
<tbody>
<tr>
<td>Valvular heart disease; vaso-oclusive diseases; pulmonary hypertension; right ventricular failure; cor pulmonale; malignant hypertension; cardiac tamponade; pacing box failure</td>
</tr>
<tr>
<td>Effect of circulatory failure and its treatment on other organ systems</td>
</tr>
<tr>
<td>Indications and contraindications for treatment; circumstances when treatment is unnecessary or futile</td>
</tr>
<tr>
<td>Complications of specific therapies, their incidence and management</td>
</tr>
<tr>
<td>Effects of concomitant treatment and/or co-morbid conditions on an individual patient’s response to treatment</td>
</tr>
</tbody>
</table>
### Principles of outcome prediction / prognostic indicators and treatment intensity scales; limitations of scoring systems in predicting individual patient outcome

#### Skills
- Measure and interpret haemodynamic variables (including derived variables)
- Optimise myocardial function

#### Advanced

#### Knowledge
- Cardiomyopathies
- Use of mechanical assist devices to support the circulation (see 4.4)

### 3.4 Recognises and manages the patient with, or at risk of, acute renal failure

#### Basic

#### Knowledge
- Renal and genito-urinary disorders:
  - Oliguria and anuria; polyuria; urological sepsis; acute renal failure; chronic renal failure; nephrotoxic drugs and monitoring
- Metabolic disorders:
  - Electrolyte disorders; acid-base disorders; fluid balance disorders
- Distinguishing features of acute versus chronic renal failure and implications for management
- Causes and complications of renal failure - methods to prevent or treat these
- Investigation of impaired renal function
- Range of therapeutic interventions available to support organ function and treat the underlying causes
- Nephrotoxic drugs and adjustment of drug doses in renal impairment/failure
- Indications for and basic interpretation of drug concentrations in blood or plasma
- Urinary catheterisation techniques: transurethral and suprapubic

#### Skills
- Identify patients at risk of developing renal failure
- Establish a management plan based on clinical and laboratory information
- Consider potential interactions when prescribing drugs and therapies
- Perform aseptic urinary catheterisation: male and female (see 5.24)

#### Intermediate

#### Knowledge
- Renal manifestations of systemic disease including vasculitides; rhabdomyolysis
- Symptoms, signs and causes of renal failure including acute kidney injury / chronic / acute on chronic and indications for intervention
- Electrolyte disorders notably hyperkalaemia; acid-base disorders; fluid-balance
- Indications and contraindications for treatment; circumstances when treatment is unnecessary or futile
- Effects of concomitant treatment and/or co-morbid conditions on an individual patient’s response to treatment
- Indications, complications and selection of renal replacement therapies (continuous and intermittent)
- Effect of renal failure and its treatment on other organ systems
- Principles of outcome prediction / prognostic indicators and treatment intensity scales; limitations of scoring systems in predicting individual patient outcome

#### Skills
- Identify and avoid factors contributing to impaired renal function
- Initiate, manage and wean patients from renal replacement therapy (see 4.7)

### 3.5 Recognises and manages the patient with, or at risk of, acute liver failure

#### Basic

#### Knowledge
- Symptoms and signs of acute liver failure and assessment of severity
- Investigation of impaired hepatic function
- Causes and complications of acute and acute-on-chronic liver failure, their prevention and management
- Causes, recognition and management of associated disorders:
  - Metabolic disorders:
    - Electrolyte disorders; acid-base disorders; fluid-balance disorders; thermoregulation and associated disorders
  - Haematological disorders:
    - Coagulation and fibrinolytic pathways and their associated disorders; disseminated intravascular coagulation (DIC);
### Intermediate

#### Knowledge

Indications and contraindications for treatment; circumstances when treatment is unnecessary or futile

Causes, recognition and management of associated disorders:

**Gastrointestinal disorders:**
- Abdominal pain and distension; peptic ulceration and upper GI haemorrhage; diarrhoea and vomiting; pancreatitis; jaundice; acute and chronic liver failure; fulminant hepatic failure; paracetamol (acetaminophen)-induced liver injury; rupture of liver or spleen

**Cardiovascular disorders:**
- Hypotension and hypertension (including hypertensive emergencies); shock (cardiogenic, hypovolaemic, septic, anaphylactic); common arrhythmias and conduction disturbances.

**Neurological disorders:**
- acute confusional states and coma; post-anoxic brain damage; convulsions; encephalopathy; raised intracranial pressure

**Principles of cerebral perfusion pressure, cerebral oxygen delivery and the methods by which they may be optimised**

**Factors and therapies which may influence intracranial pressure and cerebral perfusion pressure**

**Hepatotoxic drugs and adjustment of drug doses in hepatic impairment / failure**

#### Skills

- Examine and plan care for the confused patient
- Take prompt action to reduce acutely elevated intracranial pressure
- Manage cardiorespiratory physiology to minimise rises in intracranial pressure
- Prevent, identify and treat hyponatraemia

### Advanced

#### Knowledge

Supportive therapy for the failing liver including extracorporeal liver support and indications for emergency liver transplantation

**Principles of measurement of jugular venous saturation, cerebral Doppler velocities and cerebral blood flow.**

**Indications for transcutaneous and transjugular liver biopsies and transjugular intrahepatic portosystemic shunt (TIPSS)**

#### Skills

- Obtain and interpret data from intracranial pressure monitoring
- Determine when the patient’s needs exceed local resources or specialist expertise (requirement for transfer)

### Basic Science

#### Knowledge

Functions of the liver - biosynthetic, immunologic, and detoxification
### 3.6 Recognises and manages the patient with neurological impairment

#### Basic

**Knowledge**
- Signs and symptoms of neurological impairment
- The toxic, metabolic, structural, and infectious causes of altered consciousness
- Investigation of impaired neurological function; methods for assessing neurological function (e.g. Glasgow Coma Scale)

**Neurological disorders:**
- acute confusional states and coma; post-anoxic brain damage; intracranial haemorrhage and infarction; sub-arachnoid haemorrhage; cerebro-vascular accidents (CVA / stroke); convulsions and status epilepticus; meningitis and encephalitis
- Causes, recognition and management of associated disorders:
  - **Metabolic disorders:**
    - Electrolyte disorders; acid-base disorders; fluid-balance disorders; thermoregulation and associated disorders

**Skills**
- Assess and document Glasgow Coma Scale (GCS)
- Establish a management plan based on clinical and laboratory information
- Perform a lumbar puncture under supervision (see 5.15)
- Consider potential interactions when prescribing drugs and therapies

#### Intermediate

**Knowledge**
- Medical causes of raised intracranial pressure; acute neuromuscular diseases causing respiratory difficulty (e.g. Guillain-Barre, myasthenia gravis, malignant hyperpyrexia); critical illness polyneuropathy, motor neuropathy and myopathy
- Indications for urgent imaging of the brain and neurosurgical consultation
- Indications and contraindications for treatment; circumstances when treatment is unnecessary or futile
- Effects of concomitant treatment and/or co-morbid conditions on an individual patient’s response to treatment
- Principles of cerebral perfusion pressure, cerebral oxygen delivery and the methods by which they may be optimised
- Aetiology and management of raised intracranial pressure (ICP)
- Principles of management of closed head injury
- Coup and contra-coup injuries
- Methods of preventing the ‘second insult’ to the brain
- Management of vasospasm
- Application of techniques to treat or induce hypo/hyperthermia
- Principles, indications and limitations of electroencephalogram (EEG) and evoked potentials
- Effect of impaired neurological function and its support and treatment on other organ systems
- Principles of outcome prediction / prognostic indicators and treatment intensity scales; limitations of scoring systems in predicting individual patient outcome

**Skills**
- Identify patients at risk of neurological impairment
- Identify and avoid factors contributing to neurological impairment
- Examine and plan care for the confused patient
- Recognise changes in intracranial pressure and cerebral perfusion pressure which are life threatening
- Take prompt action to reduce acutely elevated intracranial pressure
- Manage cardiorespiratory physiology to minimise rises in intracranial pressure

#### Advanced

**Knowledge**
- Systems available for intracranial pressure monitoring - indications, principles, type and site of placement of the monitoring device, data collection and trouble-shooting
- Cerebral spinal fluid (CSF) drainage for raised ICP
- Principles of measurement of jugular venous saturation, cerebral Doppler velocities and cerebral blood flow.

**Skills**
- Undertake or assist in the insertion and maintenance of an intracranial pressure monitor
- Obtain and interpret data from intracranial pressure monitoring
- Determine when the patient’s needs exceed local resources or specialist expertise (requirement for transfer)
### 3.7 Recognises and manages the patient with acute gastrointestinal failure

#### Basic Knowledge
- Signs and symptoms of gastrointestinal dysfunction (obstruction, ischemia, perforation, dysmotility)
- Causes and complications of gastrointestinal failure
- Effects of critical illness and treatments on gastric emptying
- Investigation of acute gastrointestinal dysfunction
- **Gastrointestinal disorders:** Abdominal pain and distension; stress/peptic ulceration and upper GI haemorrhage; lower GI bleeding; diarrhoea and vomiting
- Causes, recognition and management of associated disorders:
  - **Metabolic disorders:** Electrolyte disorders; acid-base disorders; fluid-balance disorders; thermoregulation and associated disorders
- Indications for urgent imaging and surgical consultation
- Factors and therapies which may influence intra-abdominal pressure; aetiology and management of raised intra-abdominal pressure
- Effects of impaired gastrointestinal function and its treatment on other organ systems
- Principles of nutritional assessment and support *(see 4.9)*

#### Skills
- Identify and avoid factors contributing to gastrointestinal dysfunction
- Identify patients at risk of gastrointestinal dysfunction
- Prevent, identify and manage hyper / hypoglycaemia
- Establish a management plan based on clinical and laboratory information
- Consider potential interactions when prescribing drugs and therapies

### 3.8 Recognises and manages the patient with acute lung injury syndromes (ALI / ARDS)

#### Basic Knowledge
- Symptoms and signs of acute airway insufficiency and acute respiratory failure, and indications for intervention
- Causes of respiratory failure, their prevention and management
- **Respiratory disorders:**
  - Tachypnoea, dyspnoea, pneumonia, lung or lobar collapse, pulmonary oedema, pulmonary embolus, pleural effusion, pneumothorax (simple and tension)
- Pathogenesis of acute lung injury (ALI / ARDS)
- Pathogenesis of multiple organ dysfunction (MODS) and the inflammatory response in relation to organ system dysfunction
- Indications for and basic interpretation of chest radiographs: range of normal features on a chest x-ray; collapse, consolidation, infiltrates (including ALI/ARDS), pneumothorax, pleural effusion, pericardial effusion, position of cannulae, tubes or foreign bodies, airway compression, cardiac silhouette, mediastinal masses
- Indications for and methods of invasive and non-invasive mechanical ventilation
- Initial set-up of ventilator settings according to the condition or response of the patient
- Potential adverse effects and complications of respiratory support and methods to minimise these
- Detection and management of haemo/pneumothorax (simple and tension)
- Lung protective ventilation for acute lung injury (ALI)
- Principles of weaning from mechanical ventilation and factors which may inhibit weaning

#### Skills
- Identify patients at risk of acute lung injury (ALI / ARDS)
- Implement emergency airway management and ventilation under direct supervision
- Identify and avoid factors contributing to acute lung injury
Perform thoracocentesis and manage intercostal drains (see 5.7)
Establish a management plan based on clinical and laboratory information
Consider potential interactions when prescribing drugs and therapies

<table>
<thead>
<tr>
<th>Intermediate</th>
<th>Knowledge</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute lung injury (ALI) and acute respiratory distress syndrome (ARDS) and their causative factors; pulmonary haemorrhage, near-drowning</td>
<td></td>
</tr>
<tr>
<td>Modes of mechanical ventilation - indications, contraindications and expected results of each mode (CMV, IRV, PRVC, HFOV, SIMV, PS, CPAP, BIPAP, NIV)</td>
<td></td>
</tr>
<tr>
<td>Ventilator associated pneumonia: definition, pathogenesis and prevention</td>
<td></td>
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<tr>
<td>Concept of risk : benefit ratio and cost effectiveness of therapies</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Skills</th>
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</thead>
<tbody>
<tr>
<td>Implement emergency airway management and ventilation</td>
</tr>
<tr>
<td>Select the appropriate type and mode of ventilation for an individual patient</td>
</tr>
<tr>
<td>Plan, implement, review and adapt lung protective approach during mechanical ventilation</td>
</tr>
<tr>
<td>Plan, perform and review lung recruitment manoeuvres</td>
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</table>

<table>
<thead>
<tr>
<th>Advanced</th>
<th>Knowledge</th>
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</thead>
<tbody>
<tr>
<td>Pharmacological and non-pharmacological adjunct therapies for ALI</td>
<td></td>
</tr>
<tr>
<td>Principles of extra-corporeal membrane oxygenation (ECMO)</td>
<td></td>
</tr>
</tbody>
</table>

### 3.9 Recognises and manages the septic patient

<table>
<thead>
<tr>
<th>Basic</th>
<th>Knowledge</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pathogenesis, definitions and diagnostic criteria of sepsis, severe sepsis, septic shock and systemic inflammatory response syndrome (SIRS)</td>
<td></td>
</tr>
<tr>
<td>Causes, recognition and management of sepsis-induced organ dysfunction; multisystem effects of sepsis and their impact on clinical management</td>
<td></td>
</tr>
<tr>
<td>Pathogenesis of multiple organ dysfunction (MODS) and the inflammatory response in relation to organ system dysfunction</td>
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<tr>
<td>Infection and its relation to the inflammatory response</td>
<td></td>
</tr>
<tr>
<td>Infections: pyrexia and hypothermia; organ-specific signs of infection including haematogenous (venous catheter-related, endocarditis, meningococcal disease), urological, pulmonary, abdominal (peritonitis, diarrhoea), skeletal (septic arthritis)</td>
<td></td>
</tr>
<tr>
<td>Techniques for effective fluid resuscitation</td>
<td></td>
</tr>
<tr>
<td>Use of fluids and vasoactive / inotropic / anti-arrhythmic drugs to support the circulation (see 4.4)</td>
<td></td>
</tr>
<tr>
<td>Indications, complications, interactions, selection, monitoring, and efficacy of common antimicrobial drugs (antibacterial, antifungal, antiviral, antiprotozoal, antihelmintics)</td>
<td></td>
</tr>
<tr>
<td>Principles of blood glucose control: indications, methods, monitoring of safety and efficacy</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assess, predict and manage circulatory shock</td>
</tr>
<tr>
<td>Resuscitate a patient with septic shock using appropriate monitoring, fluid therapy and vasoactive agents</td>
</tr>
<tr>
<td>Manage antimicrobial drug therapy (see 4.2)</td>
</tr>
<tr>
<td>Obtain and interpret results of microbiological tests (see 2.5)</td>
</tr>
<tr>
<td>Establish a management plan based on clinical and laboratory information</td>
</tr>
<tr>
<td>Consider potential interactions when prescribing drugs and therapies</td>
</tr>
<tr>
<td>Prevent, identify and manage hyper / hypoglycaemia</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Intermediate</th>
<th>Knowledge</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infections: Organisms causing specific infections: Gram positive and Gram negative bacteria, fungi, protozoa, viruses; nosocomial infections, pyometra; septic abortion</td>
<td></td>
</tr>
<tr>
<td>Occult indicators of sepsis</td>
<td></td>
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<tr>
<td>Sepsis mediators</td>
<td></td>
</tr>
</tbody>
</table>
Local patterns of bacterial resistance and antibiotic policy
Evidence based guidelines: sepsis care bundles - rationale and indications; principles of early goal-directed therapy
Indications and contraindications for treatment; circumstances when treatment is unnecessary or futile
Effects of concomitant treatment and/or co-morbid conditions on an individual patient’s response to treatment
Detection and management of adrenocortical dysfunction
Concept of risk : benefit ratio and cost effectiveness of therapies
Prognostic implications of multiple systems dysfunction or failure

<table>
<thead>
<tr>
<th>Advanced</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge</td>
</tr>
<tr>
<td>Safe use of therapies which modify the inflammatory response</td>
</tr>
</tbody>
</table>

### 3.10 Recognises and manages the patient following intoxication with drugs or environmental toxins

#### Basic

**Knowledge**
- Symptoms and signs of acute intoxication associated with common intoxicants
- Cardiovascular disorders: drug induced arrhythmias and conduction disturbances
- Neurological disorders: drug induced neurological impairment
- Haematology: drug induced coagulopathy
- Multisystem effects of acute intoxication and implications for clinical management
- General supportive therapy and specific antidotes pertinent to individual intoxicants
- Specific management of poisoning with aspirin, paracetamol/acetaminophen, paraquat, carbon monoxide, alcohol, ecstasy, tricyclic and quadricyclic antidepressants
- Strategies to reduce absorption and enhance elimination (haemodialysis, haemoperfusion, gastric lavage and charcoal therapy): risks and benefits
- Pharmacology of common intoxicants
- Indications for and basic interpretation of drug concentrations in blood or plasma
- Aware of and know how to contact National Poisons Information Bureau/Toxbase
- Services available to patients and families to provide emotional or psychiatric support

**Skills**
- Establish a management plan based on clinical and laboratory information
- Interpret laboratory tests of liver function
- Consider potential interactions when prescribing drugs and therapies
- Assess and document Glasgow Coma Scale (GCS)
- Implement emergency airway management and ventilation under direct supervision
- Identify patients at risk of developing renal failure
- Identify patients at risk of developing acute liver failure
- Identify and manage coagulopathies

#### Intermediate

**Knowledge**
- Respiratory disorders: smoke, inhalation or burned airway damage; carbon monoxide poisoning
- Renal disorders: nephrotoxic drugs - monitoring & adjustment of drug doses in renal impairment / failure; rhabdomyolysis
- Gastrointestinal disorders: drug induced liver injury; hepatotoxic drugs and adjustment of drug doses in hepatic impairment / failure; fulminant hepatic failure
- Management of acute liver failure (see 3.5)
- Implement emergency airway management and ventilation
- Indications and contraindications for treatment; circumstances when treatment is unnecessary or futile
- Effects of concomitant treatment and/or co-morbid conditions on an individual patient’s response to treatment
- Principles of outcome prediction / prognostic indicators and treatment intensity scales; limitations of scoring systems in predicting individual patient outcome

**Skills**
- Examine and plan care for the confused patient

#### Advanced

**Knowledge**
- Indications and complications of hyperbaric oxygenation

**Skills**
- Determine when the patient’s needs exceed local resources or specialist expertise (requirement for transfer)
3.11 Recognises life-threatening maternal peripartum complications and manages care under supervision

### Basic

#### Knowledge

- **Haematological disorders:** coagulation and fibrinolytic pathways and their associated disorders; disseminated intravascular coagulation (DIC); hemolytic syndromes, acute anaemia; complications of massive blood transfusion
- **Metabolic disorders:** electrolyte disorders; acid-base disorders; fluid-balance disorders; thermoregulation and associated disorders

#### Skills

- Identify and manage coagulopathies
- Establish a management plan based on clinical and laboratory information
- Consider potential interactions when prescribing drugs and therapies

### Intermediate

#### Knowledge

- Physiological changes associated with a normal pregnancy and delivery
- Cardiopulmonary resuscitation of the pregnant patient
- Pathophysiology, identification and management of peripartum complications: pre-eclampsia and eclampsia; HELLP syndrome; amniotic fluid embolism; ante-partum and post-partum haemorrhage; ectopic pregnancy; septic abortion; peripartum cardiomyopathy.
- Risks and avoidance of pulmonary aspiration in pregnant patients
- Risk factors, identification and management of venous thromboembolism in the pregnant patient
- Methods of avoiding aorto-caval compression
- Indications and contraindications for treatment; circumstances when treatment is unnecessary or futile
- Cardiovascular disorders: peripartum cardiomyopathy; pulmonary hypertension
- Effects of concomitant treatment and/or co-morbid conditions on an individual patient’s response to treatment
- Management of critical illness in woman with concurrent pregnancy
- Awareness of the psychological impact of separation on the family
- Principles of outcome prediction / prognostic indicators and treatment intensity scales; limitations of scoring systems in predicting individual patient outcome

#### Skills

- Liaise with obstetric, midwifery and neonatal services
- Manage pregnancy induced hypertension
- Seek appropriate support and supervision in order to provide optimal patient care
Domain 4: Therapeutic interventions / Organ support in single or multiple organ failure

General Principles

Skilled organ-system support including appropriate therapeutic interventions is the ‘housekeeping’ of intensive care practice, a necessary – but in itself insufficient – requirement for promoting survival from critical illness. The practical procedures associated with organ system support are considered in the next section.

Features of competent performance may include:

- Awareness of relevant applied anatomy, physiology and pharmacology
- Consider indications and contraindications of therapeutic intervention
- Consider alternative modes, methods and techniques
- Safe use of equipment / device / drugs
- Complications: prevention; identification; management; awareness of interactions between different forms of organ system support
- Clearly defined therapeutic strategy / care plan and goals of therapy
- Evaluation and modification of therapy according to clinical response
- Appropriate referral / consultation
- Recognition of limitations (self and others)
- Attention to patient safety

Domain 4: Competencies

<table>
<thead>
<tr>
<th>Competence</th>
<th>Description</th>
<th>IBTICM level</th>
<th>Assessment methods</th>
<th>GMP</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.1</td>
<td>Prescribes drugs and therapies safely</td>
<td>Basic</td>
<td>D, C, M</td>
<td>1</td>
</tr>
<tr>
<td>4.2</td>
<td>Manages antimicrobial drug therapy</td>
<td>Basic</td>
<td>I, C, M</td>
<td>1</td>
</tr>
<tr>
<td>4.3</td>
<td>Administers blood and blood products safely</td>
<td>Basic</td>
<td>D, C, M</td>
<td>1</td>
</tr>
<tr>
<td>4.4</td>
<td>Uses fluids and vasoactive / inotropic drugs to support the circulation</td>
<td>Basic</td>
<td>I, C</td>
<td>1</td>
</tr>
<tr>
<td>4.5</td>
<td>Describes the uses of mechanical assist devices to support the circulation</td>
<td>Advanced</td>
<td>C</td>
<td>1</td>
</tr>
<tr>
<td>4.6</td>
<td>Initiates, manages, and weans patients from invasive and non-invasive ventilatory support</td>
<td>Basic</td>
<td>D, C, T</td>
<td>1</td>
</tr>
<tr>
<td>4.7</td>
<td>Initiates, manages and weans patients from renal replacement therapy</td>
<td>Intermediate</td>
<td>D, I, C, T</td>
<td>1, 4</td>
</tr>
<tr>
<td>4.8</td>
<td>Recognises and manages electrolyte, glucose and acid-base disturbances</td>
<td>Basic</td>
<td>I, C, T</td>
<td>1</td>
</tr>
<tr>
<td>4.9</td>
<td>Co-ordinates and provides nutritional assessment and support</td>
<td>Basic</td>
<td>I, C, T</td>
<td>1</td>
</tr>
</tbody>
</table>

Domain 4: Syllabus

**Knowledge, skills and attitudes common to all competencies**

**Knowledge**

Understand the roles of regulatory agencies involved in drug use, monitoring and licensing e.g. National Institute for Clinical Excellence (NICE), Committee on Safety of Medicines (CSM) Medicines and Healthcare Products Regulatory Agency (MHRA) and hospital formulary committees
**Skills**

- Prioritise therapy according to the patient's needs
- Recognise and manage emergencies; seek assistance appropriately
- Define targets of therapy and review efficacy at regular intervals
- Recognises the importance of resources when prescribing, including the role of a Drug Formulary and electronic prescribing systems
- Consider modifying diagnosis and/or therapy if goals are not achieved
- Obtain informed consent/assent from the patient where appropriate
- Critically appraise the evidence for and against specific therapeutic interventions or treatments
- Lead, delegate and supervise others appropriately according to experience and role

**Attitudes**

- Responds rapidly to acute changes in monitored variables
- Consults, communicates and collaborates effectively with patients, relatives and the health care team skill
- Desire to minimise patient distress
- Demonstrates compassionate care of patients and relatives
- Respects the expressed wishes of competent patients, even when in conflict with the views of the physician
- Appreciates the differences between organ system support and specific treatment
- Appreciates the importance of timely institution of organ-system support
- Respects the ideas and beliefs of the patient and their family and their impact on decision making (does not impose own views)
- Recognises the need for supportive care for all organ systems whether failing / injured or not
- Recognises personal limitations, seeks and accepts assistance or supervision (knows how, when and who to ask)
- Participates in adverse drug event reporting mechanisms
- Remains up to date with therapeutic alerts, and responds appropriately

### 4.1 Prescribes drugs and therapies safely

**Basic**

#### Knowledge

- **Mode of action of drugs** (*see Basic Sciences*)
- **Pharmacokinetics and pharmacodynamics** (*see Basic Sciences*)

**Systemic pharmacology:** indications, contraindications, effects and interactions of commonly used drugs including:

- hypnotics, sedatives and intravenous anaesthetic agents
- drugs used to treat delirium
- simple and opioid analgesics; opioid antagonists
- non-steroidal anti-inflammatory agents
- neuromuscular blocking agents (depolarising and non-depolarising) and anti-cholinesterases
- drugs acting on the autonomic nervous system (inotropes, vasodilators, vasoconstrictors, antiarrhythmics)
- respiratory stimulants and bronchodilators
- anti-hypertensives
- anti-convulsants
- anti-diabetic agents
- diuretics
- antibiotics (antibacterial, antifungal, antiviral, antiprotozoal, antihelmintics)
- corticosteroids and hormone preparations
- drugs influencing gastric secretion and motility; antiemetic agents
- local anaesthetic agents
- immunosuppressants
- antihistamines

**Adverse effects and interactions of drugs and their management**

**Recognition and management of serious adverse reactions and anaphylaxis**

**Local policies and procedures governing the prescription of drugs and therapies**

**Indications for and basic interpretation of drug concentrationss in blood or plasma**

**Impact of drug therapy on organ-system function**

**Principles of blood glucose control:** indications, methods, monitoring of safety and efficacy

**Theoretical advantages and disadvantages of crystalloid and colloid solutions**

**Distinguishing features of acute versus chronic respiratory failure and implications for management**

**Nephrototoxic drugs and adjustment of drug doses in renal impairment/failure**
<table>
<thead>
<tr>
<th>Indications, limitations, methods, and complications of enteral and parenteral nutritional techniques</th>
</tr>
</thead>
<tbody>
<tr>
<td>Risk of bleeding: indications, contraindications, monitoring and complications of therapeutic anticoagulants</td>
</tr>
</tbody>
</table>

**Skills**

- Establish a management plan based on clinical and laboratory information
- Consider potential interactions when prescribing drugs and therapies
- Administer intravenous drugs (prepare, select route and mode of administration and document)
- Prescribe appropriate antimicrobial therapy based on history, examination and preliminary investigations
- Choose appropriate fluid, volume, rate and method of administration
- Consider and exclude unknown pathology if goals of fluid therapy are not achieved (e.g. continued bleeding)
- Prescribe and manage anticoagulation therapy
- Prescribe an appropriate standard enteral feeding regimen

**Intermediate**

**Knowledge**

- Thrombolytic and anti-thrombolytic agents
- Effects of concomitant treatment and/or co-morbid conditions on an individual patient’s response to treatment
- Prophylactic therapies and indications for their use
- Complications of specific therapies, their incidence and management
- Circumstances when treatment is unnecessary
- Effect of critical illness upon homeostatic mechanisms and causes of homeostatic disturbances
- Treatment strategies for abnormalities of fluid, electrolyte, acid-base and glucose balance
- Methods to assess and monitor intravascular volume and state of hydration using clinical signs and technology
- Fluid therapies: components, physical properties, distribution and clearance of commonly used fluids; indications, contraindications and complications of their administration
- Hepatotoxic drugs and adjustment of drug doses in hepatic impairment / failure
- The pathogenesis and management of anaemia, thrombocytopenia, neutropenia and pancytopena
- Nutritional formulations: indications, complications and their management

**Skills**

- Set realistic goals for therapy (independently or in collaboration with other teams)
- Identify and avoid factors contributing to impaired renal function

**Advanced**

**Skills**

- Consider risk-benefit and cost-benefit of alternative drugs and therapies
- Recognise when treatment is unnecessary or futile

**Basic Science**

**Knowledge**

- Physiology of fluid, electrolyte, acid-base and glucose control

**Science**

- Types of intermolecular bonds
- Laws of diffusion. Diffusion of molecules through membranes
- Solubility and partition coefficients
- Ionization of drugs
- Drug isomerism
- Protein binding
- Oxidation and reduction

- Drug uptake from: gastrointestinal tract, lungs, nasal, transdermal, subcutaneous, IM, IV, epidural and intrathecal routes
- Bioavailability
- Factors determining the distribution of drugs: perfusion, molecular size, solubility, protein binding.
- The influence of drug formulation on disposition
- Distribution of drugs to organs and tissues:
  - Body compartments
  - Influence of specialised membranes: tissue binding and solubility
  - Materno-foetal distribution
  - Distribution in CSF and extradural space
- Modes of drug elimination:
  - Direct excretion
  - Metabolism in organs of excretion: phase I and II mechanisms
• Renal excretion and urinary pH
• Non-organ breakdown of drugs

Pharmacokinetic analysis:
• Concept of a pharmacokinetic compartment
• Apparent volume of distribution
• Orders of kinetics
• Clearance concepts applied to whole body and individual organs
• Simple 1 and 2 compartmental models: concepts of wash-in and washout curves
• Physiological models based on perfusion and partition coefficients
• Effect of organ blood flow: Fick principle
  Pharmacokinetic variation: influence of body size, sex, age, disease, pregnancy, anaesthesia, trauma, surgery, smoking, alcohol and other drugs
• Effects of acute organ failure (liver, kidney) on drug elimination
• Influence of renal replacement therapies on clearance of commonly used drugs
• Pharmacodynamics: concentration-effect relationships: hysteresis
• Pharmacogenetics: familial variation in drug response
• Adverse reactions to drugs: hypersensitivity, allergy, anaphylaxis, anaphylactoid reactions

• Dynamics of drug-receptor interaction.
• Agonists, antagonists, partial agonists, inverse agonists.
• Efficacy and potency. Tolerance.
• Receptor function and regulation.
• Metabolic pathways; enzymes; drug: enzyme interactions; Michaelis-Menten equation
• Enzyme inducers and inhibitors.
• Mechanisms of drug action
• Ion channels: types: relation to receptors. Gating mechanisms.
• Signal transduction: cell membrane/receptors/ion channels to intracellular molecular targets, second messengers
• Action of gases and vapours
• Osmotic effects. pH effects. Adsorption and chelation.
• Mechanisms of drug interactions:
  • Inhibition and promotion of drug uptake. Competitive protein binding. Receptor inter-actions.
• Effects of metabolites and other degradation products.

4.2 Manages antimicrobial drug therapy

**Basic**

**Knowledge**
Types of organisms - emergence of resistant strains, mode of transfer, opportunistic and nosocomial infections; difference between contamination, colonisation and infection

Indications, complications, interactions, selection, monitoring, and efficacy of common antimicrobial drugs (antibacterial, antifungal, antiviral, antiprotozoal, antihelmintics)

Indications for and basic interpretation of drug concentrations in blood or plasma

Impact of drug therapy on organ-system function

**Skills**
Collaborate with microbiologists / infectious diseases clinicians to link clinical, laboratory and local (hospital / regional / national) microbiological data

Establish a management plan based on clinical and laboratory information

Prescribe appropriate antimicrobial therapy based on history, examination and preliminary investigations

Administer intravenous drugs (prepare, select route and mode of administration and document)

**Intermediate**

**Knowledge**
Local patterns of bacterial resistance and antibiotic policy

Principles of prescribing initial empirical therapy and modification / refinement with further clinical and microbiological information

Epidemiology and prevention of infection in the ICU

Risk factors for nosocomial infection and infection control measures to limit its occurrence

Ventilator associated pneumonia: definition, pathogenesis and prevention

Risks of inappropriate antimicrobial therapy on the patient and the environment

Requirements for microbiological surveillance and clinical sampling
### Effects of concomitant treatment and/or co-morbid conditions on an individual patient’s response to treatment

- Prophylactic therapies and indications for their use
- Circumstances when treatment is unnecessary
- Concept of gastrointestinal microbial translocation

**Skills**
- Set realistic goals for therapy (independently or in collaboration with other teams)

#### Advanced

**Knowledge**
- Safe use of therapies which modify the inflammatory response

**Skills**
- Recognise when treatment is unnecessary or futile

---

### 4.3 Administers blood and blood products safely

#### Basic

**Knowledge**
- Risks of inappropriate antimicrobial therapy on the patient and the environment
- Indications for and basic interpretation of haematological tests (including coagulation and sickle tests)
- Indications for and basic interpretation of blood grouping and RBC-matching
- Indications for, contraindication, risks and alternatives to blood transfusion
- Local protocols which govern the ordering, storage and verification procedures, monitoring during administration of blood products and reporting of adverse incidents
- Principles of blood and blood component therapy; principles of massive transfusion
- Infections from contaminated blood / body fluids; strategy if contaminated (e.g. needle stick injury)
- Coagulation and fibrinolytic pathways, and their associated disorders; clinical and laboratory evaluation of haemostasis
- Risk of bleeding: indications, contraindications, monitoring and complications of therapeutic anticoagulants
- Recognition and management of serious adverse reactions and anaphylaxis

**Skills**
- Identify and correct haemostatic and coagulation disorders
- Order, check, verify and administer blood products according to local protocols
- Establish a management plan based on clinical and laboratory information

#### Intermediate

**Knowledge**
- The pathogenesis and management of anaemia, thrombocytopenia, neutropenia and pancytopenia
- Thrombolytic and anti-thrombolytic agents

#### Advanced

**Knowledge**
- Principles and practise of plasma exchange

**Skills**
- Recognise when treatment is unnecessary or futile

---

### 4.4 Uses fluids and vasoactive / inotropic drugs to support the circulation

#### Basic

**Knowledge**
- Physiology and pathophysiology of the heart and circulation
- Pathophysiological effects of altered intravascular volume
- Pathophysiology and treatment of cardiac failure
- Theoretical advantages and disadvantages of crystalloid and colloid solutions
- Indications for, contraindication, risks and alternatives to blood transfusion
- Pathophysiology, detection and management of shock states according to aetiology and in response to physiological data

**Skills**
- Establish a management plan based on clinical and laboratory information
- Choose appropriate fluid, volume, rate and method of administration
- Administer and monitor response to repeated fluid challenges
- Consider and exclude unknown pathology if goals of fluid therapy are not achieved (e.g. continued bleeding)
- Resuscitate a patient with septic shock using appropriate monitoring, fluid therapy and vasoactive agents
- Administer intravenous drugs (prepare, select route and mode of administration and document)
Use infusion pumps to administer drugs and fluids

### Intermediate Knowledge
- Fluid therapies: components, physical properties, distribution and clearance of commonly used fluids; indications, contraindications and complications of their administration
- Mechanisms of assessment of response to fluid
- Indications and contraindications, limitations and complications of inotropic / vasoactive drug therapy
- Interactions between inotropic agents and concomitant therapies and/or co-morbid diseases (e.g. ischaemic heart disease)
- Principles of haemodynamic monitoring - invasive and non invasive methods, indications and limitations, physiological parameters and waveform interpretation
- Invasive and non-invasive systems available for measuring cardiac output and derived haemodynamic variables, the principles involved and the type and site of placement of the monitoring device
- Indications and limitations of transthoracic / transoesophageal echocardiography in shocked patient
- Indications, limitations and complications of techniques of measurement of cardiac output (e.g. pulmonary artery catheter, oesophageal Doppler, PiCCO, LiDCO) and action to prevent them
- Receptor-specific effects of inotropic and vasopressor agents; effects of critical illness and concomitant therapies on receptor function (e.g. down-regulation)

### Skills
- Measure and interpret haemodynamic variables (including derived variables)
- Select an appropriate inotrope / vasopressor - dose, physiological endpoint, rate and route of administration

#### 4.5 Describes the use of mechanical assist devices to support the circulation

### Basic Knowledge
- Pathophysiology and treatment of cardiac failure
- Principles and techniques of cardiac pacing

### Intermediate Knowledge
- Pathophysiology, detection and management of shock states according to aetiology and in response to physiological data

### Advanced Knowledge
- Principles of right and left ventricular assist devices
- Indications, contraindications, complications and basic principles of intra-aortic counter pulsation balloon pump
- Principles of extra-corporeal membrane oxygenation (ECMO)

#### 4.6 Initiates, manages, and weans patients from invasive and non-invasive ventilatory support

### Basic Knowledge
- Causes of respiratory failure, their prevention and management
- Symptoms and signs of acute airway insufficiency and acute respiratory failure, and indications for intervention
- Distinguishing features of acute versus chronic respiratory failure and implications for management
- Principles of oxygen therapy and use of oxygen administration devices (see 5.1)
- Indications for and methods of invasive and non-invasive mechanical ventilation
- Principles of continuous positive airways pressure (CPAP) and positive end-expiratory pressure (PEEP) and CPAP and PEEP delivery systems
- Principles of emergency airway management (see 5.3)
<table>
<thead>
<tr>
<th>Operation of at least one positive pressure ventilator, one non-invasive ventilator, and a constant positive airway pressure (CPAP) device</th>
</tr>
</thead>
<tbody>
<tr>
<td>A systematic approach to checking ventilator, breathing circuit and monitoring devices</td>
</tr>
<tr>
<td>Initial set-up of ventilator settings according to the condition or response of the patient</td>
</tr>
<tr>
<td>Potential adverse effects and complications of respiratory support and methods to minimise these</td>
</tr>
<tr>
<td>Causes of regurgitation and vomiting; prevention and management of pulmonary aspiration</td>
</tr>
<tr>
<td>Safe prescribing of oxygen; manifestations of pulmonary oxygen toxicity</td>
</tr>
<tr>
<td>Principles of weaning from mechanical ventilation and factors which may inhibit weaning</td>
</tr>
<tr>
<td>Management of and complications associated with tracheostomy tubes</td>
</tr>
</tbody>
</table>

**Skills**

- Establish a management plan based on clinical and laboratory information
- Identify and correct ventilator mis-assembly and disconnections
- Stabilise a patient on a constant positive airway pressure (CPAP) device
- Stabilise a patient on a non-invasive ventilator (NIV)
- Interpret data from an arterial blood gas sample
- Confirm adequate oxygenation and control of PaCO₂ and pH
- Set and interpret data from ventilator alarms

**Intermediate**

**Knowledge**

- Modification of ventilator settings according to the condition or response of the patient
- Modes of mechanical ventilation - indications, contraindications and expected results of each mode (CMV, IRV, PRVC, HFOV, SIMV, PS, CPAP, BiPAP, NIV)

**Principles of monitoring ventilation:**

- relationship between mode of ventilation and choice of parameters monitored; airflow and airway pressure waveforms
- Measures of adequacy of tissue oxygenation, eg base deficit, lactate, central venous saturation
- Measurement and interpretation of pulmonary mechanics during mechanical ventilation
- Concept of gastrointestinal microbial translocation
- Prophylactic therapies and indications for their use
- Causes of lung injury in ventilated patients; effects and clinical manifestations of pulmonary barotrauma
- Ventilator associated pneumonia: definition, pathogenesis and prevention
- Effect of ventilation upon cardiovascular and oxygen delivery parameters, other organ function and how these effects can be monitored (heart-lung interactions)
- Principles of physiotherapy in the ICU

**Skills**

- Select the appropriate type and mode of ventilation for an individual patient
- Stabilise a patient on a positive pressure ventilator
- Construct, monitor and review a weaning plan

**Advanced**

**Knowledge**

- Principles of extra-corporeal membrane oxygenation (ECMO)

**4.7 Initiates, manages, and weans patients from renal replacement therapy**

**Basic**

**Knowledge**

- Investigation of impaired renal function
- Distinguishing features of acute versus chronic renal failure and implications for management
- Placement and management of invasive devices necessary for renal replacement therapy (e.g. temporary haemodialysis catheter)
- Indications for and interpretation of fluid balance charts
- Effect of renal failure and its treatment on other organ systems
- Nephrotoxic drugs and adjustment of drug doses in renal impairment/failure

**Skills**

- Establish a management plan based on clinical and laboratory information
- Modify fluid and electrolyte therapy according to clinical features and fluid balance charts
- Prescribe and manage anticoagulation therapy
<table>
<thead>
<tr>
<th>4.8</th>
<th>Recognises and manages electrolyte, glucose and acid-base disturbances</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Basic</strong></td>
<td><strong>Knowledge</strong></td>
</tr>
<tr>
<td>Principles of blood glucose control: indications, methods, monitoring of safety and efficacy</td>
<td></td>
</tr>
<tr>
<td><strong>Skills</strong></td>
<td></td>
</tr>
<tr>
<td>Establish a management plan based on clinical and laboratory information</td>
<td></td>
</tr>
<tr>
<td>Correct electrolyte disorders (e.g. hyperkalaemia, hyponatraemia)</td>
<td></td>
</tr>
<tr>
<td>Institute and manage a regimen to control blood glucose within safe limits</td>
<td></td>
</tr>
<tr>
<td>Confirm adequate oxygenation and control of PaCO(_2) and pH</td>
<td></td>
</tr>
<tr>
<td>Identify and treat underlying causes for a metabolic acidosis</td>
<td></td>
</tr>
<tr>
<td><strong>Intermediate</strong></td>
<td><strong>Knowledge</strong></td>
</tr>
<tr>
<td>Effect of critical illness upon homeostatic mechanisms and causes of homeostatic disturbances</td>
<td></td>
</tr>
<tr>
<td>Pathophysiological consequences, signs and symptoms of disordered fluid, electrolyte, acid-base and glucose balance</td>
<td></td>
</tr>
<tr>
<td>Treatment strategies for abnormalities of fluid, electrolyte, acid-base and glucose balance</td>
<td></td>
</tr>
<tr>
<td>Symptoms, signs and causes of renal failure (acute / chronic / acute on chronic) and indications for intervention</td>
<td></td>
</tr>
<tr>
<td>Patterns of nutritional impairment; consequences of starvation and malnutrition</td>
<td></td>
</tr>
<tr>
<td>Fluid therapies: components, physical properties, distribution and clearance of commonly used fluids; indications, contraindications and complications of their administration</td>
<td></td>
</tr>
<tr>
<td><strong>Skills</strong></td>
<td></td>
</tr>
<tr>
<td>Identify and avoid factors contributing to impaired renal function</td>
<td></td>
</tr>
<tr>
<td><strong>Advanced</strong></td>
<td><strong>Skills</strong></td>
</tr>
<tr>
<td>Recognise when treatment is unnecessary or futile</td>
<td></td>
</tr>
<tr>
<td><strong>Basic Science</strong></td>
<td><strong>Knowledge</strong></td>
</tr>
<tr>
<td>Physiology of fluid, electrolyte, acid-base and glucose control</td>
<td></td>
</tr>
</tbody>
</table>
### 4.9 Co-ordinates and provides nutritional assessment and support

<table>
<thead>
<tr>
<th>Basic Knowledge</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indications, limitations, methods, and complications of enteral and parenteral nutritional techniques</td>
</tr>
<tr>
<td>Principles of nasogastric cannulation in the intubated and non-intubated patient</td>
</tr>
<tr>
<td>Prevention of stress ulceration</td>
</tr>
<tr>
<td>Causes of regurgitation and vomiting; prevention and management of pulmonary aspiration</td>
</tr>
<tr>
<td>Prevention and management of constipation and diarrhoea</td>
</tr>
<tr>
<td>Principles of blood glucose control: indications, methods, monitoring of safety and efficacy</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prescribe an appropriate standard enteral feeding regimen</td>
</tr>
<tr>
<td>Identify surgical and other contraindications to enteral feeding</td>
</tr>
<tr>
<td>Institute and manage a regimen to control blood glucose within safe limits</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Intermediate Knowledge</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pathophysiological consequences, signs and symptoms of disordered fluid, electrolyte, acid-base and glucose balance</td>
</tr>
<tr>
<td>Methods to assess nutritional status and basal energy expenditure</td>
</tr>
<tr>
<td>Patterns of nutritional impairment; consequences of starvation, malnutrition and refeeding</td>
</tr>
<tr>
<td>Fluid and caloric requirements in the critically ill patient including electrolytes, vitamins, trace elements and principles of immunonutrition</td>
</tr>
<tr>
<td>Nutritional formulations: indications, complications and their management</td>
</tr>
<tr>
<td>Alternative routes for enteral feeding: indications, contraindications and complications of post-pyloric and percutaneous feeding tube placement</td>
</tr>
<tr>
<td>Gut motility: effects of drugs, therapy and disease</td>
</tr>
<tr>
<td>Prokinetics: indications, contraindications, complications and selection</td>
</tr>
<tr>
<td>Antiemetics: indications, contraindications, complications and selection</td>
</tr>
<tr>
<td>Concept of gastrointestinal microbial translocation</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>Establish a management plan (independently or in collaboration with the clinical dietician)</td>
</tr>
<tr>
<td>Prescribe and supervise safe administration of a standard / customized parenteral (TPN) preparation</td>
</tr>
<tr>
<td>Manage the transition from parenteral to enteral nutrition</td>
</tr>
<tr>
<td>Set realistic goals for therapy (independently or in collaboration with other teams)</td>
</tr>
<tr>
<td>Collaborate with nursing staff / clinical dietician in monitoring safe delivery of enteral and parenteral nutrition</td>
</tr>
<tr>
<td>Liaise with clinical dieticians / medical team to plan feeding regimens after discharge from the ICU</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Basic Science Knowledge</th>
</tr>
</thead>
<tbody>
<tr>
<td>Principles of metabolism: nutrients – carbohydrates, fats, proteins, vitamins and minerals; metabolic pathways, lactate metabolism, energy production and enzymes; metabolic rate; hormonal control of metabolism - regulation of plasma glucose; physiological</td>
</tr>
<tr>
<td>Gastrointestinal physiology: gastric function; secretions; gut motility, sphincters and reflex control; nausea and vomiting; digestive functions</td>
</tr>
</tbody>
</table>
## Domain 5: Practical procedures

### General Principles

Practical procedures underpin all forms of organ system support.

### Features of competent performance may include:

- Sound decision making in when to perform a practical procedure and when to avoid it
- Prior planning and preparation of patient (including consent), staff and equipment
- Prioritisation of tasks (patients and procedures)
- Consider comfort of the patient
- Awareness of relevant applied anatomy and physiology
- Correct placement / insertion technique - alternative modes and methods
- Attention to safety: safe use of equipment, infection control, confirmation of correct placement, prevention / management of complications
- Maintenance and safe use of devices - troubleshooting
- Consider duration of placement, discontinuation and removal
- Appropriate referral / consultation
- Recognition of limitations (self and others)
- Indications for specific monitoring to ensure patient safety during an intervention / procedure
- Universal precautions and preventative infection control techniques (hand washing, gloves, protective clothing, sharps disposal etc.
- Consider the use of local anaesthetics as the norm

## Domain 5: Competencies

<table>
<thead>
<tr>
<th>Competence</th>
<th>Description</th>
<th>IBTICM level</th>
<th>Assessment methods</th>
<th>GMP</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.1</td>
<td>Administers oxygen using a variety of administration devices</td>
<td>Basic</td>
<td>D</td>
<td>1</td>
</tr>
<tr>
<td>5.2</td>
<td>Performs emergency airway management</td>
<td>Basic</td>
<td>D</td>
<td>1</td>
</tr>
<tr>
<td>5.3</td>
<td>Performs difficult and failed airway management according to local protocols</td>
<td>Intermediate</td>
<td>D</td>
<td>1, 4</td>
</tr>
<tr>
<td>5.4</td>
<td>Performs endotracheal suction</td>
<td>Basic</td>
<td>D</td>
<td>1, 4</td>
</tr>
<tr>
<td>5.5</td>
<td>Performs fiberoptic bronchoscopy and BAL in the intubated patient under supervision</td>
<td>Intermediate</td>
<td>D, M</td>
<td>1, 4</td>
</tr>
<tr>
<td>5.6</td>
<td>Performs percutaneous tracheostomy</td>
<td>Advanced</td>
<td>D, M</td>
<td>1, 4</td>
</tr>
<tr>
<td>5.7</td>
<td>Performs chest drain insertion</td>
<td>Basic</td>
<td>D</td>
<td>1, 4</td>
</tr>
<tr>
<td>5.8</td>
<td>Performs arterial catheterisation</td>
<td>Basic</td>
<td>D, C</td>
<td>1, 4</td>
</tr>
<tr>
<td>5.9</td>
<td>Performs ultrasound techniques for vascular localisation</td>
<td>Basic</td>
<td>C</td>
<td>1, 4</td>
</tr>
<tr>
<td>5.10</td>
<td>Performs central venous catheterisation</td>
<td>Basic</td>
<td>D, C</td>
<td>1, 4</td>
</tr>
<tr>
<td>5.11</td>
<td>Performs defibrillation and cardioversion</td>
<td>Basic</td>
<td>D, C</td>
<td>1, 4</td>
</tr>
<tr>
<td>5.12</td>
<td>Performs transthoracic cardiac pacing describes transvenous</td>
<td>Intermediate</td>
<td>D, C</td>
<td>1, 4</td>
</tr>
<tr>
<td>5.13</td>
<td>Describes how to perform pericardiocentesis</td>
<td>Intermediate</td>
<td>C</td>
<td>1, 4</td>
</tr>
<tr>
<td>5.14</td>
<td>Demonstrates a method for measuring cardiac output and derived haemodynamic variables</td>
<td>Basic</td>
<td>D, C</td>
<td>1</td>
</tr>
<tr>
<td>5.15</td>
<td>Performs lumbar puncture (intradural / 'spinal') under supervision</td>
<td>Basic</td>
<td>D</td>
<td>1, 4</td>
</tr>
<tr>
<td>5.16</td>
<td>Manages the administration of analgesia via an epidural catheter</td>
<td>Intermediate</td>
<td>I</td>
<td>1, 4</td>
</tr>
<tr>
<td>5.17</td>
<td>Performs abdominal paracentesis</td>
<td>Intermediate</td>
<td>D</td>
<td>1, 4</td>
</tr>
</tbody>
</table>
### Domain 5: Syllabus

#### Knowledge, skills and attitudes common to all competencies

<table>
<thead>
<tr>
<th>Knowledge</th>
<th>Skills</th>
<th>Attitudes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seek appropriate supervision - discuss the patient and procedure with supervisor prior to undertaking it</td>
<td>Prioritise tasks and procedures,</td>
<td>Considers patient comfort during procedures / investigations</td>
</tr>
<tr>
<td>Patient selection - indications, contraindications and potential complications of the procedure / intervention</td>
<td>Exhibit sound decision making</td>
<td>Demonstrates desire to minimise patient distress</td>
</tr>
<tr>
<td>Methods and routes of insertion - associated indications and complications</td>
<td>Obtain informed consent/assent from the patient where appropriate</td>
<td>Promotes respect for patient privacy, dignity and confidentiality</td>
</tr>
<tr>
<td>Complications of the technique, how to prevent/recognise them and initiate appropriate treatment</td>
<td>Select appropriate equipment or device and use resources efficiently</td>
<td>Supports other staff in the correct use of devices</td>
</tr>
<tr>
<td>Principles of aseptic technique and aseptic handling of invasive medical devices</td>
<td>Prepare equipment, patient and staff prior to undertaking the procedure</td>
<td>Recognises personal limitations, seeks and accepts assistance or supervision (knows how, when and who to ask)</td>
</tr>
<tr>
<td>Indications for specific monitoring to ensure patient safety during an intervention / procedure</td>
<td>Choose an appropriate route / method of insertion and position the patient accordingly</td>
<td>Accepts personal responsibility for the prevention of cross infection and self infection</td>
</tr>
<tr>
<td>Detection of potential physiological alterations during the procedure</td>
<td>Use protective clothing (gloves / mask / gown / drapes) as indicated</td>
<td></td>
</tr>
<tr>
<td>Appropriate use of drugs to facilitate the procedure</td>
<td>Identify relevant anatomical landmarks</td>
<td></td>
</tr>
<tr>
<td>Universal precautions and preventative infection control techniques (hand washing, gloves, protective clothing, sharps disposal etc.)</td>
<td>Perform the procedure in a manner which minimises the risks of complications</td>
<td></td>
</tr>
<tr>
<td>Methods of sterilisation and cleaning or disposal of equipment</td>
<td>Undertake appropriate investigation to confirm correct placement of device or exclude complications</td>
<td></td>
</tr>
<tr>
<td>Management and use of the device once in situ necessary to minimise the risks of complications</td>
<td>Recognise and manage emergencies; seek assistance appropriately</td>
<td></td>
</tr>
<tr>
<td>Indications and technique for removal</td>
<td>Sterilise, clean or dispose of equipment appropriately</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Lead, delegate and supervise others appropriately according to experience and role</td>
<td></td>
</tr>
</tbody>
</table>

#### 5.1 Administers oxygen using a variety of administration devices

<table>
<thead>
<tr>
<th>Basic</th>
<th>Knowledge</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Symptoms, signs and causes of acute airway insufficiency and indications for intervention</td>
</tr>
<tr>
<td></td>
<td>Methods of maintaining a clear airway</td>
</tr>
<tr>
<td></td>
<td>Principles of emergency airway management (see 5.3)</td>
</tr>
<tr>
<td></td>
<td>Indications, contraindications and complications of oxygen therapy</td>
</tr>
<tr>
<td></td>
<td>Indications for and operation of fixed and variable performance oxygen therapy equipment, humidification and nebulising devices</td>
</tr>
<tr>
<td></td>
<td>Indications for different modes of ventilation and operation of at least one positive pressure ventilator, one non-invasive ventilator, and a constant positive airway pressure (CPAP) device</td>
</tr>
</tbody>
</table>
### Skills

- Check pipelines; check and change portable cylinders
- Select appropriate equipment or device to deliver oxygen therapy
- Recognise and institute appropriate oxygen therapy in the management of medical emergencies; seek assistance as appropriate
- Support ventilation using bag and mask

### Advanced

#### Knowledge

- Indications for and complications of hyperbaric oxygenation

#### Basic Science

- **Respiratory physiology**: gaseous exchange; pulmonary ventilation: volumes, flows, dead space; mechanics of ventilation: ventilation/perfusion abnormalities; control of breathing, acute and chronic ventilatory failure, effect of oxygen therapy; respiratory muscle oxygen consumption and work of breathing.
- Environmental hazards associated with storage and use of oxygen; strategies to promote safety
- Storage and use of oxygen, nitric oxide (NO), compressed air and helium, including use of gas cylinders
- Use of pipeline gas and suction systems
- Principles of nebulisers, pressure regulators, flowmeters, vaporizers and breathing systems

### 5.2 Performs emergency airway management

#### Basic

#### Knowledge

- Principles of emergency airway management (see 5.3)
- Symptoms, signs and causes of acute airway insufficiency and indications for intervention
- Methods of maintaining a clear airway
- Indications, selection and insertion of oral (Guedel) airways, nasopharyngeal airways and laryngeal mask airways (LMA)
- Tracheal intubation: selection of tube type, diameter and length; indications and techniques; methods to confirm correct placement of a tracheal tube
- Appropriate use of drugs to facilitate airway control
- Monitoring during sedation/induction of anaesthesia for endotracheal intubation
- Causes of regurgitation and vomiting; prevention and management of pulmonary aspiration
- Cricoid pressure: indications and safe provision
- Principles of endotracheal suctioning (see 5.5)
- Select appropriate tracheal tube type, size and length under direct supervision

#### Skills

- Choose a safe environment to undertake airway management (or optimise environment as circumstances allow)
- Accurately assess the airway for potential difficulties with airway management
- Optimise the patient’s position for airway management
- Maintain a clear airway using oral / nasal airways
- Support ventilation using bag and mask
- Insert and check correct placement of laryngeal mask airway
- Perform intubation and verify correct placement of tube under direct supervision
- Manage and minimise cardiovascular and respiratory changes during and after intubation under direct supervision
- Demonstrate rapid sequence induction of anaesthesia / cricoid pressure under direct supervision
- Apply an end-tidal CO₂ detector post-intubation and interpret a capnograph trace
- Prepare the patient for and perform extubation
- Change an orotracheal tube
- Select appropriate tracheal tube type, size and length under direct supervision

#### Intermediate

#### Knowledge

- Bronchoscopic appearance of the upper and lower airways
- Management of difficult or failed airway (see 5.4)
- Airway management in special circumstances including but not limited to: head injury, full stomach, upper airway obstruction, shock, cervical spine injury, laryngectomy

#### Skills

- Perform intubation and verify correct placement of tube
Manage and minimise cardiovascular and respiratory changes during and after intubation
Demonstrate rapid sequence induction of anaesthesia / cricoid pressure
Select appropriate tracheal tube type, size and length
Management of complications of tracheostomy including but not limited to: blockage, displacement

<table>
<thead>
<tr>
<th>5.3</th>
<th>Performs difficult and failed airway management according to local protocols</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Basic</strong></td>
<td><strong>Skills</strong></td>
</tr>
<tr>
<td></td>
<td>Accurately assess the airway for potential difficulties with airway management</td>
</tr>
<tr>
<td></td>
<td>Optimise the patient’s position for airway management</td>
</tr>
<tr>
<td></td>
<td>Maintain a clear airway using oral / nasal airways</td>
</tr>
<tr>
<td></td>
<td>Principles of oxygen therapy and use of oxygen administration devices (see 5.1)</td>
</tr>
<tr>
<td></td>
<td>Support ventilation using bag and mask</td>
</tr>
<tr>
<td></td>
<td>Accurately assess the airway for potential difficulties with airway management</td>
</tr>
<tr>
<td></td>
<td>Appropriate use of drugs to facilitate airway control</td>
</tr>
<tr>
<td></td>
<td>Prepare equipment for difficult or failed intubation under direct supervision</td>
</tr>
<tr>
<td><strong>Intermediate</strong></td>
<td><strong>Knowledge</strong></td>
</tr>
<tr>
<td></td>
<td>Bronchoscopic appearance of the upper and lower airways</td>
</tr>
<tr>
<td></td>
<td>Airway management in special circumstances, (head injury, full stomach, upper airway obstruction, shock, cervical spine injury)</td>
</tr>
<tr>
<td></td>
<td>Management of difficult intubation and failed intubation (local algorithm or protocol)</td>
</tr>
<tr>
<td></td>
<td>Indications and methods of securing an emergency surgical airway</td>
</tr>
<tr>
<td></td>
<td>Anatomical landmarks for cricothyrotomy/tracheostomy/mini-tracheotomy</td>
</tr>
<tr>
<td></td>
<td>Indications and techniques for needle and surgical crycothyroidotomy</td>
</tr>
<tr>
<td></td>
<td>Indications and contraindications to tracheostomy (percutaneous and surgical) and minitracheostomy</td>
</tr>
<tr>
<td><strong>Skills</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Prepare equipment for difficult or failed intubation</td>
</tr>
<tr>
<td></td>
<td>Demonstrate failed intubation drill (according to local algorithm or protocol)</td>
</tr>
<tr>
<td></td>
<td>Demonstrate minitracheotomy or needle crico-thyroidotomy</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>5.4</th>
<th>Performs endotracheal suction</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Basic</strong></td>
<td><strong>Knowledge</strong></td>
</tr>
<tr>
<td></td>
<td>Symptoms, signs and causes of acute airway insufficiency and indications for intervention</td>
</tr>
<tr>
<td></td>
<td>Methods of maintaining a clear airway</td>
</tr>
<tr>
<td></td>
<td>Principles of endotracheal suctioning</td>
</tr>
<tr>
<td></td>
<td>Consequences of the procedure during ventilation</td>
</tr>
<tr>
<td><strong>Intermediate</strong></td>
<td><strong>Knowledge</strong></td>
</tr>
<tr>
<td></td>
<td>Bronchoscopic appearance of the upper and lower airways</td>
</tr>
<tr>
<td><strong>Skills</strong></td>
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</tr>
<tr>
<td></td>
<td>Perform endotracheal suction (via oral / nasal / tracheostomy tube)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>5.5</th>
<th>Performs fibreoptic bronchoscopy and BAL in the intubated patient under supervision</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Basic</strong></td>
<td><strong>Knowledge</strong></td>
</tr>
<tr>
<td></td>
<td>Symptoms, signs and causes of acute airway insufficiency and indications for intervention</td>
</tr>
<tr>
<td></td>
<td>Detection and management of haemo/pneumothorax (simple and tension)</td>
</tr>
<tr>
<td><strong>Intermediate</strong></td>
<td><strong>Knowledge</strong></td>
</tr>
<tr>
<td></td>
<td>Bronchoscopic appearance of the upper and lower airways</td>
</tr>
<tr>
<td></td>
<td>Method of bronchoscopy via an endotracheal tube</td>
</tr>
<tr>
<td></td>
<td>Methods of broncho-alveolar lavage (BAL) in an intubated patient</td>
</tr>
</tbody>
</table>
Safety and maintenance of flexible fibreoptic endoscopes

**Skills**
- Undertake bronchoscopy to assess tube position
- Undertake therapeutic bronchoscopy for sputum clearance

### 5.6 Performs percutaneous tracheostomy

**Basic**

**Knowledge**
- Causes of regurgitation and vomiting; prevention and management of pulmonary aspiration
- Management of and complications associated with tracheostomy tubes

**Skills**
- Manage and minimise cardiovascular and respiratory changes during and after intubation under direct supervision
- Select appropriate tracheal tube type, size and length under direct supervision

**Intermediate**

**Knowledge**
- Indications and contraindications to tracheostomy (percutaneous and surgical) and minitracheostomy
- Anatomical landmarks for cricothyrotomy/tracheostomy/mini-tracheotomy
- Techniques for percutaneous and surgical tracheotomy
- Select appropriate tracheal tube type, size and length

**Skills**
- Manage and minimise cardiovascular and respiratory changes during and after intubation
- Select appropriate tracheal tube type, size and length
- Change a tracheostomy tube electively

**Advanced**

**Skills**
- Identify patients requiring tracheostomy; discuss indications and contraindications for percutaneous tracheostomy
- Manage anaesthesia and control the airway during planned tracheostomy tube insertion in the intensive care unit (ICU)

### 5.7 Performs chest drain insertion

**Basic**

**Knowledge**
- Detection and management of haemo/pneumothorax (simple and tension)
- Anatomical landmarks for intrapleural drains
- Insertion and management of chest drains and air exclusion devices
- Patient groups at risk who may require chest drain placement under ultrasound or CT guidance
- Consequences of the procedure during ventilation

**Skills**
- Demonstrate emergency relief of tension pneumothorax
- Demonstrate aseptic insertion of an intrapleural chest drain and connection to a one-way seal device

### 5.8 Performs arterial catheterisation

**Basic**

**Knowledge**
- Principles of arterial catheterisation
- Surface anatomy: arteries of the arms and legs
- Allen's test - application and limitations
- Ultrasound techniques for vascular localisation (see 5.9)
- Recognition and management of inadvertent intra-arterial injection of harmful substances

**Skills**
- Insert arterial catheters by different routes
- Minimise blood loss related to clinical investigations and procedures
### 5.9 Describes ultrasound techniques for vascular localisation

<table>
<thead>
<tr>
<th>Basic Knowledge</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic principles of ultrasound and the Doppler effect</td>
</tr>
<tr>
<td>Methods for securing vascular access rapidly</td>
</tr>
<tr>
<td>Principles, routes and techniques of peripheral and central venous cannulation</td>
</tr>
<tr>
<td>Principles of arterial catheterisation</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Basic Science Knowledge</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surface anatomy: structures in the antecubital fossa; large veins and anterior triangle of the neck; large veins of the leg and femoral triangle; arteries of the arms and legs</td>
</tr>
</tbody>
</table>

### 5.10 Performs central venous catheterisation

<table>
<thead>
<tr>
<th>Basic Knowledge</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surface anatomy: structures in the antecubital fossa; large veins and anterior triangle of the neck; large veins of the leg and femoral triangle</td>
</tr>
<tr>
<td>Principles, routes and techniques of central venous cannulation</td>
</tr>
<tr>
<td>Chest x-ray interpretation <em>(see 2.6)</em></td>
</tr>
<tr>
<td>Ultrasound techniques for vascular localisation <em>(see 5.9)</em></td>
</tr>
<tr>
<td>Methods for securing vascular access rapidly</td>
</tr>
<tr>
<td>Detection and management of haemo/pneumothorax (simple and tension)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insert central venous catheters by different routes</td>
</tr>
<tr>
<td>Minimise blood loss related to clinical investigations and procedures</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Intermediate Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>Describe a method for tunnelled intravenous catheterisation (e.g. for parenteral nutrition)</td>
</tr>
</tbody>
</table>

### 5.11 Performs defibrillation and cardioversion

<table>
<thead>
<tr>
<th>Basic Knowledge</th>
</tr>
</thead>
<tbody>
<tr>
<td>Principles of ECG monitoring (heart rate, rhythm, conduction, ST segment change and QT interval) – indications, limitations and techniques. Advantages and disadvantages of different lead configurations</td>
</tr>
<tr>
<td>Basic and complex cardiac arrhythmias - recognition and management (pharmacological and electrical)</td>
</tr>
<tr>
<td>Treatment (algorithm) of patients in ventricular fibrillation (VF) and pulseless ventricular tachycardia (VT)</td>
</tr>
<tr>
<td>Defibrillation: principles of monophasic and biphasic defibrillators; mechanism, indications, complications, modes and methods (manual and automated external defibrillators (AED))</td>
</tr>
<tr>
<td>Principles of emergency airway management <em>(see 5.3)</em></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>Obtain and interpret data from ECG (3- and 12-lead)</td>
</tr>
<tr>
<td>Use manual external defibrillators</td>
</tr>
<tr>
<td>Use automated external defibrillators (AED)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Basic Science Knowledge</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electrical safety: conditions which predispose to the occurrence of macro-shock / micro-shock; physical dangers of electrical currents; relevant standards regarding safe use of electricity in patient care; basic methods to reduce electrical hazards.</td>
</tr>
</tbody>
</table>

### 5.12 Performs transthoracic cardiac pacing, describes transvenous

<table>
<thead>
<tr>
<th>Basic Knowledge</th>
</tr>
</thead>
<tbody>
<tr>
<td>Principles and techniques of cardiac pacing</td>
</tr>
<tr>
<td>Principles of ECG monitoring (heart rate, rhythm, conduction, ST segment change and QT interval) – indications, limitations and techniques. Advantages and disadvantages of different lead configurations</td>
</tr>
</tbody>
</table>
### Methods for securing vascular access rapidly

- Principles, routes and techniques of peripheral and central venous cannulation
- Basic and complex cardiac arrhythmias - recognition and management (pharmacological and electrical)
- Surface anatomy: structures in the antecubital fossa; large veins and anterior triangle of the neck; large veins of the leg and femoral triangle
- Detection and acute management of cardiac tamponade
- Principles of emergency airway management (see 5.3)
- Detection and management of haemo/pneumothorax (simple and tension)
- Insertion and management of chest drains and air exclusion devices

#### Skills

**Intermediate**
- Demonstrate emergency relief of tension pneumothorax

#### Skills

**Intermediate**
- Principles of defibrillation and cardioversion (see 5.11)
- Demonstrate emergency percutaneous pericardial aspiration

#### Advanced

- Insert a temporary pacing wire
- Establish and review pacing box settings

### 5.13 Describes how to perform pericardiocentesis

#### Basic

**Knowledge**
- Detection and acute management of cardiac tamponade
- Anatomical landmarks and technique for percutaneous pericardial aspiration
- Principles of ECG monitoring (heart rate, rhythm, conduction, ST segment change and QT interval) – indications, limitations and techniques. Advantages and disadvantages of different lead configurations
- Treatment (algorithm) of patients in ventricular fibrillation (VF) and pulseless ventricular tachycardia (VT)
- Principles of emergency airway management (see 5.3)
- Principles of defibrillation and cardioversion (see 5.11)

### 5.14 Demonstrates a method for measuring cardiac output and derives haemodynamic variables

#### Basic

**Knowledge**
- Zero and calibration techniques for invasive pressure monitoring

#### Skills

- Obtain and interpret data from central venous catheters
- Prepare equipment for intravascular pressure monitoring

#### Intermediate

**Knowledge**
- Principles of haemodynamic monitoring - invasive and non-invasive methods, indications and limitations, physiological parameters and waveform interpretation
- Invasive and non-invasive systems available for measuring cardiac output and derived haemodynamic variables, the principles involved and the type and site of placement of the monitoring device
- Interpretation of, relationships between, sources of error and limitations of measured and derived cardiovascular variables including pressure, flow, volume and gas transport
- Indications, limitations and complications of techniques of measurement of cardiac output (e.g. pulmonary artery catheter, oesophageal Doppler, PiCCO, LiDCO) and action to prevent them

#### Skills

- Obtain and interpret data from a cardiac output measurement technique
- Measure and interpret haemodynamic variables (including derived variables)

### 5.15 Performs lumbar puncture (intradural / ‘spinal’) under supervision

#### Basic

**Knowledge**
- Indications for and contraindications of lumbar puncture and CSF sampling; laboratory analysis of CSF samples
Performs lumbar puncture under supervision

### 5.16 Manages the administration of analgesia via an epidural catheter

**Basic**

**Knowledge**
- Physiological effects of pain and anxiety
- Recognition and methods of assessment of pain
- Indications, contraindications and complications of epidural infusion / injection; principles of safe epidural drug administration

**Skills**
- Select an appropriate epidural infusion regimen and titrate safely
- Select and determine adequacy and route of administration of analgesia
- Manage an established epidural infusion
- Administer bolus analgesia via an epidural catheter
- Minimise complications associated with opioid and non-opioid analgesics

**Intermediate**

**Knowledge**
- Indications, contraindications, methods and complications of epidural catheterisation
- Contraindications, methods and complications of epidural catheter removal

**Basic Science**

**Knowledge**
- Pharmacokinetics, pharmacodynamics, indications and complications of opiates and local anaesthetic agents

### 5.17 Performs abdominal paracentesis

**Intermediate**

**Knowledge**
- Anatomy of the abdominal wall; landmarks for abdominal paracentesis and abdominal drainage catheters
- Indications, contraindications, complications and technique of abdominal paracentesis

**Skills**
- Insert an abdominal drain

### 5.18 Describes Sengstaken tube (or equivalent) placement

**Intermediate**

**Knowledge**
- Principles and techniques for insertion of gastro-oesophageal balloon tamponade tube (e.g. Sengstaken-Blakemore)

### 5.19 Performs nasogastric tube placement

**Basic**

**Knowledge**
- Principles of nasogastric cannulation in the intubated and non-intubated patient
- Causes of regurgitation and vomiting; prevention and management of pulmonary aspiration

**Skills**
- Insert a nasogastric tube in an intubated and non-intubated patient

### 5.20 Performs urinary catheterisation

**Basic**

**Knowledge**
- Anatomy of the genitourinary system and anatomical landmarks for suprapubic urinary catheters
- Urinary catheterisation techniques: transurethral and suprapubic
- Urinary catheterisation in pelvic trauma: indications, contraindications and techniques

**Skills**
- Perform aseptic urinary catheterisation: male and female
- Confirm correct placement and exclude complications
Domain 6: Perioperative care

General Principles

Acutely ill patients may present with medical, or surgical problems, or both. The complications of critical illness do not respect speciality boundaries. Perioperative care requires multidisciplinary collaboration, and often provides opportunities for preventative intensive care.

Features of competent performance may include:

- Attention to physiological optimisation and monitoring
- Consider the surgical and anaesthetic procedure in relation to plan of management (including critical decision making, application of relevant protocols / guidelines / care bundles)
- Awareness of main acute complications and their prevention / management
- Attention to patient comfort
- Effective team-working: collaboration, communication and continuity of care
- Professional relationship with patient and relatives: communication; interpersonal skills.
- Appropriate referral / consultation
- Recognition of limitations (self and others)
- Attention to patient safety

Domain 6: Competencies

<table>
<thead>
<tr>
<th>Competence</th>
<th>Description</th>
<th>IBTICM level</th>
<th>Assessment methods</th>
<th>GMP</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.1</td>
<td>Manages the pre- and post-operative care of the high risk surgical patient</td>
<td>Basic</td>
<td>C, M, T</td>
<td>1</td>
</tr>
<tr>
<td>6.2</td>
<td>Manages the care of the patient following cardiac surgery under supervision</td>
<td>Advanced</td>
<td>C, T</td>
<td>1</td>
</tr>
<tr>
<td>6.3</td>
<td>Manages the care of the patient following craniotomy under supervision</td>
<td>Advanced</td>
<td>C, T</td>
<td>1</td>
</tr>
<tr>
<td>6.4</td>
<td>Manages the care of the patient following solid organ transplantation under supervision</td>
<td>Advanced</td>
<td>C</td>
<td>1</td>
</tr>
<tr>
<td>6.5</td>
<td>Manages the pre- and post-operative care of the trauma patient under supervision</td>
<td>Intermediate</td>
<td>C, T</td>
<td>1</td>
</tr>
</tbody>
</table>

Domain 6: Syllabus

Knowledge, skills and attitudes common to all sections

Skills
- Lead, delegate and supervise others appropriately according to experience and role

Attitudes
- Demonstrates desire to minimise patient distress
- Attention to and control of pain
- Consults, communicates and collaborates effectively with anaesthetist, surgeon, nursing staff, other professionals, patients and relatives where appropriate
- Recognises personal limitations, seeks and accepts assistance or supervision (knows how, when and who to ask)
### 6.1 Manages the pre- and post-operative care of the high risk surgical patient

#### Basic

<table>
<thead>
<tr>
<th>Knowledge</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Factors determining perioperative risk</td>
<td></td>
</tr>
<tr>
<td>Importance of preoperative health status on postoperative outcomes</td>
<td>including cardiopulmonary exercise testing</td>
</tr>
<tr>
<td>Indications for, and interpretation of pre-operative investigations</td>
<td></td>
</tr>
<tr>
<td>Dangers of emergency anaesthesia and surgery</td>
<td></td>
</tr>
<tr>
<td>Effect of gastric contents and volume depletion on perioperative risk</td>
<td></td>
</tr>
<tr>
<td>Anaesthetic risk factors complicating recovery: suxamethonium apnoea,</td>
<td>anaphylaxis, malignant hyperpyrexia, difficult airway</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Perioperative implications of current drug therapy</td>
<td></td>
</tr>
<tr>
<td>Consent and assent in the competent and non-competent patient</td>
<td></td>
</tr>
<tr>
<td>Implications for postoperative care of common acute and chronic medical</td>
<td>Conditions (see 3.1 and 3.2)</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Indications and choice of agent for antibiotic prophylaxis</td>
<td></td>
</tr>
<tr>
<td>Indications for and methods of perioperative anti-thrombotic treatment</td>
<td></td>
</tr>
<tr>
<td>Recognition, assessment and management of acute pain</td>
<td></td>
</tr>
<tr>
<td>Triggered reevaluation of the patient if pain worsens days after</td>
<td>surgery eg anastomotic dehiscence</td>
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<tr>
<td></td>
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<tr>
<td>Implications of type of anaesthesia (general/regional/local) for</td>
<td>perioperative care</td>
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<tr>
<td></td>
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<tr>
<td>Implications of type / site of surgery for postoperative management</td>
<td>and potential complications within the first 24 hours of</td>
</tr>
<tr>
<td></td>
<td>surgery</td>
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<tr>
<td>Assessment and management of commonly encountered perioperative</td>
<td></td>
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<tr>
<td></td>
<td>conditions and complications including:</td>
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<tr>
<td>Respiration:</td>
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</tr>
<tr>
<td>Cardiovascular:</td>
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<tr>
<td>Renal:</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Haematology and oncology:</td>
<td>Management of acute renal failure</td>
</tr>
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<tr>
<td>Metabolic and hormonal:</td>
<td>Perioperative management of patients with diabetes; blood</td>
</tr>
<tr>
<td></td>
<td>glucose control; perioperative management of electrolyte</td>
</tr>
<tr>
<td>Gastrointestinal:</td>
<td>disorders.</td>
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<tr>
<td></td>
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<tr>
<td>Sepsis and Infection:</td>
<td>Perioperative management of patients with diabetes; blood</td>
</tr>
<tr>
<td></td>
<td>glucose control; perioperative management of electrolyte</td>
</tr>
<tr>
<td></td>
<td>disorders.</td>
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<td></td>
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</tr>
<tr>
<td>Skills</td>
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<tr>
<td>Consider the impact of long-term and chronic treatment on acute</td>
<td>surgical care</td>
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<tr>
<td>Accurately assess the airway for potential difficulties with airway</td>
<td>management</td>
</tr>
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<td></td>
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<tr>
<td>Ensure the necessary resources are available for safe post-operative</td>
<td>care</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Identify pre-operative health status and intercurrent disease,</td>
<td>medications, allergies and their interaction with the nature</td>
</tr>
<tr>
<td></td>
<td>of anaesthetic and surgery</td>
</tr>
<tr>
<td>Obtain relevant information from the patient, relatives and other</td>
<td>secondary sources</td>
</tr>
<tr>
<td></td>
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<tr>
<td>Assess conscious level and conduct a careful systems review</td>
<td></td>
</tr>
<tr>
<td>Select and determine adequacy and route of administration of analgesia</td>
<td></td>
</tr>
<tr>
<td>Document, monitor and manage fluid balance, circulating volume, drains,</td>
<td>systemic oxygen supply</td>
</tr>
<tr>
<td></td>
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</tr>
<tr>
<td>Establish a plan for postoperative management</td>
<td></td>
</tr>
<tr>
<td>Identify life-threatening cardiorespiratory complications; manage</td>
<td>hypovolaemia and impaired oxygen delivery</td>
</tr>
<tr>
<td></td>
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</tr>
<tr>
<td>Manage post-operative hypo and hypertension</td>
<td></td>
</tr>
<tr>
<td>Differentiate and manage tension pneumothorax, cardiac tamponade and</td>
<td>pulmonary embolus</td>
</tr>
<tr>
<td></td>
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</tr>
<tr>
<td>Manage post-operative stridor</td>
<td></td>
</tr>
<tr>
<td>Recognise and manage perioperative emergencies and seek assistance</td>
<td>appropriately</td>
</tr>
<tr>
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</tr>
</tbody>
</table>
### Intermediate

#### Knowledge

**Respiratory:**
- pulmonary infiltrates including acute lung injury (ALI) and the acute respiratory distress syndrome (ARDS) and their causative factors; TRALI; pulmonary oedema; pleural effusion, haemo/pneumothorax (simple and tension); use of chest drains; factors affecting patients following thoracotomy, lung resection, oesophagectomy and oro facial surgery

**Cardiovascular:**
- operative risk factors in patients with ischaemic heart disease, significant valvular disease

**Renal:**
- rhabdomyolysis; consequences of nephrectomy, ileal conduits; management post-renal transplantation

**Haematology and oncology:**
- Care of the immuno-suppressed or immuno-incompetent patient

**Metabolic and hormonal:**
- Hypo- and hyperadrenalism, surgery to thyroid, adrenal and pituitary glands

**Methods of optimising high risk surgical patients: ERAS?**

**Plastic Surgery:**
- management of vascular skin grafts

**Neurological:**
- causes of post-operative confusion and delirium, stroke (CVA), coma and raised intracranial pressure; determinants of cerebral perfusion and oxygen delivery; prevention of secondary brain injury; perioperative management of patients with neuropathies and myoopathies; intracranial pressure monitoring; extra-dural and sub-dural haematoma; intracerebral haemorrhage; spinal cord injury and ischaemia; brachial plexus injury; complications of neuromuscular blockade

**Musculo-skeletal:**
- principles and management of external fixators and casts; perioperative positioning; pressure area care; compartment syndromes and pressure monitoring; patients on muscle relaxants; principles of salvage surgery

**Optimise high-risk surgical patients before surgery:**
- consider site of care and management plan

**Communicate the risk of surgery to patients and family**

**Interpret pre-operative investigations, intra-operative findings and events/complications, and respond to them appropriately**

### Advanced

#### Knowledge

**Cardiovascular:**
- Cardiac tamponade; surgery for acquired and congenital cardiac disease; management of patients following cardiac surgery (coronary grafting, valve replacement) and aortic surgery (arch, thoracic, abdominal); heart and heart-lung transplantation

**Haematology and oncology:**
- Complications of chemotherapy and radiotherapy

**Gastrointestinal:**
- management of the pre- and post-liver transplant patient; perioperative nutrition; post operative nausea and vomiting

### 6.2 Manages the care of the patient following cardiac surgery under supervision

#### Basic

**Knowledge**

- Factors determining perioperative risk:
- Importance of preoperative health status on postoperative outcomes
- Indications for, and interpretation of pre-operative investigations
- Dangers of emergency anaesthesia and surgery
- Perioperative implications of current drug therapy
- Implications for postoperative care of common acute and chronic medical conditions (see 3.1 and 3.2)
- Implications of type of anaesthesia (general/regional/local) for perioperative care
- Implications of type/site of surgery for postoperative management and potential complications within the first 24 hours of surgery
- Recognition, assessment and management of acute pain
- Indications for and methods of perioperative anti-thrombotic treatment

**Skills**

- Consider the impact of long-term and chronic treatment on acute surgical care
- Identify pre-operative health status and intercurrent disease, medications, allergies and their interaction with the nature of anaesthetic and surgery
Obtain relevant information from the patient, relatives and other secondary sources
Assess conscious level and conduct a careful systems review
Select and determine adequacy and route of administration of analgesia
Document, monitor and manage fluid balance, circulating volume, drains, systemic oxygen supply
Establish a plan for postoperative management
Identify life-threatening cardiorespiratory complications; manage hypovolaemia and impaired oxygen delivery
Differentiate and manage tension pneumothorax, cardiac tamponade and pulmonary embolus
Recognise and manage perioperative emergencies and seek assistance appropriately

### Intermediate Knowledge

**Criteria for admission to, and discharge from ICU - factors influencing intensity and site of care (ward, high dependency unit (HDU), intensive care unit (ICU))**

**Neurological:** stroke (CVA); causes of post-operative confusion.

**Haematology:** management of severe acute haemorrhage and blood transfusion; correction of coagulation disorders and haemoglobinopathies.

**Metabolic & Hormonal:** Blood glucose control; perioperative management of electrolyte disorders

**Sepsis and Infection:** fever and hypothermia; postoperative hypoperfusion and impaired oxygen delivery; wound infection; opportunistic and nosocomial infection; perioperative infection risk and prophylactic antibiotics; intestinal ischaemia; antibiotic selection and prescribing

### Skills

Seek appropriate support and supervision in order to provide optimal patient care
Interpret pre-operative investigations, intra-operative findings and events/complications, and respond to them appropriately

### Advanced Knowledge

**Respiratory:** Interpretation of symptoms and signs of respiratory insufficiency in the surgical patient; pneumonia, collapse or consolidation, pulmonary infiltrates including acute lung injury (ALI) and the acute respiratory distress syndrome (ARDS) and their causative factors; pulmonary oedema; pleural effusion, haemo/pneumothorax (simple and tension); use of chest drains; factors affecting patients following cardiac surgery.

**Cardiovascular:** Interpretation of symptoms and signs of cardiovascular insufficiency in the surgical patient; recognition of bleeding; management of hypo/hypertension; pulmonary embolus; cardiac tamponade; surgery for congenital and acquired cardiac disease; management of patients following cardiac surgery (coronary grafting, valve replacement) and aortic surgery (arch, thoracic, abdominal); heart; principles of cardiac pacing

**Renal:** Causes of perioperative oliguria and anuria; prevention and management of acute renal failure

**Gastrointestinal:** post-operative alterations in gut motility; perioperative nutrition; post operative nausea and vomiting

Surgical interventions in patients with cardiac disease, perioperative management of the cardiovascular surgery patient and potential complications occurring within 24 hours of cardiac surgery

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### 6.3 Manages the care of the patient following craniotomy under supervision

#### Basic Knowledge

Factors determining perioperative risk
Importance of preoperative health status on postoperative outcomes
Indications for, and interpretation of pre-operative investigations
Perioperative implications of current drug therapy
Implications for postoperative care of common acute and chronic medical conditions (see 3.1 and 3.2)
Implications of type of anaesthesia (general/regional/local) for perioperative care
Recognition, assessment and management of acute pain
Indications for and methods of perioperative anti-thrombotic treatment

#### Skills

Consider the impact of long-term and chronic treatment on acute surgical care
Identify pre-operative health status and intercurrent disease, medications, allergies and their interaction with the nature of anaesthetic and surgery
Obtain relevant information from the patient, relatives and other secondary sources
Assess conscious level and conduct a careful systems review
Select and determine adequacy and route of administration of analgesia
Document, monitor and manage fluid balance, circulating volume, drains, systemic oxygen supply
Establish a plan for postoperative management
Recognise and manage perioperative emergencies and seek assistance appropriately

### Intermediate

**Knowledge**
- Criteria for admission to, and discharge from ICU – factors influencing intensity and site of care (ward, high dependency unit (HDU), intensive care unit (ICU))

#### Neurological:
- Causes of post-operative confusion, stroke (CVA), coma and raised intracranial pressure; determinants of cerebral perfusion and oxygenation; prevention of secondary brain injury; intracranial pressure monitoring; therapeutic correction of raised intracranial pressure; intracerebral haemorrhage, contusion and oedema

#### Metabolic & Hormonal:
- Blood glucose control; perioperative management of electrolyte disorders

**Skills**
- Seek appropriate support and supervision in order to provide optimal patient care
- Interpret pre-operative investigations, intra-operative findings and events/complications, and respond to them appropriately

### Advanced

**Knowledge**
- Interpretation of symptoms and signs of cardiovascular insufficiency in the surgical patient; management of hypo/hypertension

#### Respiratory:
- Interpretation of symptoms and signs of respiratory insufficiency in the surgical patient

#### Renal:
- Causes of perioperative oliguria and anuria; prevention and management of acute renal failure

#### Gastrointestinal:
- Post-operative alterations in gut motility; perioperative nutrition; post operative nausea & vomiting

#### Major neurosurgical procedures, peri-operative management of the patient undergoing major neurosurgery, and potential complications occurring within 24 hours of surgery

**Skills**
- Monitor and manipulate cerebral perfusion pressure (CPP)

### 6.4 Manages the care of the patient following solid organ transplant under supervision

**Basic**

**Knowledge**
- Factors determining perioperative risk
- Importance of preoperative health status on postoperative outcomes
- Indications for, and interpretation of pre-operative investigations
- Perioperative implications of current drug therapy
- Implications for postoperative care of common acute and chronic medical conditions (see 3.1 and 3.2)
- Implications of type of anaesthesia (general/regional/local) for perioperative care
- Implications of type / site of surgery for postoperative management and potential complications within the first 24 hours of surgery
- Indications for and methods of perioperative anti-thrombotic treatment
- Recognition, assessment and management of acute pain
- Assessment and management of commonly encountered perioperative conditions and complications including:
  - **Haematology and oncology:** Management of severe acute haemorrhage and blood transfusion; correction of coagulation disorders and haemoglobinopathies.

**Skills**
- Consider the impact of long-term and chronic treatment on acute surgical care
- Identify pre-operative health status and intercurrent disease, medications, allergies and their interaction with the nature of anaesthetic and surgery
- Obtain relevant information from the patient, relatives and other secondary sources
- Assess conscious level and conduct a careful systems review
- Select and determine adequacy and route of administration of analgesia
- Document, monitor and manage fluid balance, circulating volume, drains
- Establish a plan for postoperative management
Identify life-threatening cardiorespiratory complications; manage hypovolaemia and impaired oxygen delivery
Recognise and manage perioperative emergencies and seek assistance appropriately

**Intermediate Knowledge**

**Metabolic & Hormonal:** blood glucose control; perioperative management of electrolyte disorders

**Sepsis and Infection:** fever and hypothermia; postoperative hypoperfusion and impaired oxygen delivery; wound infection; opportunistic and nosocomial infection; perioperative infection risk and prophylactic antibiotics; intestinal ischaemia; antibiotic selection and prescribing

Assessment and management of commonly encountered perioperative conditions and complications including:

**Haematology and Oncology:**
Care of the immunosuppressed or immunoincompetent patient

Criteria for admission to, and discharge from ICU - factors influencing intensity and site of care (ward, high dependency unit (HDU), intensive care unit (ICU))

**Skills**

Interpret pre-operative investigations, intra-operative findings and events/complications, and respond to them appropriately

Seek appropriate support and supervision in order to provide optimal patient care

**Advanced Knowledge**

**Haematology and Oncology:** Complications of chemotherapy

Solid organ-specific transplantation (heart-lung, liver, renal); peri-operative considerations, pharmacological management, post operative care and potential complications

**Respiratory:** Interpretation of symptoms and signs of respiratory insufficiency in the surgical patient; pneumonia, collapse or consolidation, pulmonary infiltrates including acute lung injury (ALI) and the acute respiratory distress syndrome (ARDS) and their causative factors; pulmonary oedema; pleural effusion, haemo/pneumothorax (simple and tension); use of chest drains; factors affecting patients following heart-lung transplantation.

**Cardiovascular:** Recognition of bleeding; interpretation of symptoms and signs of cardiovascular insufficiency in the surgical patient; management of hyp/hypertension; pulmonary embolus; management of patients following heart and heart-lung transplantation

**Renal:** Causes of perioperative oliguria and anuria; prevention and management of acute renal failure; management post-renal transplantation

**Neurological:** stroke (CVA); causes of post-operative confusion.

**Gastrointestinal:** post-operative alterations in gut motility; perioperative nutrition; post operative nausea and vomiting; management of the post-liver transplant patient.

**Immunosuppression and rejection**

**Skills**

Review and monitor perioperative immunosuppressive therapy

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**6.5 Manages the care of the patient for surgery for trauma under supervision**

**Basic Knowledge**

Factors determining perioperative risk

Importance of preoperative health status on postoperative outcomes

Indications for, and interpretation of pre-operative investigations

Dangers of emergency anaesthesia and surgery

Perioperative implications of current drug therapy

Consent and assent in the competent and non-competent patient

Implications for postoperative care of common acute and chronic medical conditions (see 3.1 and 3.2)

Indications for and methods of perioperative anti-thrombotic treatment

Recognition, assessment and management of acute pain

Implications of type of anaesthesia (general/regional/local) for perioperative care

Implications of type / site of surgery for postoperative management and potential complications within the first 24 hours of surgery

**Sepsis and Infection:** fever and hypothermia; postoperative hypoperfusion and impaired oxygen delivery; wound infection; opportunistic and nosocomial infection; perioperative infection risk and prophylactic antibiotics; necrotising fasciitis; peritonitis; intestinal ischaemia; antibiotic selection and prescribing

**Skills**

Consider the impact of long-term and chronic treatment on acute surgical care
Identify pre-operative health status and intercurrent disease, medications, allergies and their interaction with the nature of anaesthetic and surgery

Obtain relevant information from the patient, relatives and other secondary sources

Assess conscious level and conduct a careful systems review

Select & determine adequacy and route of administration of analgesia

Document, monitor and manage fluid balance, circulating volume, drains, systemic oxygen supply

Identify life-threatening cardiorespiratory complications; manage hypovolaemia and impaired oxygen delivery

<table>
<thead>
<tr>
<th>Intermediate</th>
</tr>
</thead>
</table>

**Knowledge**

Criteria for admission to, and discharge from ICU - factors influencing intensity and site of care (ward, high dependency unit (HDU), intensive care unit (ICU))

Assessment and management of commonly encountered perioperative conditions & complications including:

**Respiratory:** Interpretation of symptoms and signs of respiratory insufficiency in the trauma patient; pneumonia, collapse or consolidation, pulmonary infiltrates including acute lung injury (ALI) and acute respiratory distress syndrome (ARDS) and their causative factors; pulmonary contusion; pulmonary oedema; pleural effusion, haemo/pneumothorax (management of simple and tension); use of chest drains.

**Cardiovascular:** Interpretation of symptoms and signs of cardiovascular insufficiency in the trauma patient including cardiac contusion and tamponade; management of

**Renal:** Causes of perioperative oliguria and anuria; rhabdomyelosis; prevention and management of acute renal failure

**Neurological:** causes of post-operative confusion, stroke (CVA), coma and raised intracranial pressure; determinants of cerebral perfusion and oxygenation; prevention of secondary brain injury; intracranial pressure monitoring; therapeutic correction of raised intracranial pressure; intracerebral haemorrhage, contusion and oedema

**Gastrointestinal:** Interpretation of abdominal pain and distension; intestinal ischaemia; abdominal hypertension; risk factors, monitoring and management of abdominal compartment syndrome; perioperative nutrition; post operative nausea and vomiting

**Haematology:** management of severe acute haemorrhage and blood transfusion; correction of coagulation disorders and haemoglobinopathies.

**Metabolic & Hormonal:** Blood glucose control; perioperative management of electrolyte disorders

**Musculo-skeletal:** principles and management of external fixators and casts; perioperative positioning; pressure area care; compartment syndromes; paralysed

**Skills**

Communicate the risk of surgery to patients and family

Interpret pre-operative investigations, intra-operative findings and events/complications, and respond to them appropriately

Describe the risk period for use of depolarizing neuromuscular blocking agents in patients undergoing repeated surgical procedures

Seek appropriate support and supervision in order to provide optimal patient care

Conduct a secondary survey following ATLS (or equivalent) principles

Establish a plan for postoperative management including plans for further surgery
Domain 7: Comfort and recovery

General Principles

The compassionate care of patients and families is a fundamental duty of any clinician, which is given particular emphasis by the special circumstances of critical illness. The process of rehabilitation starts in intensive care and is continued for many months – sometimes years – following discharge from hospital. This journey to recovery requires attention to both the physical and the psychological consequences of critical illness.

Features of competent performance may include:

- Awareness of impact of ICU environment on patient and relatives
- Effective communication and interpersonal skills - patients, family and staff
- Attention to patient comfort (physical and psychosocial)
- Awareness of relevant applied physiology and pharmacology
- Consider indications, contraindications and complications of intervention - alternative modes, methods and techniques
- Clearly defined therapeutic strategy / care plan for immediate and longer term care
- Evaluation and modification of therapy according to clinical response
- Safe use of equipment / device / drugs
- Effective team-working: promote collaboration, communication and continuity of care
- Appropriate referral / consultation
- Recognition of limitations (self and others)
- Attention to patient safety

Domain 7: Competencies

<table>
<thead>
<tr>
<th>Competence</th>
<th>Description</th>
<th>IBTICM level</th>
<th>Assessment methods</th>
<th>GMP</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.1</td>
<td>Identifies and attempts to minimise the physical and psychosocial consequences of critical illness for patients and families</td>
<td>Basic</td>
<td>M, C</td>
<td>1, 3</td>
</tr>
<tr>
<td>7.2</td>
<td>Manages the assessment, prevention and treatment of pain and delirium</td>
<td>Basic</td>
<td>D, I, C, M, T</td>
<td>1</td>
</tr>
<tr>
<td>7.3</td>
<td>Manages sedation and neuromuscular blockade</td>
<td>Basic</td>
<td>D, I, C, M, T</td>
<td>1</td>
</tr>
<tr>
<td>7.4</td>
<td>Communicates the continuing care requirements of patients at ICU discharge to health care professionals, patients and relatives</td>
<td>Basic</td>
<td>M, T</td>
<td>3</td>
</tr>
<tr>
<td>7.5</td>
<td>Manages the safe and timely discharge of patients from the ICU</td>
<td>Intermediate</td>
<td>M, T</td>
<td>1, 3</td>
</tr>
</tbody>
</table>

Domain 7: Syllabus

**Knowledge, skills and attitudes common to all competencies**

**Basic**

**Skills**

- Lead, delegate and supervise others appropriately according to experience and role
- Communicate effectively with relatives who may be, in denial, anxious, angry, confused, or litigious
### Attitudes

- **Desire to minimise patient distress**
- **Regards each patient as an individual**
- **Establishes trusting relationships with and demonstrates compassionate care of patients and their relatives**
- **Willingness to communicate with and support families / significant others**
- **Respects the religious beliefs of the patient and offers to liaise with a religious representative if this is the wish of the patient or family**
- **Acknowledges the consequences of the language used to impart information**
- **Fosters effective communication and relationships with medical and nursing staff in other wards / departments**
- **Recognises personal limitations, seeks and accepts assistance or supervision (knows how, when and who to ask)**
- **Recognises that intensive care is a continuum within the ‘patient journey’**

#### Intermediate

- **Attitudes**
- **Promotes appropriate and timely discharge from ICU**
- **Appreciates that physical and psychological consequences of critical illness can have a significant and long lasting effect for both patients and their relatives**

#### Advanced

- **Attitudes**
- **Early planning for rehabilitation**
- **Seeks to modify the stresses which the intensive care environment places upon patients, their relatives and members of staff**

### 7.1 Identifies and attempts to minimise the physical and psychosocial consequences of critical illness for patients and families

#### Basic

- **Knowledge**
  - Causes and methods of minimising distress in patients
  - The role of patient’s relatives and their contribution to care
  - Physiological effects of pain and anxiety
  - Stress responses
  - Recognition and methods of assessment of pain
  - Principles of acute pain management
  - Pharmacokinetics, pharmacodynamics, indications and complications of commonly used analgesic, hypnotic, and neuromuscular blocking drugs in patients with normal and abnormal organ system function
  - Causes and management of acute confusional states
  - Sensory deprivation / sensory overload
  - Environmental and drug-related psychopathology associated with critical illness (e.g. anxiety, sleep disorders, hallucinations, drug withdrawal)
  - Impact of staff-patient contact and environmental factors on patient stress
  - Methods of communicating with patients who are unable to speak
  - Relevance and methods to care for skin, mouth, eyes and bowels, and to maintain mobility and muscle strength in critically ill patients
  - Causes, prevention and management of critical illness polyneuropathy, motor neuropathy, and myopathy
  - Consequences of immobilisation and mobilisation techniques (including disuse atrophy, foot-drop, ectopic calcification)
  - Prevention and management of pressure sores
  - Resources available to patients and relatives for education and support (e.g. societies, local groups, publications, referral to allied health care professionals)
  - Common risk factors for post-ICU mortality or re-admission and their minimisation

- **Skills**
  - Identify complications associated with critical illness
  - Work with colleagues and relatives to minimise patient distress
  - Anticipate the development of pain and/or anxiety and adopt strategies for its prevention or minimisation
  - Use analgesic, hypnotic and neuromuscular blocking drugs appropriately and safely
  - Propose and implement a plan to provide adequate sleep and rest in ICU patients
  - Participate in the education of patients/families
  - Appropriate and timely referral to specialists / allied health professionals
### Intermediate Knowledge
- Common symptomatology following critical illness
- Sleep deprivation and its consequences
- Post-traumatic stress disorders
- Fluid and caloric requirements in the critically ill patient including electrolytes, vitamins, trace elements and principles of immunonutrition
- Methods to assess nutritional status and basal energy expenditure
- Principles of rehabilitation: physical and psychological
- Methods to minimise potential psychological trauma to the patient and their family of transfer from the ICU (especially with regard to long term ICU patients)
- The implications for relatives of adopting a role as a carer at home
- Impact of chronic illness post-ICU on socialisation and employment

### Skills
- Take decisions to admit, discharge or transfer patients
- Follow-up patients after discharge to the ward
- Participate in follow-up clinics / services where available

### 7.2 Manages the assessment, prevention and treatment of pain and delirium

#### Basic Knowledge
- Physiological effects of pain and anxiety
- Stress responses
- Causes and methods of minimising distress in patients
- Recognition and methods of assessment of pain
- Principles of acute pain management
- Pharmacokinetics, pharmacodynamics, indications and complications of commonly used analgesic, hypnotic, and neuromuscular blocking drugs in patients with normal and abnormal organ system function
- Indications, contra-indications, methods and complications of regional analgesia in critical illness
- Patient-controlled analgesia
- Environmental and drug-related psychopathology associated with critical illness (e.g. anxiety, sleep disorders, hallucinations, drug withdrawal)
- Causes and management of acute confusional states
- Relevance and methods to care for skin, mouth, eyes and bowels, and to maintain mobility and muscle strength in critically ill patients

#### Skills
- Anticipate the development of pain and/or anxiety and adopt strategies for its prevention or minimisation
- Interpret data from scoring or scaling systems to assess pain and sedation
- Select and determine adequacy and route of administration of analgesia
- Use analgesic, hypnotic and neuromuscular blocking drugs appropriately and safely
- Minimise complications associated with opioid and non-opioid analgesics
- Propose and implement a plan to provide adequate sleep and rest in ICU patients
- Work with colleagues and relatives to minimise patient distress

#### Intermediate Knowledge
- Sleep deprivation and its consequences
- Potential long term consequences of acute delirium

### 7.3 Manages sedation and neuromuscular blockade

#### Basic Knowledge
- Physiological effects of pain and anxiety
- Causes and methods of minimising distress in patients
- Stress responses
- Causes and management of acute confusional states
- Recognition and assessment of anxiety
Environmental and drug-related psychopathology associated with critical illness (e.g. anxiety, sleep disorders, hallucinations, drug withdrawal)

Sensory deprivation / sensory overload

Pharmacokinetics, pharmacodynamics, indications and complications of commonly used analgesic, hypnotic, and neuromuscular blocking drugs in patients with normal and abnormal organ system function

Methods of measuring depth of sedation; effects of over-sedation and strategies to avoid this; sedation holds

Consequences of immobilisation and mobilisation techniques (including disuse atrophy, foot-drop, ectopic calcification)

Causes, prevention and management of critical illness polyneuropathy, motor neuropathy, and myopathy

Prevention and management of pressure sores

**Skills**

Anticipate the development of pain and/or anxiety and adopt strategies for its prevention or minimisation

Use analgesic, hypnotic and neuromuscular blocking drugs appropriately and safely

Interpret data from scoring or scaling systems to assess pain and sedation

Obtain and interpret data from a nerve stimulator to monitor the degree of neuromuscular blockade

Identify complications associated with critical illness

Propose and implement a plan to provide adequate sleep and rest in ICU patients

Work with colleagues and relatives to minimise patient distress

**Intermediate**

**Knowledge**

Sleep deprivation and its consequences

Post-traumatic stress disorders

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**7.4 Communicates the continuing care requirements of patients at ICU discharge to health care professionals, patients and relatives**

**Basic**

**Knowledge**

Common risk factors for post-ICU mortality or re-admission and their minimisation

Environmental and drug-related psychopathology associated with critical illness (e.g. anxiety, sleep disorders, hallucinations, drug withdrawal)

Consequences of immobilisation and mobilisation techniques (including disuse atrophy, foot-drop, ectopic calcification)

Causes, prevention and management of critical illness polyneuropathy, motor neuropathy, and myopathy

Methods of communicating with patients who are unable to speak

Causes and methods of minimising distress in patients

Resources available to patients and relatives for education and support (e.g. societies, local groups, publications, referral to allied health care professionals)

Management of tracheostomy care and avoidance of complications outside the ICU

Persistent vegetative state; locked in syndromes

**Skills**

Anticipate the development of pain and/or anxiety and adopt strategies for its prevention or minimisation

Work with colleagues and relatives to minimise patient distress

Appropriate and timely referral to specialists/ allied health professionals

Ensure effective information exchange before patient discharge from ICU

Liaise with medical and nursing staff in other departments to ensure optimal communication and continuing care after ICU discharge

Participate in the education of patients/families

**Intermediate**

**Knowledge**

Criteria for admission to, and discharge from ICU - factors influencing intensity and site of care (ward, high dependency unit (HDU), intensive care unit (ICU))

Common symptomatology following critical illness

Post-traumatic stress disorders

Fluid and caloric requirements in the critically ill patient including electrolytes, vitamins, trace elements and principles of immunonutrition

Methods to assess nutritional status and basal energy expenditure

Principles of rehabilitation: physical and psychological

Supportive services integral to the long term rehabilitation of critically ill patients (physiotherapy, occupational therapy, orthotics, social services).
The implications for relatives of adopting a role as a carer at home  
Impact of chronic illness post-ICU on socialisation and employment  
Methods for assessing or measuring quality of life  
Methods to minimise potential psychological trauma to the patient and their family of transfer from the ICU (especially with regard to long term ICU patients)  
Long-term ventilation outside the ICU environment (e.g. home ventilation)

| Skills | Follow-up patients after discharge to the ward |

### 7.5 Manages the safe and timely discharge of patients from the ICU

#### Basic

**Knowledge**
- The role of patient’s relatives and their contribution to care
- Common risk factors for post-ICU mortality or re-admission and their minimisation
- Management of tracheostomy: care and avoidance of complications outside the ICU

**Skills**
- Anticipate the development of pain and/or anxiety and adopt strategies for its prevention or minimisation
- Work with colleagues and relatives to minimise patient distress
- Appropriate and timely referral to specialists / allied health professionals
- Ensure effective information exchange before patient discharge from ICU
- Liaise with medical and nursing staff in other departments to ensure optimal communication and continuing care after ICU discharge

#### Intermediate

**Knowledge**
- Common symptomatology following critical illness
- Criteria for admission to, and discharge from ICU – factors influencing intensity and site of care (ward, high dependency unit (HDU), intensive care unit (ICU))
- Methods to minimise potential psychological trauma to the patient and their family of transfer from the ICU (especially with regard to long term ICU patients)
- Long-term ventilation outside the ICU environment (e.g. home ventilation)

**Skills**
- Identify discharge criteria for individual patients
- Take decisions to admit, discharge or transfer patients
- Follow-up patients after discharge to the ward
- Change a tracheostomy tube electively
- Identify discharge criteria for individual patients

#### Advanced

**Knowledge**
- Potential psychological impact of inter-hospital transfer and family dislocation
Domain 8: End of life care

General Principles

Death is inevitably a managed, not a ‘natural’ process in intensive care. The manner in which it is conducted may affect the survivors – family and staff – for the rest of their lives. Treatment limitation or withdrawal does not mean denial of care; patients should not suffer, and, where possible, their wishes should be ascertained and respected.

Features of competent performance may include:

- Assessment of severity of illness and prognosis
- Awareness of relevant ethical / legal / religious / cultural issues
- Effective communication and interpersonal skills - patient / family / staff
- Effective team-working: promote collaboration, communication and continuity
- Effective, clear collaborative decision making resulting in an agreed plan of management
- Attempt to minimize distress - patient / family / staff
- Appropriate referral / consultation - in particular the importance of palliative care specialists
- Recognition of limitations (self and others)
- Attention to patient safety

Domain 8: Competencies

<table>
<thead>
<tr>
<th>Competence</th>
<th>Description</th>
<th>IBTICM level</th>
<th>Assessment methods</th>
<th>GMP</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.1</td>
<td>Manages the process of withholding or withdrawing treatment with the multidisciplinary team</td>
<td>Intermediate</td>
<td>C, M</td>
<td>1, 3, 4</td>
</tr>
<tr>
<td>8.2</td>
<td>Discusses end of life care with patients and their families / surrogates</td>
<td>Basic</td>
<td>C, M, D</td>
<td>3, 4</td>
</tr>
<tr>
<td>8.3</td>
<td>Manages palliative care of the critically ill patient</td>
<td>Intermediate</td>
<td>C, M, T</td>
<td>1, 3, 4</td>
</tr>
<tr>
<td>8.4</td>
<td>Performs brain-stem death testing</td>
<td>Intermediate</td>
<td>D</td>
<td>1</td>
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<tr>
<td>8.5</td>
<td>Manages the physiological support of the organ donor</td>
<td>Intermediate</td>
<td>I, C</td>
<td>1</td>
</tr>
<tr>
<td>8.6</td>
<td>Manages non heart beating organ donation</td>
<td>Advanced</td>
<td>C, T</td>
<td>1, 3, 4</td>
</tr>
</tbody>
</table>

Domain 8: Syllabus

Knowledge, skills and attitudes common to all competencies

Knowledge

Bereavement: anticipating and responding to grief
Define the standards of practice defined by the GMC when deciding to withhold or withdraw life-prolonging treatment
Know the role and legal standing of advance directives
Outline the principles of the Mental Capacity Act

Skills

Communicate effectively with relatives who may be, in denial, anxious, angry, confused, or litigious

Attitudes

Appreciates that the decision to withhold or withdraw treatment does not imply the termination of care
Desire to support patient, family, and other staff members appropriately during treatment withdrawal
Establishes trusting relationships with and demonstrates compassionate care of patients and their relatives
Offers psychological, social and spiritual support to patients, their relatives or colleagues as required
Respects the ideas and beliefs of the patient and their family and their impact on decision making (does not impose own
views)

Respects the religious beliefs of the patient and is willing to liaise with a religious representative if requested by patient or family
Willingness to communicate with and support families / significant others
Acknowledges the consequences of the language used to impart information
Integrity, honesty and respect for the truth underpin relationships with patients, relatives and colleagues
Values clear decision-making and communication
Recognises personal limitations, seeks and accepts assistance or supervision (knows how, when and who to ask)

<table>
<thead>
<tr>
<th>8.1</th>
<th>Manages the process of withholding or withdrawing treatment with the multidisciplinary team</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Basic</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Knowledge</strong></td>
<td></td>
</tr>
<tr>
<td>Principles of delivering bad news to patients and families</td>
<td></td>
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<tr>
<td>Principles of pain and symptom management</td>
<td></td>
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<tr>
<td>The value of autopsy (post-mortem) examination.</td>
<td></td>
</tr>
<tr>
<td>Procedure for pronouncing life extinct and subsequently completion of death certification</td>
<td></td>
</tr>
<tr>
<td><strong>Skills</strong></td>
<td></td>
</tr>
<tr>
<td>Participate in timely discussion and regular review of ‘do not attempt resuscitation’ orders and treatment limitation decisions</td>
<td></td>
</tr>
<tr>
<td><strong>Intermediate</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Knowledge</strong></td>
<td></td>
</tr>
<tr>
<td>Basic ethical principles: autonomy, beneficence, non-maleficence, justice</td>
<td></td>
</tr>
<tr>
<td>Ethical and legal issues in decision-making for the incompetent patient: incapacity</td>
<td></td>
</tr>
<tr>
<td>Difference between euthanasia and allowing death to occur: doctrine of double effect</td>
<td></td>
</tr>
<tr>
<td>With-holding and withdrawing treatment: omission and commission</td>
<td></td>
</tr>
<tr>
<td>Decision-making processes for withholding and withdrawing life sustaining therapies including documentation and iterative review</td>
<td></td>
</tr>
<tr>
<td>Local resources available to support dying patients and their families, and how to access them</td>
<td></td>
</tr>
<tr>
<td>Cultural and religious practices of relevance when caring for dying patients and their families</td>
<td></td>
</tr>
<tr>
<td>Procedure for withdrawing treatment and support</td>
<td></td>
</tr>
<tr>
<td>Responsibilities in relation to legal authorities for certifying death (e.g. coroner, procurator fiscal or equivalent), and reasons for referral</td>
<td></td>
</tr>
<tr>
<td><strong>Skills</strong></td>
<td></td>
</tr>
<tr>
<td>Discuss end of life decisions with members of the health care team</td>
<td></td>
</tr>
<tr>
<td>Willing and able to communicate and discuss issues pertaining to end of life with patients and relatives</td>
<td></td>
</tr>
<tr>
<td>Relieve distress in the dying patient</td>
<td></td>
</tr>
<tr>
<td>Aware of the emotional needs of self and others; seeks and offers support appropriately</td>
<td></td>
</tr>
<tr>
<td><strong>Advanced</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Knowledge</strong></td>
<td></td>
</tr>
<tr>
<td>The limitations of intensive care medicine – expectations of what can and cannot be achieved</td>
<td></td>
</tr>
<tr>
<td><strong>Skills</strong></td>
<td></td>
</tr>
<tr>
<td>Recognise when treatment is unnecessary or futile</td>
<td></td>
</tr>
<tr>
<td>Discuss treatment options with a patient or relatives before ICU admission</td>
<td></td>
</tr>
<tr>
<td>Withdraw life sustaining treatment or organ support</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>8.2</th>
<th>Discusses end of life care with patients and their families / surrogates</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Basic</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Knowledge</strong></td>
<td></td>
</tr>
<tr>
<td>Principles of delivering bad news to patients and families</td>
<td></td>
</tr>
<tr>
<td>Principles of pain and symptom management</td>
<td></td>
</tr>
<tr>
<td>The value of autopsy (post-mortem) examination.</td>
<td></td>
</tr>
<tr>
<td>Procedure for completion of death certification</td>
<td></td>
</tr>
<tr>
<td><strong>Skills</strong></td>
<td></td>
</tr>
<tr>
<td>Participate in timely discussion and regular review of ‘do not attempt resuscitation’ orders and treatment limitation decisions</td>
<td></td>
</tr>
</tbody>
</table>
### Intermediate

#### Knowledge
- Basic ethical principles: autonomy, beneficence, non-maleficence, justice
- Ethical and legal issues in decision-making for the incompetent patient: incapacity
- Difference between euthanasia and allowing death to occur: doctrine of double effect
- With-holding and withdrawing treatment: omission and commission
- Decision-making processes for withholding and withdrawing life sustaining therapies including documentation and iterative review
- Local resources available to support dying patients and their families, and how to access them
- Cultural and religious practices of relevance when caring for dying patients and their families
- Causes and prognosis of vegetative states
- Causes of brain stem death
- Cultural and religious factors which may influence attitude to brain stem death and organ donation
- Responsibilities in relation to legal authorities for certifying death (e.g. coroner, Procurator Fiscal or equivalent), and reasons for referral

#### Skills
- Willing and able to communicate and discuss issues pertaining to end of life with patients and relatives
- Differentiate competent from incompetent statements by patients
- Participate in discussions with relatives about treatment limitation or withdrawal
- Explain the concept and practicalities of brain stem death and organ donation clearly

### Advanced

#### Knowledge
- The limitations of intensive care medicine - expectations of what can and cannot be achieved

#### Skills
- Recognise when treatment is unnecessary or futile
- Discuss treatment options with a patient or relatives before ICU admission
- Lead a discussion about end of life goals, preferences and decisions with a patient and/or their relatives
- Obtain consent/assent for treatment, research, autopsy or organ donation

### 8.3 Manages palliative care of the critically ill patient

#### Basic

##### Knowledge
- Principles of delivering bad news to patients and families
- Principles of pain and symptom management

##### Skills
- Participate in timely discussion and regular review of ‘do not attempt resuscitation’ orders and treatment limitation decisions

#### Intermediate

##### Knowledge
- Basic ethical principles: autonomy, beneficence, non-maleficence, justice
- Ethical and legal issues in decision-making for the incompetent patient: incapacity
- Difference between euthanasia and allowing death to occur: doctrine of double effect
- Local resources available to support dying patients and their families, and how to access them
- Cultural and religious practices of relevance when caring for dying patients and their families

##### Skills
- Willing and able to communicate and discuss issues pertaining to end of life with patients and relatives
- Differentiate competent from incompetent statements by patients
- Participate in discussions with relatives about treatment limitation or withdrawal
- Relieve distress in the dying patient
- Aware of the emotional needs of self and others; seeks and offers support appropriately

#### Advanced

##### Skills
- Recognise when treatment is unnecessary or futile
- Discuss treatment options with a patient or relatives before ICU admission
- Lead a discussion about end of life goals, preferences and decisions with a patient and/or their relatives
### 8.4 Performs brain-stem death testing

**Intermediate**

**Knowledge**
- Basic ethical principles: autonomy, beneficence, non-maleficence, justice
- Causes of brain stem death
- Legal aspects of brain stem death diagnosis
- Applied anatomy and physiology of the brain and nervous system including cerebral blood supply, base of skull, autonomic nervous system and cranial nerves
- Physiological changes associated with brain stem death
- Preconditions and exclusions for the diagnosis of brain stem death
- Clinical, imaging and electrophysiologic tests to diagnose brain death: applicability
- Cultural and religious factors which may influence attitude to brain stem death and organ donation
- Responsibilities in relation to legal authorities for certifying death (e.g. coroner, procurator fiscal or equivalent), and reasons for referral

**Skills**
- Consult and confirm findings of brain stem function tests with colleagues as required by local / national policy or as indicated
- Document pre-conditions and exclusions to brain stem death testing

**Advanced**

**Skills**
- Perform and document tests of brain stem function

### 8.5 Manages the physiological support of the organ donor

**Basic**

**Knowledge**
- Role of national organ/tissue procurement authority and procedures for referral

**Skills**
- Monitor vital physiological functions as indicated
- Recognise and rapidly respond to adverse trends in monitored parameters

**Intermediate**

**Knowledge**
- Basic ethical principles: autonomy, beneficence, non-maleficence, justice
- Causes of brain stem death
- Physiological changes associated with brain stem death
- Principles of management of the organ donor (according to national / local policy)
- Common investigations and procedures undertaken in the ICU prior to organ donation
- Responsibilities and activities of transplant co-ordinators

**Skills**
- Explain the concept and practicalities of brain stem death and organ donation clearly
- Aware of the emotional needs of self and others; seeks and offers support appropriately

**Advanced**

**Skills**
- Obtain consent/assent for treatment, research, autopsy or organ donation
- Liaise with transplant co-ordinators (local organ donation authority) to plan management of the organ donor

### 8.6 Manages non heart beating organ donation

**Advanced**

**Knowledge**
- Legal and ethical framework for decision making
- Role of national organ/tissue procurement authority and procedures for referral
- Transplant team members and their roles
- Common investigations and procedures undertaken in the ICU prior to organ donation
- Responsibilities and activities of transplant co-ordinators
Domain 9: Paediatric care

General Principles

These competencies are those expected of a practitioner of adult intensive care medicine, not a paediatric intensivist or neonatologist. Adult intensivists may be called upon to provide immediate care for the acutely ill child while awaiting transfer to a paediatric centre.

Features of competent performance may include:

- Recognition of presenting signs and symptoms
- Identification and rapid response to life-threatening complications
- Awareness of patho-physiological differences between adult and child
- Prioritise investigations and monitoring – appropriate; timely
- Appropriate differential diagnosis
- Clear decision making and immediate management strategies (including application of relevant protocols / guidelines)
- Effective multidisciplinary team-working and leadership - clear communication and instructions
- Timely and appropriate referral / consultation
- Recognition of limitations (self and others) – maintain patient safety

Domain 9: Competencies

<table>
<thead>
<tr>
<th>Competence</th>
<th>Description</th>
<th>IBTICM level</th>
<th>Assessment methods</th>
<th>GMP</th>
</tr>
</thead>
<tbody>
<tr>
<td>9.1</td>
<td>Describes the recognition of the acutely ill child and initial management of paediatric emergencies</td>
<td>Intermediate</td>
<td>I, C</td>
<td>1</td>
</tr>
<tr>
<td>9.2</td>
<td>Describes national legislation and guidelines relating to child protection and their relevance to critical care</td>
<td>Intermediate</td>
<td>C</td>
<td>1</td>
</tr>
</tbody>
</table>

Domain 9: Syllabus

Knowledge, skills and attitudes common to all competencies

Knowledge

Impact of occupational and environmental exposures, socio-economic factors, and life style factors on critical illness

Attitudes

Recognises personal limitations, seeks and accepts assistance or supervision (knows how, when and who to ask)

9.1 Describes the recognition of the acutely ill child and initial management of paediatric emergencies

<table>
<thead>
<tr>
<th>Basic</th>
<th>Knowledge</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Intraosseous cannulation</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Intermediate</th>
<th>Knowledge</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Major anatomical and physiological differences between adults and children</td>
</tr>
<tr>
<td></td>
<td>Key stages of physical and psychological development</td>
</tr>
<tr>
<td></td>
<td>Paediatric management of conditions common to both children and adults (e.g. acute severe asthma, renal failure, trauma)</td>
</tr>
<tr>
<td></td>
<td>Paediatric resuscitation and the differences between adult and paediatric resuscitation</td>
</tr>
<tr>
<td></td>
<td>Principles of paediatric airway management: methods and techniques; calculation of tube sizes; selection of masks and airways</td>
</tr>
</tbody>
</table>
### Principles of mechanical ventilation in a child
- Preparation for and methods of securing venous access
- Estimation of blood volume, replacement of fluid loss
- Paediatric dosing of common emergency drugs
- General principles for stabilising the critically ill or injured child until senior or more experienced help arrives
- Operation of local paediatric referral/retrieval services
- Principles of communication (verbal and non-verbal) with children of different ages; awareness of the consequences of the language used to impart information
- Issues of consent in children

### Skills
- Paediatric resuscitation at advanced life support level (APLS, PALS or equivalent)
- Prepare equipment and drugs for paediatric intubation
- Demonstrate paediatric tracheal intubation
- Secure venous access (including local anaesthesia pre-medication)
- Communicate effectively with, and attempt to reassure the child and parents
- Recognise and manage paediatric emergencies until senior or more experienced help arrives

### Advanced Knowledge
- Pathophysiology and principles of management of disorders which are life-threatening to paediatric patients (determined by national case mix, but may include: acute respiratory failure, cardiac failure, trauma, severe infections including meningitis and epiglottitis, intoxications, metabolic disorders, seizures, croup, diarrhoea)

### Skills
- Manage mechanical ventilation in a critically ill child
- Manage and stabilise the injured child until senior or more experienced help arrives

---

### 9.2 Describes the national legislation and guidelines relating to child protection and their relevance to critical care

#### Intermediate Knowledge
- Key stages of physical and psychological development
- Principles of communication (verbal and non-verbal) with children of different ages; awareness of the consequences of the language used to impart information
- Legal and ethical aspects of caring for children
- Issues of consent in children
- National child protection guidelines
- Operation of local paediatric referral/retrieval services
Domain 10: Transport

General Principles

Critically ill patients may require intra- or inter-hospital transfer for clinical reasons. The principles are the same for both circumstances. Competence in aero-medical transfers is not a specific requirement though they may be used for competence acquisition and assessment if local circumstances permit.

Features of competent performance may include:

- Considering alternative strategies to transfer
- Considering alternative modes and methods of transport
- Effective preparation: planning and communication tasks
- Attention to safety: anticipation and minimisation of risks; prevention of adverse events; safe use of equipment
- Maintaining effective monitoring during transportation
- Identification, prevention, and management of complications
- Continuation of care plans
- Effective hand-over and documentation
- Recognition of limitations (self and others)

Domain 10: Competencies

<table>
<thead>
<tr>
<th>Competence</th>
<th>Description</th>
<th>IBTICM level</th>
<th>Assessment methods</th>
<th>GMP</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.1</td>
<td>Undertakes transport of the mechanically ventilated critically ill patient outside the ICU</td>
<td>Intermediate</td>
<td>D, I, C, M</td>
<td>1, 3</td>
</tr>
</tbody>
</table>

Domain 10: Syllabus

Knowledge, skills and attitudes common to all competencies

Skills

Lead, delegate and supervise others appropriately according to experience and role

Attitudes

Anticipates and prevents problems during transfer

Appreciates the importance of communication between referring, transporting and receiving staff

Desire to minimise patient distress

Recognises personal limitations, seeks and accepts assistance or supervision (knows how, when and who to ask)

10.1 Undertakes the transport of the mechanically ventilated critically ill patient outside the ICU

Intermediate

Knowledge

Indications, risks and benefits of patient transfer (intra / inter hospital)

Criteria for admission to, and discharge from ICU - factors influencing intensity and site of care (ward, high dependency unit (HDU), intensive care unit (ICU))

Principles of safe patient transfer (before, during and after)

Strategies to manage the unique problems associated with patient transfer - limitations of space, personnel, monitoring and equipment

Ethical issues surrounding transfer

Strategies to avoid transfer-use of other facilities
### Determination of required number of physicians / nurses / others during transfer and the role of paramedical personnel

<table>
<thead>
<tr>
<th>Selection and operation of transport equipment: size, weight, portability, power supply/battery life, oxygen availability, durability and performance under conditions of transport</th>
</tr>
</thead>
<tbody>
<tr>
<td>Principles of monitoring under transport conditions</td>
</tr>
<tr>
<td>Homeostatic interaction between patient and environment (e.g. thermoregulation, posture / positioning)</td>
</tr>
<tr>
<td>Communication prior to and during transport</td>
</tr>
<tr>
<td>Operation of locally available retrieval services</td>
</tr>
</tbody>
</table>

### Skills

- **Take decisions to admit, discharge or transfer patients**
- **Communicate with referring and receiving institutions and teams**
- **Check transfer equipment and plan transfers with personnel prior to departure**
- **Select appropriate staff based upon patient need**
- **Prepare patients prior to transfer; anticipate and prevent complications during transfer - maintain patient safety at all times**
- **Adapt and apply general retrieval principles where appropriate to pre-, intra-, and inter-hospital transportation.**
- **Consider the need for and implements pre-transfer stabilisation before transfer**
- **Undertake intra-hospital transfer of ventilated patients to theatre or for diagnostic procedures (e.g. CT)**
- **Undertake inter-hospital transfers of patients with single or multiple organ failure**
- **Maintain comprehensive documentation of the patient’s clinical condition before, during and after transport including relevant medical conditions, therapy delivered, environmental factors and logistical difficulties encountered**

### Advanced

#### Knowledge

- Advantages and disadvantages of road ambulance, fixed and rotary wing aircraft including problems associated with altitude, noise, lighting conditions, vibration, acceleration and deceleration
- Selection of mode of transport based upon clinical requirements, distance, vehicle availability and environmental conditions
- Physiology associated with air transport
- Potential psychological impact of inter-hospital transfer and family dislocation

#### Skills

- Determine when the patient’s needs exceed local resources or specialist expertise (requirement for transfer)
Domain 11: Patient safety and health systems management

General Principles

Error in healthcare often creates two victims – the patient, and the clinician who is usually the terminal component in an unsafe healthcare system. Creating safer systems may require changes in structures and resources, but always involves improvements in processes and organisation of care.

Features of competent performance may include:

- Professional approach - professional relationships and self governance
- Attention to sound decision making processes
- Attention to safety: identification and minimisation of risks; prevention / reporting of adverse events; safe use of equipment
- Attention to monitoring
- Appropriate prescribing and application of therapeutics
- Attention to communication and documentation tasks
- Development of collaborative care plans
- Effective multidisciplinary team-working and leadership – clear communication and promote continuity
- Timely and appropriate referral / consultation
- Recognition of limitations (self and others)

Domain 11: Competencies

<table>
<thead>
<tr>
<th>Competence</th>
<th>Description</th>
<th>IBTICM level</th>
<th>Assessment methods</th>
<th>GMP</th>
</tr>
</thead>
<tbody>
<tr>
<td>11.1</td>
<td>Leads a daily multidisciplinary ward round</td>
<td>Intermediate</td>
<td>M</td>
<td>1, 2, 3, 4</td>
</tr>
<tr>
<td>11.2</td>
<td>Complies with local infection control measures</td>
<td>Generic</td>
<td>C, M</td>
<td>2</td>
</tr>
<tr>
<td>11.3</td>
<td>Identifies environmental hazards and promotes safety for patients and staff</td>
<td>Generic</td>
<td>C, M</td>
<td>2</td>
</tr>
<tr>
<td>11.4</td>
<td>Identifies and minimises risk of critical incidents and adverse events, including complications of critical illness</td>
<td>Basic</td>
<td>C, M</td>
<td>2</td>
</tr>
<tr>
<td>11.5</td>
<td>Organises a case conference</td>
<td>Intermediate</td>
<td>C, M</td>
<td>3</td>
</tr>
<tr>
<td>11.6</td>
<td>Critically appraises and applies guidelines, protocols and care bundles</td>
<td>Basic</td>
<td>C</td>
<td>1</td>
</tr>
<tr>
<td>11.7</td>
<td>Describes commonly used scoring systems for assessment of severity of illness, case mix and workload</td>
<td>Basic</td>
<td>C</td>
<td>1</td>
</tr>
<tr>
<td>11.8</td>
<td>Demonstrates an understanding of the managerial and administrative responsibilities of the ICM specialist</td>
<td>Advanced</td>
<td>C, M</td>
<td>1, 3</td>
</tr>
</tbody>
</table>

Domain 11: Syllabus

Knowledge, skills and attitudes common to all competencies

Basic

Knowledge

Purpose and process of quality improvement activities such as evidence based practice, best practice guidelines and benchmarking and change management

Understand:

- the factors involved in clinical decision making such as knowledge, experience, biases, emotions, uncertainty, context
- the critical relationship between CDM and patient safety
- the ways in which we process decision making: dual process theory: system 1 and system 2
- the place of algorithms, guidelines, protocols in supporting decision making and potential pitfalls in their use
- the pivotal decisions in diagnosis, differential diagnosis, handing over and receiving diagnoses and the need to review evidence for diagnosis at these times

Confidentiality and data protection - legal and ethical issues
Principles of risk prevention
Critical incident or error monitoring and reporting
Professional responsibility and duty of care to patients placed at risk by the actions of fellow clinicians
Methods of effective communication of information (written; verbal etc)
Electronic methods of accessing medical literature and learning modalities
Principles of aseptic technique and aseptic handling of invasive medical devices
Methods of sterilisation and cleaning or disposal of equipment
Universal precautions and preventative infection control techniques (hand washing, gloves, protective clothing, sharps disposal etc.)
Understand the role of Notification of diseases within the UK and identify the principle notifiable diseases for UK and international purposes
Define local and national 'significant event reporting systems' relevant to specialty
Keep abreast of national patient safety initiatives including NPSA, NCEPOD reports, NICE guidelines etc

Skills
Professional and reassuring approach - generates confidence and trust in patients and their relatives
Acquire, interpret, synthesize, record, and communicate (written and verbal) clinical information
Consults and takes into account the views of referring clinicians; promotes their participation in decision making where appropriate
Inform colleagues, patients and relatives as applicable, of medical errors or adverse events in an honest and appropriate manner
Manage inter-personal conflicts which arise between different sectors of the organisation, professionals, patients or relatives
Maximise safety in everyday practice
Document adverse incidents in a timely, detailed and appropriate manner
Collaborate with other team members to achieve common goals
Use electronic retrieval tools (e.g. PubMed) to access information from the medical and scientific literature
Demonstrate an interest in quality control, audit and reflective practice
Lead, delegate and supervise others appropriately according to experience and role
Demonstrate routine application of infection control practices to all patients, particularly hand washing between patient contacts
Use protective clothing (gloves / mask / gown / drapes) as indicated

Attitudes
Desire to minimise patient distress
Consults, communicates and collaborates effectively with patients, relatives and the health care team
Ensures effective information transfer
Adopts a problem solving approach
Enquiring mind, undertakes critical analysis of published literature
Recognises impaired performance (limitations) in self and colleagues and takes appropriate action
Recognises personal limitations, seeks and accepts assistance or supervision (knows how, when and who to ask)
Accepts responsibility for patient care and staff supervision

Intermediate
Knowledge
- Principles of crisis management, conflict resolution, negotiation and debriefing

Attitudes
- Establishes collaborative relations with other health care providers to promote continuity of patient care as appropriate

Advanced
Attitudes
- Seeks to modify the stresses which the intensive care environment places upon patients, their relatives and members of staff
### 11.1 Leads a daily multidisciplinary ward round

<table>
<thead>
<tr>
<th><strong>Basic</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Knowledge</strong></td>
<td>Roles of different members of the multidisciplinary team and local referral practices</td>
</tr>
<tr>
<td><strong>Skills</strong></td>
<td>Demonstrate initiative in problem solving</td>
</tr>
<tr>
<td></td>
<td>Confirm accuracy of clinical information provided by members of the health care team with particular emphasis on that information which is handed over at admission and at shift changes</td>
</tr>
<tr>
<td></td>
<td>Summarise a case history</td>
</tr>
<tr>
<td></td>
<td>Establish a management plan based on clinical and laboratory information</td>
</tr>
<tr>
<td></td>
<td>Consider potential interactions when prescribing drugs and therapies</td>
</tr>
<tr>
<td></td>
<td>Listen effectively</td>
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</table>

<table>
<thead>
<tr>
<th><strong>Intermediate</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Knowledge</strong></td>
<td>Triage and management of competing priorities</td>
</tr>
<tr>
<td></td>
<td>Principles of crisis management, conflict resolution, negotiation and debriefing</td>
</tr>
<tr>
<td><strong>Skills</strong></td>
<td>Assemble clinical and laboratory data, logically compare all potential solutions to the patient’s problems, prioritise them and establish a clinical management plan</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Advanced</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Skills</strong></td>
<td>Consider risk-benefit and cost-benefit of alternative drugs and therapies</td>
</tr>
<tr>
<td></td>
<td>Organise multidisciplinary care for groups of patients in the ICU</td>
</tr>
</tbody>
</table>

### 11.2 Complies with local infection control measures

<table>
<thead>
<tr>
<th><strong>Basic</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Knowledge</strong></td>
<td>Types of organisms – emergence of resistant strains, mode of transfer, opportunistic and nosocomial infections; difference between contamination, colonisation and infection</td>
</tr>
<tr>
<td></td>
<td>Risk of colonisation with potentially pathogenic micro-organisms and the factors associated with patient, staff, equipment and environmental colonisation</td>
</tr>
<tr>
<td></td>
<td>Autogenous infection: routes and methods of prevention</td>
</tr>
<tr>
<td></td>
<td>Cross infection: modes of transfer and common agents</td>
</tr>
<tr>
<td></td>
<td>Infections from contaminated blood / body fluids; strategy if contaminated (e.g. needle stick injury)</td>
</tr>
<tr>
<td></td>
<td>Local policies and procedures relevant to practice</td>
</tr>
<tr>
<td><strong>Skills</strong></td>
<td>Accept personal responsibility for the prevention of cross infection and self infection</td>
</tr>
<tr>
<td></td>
<td>Apply methods to prevent autogenous infection (e.g. posture, mouth hygiene)</td>
</tr>
<tr>
<td></td>
<td>Implement prophylactic regimens appropriately</td>
</tr>
<tr>
<td></td>
<td>Prescribe antibiotics safely and appropriately</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Intermediate</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Knowledge</strong></td>
<td>Recognition of patient groups at high risk of developing infectious complications</td>
</tr>
<tr>
<td></td>
<td>Epidemiology and prevention of infection in the ICU</td>
</tr>
<tr>
<td></td>
<td>Ventilator associated pneumonia: definition, pathogenesis and prevention</td>
</tr>
<tr>
<td></td>
<td>Local patterns of bacterial resistance and antibiotic policy</td>
</tr>
<tr>
<td></td>
<td>Requirements for microbiological surveillance and clinical sampling</td>
</tr>
<tr>
<td></td>
<td>Benefits and risks of different prophylactic antibiotic regimens</td>
</tr>
<tr>
<td></td>
<td>Published standards of care at local, national and international level (including consensus statements and care bundles). Has a critical approach to bundles and their component parts.</td>
</tr>
</tbody>
</table>
# 11.3 Identifies environmental hazards and promotes safety for patients and staff

**Basic**

**Knowledge**
- Staff safety: susceptibility to harmful physical, chemical and infectious hazards in the ICU
- Hazards associated with ionising radiation and methods to limit these in the ICU
- Local policies and procedures relevant to practice
- Risk of colonisation with potentially pathogenic micro-organisms and the factors associated with patient, staff, equipment and environmental colonisation
- Types of organisms – emergence of resistant strains, mode of transfer, opportunistic and nosocomial infections; difference between contamination, colonisation and infection
- Cross infection: modes of transfer and common agents
- Infections from contaminated blood / body fluids; strategy if contaminated (e.g. needle stick injury)

**Intermediate**

**Knowledge**
- Published standards of care at local, national and international level (including consensus statements and care bundles)
- Epidemiology and prevention of infection in the ICU
- Requirements for microbiological surveillance and clinical sampling
- Benefits and risks of different prophylactic antibiotic regimens

**Advanced**

**Knowledge**
- Physical requirements of ICU design
- Equipment requirements and selection: clinical need and priority; accuracy, reliability, safety and practical issues (ease of use, acceptance by staff)
- Identification and critical appraisal of literature; integration of findings into local clinical practice

**Skills**
- Seek expert help to ensure all equipment in the ICU conforms with and is maintained to the relevant safety standard

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**Basic Science**

**Knowledge**
- Environmental control of temperature, humidity, air changes and scavenging systems for waste gases and vapours
- Measurement of gas and vapour concentrations, (oxygen, carbon dioxide, nitrous oxide, and volatile anaesthetic agents)
  - environmental safety
- **Electrical safety:** conditions which predispose to the occurrence of macro-shock / micro-shock; physical dangers of electrical currents; relevant standards regarding safe use of electricity in patient care; basic methods to reduce electrical hazards.

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# 11.4 Identifies and minimises risk of critical incidents and adverse events, including complications of critical illness

**Basic**

**Knowledge**
- Common sources of error and factors which contribute to critical incidents / adverse events (ICU environment, personnel, equipment, therapy and patient factors)
- Modification of treatment or therapy to minimise the risk of complications and appropriate monitoring to allow early detection of complications
- Risk of bleeding: indications, contraindications, monitoring and complications of therapeutic anticoagulants
- Types of organisms - emergence of resistant strains, mode of transfer, opportunistic and nosocomial infections; difference between contamination, colonisation and infection
- Autogenous infection: routes and methods of prevention
- Staff safety: susceptibility to harmful physical, chemical and infectious hazards in the ICU; psychological?
- Local policies and procedures relevant to practice
- Purpose and methods of clinical audit (e.g. mortality reviews, complication rates, National Audits)
- Plan of action / local procedures to be followed when a health care worker is noticed to be in distress, whether or not patients are considered to be at risk

**Skills**
- Consider potential interactions when prescribing drugs and therapies
- Record relevant clinical information accurately
- Confirm accuracy of clinical information provided by members of the health care team
- Accept personal responsibility for the prevention of cross infection and self infection
Participate in the processes of clinical audit, peer review and continuing medical education

**Intermediate**

**Knowledge**

Pathogenesis, risk factors, prevention, diagnosis and treatment of complications of ICU management including:

- nosocomial infection
- ventilator associated pneumonia (VAP)
- ventilator associated lung injury - pulmonary barotrauma/volutrauma
- pulmonary oxygen toxicity
- thromboembolism (venous, arterial, pulmonary, intracardiac)
- stress ulceration
- pain
- malnutrition; refeeding syndromes
- critical illness poly-neuropathy, motor-neuropathy and myopathy

Recognition of patient groups at high risk for developing complications

Epidemiology and prevention of infection in the ICU

Local patterns of bacterial resistance and antibiotic policy

Requirements for microbiological surveillance and clinical sampling

Benefits and risks of different prophylactic antibiotic regimens

Principles of crisis management, conflict resolution, negotiation and debriefing

Published standards of care at local, national and international level (including consensus statements and care bundles)

**Skills**

- Assemble clinical and laboratory data, logically compare all potential solutions to the patient's problems, prioritise them and establish a clinical management plan
- Monitor complications of critical illness
- Aware of relevant guidelines and consensus statements and apply these effectively in every day practice under local conditions

**Advanced**

**Knowledge**

Factors that determine the optimum staff establishment for specialist and junior medical staff, nurses and allied professional and non-clinical ICU staff

Equipment requirements and selection: clinical need and priority; accuracy, reliability, safety and practical issues (ease of use, acceptance by staff)

Local process for ordering consumables and maintaining equipment

Identification and critical appraisal of literature; integration of findings into local clinical practice

**Skills**

- Implement and evaluate protocols and guidelines

---

### 11.5 Organises a case conference

**Basic**

**Knowledge**

Roles of different members of the multidisciplinary team and local referral practices

**Skills**

- Summarise a case history

**Intermediate**

**Knowledge**

Principles of crisis management, conflict resolution, negotiation and debriefing

**Skills**

- Identify members of the health care team which require representation at a case conference
- Timely organisation – liaise with members of the health care team to identify a suitable time and place for a case conference to maximise attendance
- Identify necessary notes / investigations to support discussion during a case conference:
- Discuss technical, cognitive, affective, contextual and non-technical factors in relation to the case in question

**Advanced**

**Skills**

- Plan long-term multidisciplinary care for patients in the ICU
### 11.6 Critically appraises and applies guidelines, protocols and care bundles

**Basic Knowledge**
- Purpose and methods of clinical audit (e.g. mortality reviews, complication rates)
- Local policies and procedures relevant to practice
- Treatment algorithms for common medical emergencies

**Skills**
- Participate in the processes of clinical audit, peer review and continuing medical education
- Recognise the need for clinical audit and quality improvement activities to be non-threatening and non-punitive to individuals

**Intermediate Knowledge**
- Published standards of care at local, national and international level (including consent statements and care bundles)
- Recent advances in medical research relevant to intensive care

**Skills**
- Aware of relevant guidelines and consensus statements and apply these effectively in every day practice under local conditions

**Advanced Knowledge**
- Identification and critical appraisal of literature; integration of findings into local clinical practice; critical appraisal of whether this evidence is relevant to this particular patient.

**Skills**
- Implement and evaluate protocols and guidelines
- Propose realistic initiatives / projects to promote improvement
- Manage resistance to change in the ICU / hospital environment in order to optimize the outcome of a task

### 11.7 Describes commonly used scoring systems for assessment of severity of illness, case mix and workload

**Intermediate Knowledge**
- Principles of outcome prediction / prognostic indicators and treatment intensity scales; limitations of scoring systems in predicting individual patient outcome
- Principles of general and organ-specific scoring systems and their usefulness in assessing likely outcome of an illness (e.g. Glasgow Coma Scale, APACHE II and III, PRISM, organ system failure scores, injury severity scores)
- Influence of injury or illness being considered on the validity of a scoring system as a predictor of likely outcome (e.g. Glasgow Coma Score (GCS) in head injury versus drug overdose)
- One general method for measuring severity of illness (severity scoring systems)

**Advanced Knowledge**
- Principles of workforce planning
- Factors that determine the optimum staff establishment for specialist and junior medical staff, nurses and allied professional and non-clinical ICU staff

### 11.8 Demonstrates an understanding of the managerial and administrative responsibilities of the ICM specialist

**Basic Knowledge**
- Purpose and methods of clinical audit (e.g. mortality reviews, complication rates)
- Local policies and procedures relevant to practice
### Skills
- Contribute to departmental / ICU activities
- Respect, acknowledge and encourage the work of others

### Intermediate
**Knowledge**
- Concept of risk: benefit ratio and cost effectiveness of therapies
- Principles of crisis management, conflict resolution, negotiation and debriefing
- Recent advances in medical research relevant to intensive care
- Principles of appraisal of evidence: levels of evidence; interventions; diagnostic tests; prognosis; integrative literature (meta-analyses, practice guidelines, decision and economic analyses)
- Published standards of care at local, national and international level (including consensus statements and care bundles)

**Advanced**
**Knowledge**
- Principles of local / national health care provision; strategic planning of the ICU service (structure, function, financing) within the wider health care environment
- The non-clinical role of the ICU specialist and how these activities contribute to the efficacy of the ICU, the profile of the ICU within the hospital and the quality of patient management
- Principles of administration and management
- Physical requirements of ICU design
- Principles of resource management; ethics of resource allocation in the face of competing claims to care
- Difference between absolute requirement and possible benefit when applying expensive technology to critically ill patients
- Equipment requirements and selection: clinical need and priority; accuracy, reliability, safety and practical issues (ease of use, acceptance by staff)
- Local process for ordering consumables and maintaining equipment
- Principles of health economics, departmental budgeting, financial management and preparation of a business plan
- Factors that determine the optimum staff establishment for specialist and junior medical staff, nurses and allied professional and non-clinical ICU staff
- Principles of workforce planning
- Practical application of equal opportunities legislation
- Principles of national / local health care legislation applicable to ICM practice
- Identification and critical appraisal of literature; integration of findings into local clinical practice

### Skills
- Propose realistic initiatives / projects to promote improvement
- Manage resistance to change in the ICU / hospital environment in order to optimize the outcome of a task
Domain 12: Professionalism

**General Principles**

A professional is someone with special expertise who gains the privilege of self-regulation through vocation and service, high ethical standards, critical self-appraisal, and personal development. Professionalism includes the capacity for clinical judgement (the translation of data into knowledge and knowledge into appropriate actions). These distinguishing attitudes and behaviours can be evaluated in terms of communication skills, professional relationships, and personal governance (personal standards, self-development, insight and self-control).

### Domain 12: Competencies

<table>
<thead>
<tr>
<th>Competence</th>
<th>Description</th>
<th>IBTICM level</th>
<th>Assessment methods</th>
<th>GMP</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1</td>
<td>Communicates effectively with patients and relatives</td>
<td>Basic</td>
<td>D, M, T</td>
<td>3</td>
</tr>
<tr>
<td>12.2</td>
<td>Communicates effectively with members of the health care team</td>
<td>Basic</td>
<td>D, M</td>
<td>3</td>
</tr>
<tr>
<td>12.3</td>
<td>Maintains accurate and legible records / documentation</td>
<td>Basic</td>
<td>D, M, T</td>
<td>1</td>
</tr>
<tr>
<td>12.4</td>
<td>Involves patients (or their surrogates if applicable) in decisions about care and treatment</td>
<td>Intermediate</td>
<td>C, M, T</td>
<td>3, 4</td>
</tr>
<tr>
<td>12.5</td>
<td>Demonstrates respect of cultural and religious beliefs and an awareness of their impact on decision making</td>
<td>Intermediate</td>
<td>C, M, T</td>
<td>3, 4</td>
</tr>
<tr>
<td>12.6</td>
<td>Respects privacy, dignity, confidentiality and legal constraints on the use of patient data</td>
<td>Basic</td>
<td>C, M, E</td>
<td>1, 4</td>
</tr>
<tr>
<td>12.7</td>
<td>Collaborates and consults; promotes team-working</td>
<td>Basic</td>
<td>M</td>
<td>3</td>
</tr>
<tr>
<td>12.8</td>
<td>Ensures continuity of care through effective hand-over of clinical information</td>
<td>Basic</td>
<td>C, M, T</td>
<td>1</td>
</tr>
<tr>
<td>12.9</td>
<td>Supports clinical staff outside the ICU to enable the delivery of effective care</td>
<td>Intermediate</td>
<td>C, M, T</td>
<td>1</td>
</tr>
<tr>
<td>12.10</td>
<td>Appropriately supervises</td>
<td>Intermediate</td>
<td>C, M, T</td>
<td>1</td>
</tr>
<tr>
<td>12.11</td>
<td>Takes responsibility for safe patient care</td>
<td>Basic</td>
<td>D, C, M, T</td>
<td>1, 3</td>
</tr>
<tr>
<td>12.12</td>
<td>Formulates clinical decisions with respect for ethical and legal principles</td>
<td>Advanced</td>
<td>C, M, T</td>
<td>1</td>
</tr>
<tr>
<td>12.13</td>
<td>Seeks learning opportunities and integrates new knowledge into clinical practice</td>
<td>Basic</td>
<td>M</td>
<td>1</td>
</tr>
<tr>
<td>12.14</td>
<td>Participates in multidisciplinary teaching</td>
<td>Basic</td>
<td>M</td>
<td>1</td>
</tr>
<tr>
<td>12.15</td>
<td>Participates in research or audit under supervision</td>
<td>Basic</td>
<td>M</td>
<td>1, 4</td>
</tr>
</tbody>
</table>

### Domain 12: Syllabus

**Knowledge, skills and attitudes common to all competencies**

**Knowledge**

- Methods of effective communication of information (written; verbal etc)
- Confidentiality and data protection - legal and ethical issues
- Outline and follow the guidance given by the GMC on confidentiality
- Purpose and process of quality improvement activities such as evidence based practice, best practice guidelines and benchmarking and change management
- Impact of occupational and environmental exposures, socio-economic factors, and lifestyle factors on critical illness
- Electronic methods of accessing medical literature
Methods of effective communication of information (written; verbal etc)

Aware that how bad news is delivered to a patient can affect them for the rest of their lives in terms of emotions, perception of the condition and their ability to cope. It also irretrievably affects the subsequent relationship with the patient.

Aware that ‘breaking’ bad news can be extremely stressful for the professional involved.

Understand the legislative framework within which healthcare is provided in the UK and/or devolved administrations, in particular – death certification and the role of the Coroner/Procurator Fiscal; child protection legislation; mental health legislation (including powers to detain a patient and giving emergency treatment against a patient’s will under common law); advanced directives and living Wills; withdrawing and withholding treatment; decisions regarding resuscitation of patients; surrogate decision making; organ donation and retention; communicable disease notification; medical risk and driving; Data Protection Act and Freedom of Information Act; provision of continuing care and community nursing care by a local authorities.

Outline the relevance of professional bodies e.g. Royal Colleges, NHSMEE , GMC, Postgraduate Dean, BMA, specialist societies, medical defence societies etc.

<table>
<thead>
<tr>
<th>Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acquire, interpret, synthesize, record, and communicate (written and verbal) clinical information.</td>
</tr>
<tr>
<td>Professional and reassuring approach - generates confidence and trust in patients and their relatives.</td>
</tr>
<tr>
<td>Communicate effectively with relatives who may be anxious, angry, confused, or litigious.</td>
</tr>
</tbody>
</table>

In preparing to break bad news:
- Sets aside sufficient uninterrupted time.
- Chooses an appropriate private environment and ensures that there will be no unplanned disturbances.
- Has sufficient information regarding prognosis and treatment.
- Ensures the individual has appropriate support if desired.
- Structures the interview.
- Is honest, factual, realistic and empathic.
- Aware of relevant guidance documents.

Collaborate with other team members to achieve common goals.

- Lead, delegate and supervise others appropriately according to experience and role.
- Participate appropriately in educational activities and teaching medical and non-medical members of the health care team.
- Manage inter-personal conflicts which arise between different sectors of the organisation, professionals, patients or relatives.
- Maximise safety in everyday practice in part by good quality decision making sustained by critical thinking, reflection and metacognition.

Use electronic retrieval tools (e.g. PubMed) to access information from the medical and scientific literature.

<table>
<thead>
<tr>
<th>Attitudes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consults, communicates and collaborates effectively with patients, relatives and the health care team.</td>
</tr>
<tr>
<td>Acknowledges the consequences of the language used to impart information.</td>
</tr>
<tr>
<td>Recognises that communication is a two-way process.</td>
</tr>
<tr>
<td>Sensitive to the reactions and emotional needs of others.</td>
</tr>
<tr>
<td>Remains calm in stressful or high pressure situations and adopts a timely, rational approach.</td>
</tr>
<tr>
<td>Desire to minimise patient distress.</td>
</tr>
<tr>
<td>Regards each patient as an individual.</td>
</tr>
<tr>
<td>Establishes trusting relationships with and demonstrates compassionate care of patients and their relatives.</td>
</tr>
<tr>
<td>Sensitive to patients’ expectations and responses; considers their perspective in order to understand their conduct and attitudes.</td>
</tr>
<tr>
<td>Respects the expressed wishes of competent patients, even when in conflict with the views of the physician.</td>
</tr>
<tr>
<td>Respects the cultural and religious beliefs of the patient; demonstrate an awareness of their impact on decision making.</td>
</tr>
<tr>
<td>Recognises and manages circumstances where personal prejudices or biases may affect behaviour, including cultural, financial and academic aspects skill.</td>
</tr>
<tr>
<td>Promotes respect for patient privacy, dignity and confidentiality.</td>
</tr>
<tr>
<td>Willingness to communicate with and support families / significant others.</td>
</tr>
<tr>
<td>Integrity, honesty and respect for the truth underpin relationships with patients, relatives and colleagues.</td>
</tr>
<tr>
<td>Approachable and accessible when on duty.</td>
</tr>
<tr>
<td>Well-being of the patient takes precedence over the needs of society or research.</td>
</tr>
<tr>
<td>Generates enthusiasm amongst others.</td>
</tr>
<tr>
<td>Fosters effective communication and relationships with medical and nursing staff in other wards / departments.</td>
</tr>
<tr>
<td>Participates in, and promotes continuing education of members of the multi-disciplinary health care team.</td>
</tr>
<tr>
<td>Contributes effectively to interdisciplinary team activities.</td>
</tr>
</tbody>
</table>
Accepts responsibility for patient care and staff supervision
Takes responsibility for his/her personal physical and mental health, especially where impairment may affect patient care and professional conduct
Recognises personal limitations, seeks and accepts assistance or supervision (knows how, when and who to ask)
Recognises impaired performance (limitations) in self and colleagues and takes appropriate action
Desire to contribute to the development of new knowledge
Enquiring mind, undertakes critical analysis of published literature
Adopts a problem solving approach
Recognises and uses teaching and learning opportunities arising from clinical experiences, including errors
Desire and willingness to share knowledge

<table>
<thead>
<tr>
<th>Intermediate</th>
<th>Knowledge</th>
<th>Principles of crisis management, conflict resolution, negotiation and debriefing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attitudes</td>
<td></td>
<td>Assesses, communicates with, and supports patients and families confronted with critical illness</td>
</tr>
<tr>
<td>Advanced</td>
<td>Attitudes</td>
<td>Recognises personal strengths and limitations as a consultant to other specialists</td>
</tr>
<tr>
<td>Seek to modify the stresses which the intensive care environment places upon patients, their relatives and members of staff</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Seek to recognise those changes in the specialty, medicine or society, which should modify their practice and adapt their skills accordingly.</td>
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<td></td>
</tr>
</tbody>
</table>

### A. Communication

<table>
<thead>
<tr>
<th>12.1</th>
<th>Communicates effectively with patients and relatives</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.2</td>
<td>Communicates effectively with members of the health care team</td>
</tr>
<tr>
<td>12.3</td>
<td>Maintains accurate and legible records / documentation</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Basic</th>
<th>Knowledge</th>
<th>Consent and assent in the competent and non-competent patient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outline the guidance given by the GMC on consent, in particular:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Understand that consent is a process that may culminate in, but is not limited to, the completion of a consent form</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Understand the particular importance of considering the patient’s level of understanding and mental state (and also that of the relatives/carers where relevant) and how this may impair their capacity for informed consent</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Principles of delivering bad news to patients and families</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Skills</th>
<th>Communicate with patients and relatives - give accurate information and re-iterate to ensure comprehension; clarify ambiguities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use non-verbal communication appropriately</td>
<td></td>
</tr>
<tr>
<td>Use available opportunities and resources to assist in the development of personal communication skills</td>
<td></td>
</tr>
<tr>
<td>Communicate effectively with professional colleagues to obtain accurate information and plan care</td>
<td></td>
</tr>
<tr>
<td>Listen effectively</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Intermediate</th>
<th>Knowledge</th>
<th>Principles of crisis management, conflict resolution, negotiation and debriefing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skills</td>
<td>Differentiate competent from incompetent statements by patients</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Advanced</th>
<th>Skills</th>
<th>Discuss treatment options with a patient or relatives before ICU admission</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Obtain consent/assent for treatment, research, autopsy or organ donation</td>
<td></td>
</tr>
</tbody>
</table>
### B. Professional relationships with patients and relatives

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>12.4</td>
<td>Involves patients (or their surrogates if applicable) in decisions about care and treatment</td>
</tr>
<tr>
<td>12.5</td>
<td>Demonstrates respect of cultural and religious beliefs and an awareness of their impact on decision making</td>
</tr>
<tr>
<td>12.6</td>
<td>Respects privacy, dignity, confidentiality and legal constraints on the use of patient data</td>
</tr>
</tbody>
</table>

#### Basic

**Knowledge**
- Consent and assent in the competent and non-competent patient
- Principles of delivering bad news to patients and families

**Skills**
- Communicate with patients and relatives - give accurate information and re-iterate to ensure comprehension; clarify ambiguities
- Involve patients in decisions about their care and treatment when appropriate
- Listen effectively

#### Intermediate

**Knowledge**
- Basic ethical principles: autonomy, beneficence, non-maleficence, justice
- Ethical and legal issues in decision-making for the incompetent patient
- Principles of crisis management, conflict resolution, negotiation and debriefing

**Skills**
- Differentiate competent from incompetent statements by patients

#### Advanced

**Knowledge**
- Sources of information about different cultural and religious attitudes and beliefs to life threatening illness and death available to health care professionals.

**Skills**
- Discuss treatment options with a patient or relatives before ICU admission
- Obtain consent/assent for treatment, research, autopsy or organ donation

### C. Professional relationships with members of the health care team

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>12.7</td>
<td>Collaborates and consults; promotes team-working</td>
</tr>
<tr>
<td>12.8</td>
<td>Ensures continuity of care through effective hand-over of clinical information</td>
</tr>
<tr>
<td>12.9</td>
<td>Supports clinical staff outside the ICU to enable the delivery of effective care</td>
</tr>
<tr>
<td>12.10</td>
<td>Appropriately supervises, and delegates to others, the delivery of patient care</td>
</tr>
</tbody>
</table>

#### Basic

**Knowledge**
- Management of information

**Skills**
- Act appropriately as a member or leader of the team (according to skills and experience)
- Communicate effectively with professional colleagues to obtain accurate information and plan care
- Liaise with medical and nursing staff in other departments to ensure optimal communication and continuing care after ICU discharge
- Listen effectively
- Respect, acknowledge and encourage the work of others

#### Intermediate

**Knowledge**
- Principles of crisis management, conflict resolution, negotiation and debriefing

**Skills**
- Consult and take into account the views of referring clinicians; promote their participation in decision making where appropriate
- Contribute to professional meetings - understand their rules, structure and etiquette

#### Advanced

**Knowledge**
- Principles of professional appraisal and constructive feedback
### D. Self governance

| 12.11 | Takes responsibility for safe patient care |
| 12.12 | Formulates clinical decisions with respect for ethical and legal principles |
| 12.13 | Seeks learning opportunities and integrates new knowledge into clinical practice |
| 12.14 | Participates in multidisciplinary teaching |
| 12.15 | Participates in research or audit under supervision |

### Basic

**Knowledge**
- Management of information
- Principles of adult education and factors that promote learning

**Skills**
- Attentive to detail, punctual, reliable, polite and helpful
- Take decisions at a level commensurate with experience; accept the consequences of these decisions
- Contribute to departmental / ICU activities
- Participate in the processes of clinical audit, peer review and continuing medical education
- Utilise personal resources effectively to balance patient care, learning needs, and outside activities.
- Develop, implement and monitor a personal continuing education plan including maintenance of a professional portfolio
- Use learning aids and resources to undertake self directed learning
- Demonstrate initiative in problem solving
- Listen effectively

### Intermediate

**Knowledge**
- Basic ethical principles: autonomy, beneficence, non-maleficence, justice
- Ethical and legal issues in decision-making for the incompetent patient
- Principles of crisis management, conflict resolution, negotiation and debriefing
- Principles of appraisal of evidence: levels of evidence; interventions; diagnostic tests; prognosis; integrative literature (meta-analyses, practice guidelines, decision and economic analyses)
- Principles of applied research and epidemiology necessary to evaluate new guidelines / forms of therapy
- Requirements of ICM training at local and national level

**Skills**
- Use a systematic approach to locate, appraise, and assimilate evidence from scientific studies relevant to a patient's health problem and make an individual assessment of whether this evidence is relevant to this patient.

### Advanced

**Knowledge**
- Principles of professional appraisal and constructive feedback
- Methods of audit and translating findings into sustained change in practice
- Use of information technology to optimize patient care and life-long learning
- Identification and critical appraisal of literature; integration of findings into local clinical practice
- Principles of medical research: research questions; protocol design; power analysis, data collection, data analysis and interpretation of results; manuscript preparation and publication rules.
- Ethical principles involved in conducting research (including subject protection, consent, confidentiality and competing interests) and national ethical approval processes
- Ethical management of relationships with industry

**Skills**
- Propose realistic initiatives / projects to promote improvement