

COBATRICE COMPETENCIES [VERSION 1.0 (2006)]

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PREFACE

CoBaTrICE (Competency Based Training in Intensive Care medicine in Europe) aims to harmonise standards of training by defining core competencies (outcomes of training) which are shared by training programmes across professional disciplines and national borders.

This document is a product of the first two phases of CoBaTrICE. It defines the *minimum standard* of knowledge, skills and attitudes required for a doctor to be identified as a specialist in Intensive Care Medicine (ICM) in terms of competence statements.

These competence statements have been generated using consensus techniques. Ideas were sought from as many stakeholders in ICM as possible - clinicians, trainers, trainees, allied health professionals, patients and their relatives. Key themes were extracted from over 5250 suggestions submitted from 58 countries worldwide. These were presented to an expert group of clinicians who selected the minimum level of expertise required of a safe practitioner at the end of their specialist training for each, before rating importance. The output was presented to stakeholders who were invited to comment online.

There was a necessary compromise between desirable objectives and deliverable training opportunities when defining minimum outcomes of specialist training. The core competencies must be internationally applicable but able to accommodate national practices and local constraints. An iterative editorial process has culminated in the identification of this final set: 102 competence statements grouped into 12 domains.

More details of the consensus methodology used to develop these competencies have been published:

The CoBaTrICE Collaboration. Development of core competencies for an international training programme in intensive care medicine. Intensive Care Med (2006). <http://dx.doi.org/10.1007/s00134-006-0215-5>

LEVEL OF EXPERTISE AND SUPERVISION: STEPS TO INDEPENDENT ICM PRACTICE

The transition from trainee to specialist is a process of evolution from dependence to independence in clinical practice. All patients are entitled to receive care under the overall supervision of a specialist, but the requirements of training means that some of that care must be delivered by trainees. It is the responsibility of the specialist to determine the level of supervision required by a trainee in relation to the needs of the patients. Every doctor must therefore be prepared and able to oversee the work of less experienced colleagues. This means that trainees must themselves become competent at supervising and delegating safely. It is the responsibility of specialists and managers to ensure that patients are cared for in a safe environment. Trainees should therefore seek advice and assistance as early as possible whenever they are concerned about patient management, and at all stages of training a supervisor must attend whenever a trainee requests them to do so.

SUPERVISION MAY BE DIRECT OR INDIRECT¹:

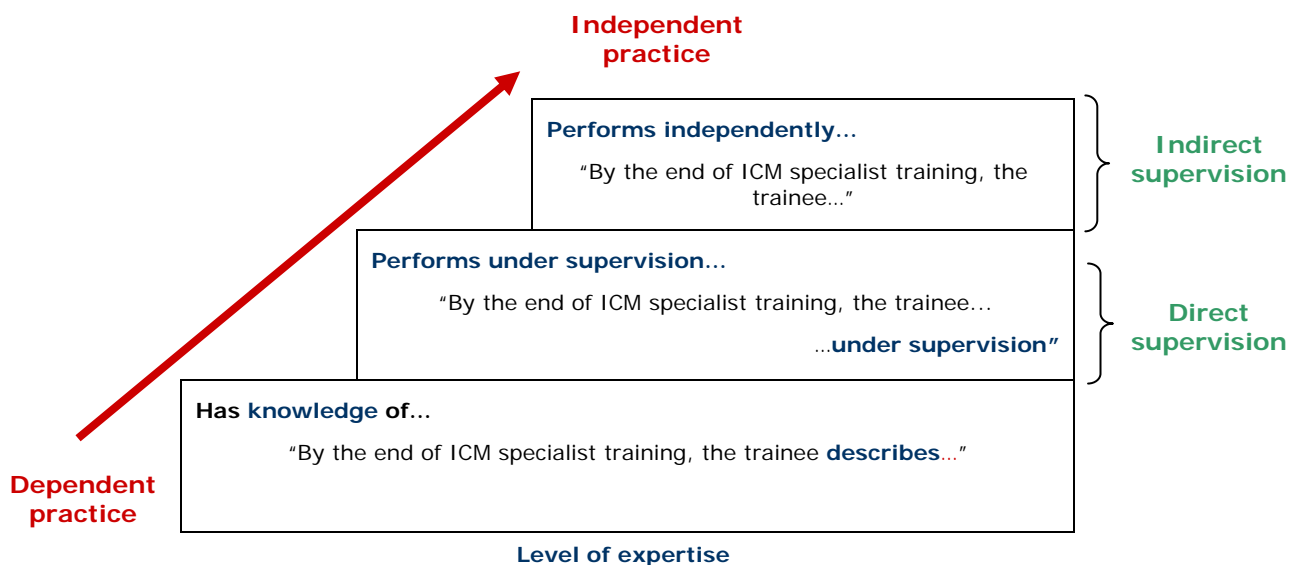
Direct: the supervisor is working directly with the trainee, or can be present within seconds of being called.

Indirect: the supervisor is either:

- **Local:** on the same geographical site, is immediately available for advice, and is able to be with the trainee within 10 minutes of being called.
- **Remote:** rapidly available for advice but is off the hospital site and/or separated from the trainee by more than 10 minutes. The maximum time or distance separation permitted will depend upon the combination of the trainee's grade, the nature of the clinical work, local geography and traffic conditions. Local guidelines should be followed.

LEVEL OF EXPERTISE:

We have identified **three levels of expertise at which competencies may be acquired**. Unless other wise indicated, competencies should be performed at the level of *independent practice*, which may include the capacity to supervise others or direct a team where appropriate. This level implies *indirect supervision* of the trainee. Where we refer to a competence being performed '*under supervision*', this implies *direct supervision*.



These competencies indicate **the minimum standard**, and in many instances a lower level of supervision (i.e. higher levels of independence) are evidently possible, and appropriate.

From a training perspective, the term 'supervisor' should be taken to refer to the person with the most appropriate skills for that task and environment; it does not imply ownership by a particular speciality. In general terms however, we expect that supervision will be provided by an intensive care specialist with due attention to multidisciplinary practice.

¹ The CCST in Anaesthesia I: General principles Section 5.2. Royal College of Anaesthetists. Edition 2: April 2003.

CoBaTrICE DOMAINS

- 1:** Resuscitation and initial management of the acutely ill patient
- 2:** Diagnosis: assessment, investigation, monitoring and data interpretation
- 3:** Disease management
 - ◆ Acute disease
 - ◆ Co-morbid disease
 - ◆ Organ system failure
- 4:** Therapeutic interventions / organ system support in single or multiple organ failure
- 5:** Practical procedures
 - ◆ Respiratory system
 - ◆ Cardiovascular system
 - ◆ Central nervous system
 - ◆ Gastrointestinal system
 - ◆ Renal / Genitourinary system
- 6:** Peri-operative care
- 7:** Comfort and recovery
- 8:** End of life care
- 9:** Paediatric care
- 10:** Transport
- 11:** Patient safety and health systems management
- 12:** Professionalism
 - ◆ Communication skills
 - ◆ Professional relationships with patients and relatives
 - ◆ Professional relationships with colleagues
 - ◆ Self governance

DOMAIN 1. RESUSCITATION AND INITIAL MANAGEMENT OF THE ACUTELY ILL PATIENT

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 underlying diagnosis. Meeting this challenge – action in uncertainty – demands a structured approach to patient management, exemplified by the resuscitation algorithms, but less well developed for the non-arrested acutely ill patient.

Features of competent performance may include:

- Recognition of presenting signs and symptoms
- Identification and rapid response to life-threatening complications
- Prioritise 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 & leadership - clear communication & instructions
- Appropriate referral / consultation
- Recognition of limitations (self and others)
- Attention to patient safety

By the end of ICM specialist training, the trainee...

1.1 Adopts a structured and timely approach to the recognition, assessment and stabilisation of the acutely ill patient with disordered physiology

NB. Acutely disordered physiology may include for example: altered consciousness including acute confusional states and coma; acute seizures; dysrhythmias; hypo / hypertension; acute chest pain; hypoxaemia; dyspnoea; hypo / hyperthermia.

1.2 Manages cardiopulmonary resuscitation

1.3 Manages the patient post-resuscitation

1.4 Triage and prioritises patients appropriately, including timely admission to ICU

1.5 Assesses and provides initial management of the trauma patient

1.6 Assesses and provides initial management of the patient with burns

1.7 Describes the management of mass casualties

DOMAIN 2. DIAGNOSIS: ASSESSMENT, INVESTIGATION, MONITORING & DATA INTERPRETATION

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
- Plan and prioritise investigations / monitoring - appropriate; timely
- Safe use of equipment / devices
- Obtain accurate data effectively
- Interpret data in the clinical context
- Accurate differential diagnosis on basis of information available
- Effective team-working: planning & interpretation of investigations
- Appropriate referral / consultation / further investigation
- Recognition of limitations (self and others)
- Attention to patient safety

By the end of ICM specialist training, the trainee...

- 2.1 Obtains a history and performs an accurate clinical examination**
- 2.2 Undertakes timely & appropriate investigations**
- 2.3 Describes indications for Echocardiography (transthoracic / transoesophageal)**
- 2.4 Performs electrocardiography (ECG / EKG) and interprets the results**
- 2.5 Obtains appropriate microbiological samples and interprets results**
- 2.6 Obtains and interprets the results from blood gas samples**
- 2.7 Interprets chest x-rays**
- 2.8 Liaises with radiologists to organise and interpret clinical imaging**
- 2.9 Monitors and responds to trends in physiological variables**
- 2.10 Integrates clinical findings with laboratory investigations to form a differential diagnosis**

DOMAIN 3. DISEASE MANAGEMENT

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.

Features of competent performance may include:

- Recognition of presenting signs and symptoms
- Identification of main acute complications and management
- Plan and prioritise investigations / monitoring - appropriate; timely
- Appropriate differential diagnosis
- Clear decision making and plan of management (including application of relevant protocols / guidelines / care bundles)
- Effective team-working: collaboration, communication & 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)
- Attention to patient safety

ACUTE DISEASE:

By the end of ICM specialist training, the trainee...

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

NB. Specific and relevant conditions should be defined according to national case mix but may include: Respiratory Disorders; Cardiovascular disorders; Shock syndromes; Hypo/hyperthermia; Haematological, Oncologic, Immunologic and Rheumatologic disorders; Metabolic & Endocrine disorders; Infections; Gastrointestinal disorders; Neurological disorders; Neuromuscular disorders; Renal disorders; Hepato-biliary disorders.

CO-MORBID DISEASE:

By the end of ICM specialist training, the trainee ...

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

NB. Chronic co-morbid disease may include, for example, diabetes, COPD, CHF, CRF, cirrhosis, malignancy, previous solid organ transplantation

DOMAIN 3. DISEASE MANAGEMENT CONT.

ORGAN SYSTEM FAILURE:

By the end of ICM specialist training, the trainee ...

- 3.3 Recognises and manages the patient with circulatory failure**
- 3.4 Recognises and manages the patient with, or at risk of, acute renal failure**
- 3.5 Recognises and manages the patient with, or at risk of, acute liver failure**
- 3.6 Recognises and manages the patient with neurological impairment**
- 3.7 Recognises and manages the patient with acute gastrointestinal failure**
- 3.8 Recognises and manages the patient with acute lung injury syndromes (ALI / ARDS)**
- 3.9 Recognises and manages the septic patient**
- 3.10 Recognises and manages the patient following intoxication with drugs or environmental toxins**
- 3.11 Recognises life-threatening maternal peripartum complications and manages care under supervision**

DOMAIN 4. THERAPEUTIC INTERVENTIONS / ORGAN SYSTEM SUPPORT IN SINGLE AND MULTIPLE ORGAN FAILURE

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 & 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 & goals of therapy
- Evaluation & modification of therapy according to clinical response
- Appropriate referral / consultation
- Recognition of limitations (self and others)
- Attention to patient safety

By the end of ICM specialist training, the trainee...

- 4.1 Prescribes drugs and therapies safely**
- 4.2 Manages antimicrobial drug therapy**
- 4.3 Administers blood and blood products safely**
- 4.4 Uses fluids and vasoactive / inotropic drugs to support the circulation**
- 4.5 Describes the use of mechanical assist devices to support the circulation**
- 4.6 Initiates, manages, and weans patients from invasive and non-invasive ventilatory support**
- 4.7 Initiates, manages and weans patients from renal replacement therapy**
- 4.8 Recognises and manages electrolyte, glucose and acid-base disturbances**
- 4.9 Co-ordinates and provides nutritional assessment and support**

DOMAIN 5. PRACTICAL PROCEDURES

Practical procedures underpin all forms of organ system support.

Features of competent performance may include:

- Consider indications, contraindications & complications of the procedure
- Prior planning & 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)

RESPIRATORY SYSTEM

By the end of ICM specialist training, the trainee...

- 5.1 Administers oxygen using a variety of administration devices**
- 5.2 Performs fiberoptic laryngoscopy under supervision**
- 5.3 Performs emergency airway management**
- 5.4 Performs difficult and failed airway management according to local protocols**
- 5.5 Performs endotracheal suction**
- 5.6 Performs fiberoptic bronchoscopy & BAL in the intubated patient under supervision**
- 5.7 Performs percutaneous tracheostomy under supervision**
- 5.8 Performs thoracentesis via a chest drain**

CARDIOVASCULAR SYSTEM:

By the end of ICM specialist training, the trainee...

- 5.9 Performs peripheral venous catheterisation**
- 5.10 Performs arterial catheterisation**

Domain 5. Practical procedures cont.

CARDIOVASCULAR SYSTEM (CONT):

By the end of ICM specialist training, the trainee...

- 5.11 Describes a method for surgical isolation of vein / artery
- 5.12 Describes ultrasound techniques for vascular localisation
- 5.13 Performs central venous catheterisation
- 5.14 Performs defibrillation & cardioversion
- 5.15 Performs cardiac pacing (transvenous or transthoracic)
- 5.16 Describes how to perform pericardiocentesis
- 5.17 Demonstrates a method for measuring cardiac output and derived haemodynamic variables

CENTRAL NERVOUS SYSTEM:

By the end of ICM specialist training, the trainee...

- 5.18 Performs lumbar puncture (intradural / 'spinal') under supervision
- 5.19 Manages the administration of analgesia via an epidural catheter

GASTROINTESTINAL SYSTEM:

By the end of ICM specialist training, the trainee...

- 5.20 Performs nasogastric tube placement
- 5.21 Performs abdominal paracentesis
- 5.22 Describes Sengstaken tube (or equivalent) placement
- 5.23 Describes indications for and safe conduct of gastroscopy

RENAL / GENITOURINARY SYSTEM

By the end of ICM specialist training, the trainee...

- 5.24 Performs urinary catheterisation

DOMAIN 6. PERIOPERATIVE CARE

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 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 & 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

By the end of ICM specialist training, the trainee...

- 6.1 Manages the pre- and post-operative care of the high risk surgical patient**
- 6.2 Manages the care of the patient following cardiac surgery under supervision**
- 6.3 Manages the care of the patient following craniotomy under supervision**
- 6.4 Manages the care of the patient following solid organ transplantation under supervision**
- 6.5 Manages the pre- and post operative care of the trauma patient under supervision**

DOMAIN 7. COMFORT AND RECOVERY

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 & techniques
- Clearly defined therapeutic strategy / care plan for immediate and longer term care
- Evaluation & modification of therapy according to clinical response
- Safe use of equipment / device / drugs
- Effective team-working: promote collaboration, communication & continuity of care
- Appropriate referral / consultation
- Recognition of limitations (self and others)
- Attention to patient safety

By the end of ICM specialist training, the trainee...

- 7.1 Identifies and attempts to minimise the physical and psychosocial consequences of critical illness for patients and families**
- 7.2 Manages the assessment, prevention and treatment of pain and delirium**
- 7.3 Manages sedation and neuromuscular blockade**
- 7.4 Communicates the continuing care requirements of patients at ICU discharge to health care professionals, patients and relatives**
- 7.5 Manages the safe and timely discharge of patients from the ICU**

Domain 8. End of life care

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 determined 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 & continuity
- Attempt to minimise distress - patient / family / staff
- Clear decision making and plan of management
- Appropriate referral / consultation
- Recognition of limitations (self and others)
- Attention to patient safety

By the end of ICM specialist training, the trainee...

- 8.1 Manages the process of withholding or withdrawing treatment with the multidisciplinary team**
- 8.2 Discusses end of life care with patients and their families / surrogates**
- 8.3 Manages palliative care of the critically ill patient**
- 8.4 Performs brain-stem death testing**
- 8.5 Manages the physiological support of the organ donor**

DOMAIN 9. PAEDIATRIC CARE

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 & leadership - clear communication & instructions
- Timely and appropriate referral / consultation
- Recognition of limitations (self and others) - maintain patient safety

By the end of ICM specialist training, the trainee describes...

- 9.1 Recognition of the acutely ill child and initial management of paediatric emergencies**
- 9.2 National legislation and guidelines relating to child protection and their relevance to critical care**

DOMAIN 10. TRANSPORT

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:

- Consider alternative modes and methods
- Effective preparation: planning & communication tasks
- Attention to safety: anticipation and minimisation of risks; prevention of adverse events; safe use of equipment
- Maintains effective monitoring during transportation
- Complications – prevention; identification; management
- Continuance of care plans
- Effective hand-over and documentation
- Recognition of limitations (self and others)

By the end of ICM specialist training, the trainee...

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

DOMAIN 11. PATIENT SAFETY & HEALTH SYSTEMS MANAGEMENT

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 involve improvements in processes and organisation of care.

Features of competent performance may include:

- Professional approach - professional relationships and self governance
- 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 & leadership - clear communication & promote continuity
- Timely and appropriate referral / consultation
- Recognition of limitations (self and others)

By the end of ICM specialist training, the trainee...

- 11.1 Leads a daily multidisciplinary ward round**
- 11.2 Complies with local infection control measures**
- 11.3 Identifies environmental hazards and promotes safety for patients & staff**
- 11.4 Identifies and minimises risk of critical incidents and adverse events, including complications of critical illness**
- 11.5 Organises a case conference**
- 11.6 Critically appraises and applies guidelines, protocols, and care bundles**
- 11.7 Describes commonly used scoring systems for assessment of severity of illness, case mix and workload**
- 11.8 Demonstrates an understanding of the managerial & administrative responsibilities of the ICM specialist**

DOMAIN 12. PROFESSIONALISM

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).

COMMUNICATION SKILLS:

Features of competent performance:

Understands communication is a 2-way process. Sensitive to the reactions and emotional needs of others. Able to communicate at all levels. Gives accurate information which is consistent between teams and over time. Allows time for understanding and reflection; clarifies ambiguities. Listens. Appropriate use of non verbal communication. Accurate documentation.

By the end of ICM specialist training, the trainee...

- 12.1 Communicates effectively with patients and relatives**
- 12.2 Communicates effectively with members of the health care team**
- 12.3 Maintains accurate & legible records / documentation**

PROFESSIONAL RELATIONSHIPS WITH PATIENTS AND RELATIVES:

Features of competent performance:

Focuses on the needs of the patient and family. Maintains trust and reassures appropriately. Listens. Is polite and caring. Seeks the views and opinions of the patient. Shows respect for patients' wishes, privacy, dignity and confidentiality. Unprejudiced. Views each patient and relative as an individual.

By the end of ICM specialist training, the trainee...

- 12.4 Involves patients (or their surrogates if applicable) in decisions about care and treatment**
- 12.5 Demonstrates respect of cultural and religious beliefs and awareness of their impact on decision making**
- 12.6 Respects privacy, dignity, confidentiality, and legal constraints on use of patient data**

DOMAIN 12. PROFESSIONALISM CONT.

PROFESSIONAL RELATIONSHIPS WITH MEMBERS OF THE HEALTH CARE TEAM:

Features of competent performance:

Accessible & approachable. Leads and delegates appropriately according to role and ability. Respects and values others' roles. Exchanges information effectively. Supports all members of the multidisciplinary team. Punctual and reliable.

By the end of ICM specialist training, the trainee...

- 12.7 Collaborates and consults; promotes team-working**
- 12.8 Ensures continuity of care through effective hand-over of clinical information**
- 12.9 Supports clinical staff outside the ICU to enable the delivery of effective care**
- 12.10 Appropriately supervises, and delegates to others, the delivery of patient care**

SELF GOVERNANCE:

Features of competent performance:

Accepts responsibility for safe patient care, including continuity of care. Shows initiative and adopts a proactive, problem solving approach. Manages stress. Decisive when action is needed. Respects and applies ethical principles. Promotes the highest quality of practice, education and research. Unbiased. Interested and motivated. Seeks learning opportunities; has insight into personal educational needs, strengths and limitations. Seeks help appropriately, acknowledges and learns from mistakes. Recognises and seeks to address unprofessional behaviour in others. Manages time and organises self effectively. Appropriate attire and personal hygiene. Accessible, punctual and reliable.

By the end of ICM specialist training, the trainee...

- 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**