Govt Medical College

Surat.

(Affiliated to VNSGU, Surat)

Curriculum

For

M D (Trauma & Emergency Medicine)

Contents

Contents 2

Introduction 3

Training Programme for Emergency Medicine 3

Curriculum Standards Error! Bookmark not defined.

What is an Emergency Physician? 9

The responsibilities of Trainers and Trainees 11

Professional development of an Emergency Physician Error! Bookmark not defined.

Emergency Medicine Generic Skills curriculum 12

Speciality Specific Curriculum 71

Introduction

This curriculum sets out the intended aims and objectives, content, experiences , outcomes and processes of the educational programme intended to provide emergency physicians with adequate knowledge and sufficient clinical experience to be safe, expert and independent practitioners functioning at consultant level. It is intended that the curriculum be forward-looking and aspirational and is very much centred on the Emergency Department as the principal learning environment for trainees.

Training Programme for Emergency Medicine

This curriculum is for the new run-through model of specialty training that will be implemented during a transitional period from June 2009. The following is an outline description of run-through training in Emergency Medicine. More detailed and background information is available from the VNSGU & GMC websites.

Entry Requirements

As per Norms set by the University for PG Medical admissions.

Assessment system

Trainees will have a training supervisor for every placement and be under the overall direction of the Dean. A system of workplace based training and assessment is laid out in this curriculum. Assessments must be satisfactory. End of the training examinations will have 50% weight age, while the other 50% will be the course long periodic assessment by all the faculty members.

Once the system for competency assessment is proven to be robust and fully embedded into our training programmes, there will be flexibility for those who can demonstrate competencies to shorten the length of their training programme.

Standard 1:- Content of Learning

a. The curriculum sets out the general professional and specialty specific content to be mastered. The knowledge, skills and expertise is specified. The general professional content includes a statement about how Good Medical Practice is to be addressed.

b. The content of the curriculum is presented in a way that identifies what the trainee will need to know about, understand, describe, and be able to do at the end of the educational programme.

c. For each of the content areas there is a recommendation for the type of learning experiences.

Standard 2:- Model of Learning

Wherever possible the curriculum describes the appropriate model of learning, be it work based experiential learning, independent self directed learning or appropriate off the job education. How learning for knowledge, competence, performance and independent action will be achieved is specified.

Standard 3:- Learning Experiences

a. Recommended learning experiences are specified. These are predominantly self-directed and work- based learning. The following methods will be used:

- Learning from practice.
- Learning from trainers either by working alongside or in specified one-to-one teaching.
- Learning from formal situations such as group teaching within the department and regional teaching programmes.
- Learning opportunities outside the department include life support courses and skills lab based teaching.

  Nearly all specialised training is centred in the Emergency Department. An understanding of the care received beyond the Emergency Department is important and is best obtained by being part of the team responsible for care both in the Emergency Department and following the patient through to the first 4 to 6 hours of their in-patient care. It is recognised that some areas of Emergency Medicine practice require dedicated time outside of the Emergency Department prior to practising such skills within it e.g. critical care and anaesthesia.
- Focused personal study outside of contracted hours is essential.

b. Educational strategies that are suitable for work based experiential learning include the use of log books and personal audit. Trainees should participate in journal clubs and case presentations.

Standard 4:- Supervision and Feedback

a. The mechanisms for ensuring feedback on learning recommended and required are specified. These include the components of the annual RITA process, one-to-one

teaching, clinical evaluation exercises, multi professional feedback appraisal and mock examination.

b. The supervision of practice and the safety of doctor and patients are provided by means of direct supervision by the trainer of the trainee, a consultant always being available for advice, and by clinical governance mechanisms including audit and risk management.

Standard 5:- Managing Curriculum Implementation

It is intended that the curriculum identify the knowledge, skills and expertise required of trainers and guide how they should deliver their training. It also identifies the means by which feedback should be given and assessment undertaken.

The trainee should have a clear idea of what is required, how they should acquire the knowledge, skill and experience to become an emergency physician and their role and responsibility.

It is the responsibility of the local trainers to ensure that the curriculum is delivered by each rotation. Different sites will provide different experiences and these should be optimised. Trainers are responsible for the out of department experiences of the trainees. For this to work effectively there needs to be clarification of the learning objectives of that experience and that those outside the department charged with that educational experience should be clear as to what is being asked of them. Areas suitable for out of department experience are identified in the curriculum.

Trainees also have responsibilities for the implementation of the curriculum. They must optimise all of the time available to them to achieve the objectives of the curriculum. All protected time must be department based unless with the prior agreement of their educational supervisor. In this situation clear educational goals must be set and achieved. Trainees must use one-to-one teaching and supervision and recognise the importance of personal study outside of contracted working hours.

By having greater definition of the speciality of Emergency Medicine other curriculum planners can use this curriculum.

Standard 6 Curriculum Review and Updating

The curriculum being a new specialty , will need the modifications & we will receive feedback from the College Board, examination committee and those specialists allocated segments of the curriculum.

Evaluation of the curriculum will be by informal feedback from trainers and trainees and feedback from the examination committee.

What is an Emergency Physician?

Emergency Medicine is a field of practice based on the knowledge and skills required for the prevention, diagnosis, and management of the acute and urgent aspects of illness and injury affecting patients of all age groups with a full spectrum of undifferentiated physical and behavioural disorders. It is a specialty in which time is critical.

- The Emergency Physician (EP) looks after patients with a wide range of pathologies from the life threatening to the self limiting in all age groups.
- The EP is expert in establishing the diagnosis and differential diagnosis especially in life threatening situations.
- The EP is able to identify the critically ill and injured, provide safe and effective immediate care and establish the diagnosis and initiate or plan for definitive care.
- The EP is an expert in resuscitation, skilled in the practical procedures needed.
- The EP safely and effectively differentiates and places patients on care pathways which lead to appropriate discharge with follow up when needed, admission to an ED based observation unit or admission into hospital.
- The EP works in the difficult and challenging environment of the Emergency Department and is able to re-prioritise and respond to new and urgent situations.
- The EP is part of a multi-disciplinary team where good communication and inter personal skills are essential.
- The EP is able to work both within and lead a team to ensure the patient's needs are met.

- The EP is able to work closely with a wide variety of in-patient teams and with primary care and pre-hospital clinicians.
- The EP is committed to the highest standards of care and of ethical and professional behaviour within the specialty of Emergency Medicine and within the medical profession as a whole.
- The EP is caring, empathetic, conscientious and practices medicine without prejudice.
- The EP continually seeks to improve care by utilising up to date evidence, being committed to lifelong learning and being innovative.
- The EP's greatest sense of satisfaction comes from ensuring that patients have received the right treatment at the right time and seeing them improve.

The responsibilities of Trainers and Trainees

All trainees are adult learners and therefore have responsibilities for their own education. It is the responsibility of the trainers to ensure adequate and appropriate educational opportunities are made available to the trainee. In turn the trainee should be enthusiastic and pro-active in identifying their own knowledge gaps and take advantage of all the formal and informal learning opportunities that go on in Departments. Trainees have a responsibility to keep to their educational agreements and to use their study leave effectively. Trainees should normally work within the Department during their protected educational time on issues directly related to their training and education unless there is prior agreement with their educational supervisor.

The trainer has a responsibility to the trainee to assist the trainee in identifying knowledge gaps and setting the trainee personal objectives. Each trainee should therefore expect to meet with their trainer every three months at a minimum to set, review and develop learning objectives and review progress.

The table on the following pages describes the progression through different phases of training and practice from trainee to consultant

Emergency Medicine Generic Skills curriculum

Contents

Summary 13
G1.1: Good clinical care – History and examination 16
G1.2: Good clinical care – Documentation 18
G1.4: Good clinical care – Decision making 22
G1.5: Good clinical care – Time management 24
G1.6: Good clinical care – Safe prescribing 26
G1.7: Good clinical care – Continuity of care 28
G1.8: Good clinical care – Therapeutic interventions 30
G2.1: Communication skills - With colleagues 32
G2.2: Communication skills - referrals 34
G2.3: Communication skills – with Patients and Carers 36
G2.4: Communication – Breaking bad news 38
G2.5: Communication – Team working 40
G3.1: Maintaining good medical practice - life long learning 42
G3.2: Maintaining good medical practice - Audit and clinical outcomes 44
G3.3: Maintaining good medical practice - Critical appraisal 46
G3.4: Maintaining good medical practice - Information management 48
G4.1: Professional behaviour and probity – professional attributes 50
G4.2: Professional behaviour and probity – career and professional development 52
G5.1: Ethics and legal – informed consent 53
G5.2: Ethics and legal – DNAR and advanced directives 55
G5.3: Ethics and legal – the competent adult 57
G6.1: Education – developing others learning 59
G6.2: Education – assessment and appraisal 62
G7.1: Maintaining good clinical care – risk management 64

G7.2: Good clinical care – medico-legal issues..... 66
G7.3: Good clinical care – confidentiality 68

Summary

Layout of section

- Each section has a separate page
- Each page has general objectives, then knowledge application, skills and attitudes identified that the learner must achieve as well as a suggested range of methods of assessment that might be employed

Assessment

- Each section has a column indicating suggested assessment methods.
- These methods use validated assessment tools that are being introduced in the Foundation programme and elsewhere. Also included are more informal processes such as peer review of notes.
- Much of the in-course assessment will be supported either by the Deanery or by the local training committee in the case of trainees.

Clinical methods

- Observed clinical care of unselected patients during working time
- Mini-CEX of index cases – initiated at trainees request. Mini CEX (mini Clinical Evaluation Exercises) focus on core clinical skills and are designed as a 15-20 minute snapshot of a trainees interaction with a patient. The results are documented on a 9 point scale in several clinical skills dimensions (Clinical judgement, counselling skills, physical examination etc). 4-6 Mini CEX are required per year to give adequate evaluation of clinical skills
- DOPS (direct observation of practical skills) focus on the practical skills and are marked in a similar way to Mini-CEX with rating scales in a series of dimensions. 4-6 DOPS per year are required to give adequate evaluation of practical skills

- Case based discussion involves selection from a range of care records and focussed discussion to explore clinical reasoning, 4-6 per year.
- Video or observed operating within a team eg. – in resuscitation room.

Office based

- Audit of cases of particular type
- Review of case notes
- Review of complaints
- Review of clinical incidents

Teaching session based assessment

- Case presentations
- Review of research in progress
- Review of clinical incidents
- Topic presentations
- Review of teaching by trainee
- Role play/scenario teaching

Peer review

- Mini PAT – short structured feedback form requested from at least 8 raters (multiprofessional). Based on the Sheffield Peer review assessment tool, this gives feedback covering the five main domains of Good Medical Practice: good clinical care, maintaining good medical practice, relationships with patients, teaching, training, appraising and assessing and working with colleagues.

Examination

- Short answer paper on clinical cases
- OSCE exam
- Extended clinical exam including data, practical skills and case discussion.

It would be expected that nearly all of the generic competencies would be acquired within the E.D and by the end of ST2, but would continue to develop and improve throughout the training period.

G1.1: Good clinical care – History and examination

Objectives	Knowledge application	Skills	Attitudes	Assessment methods
To be able to take a focused history from patients in all circumstances To be able to clinically examine patients and detect and interpret relevant clinical signs	Recognise critical symptoms and symptom patterns. Know the difference between open and closed questioning and when to utilise each type Be aware of cultural and language differences in the description of common symptoms. Be familiar with methods to elicit accurate histories Recognise the relevance of clinical signs in a given	Elicit a relevant focused history and identify and synthesise problems. Take a history in difficult circumstances, (eg, busy noisy department with competing demands, patients who are often abusive, aggressive, confused or unable to co-operate). Apply knowledge of symptomatology to determine the likely differential diagnosis. Take a history from a third party	Value the diversity of cultural backgrounds Encourage the difficult historian and actively encourage and explore alternative ways of communicating Appreciate the importance of time and attention to detail in talking to patients Be prepared to allow the patient to take their time Be effective in eliciting facts whilst being	Mini CEX Clinical notes review Audit of outcomes Audit of health inequalities Mini PAT

Objectives	Knowledge application	Skills	Attitudes	Assessment methods
	clinical situation Incorporate clinical, social and psychological factors in the history. Be aware of the considerable health equalities that exist between different groups	Examine a patient whilst maintaining dignity and privacy Elicit clinical signs effectively and be able to teach examination techniques to others	empathic in approach	

History and Examination

G1.2: Good clinical care – Documentation

Objectives	Knowledge application	Skills	Attitudes	Assessment methods
To provide clear, legible accurate and contemporaneous records of patient care where the author of the record is clearly identified To keep accurate and relevant medical records. To ensure that written referrals for patients are complete and logical To ensure all results	Be familiar with Emergency Department notes (triage, information, observation data nursing and pre-hospital notes, and provisional treatments). Know other sources of important patient information and how to access them (social services, GP, previous Emergency Department notes, inpatient notes). Be familiar with the required standards of	Record accurately and legibly the history, examination, diagnosis and differential diagnosis. Record a management plan that includes investigation and treatment. Record the results of appropriate tests and any action taken. Record in the notes advice and information given to the patient. Sign notes and to record	Value the record as a means of continuity of care & contributing to good patient management Value the role of the GP in the on-going management of the patient. Understand the importance of clear documentation of the patient episode & suggested follow up as communicated to the GP	Notes review Audits of documentation and of investigation requests Audit of referral and GP letters

Objectives	Knowledge application	Skills	Attitudes	Assessment methods
are checked & x-rays reviewed in real time To ensure that clinical details are clear and critical information is present in the notes.	documentation set out by the GMC	times and dates appropriately. Give clinical details accurately and succinctly when requesting investigations to allow appropriate choice of investigation and expert interpretation. Write clear letters to GPs or letters of referral which document clearly the details and reason for the letter Document relevant times and details to provide evidence of care.	Understand the importance of completion of documentation in real time & the implications of delayed recording of actions Optimise unavoidable handovers between junior doctors by excellent documentation Be conscientious to ensure that all results are checked and x-rays reviewed and relevant details noted in the patient notes.	

Documentation

G1.3: Good clinical care - Diagnosis

Objectives	Knowledge application	Skills	Attitudes	Assessment methods
To be able to recognise those who are critically ill To make a diagnosis that is both likely and clinically relevant To construct a comprehensive and likely differential diagnosis	Identify the most likely diagnosis in a given situation and the discriminatory investigations to confirm that diagnosis Construct a working differential diagnosis for a given clinical scenario Recognise the contribution of false positive and false negative results Interpret the results of tests and apply the results to a given patient	Identify those that require admission and those that can be safely discharged. This requires integration of the history, examination, appropriate investigation and seeking more senior advice where necessary. Consider the relevance and likely contribution of an investigation to the management of a patient and utilise such resources effectively, valuing clinical judgement In those patients presenting	Awareness and appreciation of the fact that common things are common Appreciate the value of the working diagnosis in the management of the patient as well as the desire to make a definitive diagnosis Value the " rule out" as well as " rule in" investigation in assessing the likelihood of the diagnosis	Notes review Exam OSCEs Audit of outcomes Clinical incident reporting Case based discussion

Objectives	Knowledge application	Skills	Attitudes	Assessment methods
		with cardinal symptoms e.g chest pain, headache – ensure that the important differential diagnoses are covered. Recognise atypical presentations of important conditions	Understand the importance of a non specific diagnosis of patients being discharged and identifying clear pathways for the patient to explore if their clinical condition were to change.	

Diagnosis

G1.4: Good clinical care – Decision making

Objectives	Knowledge application	Skills	Attitudes	Assessment methods
To recognise those who are critically ill. Initiate appropriate treatment. To formulate a management plan including diagnostic testing, provisional diagnosis, differential diagnosis and treatment plan. To identify those requiring admission and those who may be	Know which conditions require immediate treatment appreciating that some presentations do not require immediate intervention but nevertheless are appropriate to be treated in EMERGENCY Select the most effective immediate treatment for a given diagnosis Evaluate the benefit of hospital based treatment versus community care for	Plan future care either as an inpatient, discharged to Primary Care or followed up in a special clinic. Consider the relevance and likely contribution of an investigation to the management of a patient and utilise such resources effectively Utilise a clinical decision unit effectively to optimise patient care Be able to solve complex	Appreciate the requirement to complete clinical tasks in real time and the need to come to a timely conclusion Be conscious of the requirement to reduce the number of handovers from junior doctor to junior doctor without a conclusion being reached Make decisions based on logical evidence &avoid bias in making decisions	Notes review Exam OSCEs Audit of outcomes Clinical incident reporting Case based discussion

Objectives	Knowledge application	Skills	Attitudes	Assessment methods
safely discharged.	a given condition in a particular patient Be familiar with local and national health care services to identify the most appropriate care provider Understand the use of the clinical decision unit/observation unit and its value to patient care Be able to prioritise patients according to clinical need Be aware of local and national guidelines	clinical problems in a timely way Manage uncertainty of diagnosis in the emergency setting and make appropriate decisions based on what is best for patient and minimal risk	Take responsibility for ones decisions. Know ones own limitations	

Decision making

G1.5: Good clinical care – Time management

Objectives	Knowledge application	Skills	Attitudes	Assessment methods
To treat patients effectively and efficiently by prioritising tasks using a focused history and examination and seeking advice from senior colleagues when needed. To ensure timely correct decision-making. To manage ones own time in an effective way	Identify those patients who have an immediate threat to life and initiate treatment. Prioritise those patients in whom timely intervention will make a difference Understand the other factors that affect prioritisation of patients other than clinical priority Understand the limits and importance of time and the relationship to the patient and departmental needs	Integrate rapid assessment with immediate and life saving treatment in a timely way. Seek advice from senior colleagues within the department when diagnostic doubt exists. Manage the patient's safe care, ensuring that patients are moving through the system safely and effectively. Minimise delays by using discriminatory tests only	Recognise one's own limitations Call for help when needed Be willing to re-prioritise in the face of changing departmental demands Work as a team to achieve good care Recognise the importance of good time keeping Help others to prioritise	Notes review Complaints review Appraisal and setting and completion of personal objectives Mini PAT

Objectives	Knowledge application	Skills	Attitudes	Assessment methods
	Be aware of the principles of personal time management	Create and maintain time for research, audit and other professional activity as well as maintaining safe clinical practice Delegate appropriately and safely	and recognise that other people's priorities may not be the same as yours Respect other peoples time by being prompt and completing tasks within agreed time frame	

Time management

G1.6: Good clinical care – Safe prescribing

Objectives	Knowledge application	Skills	Attitudes	Assessment methods
Be able to prescribe emergency and continuing medications for patients in a safe and reliable way	Apply the principles of therapeutics and pharmacology to the patient who presents as an emergency Be aware of common side effects of drugs and drug interactions as well as allergic reactions Know the legal framework in which prescribing must take place in this country Be familiar with local formulary and prescribing	Complete a prescription legibly and legally Safely prescribe intravenous fluids for adults and children Safely prescribe and administer emergency drugs (including oxygen) within National protocols Select the most appropriate method of drug administration in a given situation Use the British National Formulary, Paediatric	Appreciate the value of the multidisciplinary team in reducing drug errors Utilise information sources to provide safer prescribing habits Follow national and local guidance on prescribing	Audit of prescriptions OSCE stations Short answer paper

Objectives	Knowledge application	Skills	Attitudes	Assessment methods
	guidelines Know where and how to obtain further information about a particular drug and its action Know the implications of pregnancy, old age, childhood and other factors in the safe use of commonly used drugs	Formularies and other resources to safely prescribe and to identify drug related conditions Work with the nursing staff in promoting the safe administration of drugs		

Safe prescribing

G1.7: Good clinical care – Continuity of care

Objectives	Knowledge application	Skills	Attitudes	Assessment methods
Be the link between primary and secondary care for patients who present as emergencies. For those patients discharged without formal follow up provide clear guidance about the predicted course of the disease and when and where to seek help	Know the lines of responsibility for patients Appreciate the place of primary, secondary and tertiary care in the Health care service Apply the principles of shared care and multidiscplinary team work to the continued care of patients who present as emergencies Know how to communicate with Primary Care.	Evaluate the need for continued medical and nursing care Assess the whole needs of the patient and how they might be met within the health & social care system Communicate the requirements of the patient to the whole healthcare team Complete appropriate letters to the GP explaining diagnosis, treatment and follow up arrangements	Respect the patient's autonomy and personal choice in how they live if further care is refused. Provide appropriate contacts for further care where necessary Value the right of the patient to contribute to the decision making process. Involve the whole multidisciplinary team in the evaluation of what is	OSCE Direct observation Discussions within teaching sessions Mini PAT Case based discussion

Objectives	Knowledge application	Skills	Attitudes	Assessment methods
	Know the value of community paediatric nurses, health visitors and school nurses in the subsequent care of children who have presented to the ED.	required Communicate with the GP by telephone where appropriate Communicate with the in-patient teams and complete effective safe hand over	the best for the patient Listen to carers and family in relation to the needs of the patient Be an advocate for the patient with future care providers, particularly in vulnerable patients	

Continuity of care

G1.8: Good clinical care – Therapeutic interventions

Objectives	Knowledge application	Skills	Attitudes	Assessment methods
Be able to perform practical and therapeutic interventions safely and at appropriate times	Know how to perform skills appropriate to the experience of the operator e.g. ST1 – fracture manipulation, basic airway management, insertion of chest drains ST4 – as above but in more difficult situations and in sicker patients Consultants – as above and to be able to supervise others	Perform the skills in a variety of situations dependent on the level of the operator Support others in performing the skills, either as assistant, supervisor or teacher. Prepare appropriately to pre-empt predictable complications Prompt recognition of complications. Recognise complications of procedures and deal with	Appreciate the inherent dangers and risks. Know when to ask for help and never exceed the limit of own abilities. Value the benefit of practice Understand when it is appropriate to practice Appreciate other's need to practice and support and re-enforce good practice whilst correcting	In workplace assessment- direct observation Audit OSCE DOPS Mini CEX

Objectives	Knowledge application	Skills	Attitudes	Assessment methods
		them safely.	errors and preventing unsafe practice Know when to perform the intervention and when to withhold (particularly around invasive procedures)	

Therapeutic interventions

G2.1: Communication skills - With colleagues

Objectives	Knowledge application	Skills	Attitudes	Assessment methods
The Emergency Department should be a place of excellence for team working. Effective communication between team members is essential for safe care	Know the principles of good communication – and use of verbal and body language to communicate Be aware of the importance of communication in patient care and the risks associated with poor communication Know the principles of conflict resolution techniques	Be professional at all times in dealing with others Utilise language and tone to convey messages in an appropriate way Reduce or eliminate tension in a difficult situation Put your own opinion across in a straight forward and succinct manner Listen to other views and evaluate the evidence in an open way	Approach others with an open mind and be approachable Be willing to listen to others and to try to appreciate their point of view Be flexible and prepared to change opinion in the face of valid argument Welcome other specialty doctors to the department as valued colleagues and respect their contribution	OSCE Direct observation Scenario teaching and assessment Mini PAT

Objectives	Knowledge application	Skills	Attitudes	Assessment methods

Communication with colleagues

G2.2: Communication skills - referrals

Objectives	Knowledge application	Skills	Attitudes	Assessment methods
To be able to refer patients appropriately to specialists. Have a clear understanding of what advice is being sought	Know which patients need specialist input & why Identify patients who can safely be discharged with follow up in the community Know which investigations to be completed before specialist review and which investigations do not add value Ensure that important clinical information is clear, succinct and emphasised in the notes and in the	Make clear and concise referrals both verbally and in writing Ensure the patient understands the management plan and need for specialist advice Ensure clarity as to whether one is seeking an opinion, advice or admission.	Value the specialist opinion where relevant and appropriate	Review of case notes Mini PAT Case scenario testing/discussions

Objectives	Knowledge application	Skills	Attitudes	Assessment methods
	verbal handover.			

Communication – referrals

G2.3: Communication skills – with Patients and Carers

Objectives	Knowledge application	Skills	Attitudes	Assessment methods
Be able to communicate effectively with patients and their relatives even in circumstances of extreme stress for patients/carers and staff	Elicit the concerns of the patient, their understanding of their illness and what they expect. Understand the key place of communication in team functioning Inform and educate patients and carers in a way they can understand	Use appropriate focused history and be able to listen. Give clear information and feedback. Establish a rapport with the patient and their families to enable the best communication to take place. Involve others (relatives) in the assessment and decision making process	Approach other people with an open mind Listen to the patient & to their family - value their contributions Be caring and empathic. Encourage patient involvement / partnership in decision making Be sensitive to carers of children with special needs, recognising that a multidisciplinary approach	OSCE Case based scenario discussion Direct observation Mini PAT Mini CEX

Objectives	Knowledge application	Skills	Attitudes	Assessment methods
			is often required	

Communication – patients and carers

G2.4: Communication – Breaking bad news

Objectives	Knowledge application	Skills	Attitudes	Assessment methods
This is a frequent event in the Emergency Department where unexpected critical illness and death is common. The emergency practitioner must be empathic whilst giving clear and unambiguous information.	Know how to structure the interview. Be aware of best practice in the location and setting of such an interview. Be aware that this should be done as a team with supporting staff members present. Be familiar with the requirements concerning organ donation & the legal framework in which we work.	Be empathetic, clear, honest and work with other team members to ensure this task is done well. Tackle sensitively the issue of organ donation Use appropriate language and non-jargon to communicate clearly the condition and likely prognosis in a given situation	Respect the cultural and religious wishes of the family and patient Respect the team and understand individual responses to stressful situations Provide support and assistance for family and staff alike after difficult encounters Be able to show compassion and understanding whilst maintaining a	OSCE Mini PAT Mini CEX

Objectives	Knowledge application	Skills	Attitudes	Assessment methods
	Work within the legal framework of the NHS on the care of the deceased & requirements for death certification and compulsory inquests		professional position	

Communication – bad news

G2.5: Communication – Team working

Objectives	Knowledge application	Skills	Attitudes	Assessment methods
To understand the role of colleagues and to work with them effectively. The emergency practitioner must be able to work within a large disparate team who do not work regularly together and who when they do meet may be under considerable stress.	Understand roles and responsibilities of team members. Understand how teams work effectively and what can make them ineffective Understand the key place of communication in team functioning Know the principles of team leadership and the skills that are required	Delegate and accept delegation. Demonstrate leadership skills. Supervise and communicate effectively. Be aware of one's own limitations and seek advice appropriately. Ensure the proper handover of patients Use other team members	Be respectful of others skill and knowledge. Be a positive team member. Listen to the concerns of others including team members and be proactive in dealing with those concerns. Approach other people with an open mind.	OSCE Mini PAT Direct observation and video of resuscitations

Objectives	Knowledge application	Skills	Attitudes	Assessment methods
		effectively as team leader or as team member Communicate under stress in a clear & supportive way. Give clear and constructive feedback.		

Communication – team working

G3.1: Maintaining good medical practice - life long learning

Objectives	Knowledge application	Skills	Attitudes	Assessment methods
To appreciate the principles of life long learning and how to apply them to one's own work life.	Be aware of the different styles of learning and identify own preferred style Know how to access information & educational resources including details of courses / developmental opportunities Be aware of the requirements and recommendations for CPD from the College of Emergency Medicine Know the requirements for	Devise appropriate personal educational objectives that are achievable and relevant Adhere to educational agreements & reset objectives where appropriate Utilise appropriate resources that suit the individual learning style Make best use of multiple learning methods & resources Plan a learning strategy and	Value learning opportunities Acknowledge the need to continue to develop throughout the professional career Welcome new ideas Have a positive approach to trying new learning styles and environments Make a personal development plan	Appraisal/RITA Team educational meetings and planning

Objectives	Knowledge application	Skills	Attitudes	Assessment methods
	CCST from the STC and the JCHT Know the requirements for revalidation	identify knowledge gaps Have a clear process for filling those gaps Reflect on events and clinical cases to plan learning and self development Incorporate new practices into the skills inventory Use shop floor experience to drive learning, seeking out answers to clinical questions posed by the clinical workload	Be honest at appraisal	

Life long learning

G3.2: Maintaining good medical practice - Audit and clinical outcomes

Objectives	Knowledge application	Skills	Attitudes	Assessment methods
Be able to complete audit as a way of continuously improving clinical practice and use clinical outcomes as a way of improving practice	Know the principles of the audit cycle Access and appraise the literature and other national guidelines to set an audit standard Be aware of good practice in writing recommendations Appreciate variation in practice & the reasons for variation Know how to apply the	Plan and complete an audit cycle Make recommendations based on the audit for the improvement of patient care. Implement recommendations through action plans and project planning. Interpret the audit findings and anticipate the impact of the audit findings on the department . Identify key clinical outcomes	Value the place of audit in continuous improvement of patient care Appreciate the value of monitoring clinical outcomes in daily work Ensure results of audit are always used in a positive way to improve patient care and working environment for staff	Review of the audit /clinical outcomes study performed for methodology etc Presentation of audit to audit group Discussion within appraisal

Objectives	Knowledge application	Skills	Attitudes	Assessment methods
	outcomes of audit to support and develop best practice	– and the standard for those outcomes for a given dept. Suggest and utilise ways of measuring outcomes Put the results of audit and clinical outcomes into the strategic planning and business case of the department to influence the direction of the department		

Audit and clinical outcomes

G3.3: Maintaining good medical practice - Critical appraisal of evidence & development of clinical guidelines

Objectives	Knowledge application	Skills	Attitudes	Assessment methods
Be able to use evidence to improve patient care	Know the principles of evidence based medicine Be aware of national guidance in the form of the NSFs and NICE guidance, and how they apply to the local department Know how to conduct a search of the published and grey literature Be aware of the limitations of current evidence in emergency care	Critically evaluate the evidence as it is presented and apply it to the local situation or individual patient. Apply National guidelines to local circumstances Apply rigorous evaluation criteria to new ideas before implementing them. Write guidelines which reflect best evidence and are applicable to the department and are in understandable	Value established guidelines as a source of expert guidance Be prepared to apply clear criteria for the acceptance of published evidence Appreciate the balance between rigorously evaluated evidence and pragmatic best available evidence and judge when to use either	FFAEM – CTR and critical appraisal Journal clubs Audit and guideline meetings

Objectives	Knowledge application	Skills	Attitudes	Assessment methods
	Know the principles of statistics and the interpretation of data	language and presented in a practical form	Challenge in a positive way established practice where new possibilities exist however difficult to apply Be flexible in the approach to guidelines Be receptive but questioning of new trends	

Critical appraisal

G3.4: Maintaining good medical practice - Information management

Objectives	Knowledge application	Skills	Attitudes	Assessment methods
The Emergency Physician must be able to access and manage information relevant to patient care. The Emergency department deals with a large number of undifferentiated patients for whom little information is accessible at the time. In addition the variety of presentations requires a very broad	Know the potential sources of information about an individual patient and how to access them (social services, GP, previous ED and inpatient notes) Be aware of the resources available in a given department to support clinical decision making and how to increase the access to those resources Understand the importance of population level health	Utilise information and communication technology to improve patient care in the clinical setting Access the internet resources and electronic libraries for online decision support Operate simple word processing, spreadsheet and database applications in audit, governance and service management Use E-mail and other electronic communications to	Be open to new technology in supporting patient care Value information as a tool to achieve improvements in budget and staff allocation Respect the role of information management in the hospital	Observation Evaluation of audit and other governance Production of research and guidelines based on evidence Project completion

Objectives	Knowledge application	Skills	Attitudes	Assessment methods
knowledge of latest advances.	information in managing healthcare systems Be acquainted with the principles of clinical coding and workload monitoring in the department and their use for staff, budget and other clinical resource management	optimise the department working		

Information management

G4.1: Professional behaviour and probity – professional attributes

Objectives	Knowledge application	Skills	Attitudes	Assessment methods
The emergency practitioner is a professional who is dedicated to the delivery of high quality patient care in a consistent manner	Know of the GMC document – Good medical practice Know the current aspirations of the Emergency Medicine specialty in Britain and aspire to those aims	Manage personal and interpersonal difficulties in a professional way and do not allow them to affect patient care Be consistent in style and delivery regardless of personal difficulties Adapt to change and work with new staff and colleagues Be able to self motivate even at times of stress or discomfort Identify one's own limitations	Non judgemental to staff and patients Non discriminatory and courteous at all times Sensitive to other peoples difficulties. Be aware of the health inequalities within society. Places the needs of patients above his or her own needs Values self-audit and participation in the peer	Mini PAT Direct observation Complaints monitoring

Objectives	Knowledge application	Skills	Attitudes	Assessment methods
		and work within them	review process Accepts the responsibility for contributing to the advancement of medical knowledge and improvement of patient care Aspires to influence and develop the specialty including valuing the multi-professional team Value one's own health and protect and maintain a healthy lifestyle, recognising the effect of poor health on work	

Professional attitudes

G4.2: Professional behaviour and probity – career and professional development

Objectives	Knowledge application	Skills	Attitudes	Assessment methods
The emergency physician must be able to plan and develop their career and identify and respond to challenges	The design and structure of curriculum vitae when seeking employment Identification of key achievements in an appropriate way Knows where and how to seek career guidance	Write a CV that is clear and appropriate Plan own career in the short and longer term Access advice for career development Identify new challenges and respond in a way that makes the most of existing skills and offers opportunities to develop new skills. Be able to work with others to identify own educational	Value diversity and welcome challenges Acknowledge when inappropriate choices have been made Continue to work and develop despite setbacks such as exam failure	Appraisal/RITA Self assessment tools

Objectives	Knowledge application	Skills	Attitudes	Assessment methods
		needs.		

Career and professional development

G5.1: Ethics and legal – informed consent

Objectives	Knowledge application	Skills	Attitudes	Assessment methods
Emergency practitioners must perform interventions in a timely fashion but should seek informed consent whenever possible	Describe the principles of informed consent. Identify procedures where written consent is mandatory. Be aware of the consent procedure in the local environment and the GMC guidance on informed consent. Know the law on consent in children & incompetent	Provide adequate clear information for patients to make informed consent particularly in high risk procedures e.g thrombolysis Obtain informed consent through excellent communication Seek to obtain verbal consent whenever possible by clear explanation of risk and benefits of a given procedures	Value the patient's right to refuse treatment or to be involved in planning treatment	OSCE SAQ Direct observation Case discussion Mini CEX

Objectives	Knowledge application	Skills	Attitudes	Assessment methods
	adults. Be able to define competence in an adult . Understand the implications of consent in certain circumstances such as HIV testing	Assess the competence of an adult or child to give or withhold consent Complete appropriate documentation of the process of gaining informed consent		

Informed consent

G5.2: Ethics and legal – DNAR and advanced directives

Objectives	Knowledge application	Skills	Attitudes	Assessment methods
In the practice of Emergency Medicine there are occasions where it is appropriate to discontinue active interventions. This must be carried out in a professional and empathic manner	Know the legal responsiblities for continuing or discontinuing resuscitation. Know the legal standing of DNR and advanced directives.	Apply knowledge of the law regarding DNR in practical circumstances. Be able to support junior staff in determining the appropriate action, including members of other specialty teams. Discuss the possibilities of DNR clearly & concisely with the patient & relatives and support them in agreeing the appropriate decision. Allow patients / relatives time to think & provide appropriate	Value the autonomy of patients. Appreciate the contribution of relatives and other professionals in determining the appropriate course of action. Avoid being patriarchal or autocratic but also be clear in the information given. Be empathic with patients and relatives facing difficult decisions.	OSCE Observed practice Case scenario practice Case discussions

Objectives	Knowledge application	Skills	Attitudes	Assessment methods
		and clear information		

DNAR and advanced directives

G5.3: Ethics and legal – the competent adult

Objectives	Knowledge application	Skills	Attitudes	Assessment methods
Patients who present to emergency departments may lack competence to decide for themselves. The Emergency Physician must be able to assess competence	Know the definition and assessment of competence in the adult and child Understand that competence to consent & competence to refuse may be different Know the legal requirements for the treatment of incompetent adults Know the place of common law and civil law in managing the adult patient	Assess the competence of a child or adult in difficult circumstances Explain the options to the competent adult/child in a way they can understand Recognise the incompetent adult and work within the law in managing the patient Explain competence and the autonomy of a Gillick Competent child to parents or guardians Apply National guidance (e.g.	Appreciate that the law protects patients and professionals Allow patients to refuse treatment when competent even if it appears irrational Understand and provide empathic support for parents where Gillick competent children may act against the parent wishes or families where competent adults do not take family advice	Direct observation Role play/scenario teaching OSCE Mini CEX

Objectives	Knowledge application	Skills	Attitudes	Assessment methods
	in whom competence cannot be proven Understand the Mental Health Act in relation to competence Understand the legal rights of the guardian or adult with right of attorney	NICE guidelines on DSH) to the assessment of competence and the management of the patient		

The competent adult

G6.1: Education – developing others learning

Objectives	Knowledge application	Skills	Attitudes	Assessment methods
The emergency department is an excellent learning environment and will contain many students of different levels at any one time – the practitioner must be able to facilitate others learning whilst still delivering high quality care The practitioner should be able to plan, deliver and evaluate learning programmes for others	Describe the principles of adult learning Illustrate different teaching techniques including group teaching, bedside teaching, tutorials & role play Understand the place of questioning in educational encounters Outline the use of learning outcomes, educational objectives, lesson plans and other teaching techniques	Is able to facilitate learning in the clinical environment by encouraging questions, supervising practice and giving feedback on performance Prepares multimedia learning sessions including formal lectures, tutorials, skills sessions and simulations Deliver training in a one to one and group environment Set learning objectives or outcomes that are appropriate to the learner and	Value the different styles of learning in the learners and adjust the teaching style Requests feedback on teaching from learners and observers and responds positively Value and develop a positive learning environment	Feedback from learners OSCE Instructor courses Direct observation and critique

Objectives	Knowledge application	Skills	Attitudes	Assessment methods
		the topic Identify key topics for a given learner in an informal curriculum Know the curriculum for other learners or where to find it Know where the emergency medicine curriculum fits into the undergraduate curriculum and into the curriculum of other specialties. Understand the importance of timely constructive feedback	Develops educational programmes for a group of learners appropriate to their level Utilise existing departmental resources for teaching Support others in identifying their learning needs and outlining how they will meet those needs Able to deliver lectures and skills stations in accordance with life support course methodology Use a simulator or manikin in	

Objectives	Knowledge application	Skills	Attitudes	Assessment methods
		a teaching environment Evaluate a teaching programme. Able to motivate others to learn Encourages a good learning environment		

Developing others learning

G6.2: Education – assessment and appraisal

Objectives	Knowledge application	Skills	Attitudes	Assessment methods
Emergency practitioners are required to give feedback to other staff and must do so in a supportive and constructive way as well as formally assessing performance of some groups.	Knows the principles of good feedback. Understands the difference between summative and formative assessment. Be aware of the difference between assessment and appraisal. Be aware of current examination and accreditation guidance and criteria. Be aware of different methods used in	Identify measurable relevant criteria for assessment of a given knowledge or skills base. Apply those criteria in an objective way during an assessment. Give constructive feedback emphasising the positive and providing alternative strategies where there is error or a need to change. Contribute to the development of assessment methods that are generic,	Understand the importance of feedback in personal development. Acknowledge the impact of negative feedback on individual. Respect individuality in a learner and that there may be valid alternative views at work. Ensure that appraisal is a two way process valuing the feedback of the appraisee as well as the appraisor.	Direct observation SAQ Discussions and sessional tasks Project completion

Objectives	Knowledge application	Skills	Attitudes	Assessment methods
	assessment of clinical competence. Knows the place of the College examinations in the development of the emergency physician	objective, reliable and valid in the given circumstances.		

Assessment and appraisal

G7.1: Maintaining good clinical care – risk management

Objectives	Knowledge application	Skills	Attitudes	Assessment methods
To provide care that is effective and safe To reduce risk associated with emergency care	Recognise high risk patients and presentations Know the theory of risk management and human factors in clinical risk Identify areas where care can be improved by the use of critical incident reporting Know the process of investigation of a clinical incident and understand their role in the process Know the effect of other	Apply principles of risk management to emergency care Recognise high risk situations and minimise risk by appropriate involvement of the whole team Identify when errors in care have occurred and minimise consequences to the patient and their relatives. Involve senior personnel in high risk areas to make the patient and family aware of the problems and potential	Recognise one's own limitations Call for help, when needed, from more experienced staff in order to make the correct decisions. Avoid bias in making decisions Recognise adverse or critical events and act on them to prevent future events Continue to work after an	Notes review Complaints review Critical incident review Project completion M & M meetings

Objectives	Knowledge application	Skills	Attitudes	Assessment methods
	pressures on the risk of error occurring Know the principles and where to find further information on health and safety legislation Be familiar with the Zero tolerance of violence policy of the NHS	solutions Communicate effectively to ensure continuity of care and reduce risk Manage violence Carry out a risk assessment on a given clinical area or topic Liaise with Health and Safety dept to reduce risk	adverse event and incorporate learning for others Recognise that one can be wrong and respond to the challenge of being corrected Be responsible and pro-active to ensure the effects of any errors are minimised and learning is maximised and system changes are instituted	

Risk management

G7.2: Good clinical care – medico-legal issues

Objectives	Knowledge application	Skills	Attitudes	Assessment methods
The emergency physician must operate within the legal framework of the country in which they work.	Understand the law as it applies to the practice of medicine Know the limits of the law in particular regard to mental health patients, the coroner, the powers of the police and the relevant driving authority. Understand the law around confidentiality and data protection. Understand the law around consent (as above)	Work with the patient and the national legal institutions to provide the best possible care to patients and to protect society. Work within the law . Interpret the law for the patient and for those who are less informed.	Value the legal framework as it stands to protect the patient and the practitioner but be prepared to challenge unreasonable behaviour on the part of a patient or colleague particularly when it interferes with safe and effective patient care Appreciate the need to balance the needs of the individual against the needs of society	OSCE SAQ Management section of the exam Case based discussion

Objectives	Knowledge application	Skills	Attitudes	Assessment methods
	Know the difference between civil and criminal law as it applies to medical practice			

Medico legal issues

G7.3: Good clinical care – confidentiality

Objectives	Knowledge application	Skills	Attitudes	Assessment methods
Emergency physicians must communicate freely with other agencies to optimise patient care but must respect the confidentiality of the patient	Know the principles of the data protection act as applied to both clinical care and research work Be familiar with the GMC documents on confidentialtiy and the responsibility of the medical practitioner Know the implications of the Access to Medical Records Act Know the application of the Freedom of Information	Communicate within the law, restricting the use of confidential information to that which is absolutely essential. Apply the principles of confidentiality to normal practice including the use of Information and Communication Technology (ICT) and dealing with telephone enquiries in the clinical area Explain the rules of confidentiality to patients and	Respect the right of patients and staff to confidentiality	Audit of clinical paperwork and research information Observation

Objectives	Knowledge application	Skills	Attitudes	Assessment methods
	Act	other interested parties Use anonymised data where possible in research and audit. Avoid using confidential information in presentations of cases. Protect personal information in managing and developing staff .		

Confidentiality

Speciality Specific Curriculum

Contents

Introduction to Specialty Specific Curriculum 73
Abbreviations used in Speciality Specific Curriculum 74
A1: Generic objectives for Resuscitation 75
A1.1: Resuscitation - Airway 77
A1.2: Resuscitation – Cardiac Arrest / Peri-arrest 81
A1.3: Resuscitation - Shock 83
A1.4: Resuscitation - Coma 85
A2.1: Anaesthetics and Pain Relief - Pain Management 86
A2.2: Anaesthetics and Pain Relief - Local Anaesthetic Techniques 87
A2.3: Anaesthetics and Pain Relief - Safe Conscious Sedation 89
A3: Wound Management 91
A4.1: Major Trauma 93
A4.2: Head Injury 95
A4.3: Chest Trauma 97
A4.4: Abdominal Trauma 99
A4.5: Spinal Injury 101
A4.6: Maxillo-facial Trauma 103
A4.7: Burns 105
A5: Generic objectives for musculoskeletal conditions 108
A5.1: Upper limb 109
A5.2: Lower limb & Pelvis 113
A5.3: Spinal conditions 118
A6.1: Vascular Emergencies - Arterial 119
A6.2: Vascular Emergencies - Venous 120
A7.1 Abdominal conditions - Undifferentiated Abdominal Pain 121
A7.2 Abdominal conditions - Haematemesis / malena 122
A7.3 Abdominal conditions - Anal Pain and Rectal Bleeding 123
A8: Urology 124

A9: Sexually Transmitted Disease 126
A10: Eye problems 127
A11: ENT conditions 130
A12: Dental Emergencies 134
A13: Gynaecology 135
A14: Obstetrics 137
A15: Cardiology 139
A16: Respiratory Medicine 145
A17: Neurological Emergencies 153
A18: Hepatic Disorders 159
A19: Toxicology 162
A20: Acid Base and Ventilatory disorders 164
A21: Fluid and Electrolytes 166
A22: Renal Disease 168
A23: Diabetes and Endocrinology 171
A24: Haematology 174
A25: Infectious Diseases and Sepsis 177
A25: Infectious Diseases and Sepsis 177
A26: Dermatology 181
A27: Rheumatology 185
A28: Child Protection and Children in Special Circumstances 188
A29: Neonatology 192
A30: Environmental Emergencies 194
A31: Oncology 196
A32: Psychiatry 198
A34: Major Incident Management 203
A35: Legal Aspects of Emergency Medicine 205
A36: Research 207
A37: Management 210

Introduction to Specialty Specific Curriculum

The following pages describe the knowledge and skills required of an Emergency Physician in specific areas of specialist training.

The knowledge and skills should be put into practice on the background of the generic professional skills described in the previous section.

It is expected that the trainee will manage increasingly complex cases independently as he or she progresses through training.

With regard to Paediatrics much of the curriculum is directly applicable to children and should be assumed. Where there are areas unique to children or that require special emphasis they have been highlighted. The paediatric content of this curriculum reflects what would be expected of a typical emergency physician in departments that see both children and adults. It would be expected that trainees would be competent in paediatric aspects of Emergency Medicine by the end of ST3.

What this curriculum does not convey, as by its nature it is reductionist, is the complexity of the specialty of Emergency Medicine. It is the specialty that sees patients of all age groups, with all pathologies, who present with a spectrum of urgency, in an unpredictable way. Therefore the knowledge, skills and competencies needed to manage such undifferentiated patients are much greater than the sum of the individual components of the curriculum. Add to this the greyness of the cases, often with limited information, against a background of dealing with the competing priorities of managing several patients concurrently and one starts to have a sense of the equalities and depth of medical experience required to be an Emergency Physician.

Abbreviations used in Speciality Specific Curriculum

Learning Experiences

Learning from practice	LP
Learning from Trainers	LT
Group Teaching	GT
Personal Study	PS
Life Support Courses	LS
Skills Laboratory	SL
Out of Department Training	
a) Follow through of patient/OPD Clinic	ODA
b) Dedicated time in another department (e.g. ICU, anaesthesia)	ODB

Assessment

Clinical

a) Observed Care	OC

b) Min – Cex	MC
c) DOPS	DOPS
d) Case based discussion	CBD
e) Audit of Case Notes	AUD

Examination

a) Mock Exam	ME
b) FCEM	FCEM
c) MCEM	MCEM

Levels

Ordinary text indicates competencies to be achieved at the end of ST2

Blue text indicates competencies to be achieved at the end of ST3

Red text indicates competencies to be achieved at the end of ST5.

A1: Generic objectives for Resuscitation

Objectives:

- To be able to use a structured prioritised approach to life threatening situations.
- To be able to undertake resuscitation procedures in a timely and effective manner.
- Understand the pharmacology, indications, and contra indications of resuscitation drugs.
- Lead and supervise the resuscitation team.
- Effectively interact with other specialties to ensure optimal care.
- To be supportive of relatives and friends of the patient whilst giving clear information.
- Exercise good judgement as to when resuscitation is futile or inappropriate.

Specific paediatric objectives:

- Be able to formulate a differential diagnosis by age of a patient with acute life threatening respiratory difficulty and prioritise management

- Be able to lead a resuscitation team in line with APLS/EPLS/NLS guidelines
- Understand the indications, pharmacology, contraindications, dose calculation and routes of administration of drugs used in resuscitation and in the stabilization of children in cardiac arrest or failure
- Be able to obtain appropriate peripheral venous and arterial access including intraosseous route
- Understand the prognostic factors for outcome of cardiac resuscitation for children
- Understand the indications and procedures for transport to a definitive facility following stabilization
- Have developed a sensitivity and understanding in the management of chronic end-stage conditions
- Understand the appropriate management of Sudden Death in Infancy and the local management guidelines for supporting the family
- Understanding the differential diagnosis of the well looking infant presenting with apparent life threatening events (ALTE) e.g. apnoea, cyanosis, floppy baby.

A1.1: Resuscitation - Airway

Objectives	Knowledge	Skills / Attitudes	Learning	Assessment
To be able to assess, establish and maintain a patent airway, using both Basic Life Support and Advanced Life Support techniques.	Identification of the obstructed airway and its causes. Methods of maintaining a patent airway i.e. head positioning, jaw thrust, adjuncts, suction. Bag valve mask ventilation / Mapleson C circuit. Oxygen delivery systems. Indications for tracheal intubation. Complications of tracheal intubation. Understand the appropriate use of pharmacological agents in induction	**Skills** Airway assessment & optimising the patient's position for airway management. Be able to identify the difficult or potentially difficult airway and summon expertise. Airway management with the use of oral/nasal airways. Ventilation using bag valve and mask. Appropriate choice and passage of tracheal tubes using appropriate laryngoscope blades.	LP LT GT PS LS SL ODA ODB	OC DOPS CBD AUD ME FCEM MCEM

Objectives	Knowledge	Skills / Attitudes	Learning	Assessment
	and maintenance of anaesthesia and be aware of their complications and side effects Understand the principles of simple ventilators Have knowledge of monitoring techniques ($SpA0_2$, $ETC0_2$) Failed airway drill, including LMA, needle & surgical cricothyroidotomy	Use of gum elastic bougie/introducers. Tracheal suction. Manage tracheostomy tube complications Identifying correct/incorrect placement of tube (oesophagus, right main bronchus). Perform needle/surgical cricothyroidotomy and percutaneous transtracheal ventilation Interpretation of capnograph trace. Introduction and checking correct placement of laryngeal mask airway. Heimlich manoeuvre		

Objectives	Knowledge	Skills / Attitudes	Learning	Assessment
		Attitudes: Know own limitations Appreciate the urgency of providing a patient airway, and the importance of basic airway manoeuvres Always know the location of senior assistance		
To be able to assess, establish and maintain a patent airway in a child	Know the indications and contraindications for a surgical airway Understand the prognostic features of the outcome of respiratory arrest	Be able to follow age-appropriate algorithms for obstructed airway including choking.	LP LT GT PS LS SL ODA ODB	OC DOPS CBD AUD ME FCEM MCEM

Airway

A1.2: Resuscitation – Cardiac Arrest / Peri-arrest

Objectives	Knowledge	Skills / Attitudes	Learning	Assessment
To confirm cardiac arrest, establish Basic Life Support, use defibrillation appropriately and use appropriate drugs. To be able to recognise and manage peri arrest arrhythmias.	Familiarity with the ALS and APLS algorithms and pharmacology. Knowledge of cardiac arrests in special situations, e.g. hypothermia, trauma, overdose. Knowledge of the outcomes of pre-hospital arrest. Post arrest management. Peri-arrest arrhythmias and pharmacology of drugs used. Organ Donation	**Skills** Perform effective B.L.S. and A.L.S. Rhythm recognition and treatment. Safe defibrillation. To know when to discontinue resuscitation. Central venous access. External pacing Endotracheal drug administration **Attitudes** Team Work	LP LT GT PS LS SL	OC DOPS CBD AUD ME FCEM MCEM Life support course assessments

Objectives	Knowledge	Skills / Attitudes	Learning	Assessment
		Compassion To act as the patient's advocate when continued critical care input is needed		
Understand specific aspects of the management of cardiac arrest in children	Understand the prognostic features and the outcome of respiratory arrest Understand the causes of cardiac arrest in children. Understand the outcomes of cardiac arrest in children	Be able to take decisions in circumstances that present ethical issues and know when to cease resuscitation. Be able to discuss end of life decisions in a sympathetic and caring manner with patients and their families Be able to discuss organ donation in a sensitive manner	LP LT GT PS LS SL	OC DOPS CBD AUD ME FCEM MCEM Life Support Course assessments

Cardiac Arrest and peri-arrest

A1.3: Resuscitation - Shock

Objectives	Knowledge	Skills / Attitudes	Learning	Assessment
To be able to recognise the shocked patient, the likely cause and to initiate treatment.	Know the differential diagnosis of the shocked patient and the distinguishing features of hypovolaemic shock, distributive shock, obstructive shock and cardiogenic shock. Patho-physiology of shock. Role and types of monitoring Appropriate use of inotropes and vasopressors. The role of imaging, e.g. FAST scanning and echocardiography in the shocked patient. To be competent in undertaking a	**Skills** To be able to gain peripheral and central venous access in the shocked patient. (Ultrasound guided). Central access including: Subclavian / internal jugular / femoral and CVP measurements Arterial line insertion Judicious use of fluids especially in the elderly and the trauma patient. Intra-osseous and cut down techniques. Accessing indwelling vascular lines	LP LT GT PS LS SL ODA ODB	OC DOPS CBD AUD ME FCEM MCEM

Objectives	Knowledge	Skills / Attitudes	Learning	Assessment
	FAST scan. (AFTER 2010)	Recognition of the need for urgent surgical intervention. **Attitudes** Ensure optimal team working to establish the diagnosis and commence treatment. This will require close liaison with in-patient teams and radiology.		

Shock

A1.4: Resuscitation - Coma

Objectives	Knowledge	Skills / Attitudes	Learning	Assessment
To be able to look after the comatose patient safely and establish the diagnosis and differential diagnosis by systematic history and examination and appropriate diagnostic testing.	Understand the differential diagnosis of the comatose patient and be able to undertake investigation (routine blood tests/arterial blood gas/radiology) and commence treatment.	**Skills** Apply the A, B, C, D approach to manage and stabilize the patient. Protection of the comatose patient including log rolling and urinary catheterisation. **Attitudes** Respect Compassion	LP LT GT PS LS SL ODA ODB	OC DOPS CBD AUD ME FCEM MCEM

Coma

A2.1: Anaesthetics and Pain Relief - Pain Management

Objectives	Knowledge	Skills / Attitudes	Learning	Assessment
To safely and effectively relieve pain, the commonest presenting complaint in the Emergency Department, in a timely way.	Assessment of pain including pain scoring Understand the appropriate use of analgesics (including paracetamol, NSAIDs, opioids, ketamine, Entonox) and be aware of their complications and side effects. Routes of administration: Oral, IV, IM, and nasal/PR. Monitoring Knowledge of controlled drug policy. Knowledge of adjuncts such as local	**Skills** Selection and safe prescribing of appropriate analgesic, dosage and route of administration. Appropriate monitoring. Be able to discuss options for pain relief with the patient. **Attitudes** To be safe To ensure effectiveness and to seek help if pain is not relieved or is disproportionate.	LP LT GT PS LS SL	OC MC DOPS CBD AUD ME FCEM MCEM

Objectives	Knowledge	Skills / Attitudes	Learning	Assessment
	anaesthesia, splinting, distraction.	To treat the underlying cause of pain		

Pain management

A2.2: Anaesthetics and Pain Relief - Local Anaesthetic Techniques

Objectives	Knowledge	Skills / Attitudes	Learning	Assessment
To use local anaesthesia appropriately and safely.	Understand the appropriate use of local anaesthetic agents (lidocaine, bupivicaine and prilocaine) and be aware of complications and side effects Anatomy of nerve blocks and physiology of nerve function. Intravenous regional anaesthesia	**Skills** To be able to undertake the following nerve blocks and know their contra-indications: • digital • wrist (ulnar ,median,radial), • femoral • facial (auricular, supratrochlear, supraorbital) • ankle • Biers Block To calculate max. dose of local	LP LT GT PS SL	OC DOPS CBD AUD ME FCEM MCEM

Objectives	Knowledge	Skills / Attitudes	Learning	Assessment
		anaesthetic for each patient. **Attitudes** Have patient safety and comfort as prime driver. Know own limitations and recognise when to call for help		

Local anaesthesia

A2.3: Anaesthetics and Pain Relief - Safe Conscious Sedation

Objectives	Knowledge	Skills / Attitudes	Learning	Assessment
To be able to deliver safe conscious sedation to selected patients	Know “Implementing and ensuring safe sedation practice for healthcare procedures in adults” http://www.rcoa.ac.uk/ Recognition of risk factors: airway, co-morbidity, and drugs/alcohol. Drug pharmacology, selection, dosage. Knowledge of antagonists. Monitoring, O_2 therapy, resuscitation equipment. Safe discharge.	**Skills** Airway assessment and management including BVM in order to deal with complications. Safe titration of drugs in a monitored environment. Prompt recognition of over sedation and recognition that loss of verbal responsiveness equates with general anaesthesia in terms of the level of patient care required. **Attitudes** Be able to take informal consent Respect patient choice	LP LT GT PS LS SL ODA	OC DOPS CBD AUD

Objectives	Knowledge	Skills / Attitudes	Learning	Assessment
		Have patient safety as prime driver Work with others to ensure implementation of local and national guidelines Know own limitations and recognise when to call for help		

Conscious sedation

A3: Wound Management

Objectives	Knowledge	Skills / Attitudes	Learning	Assessment
To be able to assess a wound and its under-lying structures, provide analgesia to ensure adequate exploration, cleansing and debridement. Decide if wound should be closed or not and select appropriate technique. Recognise those wounds that require more senior Emergency	Classification and description of wounds. Closure techniques: sutures, staples, glue, adhesive strips, delayed primary closure. Wound infections. Wound dressings/splintage. Special wounds: puncture, bites, amputation, degloving, foreign bodies. Tetanus immunisation schedules. Special patients, e.g. the	**Skills** Local anaesthetic techniques. Recognition of underlying structures. Ensure thorough mechanical wound cleansing and removal of foreign bodies. Ensure the best conditions for wound management i.e. good lighting, good analgesia, good equipment. Correct closure technique. Appropriate follow up, recognising those patients at risk of wound	LP LT GT PS SL	OC MC DOPS CBD AUD ME FCEM MCEM

Objectives	Knowledge	Skills / Attitudes	Learning	Assessment
Department staff or specialist referral.	immunocompromised Role of antibiotics. Detailed knowledge of hand, wrist and facial anatomy.	infection and delayed healing. **Attitudes** Be meticulous in wound assessment and thorough in wound cleaning using appropriate investigations to establish presence of foreign bodies and damage to underlying structures.		

Wound management

A4.1: Major Trauma

Objectives	Knowledge	Skills / Attitudes	Learning	Assessment
To be able to assess, resuscitate and stabilise victims of major trauma based on ATLS principles. To identify those that need life or limb saving surgery. To use diagnostic testing appropriately.	To understand the epidemiology of trauma. Understand the importance of mechanisms of injury, trauma scoring and how trauma teams work.	**Skills** Take an ambulance service hand over. To be able to recognise need for, and carry out, life saving procedures. To provide adequate pain relief and splintage. To be skilled in x-ray interpretation and the use of FAST. **Attitudes** Optimal working within a team, using ATLS principles and sensitive handling of relatives.	LP LT GT PS LS SL ODA	LP OC DOPS CBD AUD ME FCEM MCEM ATLS Courses

Objectives	Knowledge	Skills / Attitudes	Learning	Assessment
To be able to manage major trauma in children.	Understand and apply the principles of Acute Trauma Life Support / Advanced Paediatric Life Support	**Skills** To be able to examine a child in a way which localises injuries Be aware of child protection and accident prevention issues	As above	As above

Major trauma

A4.2: Head Injury

Objectives	Knowledge	Skills / Attitudes	Learning	Assessment
To be able to assess the head injured patient using history and examination and appropriate investigation.	Knowledge of the anatomy of the scalp, skull and brain. Physiology of cerebral perfusion and intracranial pressure. To be able to stratify head injured patients, identify those who need CT/plain radiology, identify those who need neurosurgical referral. Intracranial consequences of a head injury i.e. extradural, subdural, intracerebral haematoma, diffuse axonal injury, post concussion syndrome. Plain radiology/CT appearances.	**Skills** To recognise the major head injury and institute an A, B, C, D approach, optimise therapy to avoid secondary brain injury. Identify those patients who will need intubation and ventilation. Appropriate and timely involvement of neurosurgery. Management of scalp lacerations. To be able to safely recognise and treat for minor head injury. Ensure the safe discharge of patients	LP LT GT PS LS SL ODA	OC MC DOPS CBD AUD ME FCEM MCEM

Objectives	Knowledge	Skills / Attitudes	Learning	Assessment
		with minor head injury. **Attitudes** Optimise joint team working with Critical Care, Neurosurgery and the Emergency Department for the seriously head injured patient.		
To manage the head injured child	Understand the NICE guidelines for head injury in children Understand when to safely discharge children with minor head injury Understand how to recognize signs of physical abuse and how to proceed with local child protection protocols	**Skills** Be able to assess AVPU and Glasgow Coma Score (GCS) in children Be able to request appropriate radiology including plain skull x rays and head CT scanning as per national guidelines Be able to initiate management of all children with scalp lacerations	LP LT GT PS LS SL ODA	OC MC DOPS CBD AUD ME FCEM MCEM

Head injury

A4.3: Chest Trauma

Objectives	Knowledge	Skills / Attitudes	Learning	Assessment
To be able to recognise and treat those patients who have life-threatening or potentially life-threatening chest injuries.	Knowledge of the anatomy of the intrathoracic organs and surface anatomy of the major thoracic structures. Knowledge of the pathophysiology of cardiothoracic injury. To be able to identify life threatening chest trauma, i.e. tension, pneumothorax, open pneumothorax, flail chest, massive haemothorax, and cardiac tamponade. To be able to identify those patients with a potential aortic injury, diaphragmatic rupture, pulmonary contusion, myocardial contusion,	**Skills** To undertake the ATLS approach. Identify life threatening chest conditions. To be able to undertake a needle thoracocentesis, place an intercostal chest drain, pericardiocentesis. Know when to call cardiothoracic surgery. Resuscitative thoracotomy. (not in children) To provide advice and care for those patients with isolated chest wall injuries	LP LT GT PS LS SL ODA	OC MC DOPS CBD AUD ME FCEM MCEM

Objectives	Knowledge	Skills / Attitudes	Learning	Assessment
	oesophageal rupture, tracheobronchial injury, rib fracture and sternal fracture and to appreciate the plain radiology and CT appearances of these injuries. Understand importance of mechanism of injury e.g., penetrating versus blunt trauma	who are to be discharged.		
To manage chest injuries in children	Understand the likely chest injuries through different age groups		LP LT GT PS LS SL ODA	OC MC DOPS CBD AUD ME FCEM MCEM

Chest trauma

A4.4: Abdominal Trauma

Objectives	Knowledge	Skills / Attitudes	Learning	Assessment
Recognition of those patients who have sustained significant abdominal trauma by thorough history and examination and appropriate investigation.	Knowledge of the structural function and surface markings of the abdominal organs. Knowledge of the different presentation of abdominal trauma and the structures that may be damaged. Specifically blunt splenic, hepatic, renal pancreatic trauma, hollow viscus injury, penetrating abdominal injury, urethral / bladder / testicular trauma. Indications for CT / early surgical involvement.	**Skills** To be able to assess and reassess the traumatic abdomen, initiate treatment and investigation and involve appropriate specialists. Recognise the influence of injuries elsewhere on abdominal assessment. Be able to undertake a FAST scan or DPL. NGT placement	LP LT GT PS LS SL ODA	OC DOPS CBD AUD ME FCEM MCEM

Abdominal trauma

A4.5: Spinal Injury

Objectives	Knowledge	Skills / Attitudes	Learning	Assessment
To be able to recognise those patients who have suffered a spinal cord, peripheral nerve or plexus injury by appropriate history, examination and investigation.	Knowledge of anatomy and physiology of spinal cord, myotomes and dermatomes. Recognition of injury to vertebrae (fracture / dislocation), cord (including spinal cord syndromes / SCIWORA) and ligaments. Methods of appropriate imaging (plain radiology / CT / MRI). (NICE Guidelines http://www.nice.org.uk) Neurogenic shock / spinal shock – recognition and treatment. To be able to interpret plain radiology	**Skills** Safe initial care of the potential spinally injured patient (spinal immobilisation). Techniques of spinal immobilisation and log roll Appreciate how spinal cord injury affects assessment. Identify when CT and MRI is appropriate. To record accurately the neurological status of the patient. Liaise with appropriate specialist.	LP LT GT PS LS SL ODA	OC MC DOPS CBD AUD ME FCEM MCEM

Objectives	Knowledge	Skills / Attitudes	Learning	Assessment
	of the spine.	To safely 'clear' the c-spine. **Attitudes** To communicate sensitively and accurately to the patient and their relatives the nature of these injuries.		
To manage the child with a spinal injury	Understand the mechanisms and risk of spinal injury in children	**Skills** Be able to manage the anxious immobilised child Be able to examine the spine and apply the indications for being able to clinically 'clear' the spine	LP LT GT PS LS SL ODA	OC MC DOPS CBD AUD ME FCEM MCEM

Spinal injury

A4.6: Maxillo-facial Trauma

Objectives	Knowledge	Skills / Attitudes	Learning	Assessment
To identify those patients with maxillo-facial trauma, specifically those that may have airway threat. To be able to characterise maxillo-facial injuries.	Anatomy and physiology of facial structure Nasal fractures Le Fort fractures Mandibular fractures/dental fractures/ avulsed teeth/orbital fractures. Zygomatic fractures To be able to identify underlying structures at risk from facial lacerations, specifically parotid duct, facial nerve and lacrimal duct.	To be able to recognise a threat to the airway – initiate emergency treatment and call for help. Assess the facio-maxillary bones and associated structures. Identify those patients who will need inpatient or outpatient care. To be able to manage torrential nasopharangeal bleeding Avoidance of facial tattooing by thorough cleansing. To ensure a good cosmetic result after	LP LT GT PS LS SL ODA	OC MC DOPS CBD AUD ME FCEM MCEM

Objectives	Knowledge	Skills / Attitudes	Learning	Assessment
	TMJ dislocation Tongue laceration. Soft tissue injury and wounds to the neck.	facial suturing		

Maxillo-facial trauma

A4.7: Burns

Objectives	Knowledge	Skills / Attitudes	Learning	Assessment
To be able to evaluate patients with burns. To be able to commence resuscitation and refer appropriately whilst providing effective analgesia. To manage minor burns.	Know and understand the pathophysiology of burns. To recognise the particular risks to the upper airway from heat and lower airway from inhalation injury. To be able to assess the size and depth of a burn and calculate the fluid loss. To recognise the importance of burns in special areas (i.e. face, joints, perineum). Have knowledge of electrical and chemical burns (e.g. hydrofluoric acid).	To recognise the burns patient who has an airway at risk and the need for early intubation. The A, B, C, D approach. To be able to calculate fluid replacement. To identify those patients that need referral to a specialist centre. To be able to manage minor burns and arrange appropriate follow up. To be able to undertake escharatomy	LP LT GT PS LS SL ODA ODB	OC MC DOPS CBD AUD ME FCEM MCEM
To manage the child	Be able to calculate % burn surface	**Skills**	LP	OC

Objectives	Knowledge	Skills / Attitudes	Learning	Assessment
with burns	area for children.	Be able to recognise possible patterns of child abuse in burn injuries and make the appropriate referral.	LT GT PS LS SL ODA ODB	MC DOPS CBD AUD ME FCEM MCEM

Burns

A5: Generic objectives for musculoskeletal conditions

Objectives:

- To be able to take an appropriate history, examination, investigation and initiate treatment of patients presenting with musculoskeletal pathology. This includes splintage, POP and pain relief.
- Emergency Physicians should be aware of the predicted clinical course and specific complications for these conditions.
- Recognise those that need further in- patient/outpatient care, the role of physiotherapy and those who can be discharged directly from the Emergency Department.
- Detailed knowledge including plain radiology of both traumatic and atraumatic pathologies is required (see below for specific anatomical regions).

Specific paediatric objectives

- Understand the likely types of soft tissue and bony injuries for each age group
- Be able to judge if these relate correctly to the stated mechanism of injury
- Be aware of rheumatological, infectious, malignant and non-accidental causes of musculoskeletal presentations
- Be able to examine a child in a way which localises the injury
- Understand the Salter-Harris classification of epiphyseal injuries
- Understand the likely time-frame for recovery in children

A5.1: Upper limb

Anatomical region	Knowledge	Skills / Attitudes	Learning	Assessment
Shoulder region.	**Trauma** Fracture of the clavicle, proximal humerus, scapula, ACJ and SCJ injuries Dislocation of shoulder, Rotator cuff injuries. **Non-trauma** Sub acromion bursitis Supraspinatus tendonitis Ruptured biceps tendon Shoulder joint inflammation including capsulitis and impingement syndrome	To be able to examine the shoulder region, identify injuries and any associated neurovascular problems. To be able to safely reduce a dislocated shoulder (anterior/posterior) and treat any associated conditions appropriately. Ensure appropriate follow up including physiotherapy. To be thorough and to identify serious underlying pathology, e.g. pathological fractures. Application of broad arm sling / collar and cuff / U slab	LP LT GT PS ODA	OC MC ME FCEM MCEM

Anatomical region	Knowledge	Skills / Attitudes	Learning	Assessment
Long bones of the upper limb	**Trauma** Fractures of the humerus, radius and ulna. Understand their common fracture patterns and associations /complications. Compartment syndrome.	To be able to undertake appropriate examination and determine any associated injuries and the need for urgent intervention. To be able to interpret plain radiology. To be able to splint appropriately including application of above and below elbow POP	LP LT GT PS ODA	OC MC DOPS ME FCEM MCEM
Elbow	**Trauma** Supracondylar, radial head, olecranon, condyle fractures Dislocated elbow and pulled elbow. **Non trauma** Bursitis	Be able to exam the elbow region, identify injuries and any associated neurovascular problems. To be able to safely reduce a dislocated elbow / pulled elbow and treat the other conditions appropriately. To recognise which supracondylar	LP LT GT PS ODA	OC MC ME FCEM MCEM

Anatomical region	Knowledge	Skills / Attitudes	Learning	Assessment
	Tendonitis.	fractures require urgent orthopaedic referral.		
Wrist	**Trauma** Colles' / Smith's, scaphoid and Barton's fractures. Management of the "clinical scaphoid" fracture Fractures of other carpal bones. To be able to recognise dislocation of the carpal bones. **Non trauma** Tenosynovitis Carpal tunnel syndrome	To be able to recognise the conditions listed and safely reduce distal wrist fractures and identify carpal dislocations. Application of below elbow POP/short arm backslab Arrange appropriate follow up.	LP LT GT PS ODA	OC MC ME FCEM MCEM
Hand	**Trauma** To be able to identify metacarpal and	Reduction of phalageal dislocation and simple phalangeal fractures	LP	OC

Anatomical region	Knowledge	Skills / Attitudes	Learning	Assessment
	phalangeal fracture/ dislocations. To be able to evaluate wounds of the hand including nail bed injuries, nerve injury, foreign body, high pressure injection injury, amputations and crush injuries. Hand compartment syndrome Identify tendon injuries, Mallet finger and Boutoniere deformity. **Non trauma** Infections: paronychia, pulp space, flexor sheath infection, deep space hand infections.	To be able to assess the neurovascular function and tendon function of the hand. To be able to interpret x-rays. To be able to explore wounds appropriately and refer those who need inpatient care. Ideally tendons should be repaired by a hand surgeon especially flexor tendons.	LT GT PS ODA ODP (Hand Clinics)	MC ME FCEM MCEM

Upper limb

A5.2: Lower limb & Pelvis

Anatomical region	Knowledge	Skills / Attitudes	Learning	Assessment
Pelvis and hip.	**Trauma** Fractured neck of femur – types. Dislocation of the hip – types, including dislocation of THR. Pelvic fractures, sacral fractures, acetabular fractures, coccygeal fracture – types. To understand management of the exsanguinating pelvic fracture including the role of external fixation and arteriography/embolisation.	To be able to examine the hip, pelvis and SI joints. Recognise those patients who need urgent specialist care. To recognise the injury patterns and associations. Femoral nerve block and splintage of femoral shaft fractures. Apply a pelvic splint.	LP LT GT PS LS SL ODA	OC MC DOPS CBD AUD ME FCEM MCEM

Anatomical region	Knowledge	Skills / Attitudes	Learning	Assessment
Long bones of lower limb	Fractures of the femur, tibia and fibula Understand their common fracture patterns and associations / complications. Compartment syndrome.	To be able to undertake appropriate examination and determine any associated injuries and the need for urgent intervention. To be able to interpret plain radiology. To be able to undertake a femoral nerve block. To be able to splint appropriately, using Donway / Hare /Thomas splint	LP LT GT PS ODA	OC MC DOPS ME FCEM MCEM
Knee	**Trauma** Meniscal injury, Ligamentous injury (cruciate / collateral)	To be able to examine the knee in detail. Use plain radiography (Ottawa Knee Rules) appropriately.	LP LT GT	OC MC DOPS

Anatomical region	Knowledge	Skills / Attitudes	Learning	Assessment
	Dislocation and fracture of the patella. Dislocation of the knee and, knowledge of associated injuries. Tibial plateau fractures, fractured neck of fibula, supracondylar fractures. Gastrocnemius tear. **Non trauma** Acute arthritis / bursitis Quadriceps & patellar tendon rupture. Ruptured Baker's cyst	To be able to reduce a patella dislocation and knee dislocation with limb threatening vascular compromise. Application of knee immobiliser Arthrocentesis Above and below knee POP.	PS ODB	CBD AUD ME FCEM MCEM
Ankle	**Trauma** To understand the classification of ankle fractures.	To be able to examine and assess the ankle joint and identify who needs plain radiography (Ottawa Ankle Rules).	LP LT	OC MC

Anatomical region	Knowledge	Skills / Attitudes	Learning	Assessment
	To understand the grading of ligamentous injury and to recognise dislocation of the ankle joint. **Non trauma** Achilles tendonitis Achilles rupture.	Recognise those patients who need urgent reduction of a dislocated ankle, and to be able to reduce it. Recognition of those ankle fractures that require operative intervention.	GT PS ODA	DOPS CBD AUD ME FCEM MCEM
Foot	**Trauma** Talar, calcaneal, tarsal bone, metatarsal and phalangeal fractures. Sub-talar, talar, mid-tarsal, tarso-metatarsal dislocations. Crush injury of the foot. **Non trauma** Plantar fasciitis and metatarsalgia.	To be able to examine the foot. Recognise those patients who need urgent intervention (reduction of dislocations, compartment syndrome).	LP LT GT PS ODA	OC MC DOPS ME FCEM

Anatomical region	Knowledge	Skills / Attitudes	Learning	Assessment
	Stress fractures. Diabetic foot.			MCEM

Lower limb

A5.3: Spinal conditions

Anatomical region	Knowledge	Skills / Attitudes	Learning	Assessment
Spine	**Trauma** See Spinal Injury section above **Non trauma** Myotomes/Dermatomes. Cord syndromes, including cauda equina Low back pain – recognition of important causes. Ankylosing spondylitis, Rheumatoid Arthritis	To be able to immobilise the spine; log roll. Examine the spine. Understand the indications for radiology and interpret spinal X-rays. (http://www.nice.org.uk) Recognise associated injuries (neurogenic shock / spinal cord injury). Masking effect of spinal injury.	LP LT GT PS LS ODA	OC MC CBD AUD ME FCEM MCEM

Spinal conditions

A6.1: Vascular Emergencies - Arterial

Objectives	Knowledge	Skills / Attitudes	Learning	Assessment
To be able to under-take a history and examination focussed on the vascular system and identify those conditions that threaten life or limb.	The symptoms, signs, presentation, causes and treatment of peripheral ischaemia, abdominal and thoracic aortic aneurysms and aortic dissection. Mesenteric ischaemia. Intra-arterial drug injection Traumatic vascular injury and associated fractures/dislocations.	To be able to resuscitate, use appropriate investigations (bed side, ultrasound and CT) and to ensure timely referral to appropriate specialist.	LP LT GT PS ODA	OC DOPS CBD ME FCEM MCEM

Arterial emergencies

A6.2: Vascular Emergencies - Venous

Objectives	Knowledge	Skills / Attitudes	Learning	Assessment
Differential diagnosis of the painful / swollen calf. Venous occlusion / DVT	Investigation and management of DVT including role of risk stratification, d-dimers and ultrasound. Proximal vein thrombosis	Focused clinical examination to establish most likely diagnosis	LP LT GT PS ODA CDU/ODB	OC MC CBD AUD ME FCEM MCEM

Venous emergencies

A7.1 Abdominal conditions - Undifferentiated Abdominal Pain

Objectives	Knowledge	Skills / Attitudes	Learning	Assessment
To be able to take a full history and examination, elicit relevant physical signs, commence resuscitation and investigation.	To have knowledge of the causes of acute abdominal pain, including peptic ulcer disease, pancreatitis, (www.bsg.org.uk/clinical_prac/guidelines.htm) cholecystitis, cholangitis, biliary colic, bowel obstruction, diverticular disease, viscus perforation, acute appendicitis and ischaemic colitis, AAA, hernias, renal calculi, pyelonephritis, chronic inflammatory bowel disease, volvulus and the medical and gynae - causes of abdominal pain.	To have an A, B, C, D approach ensuring effective fluid resuscitation, pain relief and appropriate use of a nasogastric tube and antibiotics. Identify those who need resuscitation and urgent surgery. Those that require admission and those who may be safely discharged. Investigation using plain radiology, CT, ultrasound and blood tests.	LP LT GT PS ODA	OC DOPS CBD AUD ME FCEM MCEM

Abdominal pain

A7.2 Abdominal conditions - Haematemesis / malena

Objectives	Knowledge	Skills / Attitudes	Learning	Assessment
To be able to undertake appropriate history and examination and initiate appropriate treatment for patients presenting haematemesis	Causes. Indications for blood administration, central venous pressure monitoring, urgent endoscopy and surgical involvement Specific knowledge of the management of bleeding oesophageal varices, including understanding of the appropriate use of pharmacological agents Scoring systems/risk stratifications Guidelines for management of non variceal/variceal haemorrhage www.bsg.org.uk/clinical_prac/guidelines.htm	Recognition of shock. IV access in the shocked patient. Coordination of teams	LP LT GT PS ODA	OC MC DOPS CBD ME FCEM MCEM

Haematemesis

A7.3 Abdominal conditions - Anal Pain and Rectal Bleeding

Objectives	Knowledge	Skills / Attitudes	Learning	Assessment
To be able to undertake appropriate history and examination to establish diagnosis and initiate appropriate treatment with patients presenting with anal pain or rectal bleeding.	Know the causes of anal pain, specifically thrombosed haemorrhoids, anal fissure, anorectal abscess, pilonidal disease, rectal prolapse. To know the causes of lower G I bleeding To know the causes of rectal bleeding including haemorrhoids / fistula / tumour / colitis etc. Options for appropriate and adequate analgesia	Identify those patients who need admission and those who can be appropriately managed as an outpatient. . Recognition and treatment of shock.	LP LT GT PS ODA	OC CBD ME FCEM MCEM

Anal pain and rectal bleeding

A8: Urology

Problem	Knowledge	Skills / Attitudes	Learning	Assessment
Acute urinary retention.	To recognise patients with acute urinary retention, relieve symptoms and establish diagnosis. Suprapubic catheterisation – its indications and how to do it	Urethral catheterisation.	LP LT GT PS SL	OC DOPS ME MCEM
Acute scrotal pain.	Knowledge of the common cause of scrotal pain, i.e. epididymo-orchitis, testicular torsion, torsion of testicular appendix, trauma, and tumour. Understand the role of ultrasound.	Recognition that testicular torsion is an emergency and ensuring timely referral.	LP LT GT PS	OC CBD ME FCEM MCEM

Problem	Knowledge	Skills / Attitudes	Learning	Assessment
Other conditions	Priapism Renal colic/renal calculi Phimosis and paraphimosis Urinary tract infections Fracture of the penis Haematuria Gangrene of the scrotum Prostatitis		LP LT GT PS	OC CBD ME FCEM MCEM

Urology

A9: Sexually Transmitted Disease

Objectives	Knowledge	Skills / Attitudes	Learning	Assessment
Sexually transmitted disease including HIV	Common presentations Common pathogens Appropriate testing Complications	Appropriate investigation and referral to specialist. Symptomatic and sensitive handling Importance of relevant health care advice	LP LT GT PS ODA	OC ME FCEM

STD

A10: Eye problems

Objectives: To be able to evaluate those patients presenting with red or painful eyes and those suffering sudden visual loss. To be able to assess visual acuity and undertake ophthalmoscopy and slit lamp examination. To understand the pharmacology of ocular drugs. See below for specific ocular problems.

Problem	Knowledge	Skills / Attitudes	Learning	Assessment
Red eye	Conjunctivitis, corneal abrasions, corneal ulcers, keratitis, foreign bodies, ocular burns, scleritis, episcleritis	To be able to diagnose, recognise associations. Attempt removal of foreign bodies from the cornea and conjunctiva. To provide immediate treatment for those patients who have suffered ocular chemical burns.	LP LT GT PS ODA ODB	OC DOPS CBD ME FCEM MCEM
Sudden visual loss	Retinal haemorrhage, esp. diabetics Retinal vascular occlusions	To be able to undertake the examination to identify these conditions and ensure prompt referral.	LP LT	OC MC

Problem	Knowledge	Skills / Attitudes	Learning	Assessment
	Vitreous haemorrhage Retinal detachment Optic neuritis Central causes of visual loss		GT PS ODA	CBD ME FCEM MCEM
Painful eye	Glaucoma Uveitis, iritis	To be able to establish diagnosis and refer to ophthalmology	LP LT GT PS ODA ODB	OC CBD ME FCEM MCEM
Trauma to the eye.	To be able to recognise hyphema, lens	To be able to recognise these	LP	OC

Problem	Knowledge	Skills / Attitudes	Learning	Assessment
	dislocation, orbital floor fractures and penetrating injuries of the eye. Lacrimal duct injuries Retinal detachment Lid margin laceration	conditions and refer appropriately.	LT GT PS ODA ODB	CBD ME FCEM MCEM
Other problems	Cellulitis (orbital, pre-orbital and endophthalmitis). Dacrocystitis Eyelid disorders – blepharitis Keratitis, Cavernous sinus thrombosis		LP LT GT PD ODA	OC ME FCEM MCEM

Eye conditions

A11: ENT conditions

Objectives: To be able to undertake appropriate history, examination and investigation of patients presenting with ENT problems, ensuring appropriate treatment and referral. See below for specific ENT problems.

Problem	Knowledge	Skills / Attitudes	Learning	Assessment
Painful ear	Otitis media Otitis externa Cholesteatoma Perforated tympanic membrane Mastoiditis Foreign bodies	To be able to use an auroscope Prescribe appropriately Identify those who need ENT referral Removal of foreign bodies. Aural toilet / insertion of wick.	LP LT GT PS ODA ODB	OC CBD AUD ME FCEM MCEM
Epistaxis	Common causes including trauma and medication Assessment of nasal fractures	To be able to undertake anterior nasal packing / use nasal tampon. To be able to do posterior nasal	LP LT	OC DOPS

Problem	Knowledge	Skills / Attitudes	Learning	Assessment
		packing using a Foley catheter. Appropriate referral of nasal fractures. Identification of septal haematoma.	GT PS ODA ODB	ME FCEM MCEM
Sore throat Ludwig's angina Tonsillitis Pre-tonsillar abscess Retro-pharangeal abscess	Epiglottitis	To recognise these underlying pathologies and the risk to the airway and involve appropriate specialist in a timely fashion Indirect laryngoscopy	LP LT GT PS ODA ODB	OC CBD ME FCEM MCEM
Foreign bodies	Foreign bodes in the nose, ear, oesophagus, pharynx and larynx.	To be able to remove foreign bodies from the ear and nose and recognise those that need referral.	LP LT GT	OC DOPS CBD

Problem	Knowledge	Skills / Attitudes	Learning	Assessment
	Risks of button batteries.	Identify those with oesophageal foreign bodies and ensure prompt referral.	PS ODA	ME FCEM MCEM
Other problems:	Causes of vertigo – labyrinthitis etc. Salivary gland problems and oral pathology Sinusitis Facial pain – dental abscess/neuralgia VII Nerve palsy Laceration to ear and injury to underlying cartilage Post tonsillectomy bleed		DOPS CBD	ODB OC MC DOPS FCEM MCEM
Traumatic ear conditions in children	Be aware of the possibility of abuse in cases of ear trauma	Be able to remove foreign bodies in the ear canal or pinna	LP	OC

Problem	Knowledge	Skills / Attitudes	Learning	Assessment
		Be able to recognise a haematoma requiring surgical drainage	LT ODA	FCEM
Earache or discharge in children	Understand the presentation of otitis media and glue ear and their association with hearing loss in children	Be able to perform otoscopy correctly Be able to identify otitis externa and otitis media and treat them appropriately Recognise that language delay or attention deficit requires onward referral	LP LT ODA	OC FCEM
Acute throat infections in children	Be aware of life-threatening airway obstruction in epiglottitis, and how to avoid it	Recognise the potentially life threatening nature of post-tonsillectomy bleeding	LP LT	OC FCEM

ENT conditions

A12: Dental Emergencies

Problem	Knowledge	Skills / Attitudes	Learning	Assessment
Dental emergencies	Normal dental development. Dental abscess Dental fractures Avulsed permanent teeth Post extraction complications	To be able to replace and temporarily splint avulsed permanent teeth. To provide appropriate analgesia and antibiotic therapy for patients with dental abscess. Identify those that require immediate referral for drainage. To be able to perform a local anaesthetic dental block.	LP LT GT PS ODA	OC CBD ME FCEM MCEM

Dental emergencies

A13: Gynaecology

Specific paediatric objectives: Know how to assess and manage children and adolescents presenting with gynaecologic disorders to the Emergency department. Understand when referral for specialist paediatric gynaecology assessment is appropriate. Understand when referral to child protection team is appropriate. Ensure follow-up for children with sexually transmitted disease

Problem	Knowledge	Skills / Attitudes	Learning	Assessment
Abdominal Pain (ectopic pregnancy, endometriosis, complications of ovarian/corpus luteum cysts, pelvic inflammatory disease, ovarian torsion, complications of fibroids, dysmenorrhoea)	A knowledge of the differential diagnosis, diagnostic features, investigation and management of gynaecological abdominal pain An awareness of the more unusual presentations of ectopic pregnancy Diagnostic criteria for PID	**Skills** To be able to undertake a pelvic examination and use a speculum. To be able to take microbiological swabs from femal genitalia **Attitudes** To be sympathetic and respectful. Ensure a chaperon is present	LP LT GT PS ODA	OC DOPS CBD ME FCEM MCEM
Abnormal Vaginal Bleeding	Also see Obstetric section for bleeding in pregnancy	As above	LP	LP OC

Problem	Knowledge	Skills / Attitudes	Learning	Assessment
(menorrhagia, postmenopausal, post traumatic, cervicitis)	An awareness of the appropriate investigation, initial management and follow up of abnormal vaginal bleeding		LT PS	MC ME FCEM MCEM
Other (vaginal prolapse, cervicitis, Bartholin's abscess, emergency contraception, sexual assault)	An awareness of the appropriate investigation and management of these conditions Knowledge of the options and use for post coital contraception within the emergency department An awareness of the need for forensic evidence from assault patients and follow up requirements e.g. screening for STD	As above Acknowledge that personal beliefs e.g. regarding emergency contraception should not compromise a patients care		

A14: Obstetrics

Objectives: To safely manage emergencies / problems in pregnancy and establish a diagnosis. See below for specific conditions

Specific paediatric objectives: Understand when referral to child protection team is appropriate. Ensure specialist follow-up for children who are pregnant.

Problem	Knowledge	Skills / Attitudes	Learning	Assessment
Bleeding in pregnancy (inevitable abortion, missed abortion, threatened abortion, ectopic pregnancy, abruptio placentae, placenta praevia)	Normal physiological and anatomical changes of pregnancy Role of anti-D immunoglobin Safe and appropriate use of radiology in pregnancy	**Skills** Management of haemorrhagic shock including uterine displacement. Use of Pinard/Doppler **Attitudes** To ensure the early involvement of other specialists.	LP LT GT PS ODA	OC CBD ME FCEM MCEM
Eclampsia / HELLP syndrome	Management of D.I.C.	As above	As above	As above

Problem	Knowledge	Skills / Attitudes	Learning	Assessment
Trauma in pregnancy	Awareness of how trauma and pregnancy impact on one another Obstetric complications associated with trauma Role of anti-D immunoglobin Safe and appropriate use of radiology in pregnancy	As above Ability to lead an obstetric trauma team	LP LT GT PS ODA	OC ME FCEM MCEM
Emergency delivery (normal delivery, complications of labour and delivery e.g. cord prolapse)	Awareness of the normal physiological process and stages of delivery The management of common complications	Resuscitation of the newborn	LP LT GT PS ODA LS	OC ME FCEM MCEM

Obstetrics

A15: Cardiology

Objectives: To undertake a structured approach to the history, examination and investigation of patients presenting with symptoms that may be due to a cardiological cause. To be able to interpret the results of investigations such as ECG, chest x-ray and cardiac marker testing. See below for specific conditions.

Specific paediatric objectives: To have the knowledge and skills to be able to assess and initiate management of babies and children presenting to the Emergency department with cardiological disorders. To understand the life-threatening nature of some of these conditions and when to ask for the help of a cardiologist or those with more specialised expertise. To know the indications for cardiological investigations including ECGs at all ages and echocardiography.

Problem	Knowledge	Skills / Attitudes	Learning	Assessment
Chest pain	Causes (cardiac/vascular, respiratory gastrointestinal, locomotor, psychological, trauma/musculoskeletal, other)	Appropriate monitoring, treatment and investigation and be familiar with local guidelines for the management of patients with chest pain of possible cardiac origin and pulmonary embolism. To be able to risk stratify patients with chest pain and to be able to follow	LP LT GT PS LS SL ODA ODB	OC MC CBD AUD ME FCEM MCEM

Problem	Knowledge	Skills / Attitudes	Learning	Assessment
		appropriate departmental pathways.		
Acute coronary syndromes	Understand stable and unstable angina and myocardial infarction. (ACS) Pathophysiology of STEMI/non STEMI. Recognise ECG changes related to ACS, including right ventricular infarct and posterior infarct. Indications, contraindications and complications of thrombolysis. Adjunctive treatments. Indications for interventional cardiology. Causes of ST elevation in the absence of myocardial infarction. Management of left ventricular failure in the setting of myocardial infarction.	Recognise the need for urgent assessment and prompt treatment with thrombolysis when indicated. To be able to obtain assent for thrombolysis. To identify and treat complications such as arrhythmias, pulmonary oedema and hypotension.	LP LT GT PS LS ODA ODB	OC MC CBD AUD ME FCEM MCEM

Problem	Knowledge	Skills / Attitudes	Learning	Assessment
	Management of cardiogenic shock Pharmacology of cardiac drugs.			
Patients presenting with syncope.	Causes (cardiac, neurological, endocrine and others) To be able to risk stratify. Appropriate diagnostic testing of patients with syncope.	To be able to identify those patients that require admission, those that need out patient follow up and those that can be safely discharged. To work with support services closely e.g. Syncope Clinics etc.	LP LT GT PS ODA	OC MC CBD ME FCEM MCEM
Patients presenting in heart failure.	Causes, precipitating factors and prognosis. Knowledge of which drugs to use, contraindications and side effects. Non-invasive ventilation. Understand pathophysiology of cardiac	Initiate investigations to identify the cause. Initiate treatment including non-invasive ventilation. To be able to identify those who require invasive ventilation.	LP LT GT PS LS SL ODA	OC MC CBD ME FCEM MCEM

Problem	Knowledge	Skills / Attitudes	Learning	Assessment
	failure.			
Arrhythmias	ECG recognition of narrow and broad complex tachycardias and bradycardias. Indications, contraindication and side effects of anti-arrhythmic drugs. Knowledge of ALS guidelines for management of arrhythmias. Recognition of complex arrhythmias, eg Wolff-Parkinson-White in AF Indications for pacing.	To recognise and correctly identify arrhythmias. Ability to perform carotid sinus massage. Explain the valsalva manoeuvre. Perform DC cardioversion. Manage arrhythmias according to Resuscitation Council Guidelines. Use of external pacing equipment. To be able to manage those patients haemodynamically compromised	LP LT GT PS LS SL ODA	OC MC CBD ME FCEM MCEM
Severe haemodynamic compromise	Cardiogenic shock, secondary to myocardial infarction, massive PE, aortic dissection, valve rupture etc.	Recognise the need for rapid assessment. Initiate investigation and treatment.	LP LT	OC CBD

Problem	Knowledge	Skills / Attitudes	Learning	Assessment
	Emergency imaging including echocardiogram and CT. Role of thrombolysis / angioplasty / surgery. Use of inotropes.	Liaise with appropriate in-patient teams and co-ordinate investigation.	GT PS LS ODA	ME FCEM MCEM
Other topics.	Endocarditis Implantable cardiac devices External and internal emergent cardiac pacing Hypertensive emergencies Disorders of the myocardium and pericardium Valve disorders		LP LT GT PS ODA ODB	OC DOPS ME FCEM MCEM

Problem	Knowledge	Skills / Attitudes	Learning	Assessment
	Cardiac transplantation Congenital abnormalities as they present in adults Indications for exercise ECG testing			
Syncope in children	Understand the common causes of syncope	Be able to form a differential diagnosis for syncope Be able to recognise those patients who need immediate treatment, investigations and admission and those who can be managed as outpatients	LP LT GT	OC MC FCEM

A16: Respiratory Medicine

Objectives: To be able to undertake a history and clinical examination of the respiratory system and interpret the clinical signs. Detailed knowledge of investigations of the respiratory system including interpretation of blood gases and chest x-ray. Principles of invasive and non-invasive ventilation. Principles of oxygen therapy. See below for specific conditions.

Objectives	Knowledge	Skills / Attitudes	Learning	Assessment
Asthma	Pathophysiology of asthma. BTS Guidelines (http://www.brit_thoracic.org.uk/) Including who may be discharged. Detailed knowledge of drug therapy including magnesium. To recognise the difficulties of rapid sequence induction and ventilation in asthmatics	To be able to recognise acute severe asthma and institute emergency treatment. To be able to recognise early those patients with life threatening asthma who may require ventilation. To be able to organise safe discharge of patients suffering from an acute asthma exacerbation.	LP LT GT PS LS ODA	OC MC DOPS CBD AUD ME FCEM

Objectives	Knowledge	Skills / Attitudes	Learning	Assessment
				MCEM
Spontaneous pneumothorax.	Causes BTS Guidelines	To be able to aspirate a pneumothorax and insert a intercostal drain using open and closed (Seldinger) techniques	LP LT GT PS SL ODA	OC DOPS ME FCEM MCEM
Pulmonary embolism	Causes and risk factors. Differential diagnosis. BTS Guidelines (http://www.brit_thoracic.org.uk/) Severity stratification, investigation and initial treatment including anticoagulation, thrombolysis and thromboembolectomy	Recognise the need for urgent investigation (ECG, blood gas, analysis, echocardiography, CTPA) and treatment.	LP LT GT PS LS ODA	OC MC CBD AUD ME FCEM

Objectives	Knowledge	Skills / Attitudes	Learning	Assessment
	Other embolic phenomena, e.g. septic, air, amniotic fluid			MCEM
COPD	BTS Guidelines for the management of acute exacerbations of COPD. (http://www.brit_thoracic.org.uk/) Oxygen therapy, drug therapy. Management of type II respiratory failure. Pathophysiology of respiratory failure. Principles of non-invasive ventilation	To be able to initiate appropriate therapy. Recognise and treat precipitating factors (infection, PE, pneumothorax). Identify those who can be safely discharged. Assessment and timely initiation of non invasive ventilation in appropriate patients Recognition of those patients who need intubation and ventilation	LP LT GT PS SL ODA	OC MC DOPS CBD AUD ME FCEM MCEM
Pneumonia	Assessment and management of	To be able to undertake appropriate	LP	OC

Objectives	Knowledge	Skills / Attitudes	Learning	Assessment
	community acquired pneumonia according to BTS Guidelines. (http://www.brit_thoracic.org.uk/) Recognition of the severity of pneumonia. Knowledge of the causes of pneumonia and appropriate antibiotic therapy.	investigation (chest x-ray, arterial blood gases, full blood count, blood cultures). To be able to record the markers of severity of pneumonia. Identify co-morbidity (COPD, HIV, Cancer). Identify those patients needing ventilation and intensive care. To initiate O_2 / IV antibiotics. To identify those patients suitable for community care. To identify those patients with associated septicaemia.	LT GT PS ODA	MC CBD AUD ME FCEM MCEM

Objectives	Knowledge	Skills / Attitudes	Learning	Assessment
Respiratory failure	Identification of the causes of respiratory failure and knowledge of appropriate investigations. Indications for ventilation.	Recognition of those patients in respiratory failure. Initiate therapy, including oxygen and bag valve mask ventilation if needed. Identify those that need non-invasive ventilation/invasive ventilation.	LP LT GT PS LS ODA ODB	OC CBD ME FCEM MCEM
Other topics	Aspiration pneumonia. Acute lung injury Pleural effusion. Foreign body inhalation. Haemoptysis. Presentation of TB, neoplasia and lung abscess. Physical and chemical irritants		LP LT GT PS ODA	Respiratory medicine OC ME FCEM MCEM

Objectives	Knowledge	Skills / Attitudes	Learning	Assessment
	Non cardiogenic pulmonary oedema Pneumomediastinum Adult cystic fibrosis			
Acute stridor in children	Understand the infective, allergic and obstructive causes of this condition	Be able to institute appropriate acute airways management		
Asthma in children	Understand and be able to apply the British Thoracic Society (http://www.brit_thoracic.org.uk/) asthma guidelines for the management of asthma in children Understand the pharmacological therapies available and their indications and complications	Be able to recognize patients with life-threatening asthma who may require ventilation Be able to provide bag valve mask ventilation and recognise the need for intubation in life-threatening asthma	LP LT GT	OC MC FCEM

Objectives	Knowledge	Skills / Attitudes	Learning	Assessment
	Understand the indications and complications of drugs used in intubating severely asthmatic patients			
Bronchiolitis	Understand the common presentations of bronchiolitis	Be able to prioritise and interpret investigations and treatment Be able to formulate a differential diagnosis Be able to recognize other conditions with similar presentations including cardiac causes	LP	OC
Pneumonia in children	Understand the principles of management of community-acquired pneumonia according to local antimicrobial resistance	Be able to recognize the patient requiring admission and possible ventilatory support	LT GT	MC FCEM
Pertussis	Understand the age-dependent	Be able to initiate appropriate		

Objectives	Knowledge	Skills / Attitudes	Learning	Assessment
	presentations and indications for admission	treatment of patient and contacts Be able to identify those at risk of life-threatening complications		

Respiratory medicine

A17: Neurological Emergencies

Objectives: To be able to undertake a full neurological history and examination and interpret the clinical findings in the Emergency Department setting. To be able to undertake appropriate investigation, and manage those with life-threatening neurological emergencies. See below for specific conditions.

Specific paediatric objectives: To be able to perform a developmental assessment using typical milestones. To understand and use a range of communication skills with disabled children, their families and other professionals.

Problem	Knowledge	Skills / Attitudes	Learning	Assessment
Headache	Causes of headache presenting to the Emergency Department, in particular ▪ Subarachnoid haemorrhage, AV malformation, meningitis, encephalitis. ▪ Glaucoma ▪ Raised intracranial pressure. ▪ Temporal arteritis. ▪ Migraine and cluster headaches.	Initiate investigations to explore the differential diagnosis. Appropriate use of CT, ESR, LP. To be able to identify unusual headaches and liaise with Radiology / Neurology / Neuro-surgery. To be able to identify after appropriate investigation those who are suffering	LP LT GT PS ODA	OC MC CBD ME FCEM MCEM

Problem	Knowledge	Skills / Attitudes	Learning	Assessment
	▪ Sinusitis	from benign headache and therefore suitable to be discharged.		
Status epilepticus.	Understand the appropriate use of pharmacological agents Follow an algorithm for status epilepticus and be aware of complications and side effects Indications for general anaesthetic. Causes and complications. Diagnosis of pseudo-seizures	A, B, C, D, E approach. Initial focus on the readily remediable causes, but ability to retain a broader differential and appropriate investigation.	LP LT GT PS LS ODA	OC CBD ME FCEM MCEM
Coma	Assessment including GCS. Causes and treatment. Indications for intubation and	Stabilisation and initiation of investigations. Be able to undertake a detailed neurological examination of the	LP LT GT PS LS	OC MC DOPS CBD AUD

Problem	Knowledge	Skills / Attitudes	Learning	Assessment
	ventilation. Indications for imaging.	comatose patient	SL ODA	ME FCEM MCEM
Meningitis, encephalitis, brain abscess	Clinical features, antiviral and antimicrobial therapy, complications. Prognosis and differential diagnosis. Predisposing conditions, eg HIV etc.	Differential diagnosis, Urgent treatment Appropriate investigations: CT, LP antigen testing etc.	LP LT GT PS ODA	OC CBD ME FCEM MCEM
Cerebrovascular disease	Knowledge of the Royal College of Physicians guidelines for the Management of Stroke and TIA (http://www.rcplondon.ac.uk/) The aetiology of stroke, TIAs and stroke syndromes. Subarachnoid haemorrhage.	Recognise the value of Stroke Units. Ensure timely referral for further investigation of those patients suffering a TIA. Indications for thrombolysis	LP LT GT PS ODA	OC MC CBD ME FCEM

Problem	Knowledge	Skills / Attitudes	Learning	Assessment
	Carotid artery dissection. Venous sinus thrombosis.		ODB	MCEM
Others	Understand vertigo, ataxia and dystonia (causes and how to investigate and treat these patients). Detailed knowledge of the acute presentation of myasthenia gravis, Guillain-Barré syndrome, MS and tetanus. Knowledge of cranial nerve disorders. Knowledge of dementia & Parkinsonism. Knowledge of peripheral neuropathy and entrapment syndromes. Recognition of raised intracranial	Recognise own limitations and know how to obtain appropriate advice	LP LT GT PS ODA	OC ME FCEM MCEM

Problem	Knowledge	Skills / Attitudes	Learning	Assessment
	pressure and its initial treatment. Knowledge of the causes and management of hydrocephalus, shunts and their complications. Knowledge of the presentation of brain tumours.			
Meningitis/ Encephalitis in children	Understand the bacterial and viral aetiologies for all age groups and the appropriate antimicrobial / antiviral treatment	Be able to recognize and institute treatment for life-threatening complications, including raised intracranial pressure	LT LP	OC CBD
Seizures including status epilepticus in children	Know the differential diagnosis of seizures including febrile convulsions	Be able to recognize and treat the life-threatening complications Be able to institute appropriate management for status epilepticus (e.g. APLS protocol)		FCEM OC
Blocked shunt in children	Understand the presentation, complications and management of	Be able to tap a blocked shunt in a child with signs of impending herniation	LT	CBD

Problem	Knowledge	Skills / Attitudes	Learning	Assessment
	children with blocked shunts		LP	
Headaches in children	Know the causes and differential diagnosis in children	Initiate investigation and management		FCEM

A18: Hepatic Disorders

Objectives: To be able to undertake focussed history and examination of those patients presenting with symptoms and signs related to underlying liver disease. See below for specific problems.

Problem	Knowledge	Skills / Attitudes	Learning	Assessment
Liver failure (Acute, Acute on chronic)	Causes and precipitants. Specific complications including encephalopathy, sepsis, fluid and electrolyte balance, renal impairment, hypoglycaemia, coagulopathy, bleeding and malnutrition. Interpretation of LFTs	Initiative investigations to establish diagnosis and cause. To manage the complications of liver failure. Avoid precipitating/exacerbating drugs. Recognise the need to discuss with heptatologists	LP LT GT PS ODA	OC ME FCEM MCEM
Alcohol withdrawal syndrome	Identify this syndrome and its complications, e.g. Wernicke Korsakoff Syndrome.	Recognise the need for vitamin administration. Initiate appropriate drug treatment.	LP LT GT	OC ME FCEM

Problem	Knowledge	Skills / Attitudes	Learning	Assessment
		Involve other specialties e.g. psychiatry, social services, General Practitioner, rehabilitation services. To be sympathetic and non judgemental.	PS ODA	MCEM

Problem	Knowledge	Skills / Attitudes	Learning	Assessment
Other topics	Spontaneous bacterial peritonitis. Jaundice Liver transplant Alcoholic liver disease Hepatorenal syndrome Portal hypertension and variceal haemorrhage Hepatitis		LP LT GT PS ODA MFAEM	OC ME FCEM MCEM

Hepatic disorders

A19: Toxicology

Objectives: To be able to assess and initiate the management of patients presenting with toxicological problems. To be able to recognise common toxidromes, understand the role of antidotes. To be able to access poisons information and understand the legal, psychiatric and social aspects of overdose. To understand the pharmacology of common poisons. See below for specific problems.

Specific paediatric objectives: To understand the epidemiology and be able to identify the major types of ingestions by age. To understand how to manage the adolescent refusing treatment for a life-threatening overdose. To be aware of over dose as a self-harm presentation and know that repeated ingestions may be a presentation of neglect

Problem	Knowledge	Skills / Attitudes	Learning	Assessment
Poisoning and drug overdose.	Initial management of common poisonings with salicylates, paracetamol, antidepressants, opioids, benzodiazepines, carbon monoxide, SSRIs. (This list is not exhaustive.) The role of drug testing / screening. To be able to identify the psychiatric aspects of overdose.	**Skills** Assess and provide emergency care. To be able to use poisons information. and know the role of charcoal and alkalisation and antidotes. **Attitudes** To be sympathetic and non judgemental and supportive to those	LP LT GT PS ODA	OC CBD AUD ME FCEM

Problem	Knowledge	Skills / Attitudes	Learning	Assessment
		patients who have taken an overdose.		MCEM
Illicit drugs	Psychological and physiological effects of opioids, amphetamines, ecstasy, cocaine and alcohol. To understand addiction, dependence and withdrawal. To understand the role of rehabilitation services.	Recognise illicit drug use, acquire accurate history, and be able to use poisons information services.	LP LT GT PS ODA	OC ME FCEM MCEM
Other topics.	Industrial toxicology, pesticides, etc., bioterrorism, envenomation Ingestion of mushrooms and berries Carbon monoxide poisoning		LP LT GT PS	OC ME FCEM MCEM

Toxicology

A20: Acid Base and Ventilatory disorders

Objectives	Knowledge	Skills / Attitudes	Learning	Assessment
To be able to interpret arterial blood gases and establish the diagnosis or differential diagnosis. To understand how blood gas analysis can be used to determine treatment and monitoring.	Interpretation of arterial blood gas results. Alveolar Gas equation and A-a Gradient Metabolic (including lactic) acidosis. Acute and chronic respiratory acidosis, respiratory alkalosis and metabolic alkalosis. Anion and osmolar gap. Role of sodium bicarbonate as a therapeutic agent.	To be able to take an arterial blood gas from the radial or femoral artery safely. Arterial line insertion	LP LT GT PS	OC DOPS CBD AUD ME FCEM MCEM

A21: Fluid and Electrolytes

Objectives	Knowledge	Skills / Attitudes	Learning	Assessment
To understand the common electrolyte and fluid compartment changes and manage them safely.	Knowledge of volume and composition of the different fluid compartments. Know the constituents of common crystalloid and colloid solutions. Understand the common electrolyte fluid disturbances for sodium, potassium, magnesium, calcium and chloride and how they are managed.	Use of appropriate type of fluid and volume. Avoidance of fluid overload. To be able to treat the common electrolyte disturbances safely.	LP LT GT PS LS ODA	OC CBD ME FCEM MCEM
To understand acid-base and electrolyte abnormalities in children	Know the aetiology and pathophysiology of dehydration. Be familiar with the presentation of dehydration.	Be able to recognize the life-threatening complications of dehydration Be able to calculate and prescribe fluid replacement, maintenance fluids and	As above	As above

Objectives	Knowledge	Skills / Attitudes	Learning	Assessment
	Understanding of the presentation, investigation and treatment of life threatening electrolyte disturbances	replacement for ongoing losses as per APLS		

Electrolytes

A22: Renal Disease

Objectives: To be able to undertake history and examination, establish diagnosis, differential diagnosis and initiate management of common renal emergencies. See below for specific problems.

Objectives	Knowledge	Skills / Attitudes	Learning	Assessment
Acute renal failure	To be able to identify pre-renal uraemia, causes of oliguria, strategies to treat reversible causes of acute renal failure. Identify the patient with possible urinary tract obstruction. First line methods of investigating the severity and cause of acute renal failure. Indications for dialysis. Understand the different type of	Use clinical findings and laboratory results to detect and treat pre renal uraemia and urinary tract obstruction. Initiate investigations to identify the cause and assess the severity of renal failure. Liaise with renal physicians.	LP LT GT PS ODA	OC CBD ME FCEM MCEM

Objectives	Knowledge	Skills / Attitudes	Learning	Assessment
	dialysis and their complications.			
Urinary tract infections	To be able to diagnose lower urinary tract infection, pyelonephritis and recognise the patient with an infected or obstructed urinary tract. To be able to select appropriate antimicrobial agents and identify those patients who warrant further investigation, e.g. male with UTI. To be able to interpret urine dipstick, microscopy and culture results.	Identify those patients who require admission, those who require out patient follow up or those whose treatment can continue with Primary Care.	LP LT GT PS	OC CBD AUD ME FCEM MCEM
Patients with renal replacement therapy.	Recognise common emergencies in patients with a renal transplant or those on dialysis	Timely recognition and emergency treatment of life threatening conditions in these patients e.g. hyperkalaemia. To be able to initiate emergency management, identify those who need	LP LT GT PS	OC ME FCEM

Objectives	Knowledge	Skills / Attitudes	Learning	Assessment
		emergent dialysis and liaise with renal physicians.	ODA ODB	MCEM
Other topics.	Rhabdomyolysis, acute and chronic renal failure, haemolytic uraemic syndrome, hepato-renal syndrome. Haematuria, proteinuria Diabetes		LP LT GT PS ODA	OC ME FCEM MCEM
UTI in children	Understand the presentation, aetiology and management of urinary tract infections in the acute setting at different age groups Understand the range and accuracy of different methods of urine collection	be able to interpret common urine microscopic and culture findings and institute appropriate treatment according to local policy	LP LT GT	FCEM

Renal Medicine

A23: Diabetes and Endocrinology

Objectives: To be able to assess and initiate management of patients presenting with diabetic and the other common endocrinology emergencies. To understand the pathophysiology. See below for specific problems.

Specific paediatric objectives: The recognition of the life threatening complications of inborn errors of metabolism e.g. presenting as coma, hypoglycaemia. To be able to measure children accurately and assess their growth using appropriate growth charts

Problem	Knowledge	Skills / Attitudes	Learning	Assessment
Diabetic ketoacidosis	To be able to make the diagnosis and recognise the precipitating causes and undertake appropriate investigations. To be aware of protocols for the management of diabetic ketoacidosis.	**Skills** To be able to prescribe fluids, insulin and potassium appropriately. **Attitudes** To be meticulous and conscientious about reviewing and testing these patients regularly.	LP LT GT PS ODA ODB	OC CBD AUD ME FCEM MCEM
Hyperosmolar non-ketotic coma.	To be able to make the diagnosis and identify precipitating causes.	To prescribed fluids, insulin and potassium appropriately.	As above	As above

Problem	Knowledge	Skills / Attitudes	Learning	Assessment
Hypoglycaemia	Clinical features and precipitating causes.	To be able to measure blood glucose at the bedside. To be able to rapidly administer glucose and Glucagon.	LP LT GT PS	OC ME FCEM MCEM
Acute adreno cortical insufficiency.	To be able to identify the types and causes of insufficiency and to be able to recognise an adrenal crisis.	To be able to manage the emergency, initiate appropriate investigations and treatment.	LP LT GT PS ODA	OC CBD ME FCEM MCEM
Other topics	Thyroid storm and hypothyroid crisis Phaeo-chromocytoma Pituitary failure Diabetes Insipidus Complications of long-standing		LP LT GT PS ODA	OC ME FCEM MCEM

Problem	Knowledge	Skills / Attitudes	Learning	Assessment
	diabetes			
Diabetic ketoacidosis in children	Understand local and national guidelines for the management of diabetic ketoacidosis, including the principles of fluid management and insulin therapies	Be able to formulate a likely diagnosis and recognise features of the presentation and complications Be able to recognise the features of cerebral oedema and be able to provide emergency treatment Be able to perform appropriate investigations and act on the results Be able to prescribe fluid, electrolyte and insulin therapy according to local guidelines	LP LT GT PS ODA ODB	OC CBD AUD ME FCEM MCEM

Endocrinology

A24: Haematology

Objectives: By taking appropriate history, examination and investigation identify the following common haematological emergencies. See below for specific problems.

Specific paediatric objectives: To identify children presenting to the Emergency department with common haematological disorders. To understand the normal age-dependent haematological blood values

Problem	Knowledge	Skills / Attitudes	Learning	Assessment
Sickle Cell crisis and other common haemoglobinopathies	Understand their pathogenesis. Clinical features and precipitating circumstances. Complications: Sepsis, aplasia, acute sequestration, haemolysis. Treatment of crises and complications	Manage fluid balance and analgesia. Liaison with haematology. Patient education and prevention.	LP LT GT PS ODA	OC CBD AUD ME FCEM MCEM

Problem	Knowledge	Skills / Attitudes	Learning	Assessment
Disseminated intravascular coagulation.	Understand the pathophysiology. Diagnostic criteria. Recognition of underlying causes: trauma, massive transfusion, fluid, embolism, sepsis etc.	To initiate emergency treatment Close liaison with haematology Initiate investigations to identify the underlying cause.	LP LT GT PS ODA	OC ME FCEM MCEM
Other topics.	Anaemia, haemophilia, recognition of marrow failure, complications of anticoagulants, especially in the head injured patient. Management of overanticoagulation. ITP. Presentation of the common haematological malignancies.		LP LT GT PS ODA	OC ME FCEM MCEM

Problem	Knowledge	Skills / Attitudes	Learning	Assessment
Leukaemia / lymphoma in children	Understand the presentations	Be able to recognize and ensure referral		
Purpura and bruising in children	Understand the causes of purpura	Be able to recognise features in the presentation which suggest serious pathology including meningococcemia and leukaemia Be able to manage life- threatening causes of purpura Be able to recognize patterns suggestive of child abuse and organise care	LP LT GT	ME FCEM

Haematology

A25: Infectious Diseases and Sepsis

Objectives: To be able to identify after complete history, examination and investigation those patients suffering from infectious diseases. See below for specific problems.

Specific paediatric objectives: To understand the epidemiology, pathology and 'natural history' of common infections of the newborn and children in Britain and the public health policies associated with them. To be able to follow agreed national and local guidelines on the notification of infectious diseases

Problem	Knowledge	Skills / Attitudes	Learning	Assessment
In general	To be able to identify those patients who present as infectious disease emergencies, e.g. malaria, meningococcal septicaemia, Weils' disease, Tuberculosis, necrotising fasciitis and HIV. To understand the importance of universal precautions and vaccination (Tetanus Toxoid, Hepatitis B).	To recognise those patients whose presentation is due to infectious disease, initiate appropriate antibiotic and supportive therapy.	LP LT GT PS ODA	OC MC CBD ME FCEM MCEM
Sepsis	Definition of sepsis, severe sepsis,	Assess severity.	LP	OC

Problem	Knowledge	Skills / Attitudes	Learning	Assessment
	septic shock and systemic inflammatory response syndrome. Early goal directed therapy. Complications of sepsis. Typical sites of origin and microbiology. Understand the pathophysiology of sepsis causing shock.	Select appropriate investigations. Recognise and rapidly resuscitate sick patients with presumed meningitis, toxic shock syndrome and severe sepsis / shock. Indications for vasopressors, and their initiation. To be able to select the appropriate antibiotic.	LT GT PS ODA ODB	CBD ME FCEM MCEM
Immunocompromised hosts.	To be able to identify those patients who are immunocompromised and have atypical presentation of infection (e.g. the elderly, those on steroids or other immunosuppressive drugs, chemotherapy, HIV).	High index of suspicion of infection especially in the higher risk patient population. To liase with the appropriate specialists regarding investigation and treatment	LP LT GT PS	OC CBD ME FCEM

Problem	Knowledge	Skills / Attitudes	Learning	Assessment
			ODA	MCEM
Needlestick injury.	To identify those patients who need prophylactic treatment (HIV, hepatitis B, Tetanus). To understand the departmental needle policy.	Selection of appropriate investigations and treatments. Undertake procedures safely and ensure safe disposal of sharps. Recognise the importance of universal precautions.	LP LT GT PS	OC AUD ME FCEM MCEM
Fever from abroad.	Likely causes, especially malaria, typhoid, TB and sexually transmitted diseases.	To be able to take a travel history and check vaccination/prophylaxis especially compliance. To be able to select appropriate investigations.	LP LT GT PS ODA	OC CBD ME FCEM MCEM
Febrile child	Understand the implication of fever without a focus in different age groups	Be able to appropriately investigate and treat children with fever without a focus in all age groups	)) LP	OC
Kawasaki disease	Understand and recognise the signs of Kawasaki disease	Be able to recognise and manage life-threatening complications of Kawasaki Disease	) LT))	CBD FCEM

A26: Dermatology

Objectives: To be able to assess patients with dermatological problems. To be able to describe dermatological lesions and recognise dermatological emergencies. See below for specific problems.

Problem	Knowledge	Skills / Attitudes	Learning	Assessment
Life-threatening dermatological emergencies (e.g. toxic epidermal necrolysis, Steven Johnson syndrome, staphylococcal scalded skin syndrome erythroderma, pemphigus,	Causes, emergency management and complications.	Assess mucosal involvement and systemic effects including estimation of fluid requirements. Start treatment rapidly. Liaise with dermatological and ophthalmology specialists.	LP LT GT PS ODA	OC CBD ME FCEM MCEM
Urticaria Angio-oedema Anaphylaxis	Understand precipitating causes associations and complications. Understand the pathophysiology of these conditions.	Assess airway patency and manage upper airway obstruction and initiate rapid treatment. Knowledge of anaphylaxis guidelines.	LP LT GT	OC CBD ME

Problem	Knowledge	Skills / Attitudes	Learning	Assessment
		(http://www.resus.org.uk) To be able to safely identify those who are suitable for discharge and those who need further observation. Recognise the importance of a follow up (allergy clinic) and the role of the Epipen.	 PS LS ODA	 FCEM MCEM
Cellulitis, erysipelas, impetigo, necrotising infection	Causal microbial agents and appropriate antibiotics. Knowledge of associated underlying problems	Identify those patients who are systemically unwell and require admission, those who may be managed as an outpatient. To identify those who have abscess formation and organise drainage.	LP LT GT PS ODA	OC MC CBD AUD ME FCEM MCEM
Cutaneous Drug Reactions	Patterns and common precipitants. Serious complications, e.g. Stevens-Johnson syndrome.	To be able to assess mucosal involvement, especially the airway.	LP LT GT PS ODA	OC ME FCEM MCEM

Problem	Knowledge	Skills / Attitudes	Learning	Assessment
Other topics.	Dermatitis, eczema, viral xanthems, macular rashes, maculopapular lesions Erythema multiforme and erythema nodosum Herpes Zoster. Dermatological manifestations of underlying systemic and neoplastic diseases. Skin malignancies. Blistering and purpuric rashes, especially meningococcal septicaemia.		LP LT GT PS ODA	OC ME FCEM MCEM
Eczema and seborrheic dermatitis in children	Understand the common treatments for eczema and reasons for treatment failure	Be able to manage eczema and seborrheic dermatitis Be able to advise patients and families about disease process and rationale for treatment	))) LP) LT) GT)	OC FCEM

Problem	Knowledge	Skills / Attitudes	Learning	Assessment
Rash in childhood	Know common childhood exanthemata.	Be able to advise on risk of contact with e.g. pregnant women	))	

Dermatology

A27: Rheumatology

Objectives: To be able to assess and initiate management of patients presenting with rheumatological problems, e.g. exacerbations of neck pain, shoulder pain, back pain. Specifically to be able to examine all joints, and interpret signs of rheumatological disease. See below for specific problems.

Problem	Knowledge	Skills / Attitudes	Learning	Assessment
Acute monoarthritis	Causes and disease associations	To be able to initiate investigations Joint aspiration. To explore the differential diagnosis and specifically to identify those patients who may have septic arthritis. Identify those patients who require admission.	LP LT GT PS ODA ODB	OC MC DOPS ME FCEM MCEM
Acute low back pain.	See Spinal Conditions above To know the causes – malignant,	To be able to initiate investigations to explore the differential diagnosis.	LP LT	OC MC

Problem	Knowledge	Skills / Attitudes	Learning	Assessment
	septic, locomotor, renal, urological, neurological, AAA. Cauda equina syndrome. Guidelines for the treatment and investigation of acute low back pain.	Identify when to consult with other specialties e.g. orthopaedics /neurosurgery Understand when plain radiology is required.	GT PS	CBD ME FCEM MCEM
Other topics	Acute polyarthritis and Crystal arthropathies Osteoarthritis Rheumatoid arthritis (including cervical spine and masking of septic arthritis) Tendonitis / Tenosynovitis Bursitis		LP LT GT PS ODA	OC ME FCEM MCEM

Problem	Knowledge	Skills / Attitudes	Learning	Assessment
	Peripheral nerve syndromes Complications of drugs used in rheumatic diseases Reflex sympathetic dystrophy			

Rheumatology

A28: Child Protection and Children in Special Circumstances

Problem	Knowledge	Skills / Attitudes	Learning	Assessment
Physical abuse	Understand the signs of physical abuse Understand the signs of common injury or illness that may mimic physical abuse Understand the common fractures seen in physical abuse	Be able to recognise patterns of injury or illness which might suggest child abuse Be able to initiate child protection procedures as per local policy	LP LT GT	OC CBD FCEM
Sexual abuse	Understand the ways in which children might reveal sexual abuse Understand and recognise the signs and symptoms of sexual abuse. Understand the importance of seeking help from experienced colleagues help in the assessment of children where	Be able to institute appropriate child protection procedures if sexual abuse suspected.	LP LT GT	OC CBD FCEM

Problem	Knowledge	Skills / Attitudes	Learning	Assessment
	child abuse might be an issue.			
Neglect	Understand the ways in which children may present with neglect	Be able to refer appropriately	LP	OC
Apnoeic episodes as an infant and a presentation of NAI/factitious or induced injury	Be aware of this as a possible presentation of imposed airway obstruction and know the indicators that this may be the case Understand the life- threatening nature of imposed airway obstruction	Refer to an experienced colleague for help	LP LT GT	OC CBD FCEM
Best Practice	Know the relevant national documents which underpin child protection policy in the emergency setting	Ability to translate recommendations into appropriate actions on a case by case basis and follow local guidelines		
Legal framework	Understands consent, capacity to take decisions, and confidentiality in relation to children, and is aware of the issues of parental responsibility	Can engage children appropriately in their own decisions and protects the best interests of the child at all times	LP LT GT	OC FCEM
Child protection and welfare systems outside of hospitals	To have a basic understanding of the roles of other systems in protecting children, eg Social Services, the Child	To respect the roles of these other agencies and use them appropriately	LP GT LT	OC CBDS FCEM

Problem	Knowledge	Skills / Attitudes	Learning	Assessment
	Protection Register, Police Child Protection and Domestic Violence Units, SureStart, Childline, Health Visitors, School Nurses, Area Child Protection Committee, Community Paediatricians	To be aware of local agencies available, including the voluntary sector (e.g. drug and alcohol support)		
Categorisation of child protection and welfare issues	Understand the types of issues and terminology to describe these issues, e.g. neglect, physical abuse, factitious or induced illness (FII), looked-after children, children with special needs or learning difficulties	Accurately identify such problems in children at risk and be able to convey concerns to others	PS	FCEM
Ability to identify children in need	Know the range of conditions presenting as a symptom of abuse or psychological distress, e.g. deliberate self harm, aggression or risk-taking behaviour, recurrent abdominal pain, headaches or faints, recurrent attendances in young children	Reliably picks up clues which should give rise to concern Refers concerns on in all cases	LP LT GT	OC FCEM CBD
Documentation of	Knows national guidance on how much	Reliably documents concerns,		

Problem	Knowledge	Skills / Attitudes	Learning	Assessment
concerns	documentation is required	conversations with other professionals, and detailed descriptions of history or examination findings as appropriate.	PS	CBD
Infants at risk	Know which infants are most at risk	Can identify such infants in the emergency setting, e.g. excessive crying, infants with fractures, social circumstances which increase risk	LP	Child protection
Toddlers	Have a basic understanding of common problems e.g. toddler tantrums, food refusal	Refers problems back to the primary care team appropriately		
Schooling	To have an awareness of the effect of bullying, truancy, and work pressure upon children	Reports concerns to the school or school nurse, and involve parents where appropriate		

Child protection

A29: Neonatology

Objectives: To have the knowledge and skills to be able to assess and manage neonates presenting to the Emergency department. To be able to formulate a differential diagnosis for a variety of common presenting symptoms. To be able to lead a resuscitation team as per APLS / EPLS / NLS guidelines. To understand the pathophysiological processes leading to neonatal cardio-pulmonary instability, including the role of thermoregulation. To be able to identify neonates requiring admission, requiring midwife or health visitor input and identify mothers requiring additional support

Problem	Knowledge	Skills / Attitudes	Learning	Assessment
Cyanotic/non cyanotic congenital heart disease	Importance and relevance of duct dependant heart disease	Be able to identify those neonates requiring urgent specialist opinion	ILP LT GT	OC FCEM
Sepsis	Know symptoms and signs of sepsis in children e.g., hypothermia, apnoea Understand the importance of timely treatment and the range of treatments for likely pathogens	Undertake resuscitation and appropriate investigations	LP LT GT	CBD FCEM

A30: Environmental Emergencies

Objectives	Knowledge	Skills / Attitudes	Learning	Assessment
To identify, resuscitate, treat and appropriately refer environmental emergencies.	Heat stroke and heat exhaustion Drug related hyperthermias Hypothermia/Frost bite Electric burns / electric shock / lightning Decompression illness Barotrauma Near drowning Radiation exposure/ safety Industrial chemical incidents.	A, B, C, D approach To be able to provide specific treatments e.g. cooling / warming. Recognise associated problems e.g. myoglobinuria.	LP LT GT PS LS SL ODA	OC ME DOPS FCEM MCEM

Objectives	Knowledge	Skills / Attitudes	Learning	Assessment
	High altitude cerebral / pulmonary oedema Bites and envenomation (snakes)			

Environmental emergencies

A31: Oncology

Specific paediatric objectives: Identify children presenting to the Emergency department with common oncological disorders

Problem	Knowledge	Skills / Attitudes	Learning	Assessment
Complications related to local tumour progression.	Acute spinal cord compression (Cauda Equina syndrome). Upper airway obstruction. Malignant pericardial effusion. SVC syndrome. Malignant pleural effusion. ↑ ICP	To be able to recognise and provide initial emergency management Involve specialists urgently.	LP LT GT PS ODA	OC ME FCEM MCEM
Biochemical complications of malignancy	Hypercalcaemia of malignancy. Inappropriate ADH.	To be able to test for, diagnose and initiate treatment for these conditions.	LP LT GT PS	OC ME FCEM MCEM

Problem	Knowledge	Skills / Attitudes	Learning	Assessment
	Adrenocortical insufficiency.		ODA	
Complications related to myelosuppression (including sepsis, thrombocytopenia and haemorrhage)	To identify those patients at risk and to take appropriate microbiological samples. Initiate appropriate antibiotics.	Recognise urgency and need for oncological involvement.	LP LT GT PS ODA	OC CBD ME FCEM MCEM
Other topics	Paraneoplastic syndromes. Care of the terminally ill Pain management DNR orders / living wills		LP LT GT PS	OC CBD ME FCEM MCEM

A32: Psychiatry

Specific paediatric objectives:

- Understand normal behaviour patterns including response to injury and illness from birth to adolescence
- Be able to recognise abnormal child behaviour patterns
- Understand the influence of physical, emotional and social factors on development and health
- Understand excessive crying, its causes and the resources available to help families
- Understand about the roles of other professions, agencies and the voluntary sector
- Understand the emotional impact of hospitalisation on children
- Be able to recognise fabricated illness and injury in children
- Understand adolescent behaviour in maturation
- Be able to recognise, and refer patients presenting with self-harm
- Understand about the multi-disciplinary nature of child and adolescent mental health services
- Understand the signs and symptoms that indicate serious conditions such as depression and psychosis

Problem	Knowledge	Skills / Attitudes	Learning	Assessment
Deliberate self-harm/parasuicide	NICE guidelines for deliberate self-harm. http://www.nice.org.uk/ Risk factors for suicide. Liaison with psychiatric services.	Assessment of suicide risk. Management within the Emergency Department Appropriate referral and discharge. Identification of co-morbid psychiatric problems. Importance of prevention	LP LT GT PS ODA	OC MC CBD ME FCEM MCEM MCEM
Acute psychosis	Causes including organic. Initial management options including drug indications/contraindications.	Establish if organic causes present.	LP LT GT PS ODA	OC CBD ME FCEM MCEM
Alcohol and drug / substance related	See Toxicology section above	Recognition of associated conditions, e.g. head injury.	LP	LP

Problem	Knowledge	Skills / Attitudes	Learning	Assessment
problems (intoxication, dependence, withdrawal)	Identification for those patients warranting admission. Recognition of associated co-morbidities. Identification of those who are alcohol and drug / substance dependant.		LT GT PS ODA	OC MC CBD ME FCEM MCEM
Other topics	Violent behaviour (domestic, sexual assault, staff safety, restraint) Violence guideline: http://www.nice.org.uk/ Dementia – assessment and causes Difficult patient (malingering,	Management including de-escalation techniques Working with other agencies	LP LT GT PS ODA	OC MC CBD ME FCEM

Problem	Knowledge	Skills / Attitudes	Learning	Assessment
	personality disorder, frequent attender) Mental Health Law (UK countries) and place of safety			MCEM
Self-harm in children and adolescents	Recognise this as an expression of distress, acute or long-term Recognise self- harm as indicating serious emotional distress	To be able to refer to the Child and Adolescent Mental Health Service team	LP LT GT	Psychiatry OC FCEM

Psychiatry

A33: Principles of Pre-hospital care

Objectives	Knowledge	Skills / Attitudes	Learning	Assessment
To be sufficiently familiar with pre-hospital care systems to ensure optimal patient care across the pre-hospital / E.D. interface. This is the minimum requirement of all Emergency Physicians.	To have sufficient experience of pre-hospital care so as to understand the organisation of pre-hospital services, scene safety, protective clothing, patient care (including splintage and spinal immobilisation, resuscitation in the pre-hospital environment and patient transport). To be able to communicate effectively to the next link in the evacuation chain. To be able to prioritise multiple casualties.	To be able to work closely with Pre-Hospital staff, providing clear and concise “on-line” advice. Take a handover from the ambulance team. To be supportive and understanding, ensuring Pre-Hospital staff are part of the Emergency Department team.	LP LT GT PS LS ODA(Ambulance Service/BASICS/ HEMS) ODB	OC MC ME FCEM MCEM

Pre-hospital care

A34: Major Incident Management

Objectives	Knowledge	Skills / Attitudes	Learning	Assessment
To understand the role of the E.D. and its staff in major incidents, to understand the planning and to be prepared for a major incident. to be able to take a senior coordinating and command role in the reception phase of a major incident in the E.D. To know the role of the Medical Incident Officer.	Definition of major incident. Understand typical major incident plan. To participate in major incident exercises. Understand the importance of triage, communication, equipment and documentation for the major incident. To understand the term CBRN and its implications for casualty handling and care. To be familiar with PPE and how to use it.	To be a good communicator, (to be able to use the radio) calm, co-operative, flexible and demonstrate leadership within a team. Ability to triage. Work with other agencies	LP LT GT PS MIMMS SACC ODA	OC MC CBD ME FCEM MCEM

Objectives	Knowledge	Skills / Attitudes	Learning	Assessment

Major Incident

A35: Legal Aspects of Emergency Medicine

Objectives	Knowledge	Skills / Attitudes	Learning	Assessment
To be familiar and compliant with the legal aspects of Emergency Medicine.	Consent, capacity to consent, refusal to consent, and documentation. Reporting to the Coroner / Procurator Fiscal Rules 1984 and 1999 The role of the Expert Witness Privacy and confidentiality (access to Health Records Act 1990/ Data Protection Act 1998) Mental Health Act Child abuse, domestic violence. Medical conditions and driving.	To always have the patient's interest as central, whilst working within the legal framework and with legal agencies. Seek senior advice, including Medical Defence Societies and hospital legal departments. To be sensitive and sympathetic.	LP LT GT PS	OC ME FCEM MCEM

Objectives	Knowledge	Skills / Attitudes	Learning	Assessment
	Living Wills Death Certificates. Forensic: evidence, drug and alcohol testing, sexual assault. Road Traffic Act and Police Reform Act 2002, Giving evidence in Court. Freedom of Information Act 2000 Children's Act 1989 and 2004			

Legal aspects

A36: Research

Problem	Knowledge	Skills / Attitudes	Learning	Assessment
Literature evaluation	How to critically appraise the primary literature (especially therapy, diagnostic and meta-analysis papers).	Be able to search the common data bases (Medline, EMbase, CINAHL and Cochrane Library)	LP LT GT PS	ME FCEM MCEM
Which research design is best for the research question?	Common research designs: RCTs, Cohort studies, case studies. Sample size estimation and power calculation	Select the right design for the right question	LP LT GT PS	ME FCEM MCEM
Statistical testing	Hypothesis testing including type I and II errors Common parametric & non-parametric tests and confidence intervals. Understand RR, AR, NNT Diagnostic test descriptions (sensitivity,		LP LT GT PS	ME FCEM MCEM

Problem	Knowledge	Skills / Attitudes	Learning	Assessment
	specificity, likelihood ratios, ppv npv)			
Optional: Research question formulation.	Key characteristics of a good research question. Hypothesis formulation / research design. Ethical approval and application process.	To be persistent with the research idea, seek help from experienced researchers. To be able to use commonly available computer programmes e.g. SPSS.	LP LT GT PS	
Optional: Publication.	To know the standard research paper layout. Best BETS layout.	To develop authorship skills working with experienced authors.	LP LT GT PS	
Optional: Funding.	To know the common funding sources, e.g. College/BAEM, NHS R&D, MRC, Welcome Foundation.			

Problem	Knowledge	Skills / Attitudes	Learning	Assessment

Research

A37: Management

Objectives: The clinical leader in emergency medicine must possess and demonstrate management skills in order to enhance the quality of patient care. See below for specific topics.

Topic	Knowledge	Skills	Attitudes
General	Knowledge of NHS/Trust management structures Knowledge of PCT arrangements and impact on funding of Trusts Knowledge of payment by results and impact on Emergency Department funding	Access appropriate senior management and engage in discussion regarding development of the service Accountability Leadership	Value the contribution of managers and clinicians to the overall management of the health service
Physical design of departments	Design Equipment		
Human resources	Recruitment Job descriptions	To be able to write a job description Interviewing skills	

Topic	Knowledge	Skills	Attitudes
	Employment law Interviewing Consultant contract EWTD – junior doctors hours Skill mix Multidisciplinary working – legal responsibilities Non professional support staff issues Disciplinary procedures		
Finance	Budgets Business planning		

Topic	Knowledge	Skills	Attitudes
	Capital vs revenue Contracting and Commissioning		
Project work		Project planning Management of projects Modernisation projects	
GMC and probity issues	Relationship with drug companies Private work – medicolegal financial arrangements		

Management

Appendix 1: - MCEM – Part A syllabus

The objective of the Part A MFAEM is for candidates to demonstrate their knowledge and understanding of the application of key basic sciences in Emergency Medicine (EM).

Contents

Anatomy ..... Error! Bookmark not defined.
Upper limb ..... Error! Bookmark not defined.7
Lower limbr ..... Error! Bookmark not defined.4
Thorax ..... Error! Bookmark not defined.73
Abdomen ..... Error! Bookmark not defined.
Head and neck ..... Error! Bookmark not defined.
CNS 203
Cranial Nerve Lesion 209
Pathophysiology 210
Respiratory 211
CVS 211
Neurology 212
Renal 212
Haematology 212
Metabolic 213
Physiological measurements 214
Respiratory 214
CVS 214
Neurology 214
Renal 302
Haematology 215
Metabolic 215
Pathology 216
Inflammatory response 216
Immune response 216

Infection 216
Wound healing 217
Haematology 217
Pharmacology 218
Radiology 221
Recommended reading list 219

Basic Sciences Curriculum for Emergency Medicine

Introduction

Questions will be set based upon the listed topics which follow. Where appropriate, comments are included to guide you in relation to the depth of knowledge required.

Whilst learning the core content, remember that the importance of anatomy rests upon its implications for safe clinical practice. The functional effects of damage to a given structure are only predictable if you know the location and action of that structure. This is the important principle.

The content of the document has been derived through systematic analysis of expert group opinion. This methodology represents one of the best established ways of determining relevant knowledge.

Format

The document is arranged logically based upon anatomical regions. There is naturally some overlap between regions and this means that some structures may be mentioned more than once. This does not reflect a particular importance of that structure.

Learning the content

This document tells you what you need to know but does not tell you how to learn it. Individual learning styles vary from rote-remembering of lists to patient-based learning. What matters is that you find a leaning style which suits your abilities and aptitude: if you are finding this difficult, seek advice from your educational supervisor.

Feedback

Although the content of this document has been methodically developed, you may find errors in the grammar or format. Please feel free to let us know about any such errors, as only be receiving feedback can we improve.

SECTION I: UPPER LIMB

PECTORAL REGION

Muscles

Surface markings, actions and nerve supply of:

Pectoralis major
Pectoralis minor
Trapezius
Latissimus dorsi
Serratus anterior

Joints

Sternoclavicular and acromioclavicular joints – an appreciation of their role in producing pectoral movement and the fact that their stability rests upon ligaments. The role of the ACJ in force transmission following a fall.

AXILLA

Muscles (see also below)

Surface markings, actions and nerve supply of:

Subscapularis
Teres major

Contents

Appreciation that the axilla transmits the neurovascular bundle from the neck to the upper limb.

Axillary artey as a source of the blood supply to the circumflex humeral arteries. Detailed knowledge of the branches of the axillary artery NOT required.

Brachial plexus

Knowledge of its root derivation (C5-T1).

Broad appreciation of the root / trunk / division / cord structure.

Detailed knowledge of which nerves derive through which cord NOT required.

Appreciation of the potential for plexus damage based upon its position in the axilla.

BREAST

Lymph drainage pattern to nodes based upon quadrants of the breast: its significance for patients presenting with breast lumps and/or lymphadenopathy.

Appreciation of the landmarks for chest drain insertion.

SHOULDER

Muscles and movements

Actions and innervation of:

Supraspinatus
Infraspinatus
Teres minor

Deltoid

Knowledge of origins and insertions NOT required.

Knowledge of the muscles which exert group effects (eg abduction) at the shoulder joint and the means of clinical testing: an ability to describe shoulder movements according to muscle actions and an appreciation of the role of humeral & scapular rotation.

Shoulder joint

Joint type.

Stability factors of the joint – names of the ligaments which provide support (eg coracoacromial) and their positions in relation to the joint. The components of the coraco-acromial arch. The muscles and tendons which provide stability (eg rotator cuff).

THE ANTERIOR ARM

Note: the arm is divided anatomically to facilitate learning. Question stems may involve knowledge from several of these subsections.

Muscles and movements

Actions & innervation of:

Coracobrachialis
Biceps
Brachialis

Knowledge of origins & insertions is NOT required but an appreciation of the surface topography is required, for example in relation to the palpation of brachial pulsation in relation to biceps at the elbow.

Brachial artery

Appreciation of it being a continuation of the axillary artery.

Its anatomical landmarks for palpation.

Its main branches:

Profunda brachii
Muscular
Nutrient
Ulnar collateral
Terminal (radial & ulnar)

Appreciation that venae comitantes accompany the brachial artery.

Median nerve

Formation from medial and lateral plexus roots

Surface marking.

Musculocutaneous nerve

Territory of supply in anterior arm. Appreciation that it is the nerve of the flexor component of the arm.

Ulnar nerve

Surface marking.

Other nerves of the compartment

Knowledge of the territories of:

Medial cutaneous nerve of arm and forearm
Intercostobrachial nerve

Lymph nodes

Positions of the infraclavicular and supratrochlear node groups and the regions they drain.

THE POSTERIOR ARM

Muscles and movements

Actions & innervation of triceps

Radial nerve

Its position relative to the humerus and the clinical implications of this.

Surface marking.

Its role in supply to triceps.

Elbow joint

Joint type.

Bony articulations of the joint.

Ligaments of the elbow (collaterals and annular): their structure as bands of ligament (collaterla) and the role of the annular ligament in radial rotation.

Knowledge of the muscles which exert movement about the elbow. The range of movement of the joint in health and the risk of ulnar nerve palsy from pathological increase of the carrying angle.

THE ANTERIOR FOREARM

Muscles

Appreciation of a common origin from the medial humeral epicondyle.

Actions & innervation of:

Pronator teres
Flexor carpi radialis
Flexor digitorum superficialis
Palmaris longus
Flexor carpi ulnaris

Flexor digitorum profundus
Flexor pollicis longus
Pronator quadratus

Detail in relation to attachments and relations is NOT required but the surface topography in relation to injuries at any given point should be appreciated in order to predict possible muscular damage and functional disability.

Vessels of the compartment: arteries

Appreciation of the division of the brachial artery halfway through this region.

Radial artery: surface marking

Ulnar artery: surface marking and as source of common interosseous artery.

Wrist anastomosis

Derivation and location of the anterior and posterior carpal arches and their territory of supply.

Vessels of the compartment: veins

Appreciation of the fact that venae comitantes accompany the main arteries.

The cephalic, basilic and median forearm veins as the main superficial veins and broad knowledge of their location.

Nerves of the flexor compartment

Lateral and medial cutaneous nerves of forearm: supply territories.

Median nerve: Branches given off in this compartment and structures supplied. Its surface marking and the clinical implications of its division.

Ulnar nerve: Structures supplied in this compartment. Surface marking.

Radioulnar joints

Appreciation that the proximal (see Elbow above) and distal radioulnar joints allow rotational movement of these two bones.

Movement: muscles exerting and allowing flexion, extension and rotation (see also individual muscle names).

POSTERIOR COMPARTMENT OF THE FOREARM

Muscles and movements

Actions & innervations of:

Brachioradialis
Extensor carpi radialis longus
Extensor carpi radialis brevis
Extensor digitorum
Extensor carpi ulnaris
Supinator
Abductor pollicis longus
Extensors pollicis longus & brevis
Extensor indicis

Note – although detailed knowledge of attachments and relations is not required, particular focus should be given to the clinical effects of injury or division of any of these muscles or their tendons.

Anatomical snuffbox

Its position and anatomical boundaries.

Its clinical significance. Bones palpable within it.

Extensor retinaculum

Its position and attachments to bone.

The relations of the long extensors as they pass beneath it.

WRIST AND HAND

Note: The anatomy of this region represents key knowledge for Emergency Medicine. Although questions will focus on functional effects of injury, only by a thorough grasp of the arrangement of the structures listed can competence be gained. You are strongly advised to equip yourself with as detailed a knowledge of the hand as possible.

Movements of the wrist joint

Muscles which exert flexion / extension / adduction / abduction.

Palmar aponeurosis

Its structure (slips) and function (mechanical).

Flexor retinaculum

Its attachments.

Appreciation that the thenar & hypothenar muscles arise from it.

Structures which pass above and below the retinaculum.

Carpal tunnel

Its constituents: the separated tendons of the superficial flexors and the different arrangement of the deep tendon. Position of the median nerve in the tunnel.

Thenar eminence

Actions & innervation of:

Abductor pollicis brevis
Flexor pollicis brevis
Opponens pollicis

Hypothenar eminence

Actions & innervation of:

Abductor digiti minimi
Flexor digiti minimi
Opponens digiti minimi

Palmar arches

Appreciation that there are two arches in the palm. Their constituents and the territories supplied. The clinical implications of injury to the arches.

Digital nerves

Ulnar & median nerves: territories supplied and the particular importance of the recurrent branch of the median nerve. Surface anatomy of the digital nerves as they enter and supply each digit in relation to injury and anaesthetic field blockade.

Lumbricals and interossei

Lumbricals: derivation from profundus tendons.
Anatomical attachments.
Nerve supply & actions.

Interossei: derivations and grouping into palmar & dorsal groups.
The actions of each group.
Nerve supply.

The flexor sheaths

Appreciation of the disposition of the tendons within flexor sheaths in terms of infection in the thenar or midpalmar spaces and the risks to the lumbrical canals.

THE DIGITAL ATTACHMENTS OF THE LONG TENDONS

This section warrants a separate heading: a detailed knowledge is expected of the anatomy of the attachments of both the flexor and extensor tendons, particularly to allow understanding of the clinical effects of division or injury at any given level of the finger.

OTHER ASPECTS OF UPPER LIMB ANATOMY

Innervation

The dermatomal (segmental) supply of the limb (based upon standard dermatomal maps).

Muscular innervation: knowledge of the nerves implicated in all major upper limb movements (eg elbow flexion, adduction of the wrist).

Injuries to nerves: knowledge of the likely clinical effects resulting from:

Traction injury to the brachial plexus (Erb palsy);
All-root damage to the brachial plexus;
Axillary nerve damage (and common precipitants of it);
Radial nerve;
Ulnar nerve;
Median nerve.

UPPER LIMB BONY ANATOMY AND RADIOLOGY

Knowledge of osteology need extend ONLY to an appreciation of the key attachment points for soft tisues specifically mentioned above. Topographical anatomy of individual bones is NOT required.

Radiological anatomy is not explicitly assessed by MCQ but the other components of the examination will test knowledge of the key and common radiological landmarks in relation to clinical injury. These do not fall within the scope of this document.

SECTION 2 LOWER LIMB

General introduction

Required anatomy knowledge for lower limb follows the same principles as upper limb: emphasis is placed on those key structures which are of high clinical importance by virtue of their location, relations or actions. In learning the required content, approach the material from the viewpoint of shopfloor clinical practice. The MFAEM will assess your grasp of the lower limb anatomy detailed below.

You can assume that, where a given structure is *not* specifically listed, then details of it will *not be required.*

The limb is divided to facilitate learning but questions may contain material from several regions in one stem.

ANTERIOR THIGH

Superficial innervation

Dermatomal pattern of innervation.

The names of the specific nerves (eg genitofemoral) are *not* required.

Superficial arteries

Appreciation that cutaneous arteries arise from the femoral artery.
The names of the specific arteries (eg superficial epigastric) are *not* required.

Superficial veins

Great saphenous vein: Surface marking throughout the compartment
The common pattern of its tributaries

Lymph nodes / vessels

Location and drainage territories of the superficial and deep inguinal nodes.

Muscles and movements

Actions and innervation of: Sartorius
Iliacus
Psoas major
Pectineus

The group actions of these muscles as hip flexors and medial femoral rotators.

Actions and innervation of: Quadriceps femoris
Rectus femoris
Vasti lateralis, intermedius and medialis

The group actions of these muscles as knee extensors. Attachments *not* required.

Femoral sheath

Appreciation of its origin as a prolongation of extraperitoneal fascia.

Surface marking.

The femoral canal and femoral ring.

Femoral artery:	Surface marking at point of entry into thigh Details of its named branches (eg lateral circumflex femoral) *not* required
Femoral vein:	Surface marking and clinical significance (line insertion)
Femoral nerve:	Derivation (L2,3,4) Surface marking at point of entry into thigh Superficial and deep branches as the source of cutaneous and muscular supply As the source of the saphenous nerve

Patellar region

Patellar ligament and the patellar bone as a sesamoid bone.

The bony, ligamentous and muscular factors preventing lateral patellar draw.

MEDIAL THIGH

Muscles and movements

Adductors longus, brevis & magnus as the prime adductors of the hip. Their role in medial femoral rotation and the clinical test of their integrity.

Nerve supply of the adductors. Attachments *not* required.

Obturator externus: Actions and innervation (attachments *not* required).

Arteries and nerves

Profunda femoris artery as the key artery of the region supported by obturator artery.

Obturator nerve: Territory of supply

HIP JOINT & GLUTEAL REGION

Cutaneous innervation

Appreciation of supply via posterior and anterior rami of lumbosacral nerves: the dermatomal pattern.

Muscles and movements

Actions and innervation of:

Gluteus maximus
Gluteus medius
Gluteus minimus
Piriformis

Appreciation of piriformis, obturator internus and quadratus femoris as *synergistic* femoral lateral rotators and hip stabilisers: attachments *not* required.

Sciatic nerve

This nerve is highlighted as a key structure. You should know its derivation and surface marking at both the point of entry into the buttock and at the top of the thigh.

Clinical relevance for i.m. injections

Correct identification of the upper outer quadrant based upon regional landmarks.

Hip joint

Bony components of the acetabulum.

Ligaments of the joint as providers of stability:
- Transverse ligament
- Ligamentum teres
- Iliofemoral ligament
- Pubofemoral ligament
- Ischiofemoral ligament

Blood supply of the capsule and synovium

Nerve supply of the hip joint.

Movements: The prime movers in relation to:
- Flexion
- Extension
- Adduction
- Abduction
- Thigh rotation

POSTERIOR THIGH COMPARTMENT

Muscles and movements

Hamstrings

Names
Actions
Innervation
Clinical test of integrity

Sciatic nerve

Surface marking in this region and territory supplied

POPLITEAL FOSSA AND KNEE

The knee joint is complex and clinically highly relevant for Emergency Medicine. Your knowledge of the arrangement of the structures of the knee will facilitate a clearer understanding of the clinical symptoms and signs generated by anatomical injury.

Although detailed knowledge of the contents of the popliteal fossa is *not* required, pay attention to the highlighted material below which is of particular relevance and which may be assessed in MFAEM.

Boundaries and composition of the popliteal fossa

Structures comprising the boundaries of the fossa;

Arrangement of major neurovascular structures across the fossa – tibial nerve, politeal artery, popliteal vein, common peroneal nerve;

Position and technique for palpation of popliteal pulse.

Muscles and movements

Popliteus	Innervation Actions (on the femur / tibia and its role in lateral meniscus movement)

Knee joint

Bony anatomy	Appreciation of the way in which the condyles are anatomically adapted for the 'screw-home' movement (see below)
Capsule	Detail *not* required, but appreciation of its openings for popliteus & suprapatellar bursa
Ligaments	Tibial & fibular collaterals Oblique popliteal Cruciates Menisci

Although a detailed knowledge of the attachments and relations of these ligaments is *not* required, you should be aware of the principal actions and roles of each.

Bursae	Names and communications
Movements of the knee	Muscles effecting movement 'Screw-home' mechanism and 'locking' Role of menisci

Stability of the knee	Role of tibial spines, cruciates, muscles

ANTERIOR LEG

Muscles

Actions and innervation of:	Tibialis anterior
	Extensor hallucis longus
	Extensor digitorum longus
	Peroneus tertius
	Sartorius
	Gracilis
	Semitendinosus (see other regions)

Appreciation of the attachment of the patellar ligament and the disposition of the patellar bursae.

DORSUM OF THE FOOT:

Innervation

Cutaneous nerves supplying the dorsum (dermatomes and names)

Vessels

Dorsalis pedis artery :	As a continuation of the anterior tibial artery
	Its surface marking
	Knowledge of its branches not required

LATERAL LEG

Muscles

Actions & innervation of:	Peroneus longus & brevis
	Appreciation of their arrangement around the lateral malleolus

Appreciation of the insertions of the peronei and the clinical correlation to inversion injuries at the ankle.

POSTERIOR LEG (CALF)

Knowledge of calf anatomy assists in understanding the basis of deep vein thrombosis and compartment syndrome.

Appreciation that the calf muscles fall into two groups.

An understanding of the arrangement of the muscles and vessels of the calf in cross-section: the association of deep veins around soleus and the potential for DVT.

Muscles and movements

Actions and innervation of:	Gastrocnemius
	Soleus
	Flexor digitorum longus
	Flexor hallucis longus
	Tibialis posterior

Vessels

Posterior tibial artery:	As derived from the popliteal artery
	Surface marking at the medial malleolus
	Named branches not required

Nerves

Tibial nerve:	As the nerve of the flexor compartment
	Surface marking

SOLE OF THE FOOT

Appreciation that the sole is layered and that plantar arteries and nerves lie between the first and second layers. This has implications for the structures likely to be compromised when the sole is injured.

The four layers

Detailed knowledge of the muscles which lie within a given layer is *not* required but it is expected that candidates will know that the long flexor tendons lie within the second layer and that the tendons of tibialis posterior and peroneus longus are part of the fourth.

Appreciation that the neurovascular plane lies between the first and second layers.

Individual muscles

Actions & innervation of: Peroneus longus
Tibialis posterior

Knowledge of the sites of insertions of these to the bones of the feet.

ANKLE AND FOOT JOINTS ; JOINT DYNAMICS

Ankle joint

The weightbearing surfaces (talus & tibia)
The stabilising surfaces (malleoli)

Stabilising ligaments: Deltoid
"Lateral"

Knowledge of the attachments and function of these ligaments is expected.

Ankle movements

The role of the talus and the implications of its shape for joint stability in dorsiflexion and plantarflexion.

The axis of rotation of the ankle.

Tarsal joints

Names of the tarsal bones and their relations to each other.

Appreciation of the role of interosseous plantar ligaments: names *not* required.

Spring ligament: position
function

Foot movements

Candidates should possess sufficient anatomical knowledge to appreciate that inversion & eversion involve the midtarsal and subtalar joints and should know what bones make up these joints.

Muscles exerting inversion & eversion.

Supporting mechanisms of the foot

Knowledge of which parts of the foot rest on the floor when standing normally.

Constituent bones of the medial & lateral arches.

Appreciation of the prime muscular and tendinous factors in maintaining the medial arch and the fact that ligaments alone cannot maintain the medial arch if muscles are damaged.

The soft tissue factors contributing to lateral longitudinal arch stability.

LOWER LIMB INNERVATION

Candidates should possess sufficient anatomical knowledge to be able to predict the clinical effects of damage to:

Femoral nerve

Lateral cutaneous femoral nerve

Obturator nerve

Sciatic nerve

Common peroneal nerve

LOWER LIMB OSTEOLOGY

The normal x-ray appearances of the bones of the lower limb and foot should be known together with the names of all bones.

Common variants of normal will *not* be required in detail.

You should be aware of the typical radiological appearances of fractures of the femur, tibia, fibula, malleoli and foot.

SECTION 3 THORAX

Introduction

The level of knowledge required is stated below. Throughout, items with particular clinical significance are highlighted. Where structures are mentioned, the detail required is clarified.

THORACIC WALL

Thoracic body wall

The dermatomal innervation map of the thoracic body wall.

Appreciation of the structure of the body wall: ribs and their articulations; the particular articulations of the first rib (with T1 not C7).

Arrangement of muscles of the thoracic wall into three layers: details of the constituent muscles of the outer layer *not* required except for knowledge of the external intercostals as part of this layer.

Intermediate muscle layer: internal intercostals.

Innermost layer: innermost intercostals & transversus as main components.

Thoracic movements

The main muscular actions effecting a cycle of respiration.

The ‘pump handle’ and ‘bucket handle’ actions of upper/lower ribs and the anatomical rationale for these actions.

Movements of the abdominal wall in normal and abnormal respiration.

Appreciation of the central control of respiration.

Intercostal structures

The cross-sectional anatomy of an intercostal space. Implications for pleural aspiration and chest tube insertion.

Detailed knowledge of the derivation, course and territories of the intercostal nerves, arteries and veins is *not* required.

DIAPHRAGM

Appreciation of its essential respiratory role.

The surface markings of the diaphragm.

Openings and landmarks

The three main openings (aortic, oesophageal, vena caval) and their vertebral levels.

Innervation

Innervation from the phrenic nerve; the ramifications of the nerve on the muscle.

Actions

Appreciation of the ways in which the diaphragmatic movements contribute to inspiration and straining.

Herniations

Congenital and acquired: outline details only.

SURGICAL APPROACH TO THE THORAX

Knowledge of the key structures implicated in anterolateral or posterolateral thoracotomy or median sternotomy.

Candidates will be expected to know the anatomical disposition of structures routinely divided during thoracotomy and the nearby structures which are also at risk.

THORACIC INLET

The key aspect of knowledge here is an appreciation of the arrangement of structures at the inlet to allow understanding of the consequences of trauma or disease within this important region.

Anatomy of the inlet

Relations of the key structures to each other at the thoracic inlet: oesophagus, trachea, subclavian arteries, aortic arch, subclavian veins, brachiocephalic trunk.

A detailed knowledge of the anatomical course of the individual major structures is *not* required. The branches of the aortic arch should be appreciated but their anatomical course is *not* required. Likewise, apart from appreciation of the relations at the inlet, knowledge of the formation of the brachiocephalic veins and superior vena cava is not required.

TRACHEA

Appreciation of its primary functions and the adaptations it possesses for these functions:

Elastic walls;

Hyaline cartilage;

Mucous membrane

The anatomical landmarks defining its upper and lower extremities.

Appreciation of those structures which lie in close proximity to the trachea in the thorax (oesophagus, veins, arteries, lung) in relation to potential for injury or involvement in local disease processes. Detailed knowledge of the anatomical relations *not* required.

See also head and neck section.

THYMUS

Anatomical location and implications for injury or local pathology.

Natural history of regression after puberty.

HEART AND PERICARDIUM

General notes

Knowledge of cardiac anatomy and the structures surrounding the heart is vital for competent assessment of normal and abnormal function: auscultation and potentially life-saving interventions such as pericardiocentesis are both equally reliant on this knowledge.

Throughout this section, remember that knowledge of the following is *not* required:

Development of the sinuses of the serous pericardium;

The anatomy of the individual cardiac chambers;

The structure of the heart valves;

The anatomy of the conducting system *other than as specifically detailed below;*

The anatomy of the coronary arteries;

Development of the heart.

Focus your learning on those aspects of cardiac and perocardiac anatomy with relevance to clinical assessment, injury and disease.

Pericardium

The fibrous and serous layers and their roles.

Nerve supply of the fibrous perocardium and its role in the pain of pericarditis *vs* ACS.

Heart

Appreciation of the cardiac structures making up the borders and surfaces of the normally-orientated heart (eg right border = right atrium).

Surface markings of the heart.

Surface markings of the heart valves and also the auscultation positions for each valve.

Great vessels

Origins and relations of the ascending aorta and pulmonary trunk to each other as they emerge from their orifices.

Conducting system

Overview of the nature of the pathway; anatomical location of the SA and AV nodes and the nature of impulse transmission via left and right bundles.

Cardiac blood supply

Origin of the coronary arteries from the aortic root.

The two named principal branches of each coronary artery and the territory they supply; appreciation of the 'standard' description of the territories supplied by each coronary artery and the specific supply of the nodes.

Anatomy of the cardiac veins is *not* required.

Procedural anatomy

Candidates will be expected to know the procedural steps for pericardial aspiration and be able to relate this to relevant anatomical landmarks.

OESOPHAGUS

Anatomical extent (C6-T10).

Position of the oesophagus in relation to the vertebral bodies, left bronchus, thoracic aorta and pericardium en route to the diaphragm and the surface marking of the point where it pierces the diaphragm.

The points of constriction.

Oesophageal nerve supply in relation to referred pain.

PLEURA AND LUNGS

General note

As with cardiac anatomy, knowledge here is focussed upon clinical relevance. Items which are *not* required knowledge are:

Anatomical arrangement of the components of the lung roots;
Divisions / segments of the bronchi or their blood supply / lymph drainage;
Developmental anatomy.

Pleura

Parietal & visceral pleura: functions. Nerve supply.

Surface markings and implications for aspiration & drainage.

Lungs

Appreciation of the numbers of lobes in each lung; the overall structural arrangement of bronchi, pulmonary arteries and veins and the principles of subdivision within the lung substance.

The lung roots as key structures connecting lung with mediastinum and the contents of each root.

Fissures: the oblique fissures as key functional anatomy in normal respiratory excursion of the lung substance.

Surface markings of the hila, lungs and fissures.

Lymph drainage via hilar, tracheobronchial and mediastinal groups/trunks.

Nerve supply - autonomic (and implications for bronchial stimulation and pain perception) and appreciation of central control of respiration.

OSTEOLOGY

Ribs: typical arrangement. The costal groove and its clinical implication.

Knowledge of the functional anatomy of the bony thorax to allow understanding of the way in which the typical and atypical ribs and sternum work as a functional unit in respiration. The clinical consequences of injury to the bony cage: flail chest.

SECTION 4 ABDOMEN

Knowledge requirements focus on the applied anatomy of the abdominal wall and key internal structures. The detailed anatomy of individual organs is *not* required but aspects of importance are highlighted below for specific study.

Knowledge of the development of the gut (growth, movement, rotation) is *not* explicitly assessed, but having an overview knowledge of the topic facilitates understanding of the arterial supply and lymph drainage of the gut which may aid your learning.

Bear in mind that knowledge of the *cross-sectional anatomy of the abdomen as revealed by CT is highly important* in determining the extent of injury or disease. You should make every effort to familiarise yourself with normal and common abnormal cross-sectional CT films of the abdomen.

Abdominal wall

The standard regions of the abdomen and their lines of definition (eg epigastric, unbilical).

External oblique: Extent
Attachments
As the origin of the inguinal ligament

Internal oblique: Extent

Transversus: Extent

Rectus abdominis: Extent

The derivation of the aponeurosis between the two recti.

Nerve supply of anterior abdominal wall muscles.

Rectus sheath: Derivation from the obliques
Contents: Posterior intercostal nerves
Superior epigastric artery
Inferior epigastric artery

Actions of the abdominal muscles:

Truncal movement
Rib depression
Visceral support

Inguinal region

Knowledge of the inguinal region enables understanding of the basis of hernias as well as the procedural anatomy of line placement and regional nerve blockade.

Inguinal canal: Position
Roof, walls and floor

Origin of the superficial inguinal ring

Origin of the deep inguinal ring

Anatomical relations of the nerves, arteries & veins in the inguinal region and the position of psoas.

Testis, epididymis and spermatic cord

Components of the spermatic cord: vas, vessels and 3 covering layers.

Appreciation of the gross anatomy of the testis: structure *not* required.

Blood supply as being derived from aorta via testicular artery in the cord.

Lymph drainage: differentiation from scrotal drainage pattern.

Descent pathway: derivation of undescended testis & indirect inguinal hernias in infants.

Vas (ductus) deferens: As being derived from epididymal canal
As a component of spermatic cord
Its course through to prostatic urethra

Nerve supply of testis and epididymis

Topography of the abdominal cavity

Note: Knowledge requirements for this section relate to the anatomical implications of injury to the cavity. A detailed knowledge of the sacs, compartments and peritoneal folds of the abdomen is *not* required.

Appreciation of those abdominal organs possessing free mesenteries and those bound to the posterior abdominal wall.

Retroperitoneal *vs* intraperitoneal structures.

The implications of the above concepts for likelihood and patterns of injury following abdominal trauma and decelerative forces.

Peritoneum

Note: Knowledge of the compartments, ligaments and sacs is of direct relevance in relation to abdominal ultrasonography. Assessment at MFAEM level will not assume any experience of the technique.

Parietal and visceral peritoneum as a serous membrane; functional differences of the two.

Knowledge of the peritoneal folds and the greater and lesser sacs is *not* required.

Concept of the supracolic, infracolic and pelvic compartments.

Infracolic compartment

The transverse mesocolon as the division between this and the supracolic compartment.

Primary components of the right and left infracolic compartments.

The small intestinal mesentery: anatomical attachments (root) and role of encapsulated mechanoreceptors.

The sigmoid mesocolon: anatomical attachments.

Supracolic compartment

Appreciation of its position largely under cover of the costal limits of the thoracic cage.

Greater omentum: attachment around oesophagus, greater gastric curve and duodenum
its extent across the abdomen
its function

Knowledge of the lesser sac is *not* required.

Gastrointestinal tract

Abdominal oesophagus

Its anatomical landmarks (eg diaphragmatic opening at level of 7th costal cartilage) at both its diaphragmatic and gastric limits and the factors guarding against gastric reflux.

Anatomical relations in terms of the consequences of oesophageal rupture or penetration.

Stomach

The anatomical distinctions of fundus, body & pylorus: role of the pylorus in the digestive process.

Relations of the stomach: Diaphragm; greater omentum; spleen; transverse mesocolon. Implications for local spread of disease.

Arterial supply as being derived from the 3 branches of the coeliac trunk. Detailed knowledge of the arterial supply *not* required, but see below for note regarding vasculature of the alimentary tract.

Nerve supply: appreciation of the importance of vagal parasympathetic input via the anterior & posterior trunks and their main branches.

Small intestine 1: duodenum

Relation to aorta, pancreas & inferior vena cava.

Its largely retroperitoneal position and division into 4 parts: the vertebral levels corresponding to these divisions. Detailed relations of each section are *not* required.

Blood supply from the pancreaticoduodenal arteries.

Small intestine 2: jejunum, ileum

Anatomical position within free mesenteric margin: implications for injury.

Meckel's diverticulum as a site of potential ulceration / perforation.

Innervation: the importance of sympathetic supply from spinal segments T9/10 in referred pain.

Blood supply as being derived from the (midgut) superior mesenteric artery.

Large intestine 1: caecum

Position on peritoneal floor of right iliac fossa: implications of local relations (eg psoas fasciae & femoral nerve) for disease.

Position of appendix & common positional variants of its tip: McBurney's point.

Large intestine 2: colon

Position of the ascending, transverse & descending colon in relation to abdominal organs.

Appreciation of the mesentery and implications of arterial blockade for ischaemia or infarction.

Arterial supply as being derived from the (hindgut) inferior mesenteric artery.

Innervation: sympathetic supply from spinal segments T10-L2 & implications for referred pain.

Liver & biliary tract

Surfaces, relations and features of the liver

Surface marking.

The liver lobule as an architectural building block: function of the lobule, vessels, sinusoids.

The named four lobes of the liver: appreciation of their functional division into two halves. Detailed anatomy of lobes and segments *not* required.

The shape of the liver: presence of visceral & diaphragmatic surfaces.

Principal relations of the diaphragmatic surface (eg diaphragm, lungs, pleura). Position of vena cava and other key structures (eg porta hepatis) in relation to the gross structure of the liver. Detailed knowledge of relations *not* required.

The hepatic veins & IVC as providers of organ stability.

Blood supply via hepatic artery (and overview of its divisions) and portal vein: anatomical basis of the potential for one-sided liver infarction. Pattern of venous return.

Lymphatic drainage pattern and implications for spread of carcinoma.

Gall bladder

Gross structure, surface anatomy and principal relations.

Course of normal bile flow: location of Hartmann's pouch & implications for stone formation.

Details of histology, blood supply and lymph drainage *not* required.

Biliary ducts

Pattern of formation of common hepatic duct from tributaries.

The (common) bile duct as a 3-part tube: principal relations of each part and point of entry into ampulla of Vater.

Innervation: action of sympathetic & parasympathetic nerves in normal function. Basis of referred pain.

Portal vein

Appreciation of the five sites of portosystemic anastomosis and the implications of these.

Appreciation of the vein as being a continuation of the superior mesenteric vein & splenic vein.

Detailed anatomy of the portal vein *not* required.

Pancreas

Overview of the exocrine & endocrine function of the organ.

Surface marking.

Principal relations of the head, neck, body & tail.

Blood supply from the splenic artery (primarily): pattern of venous drainage & lymph drainage.

Innervation: basis of referred pain (T6-10).

Developmental details are *not* required.

Spleen

Functional overview: surface markings.

Palpation of the enlarged spleen: anatomical basis of differentiation of splenomegaly from retroperitoneal masses.

Details of vasculature/ innervation/ development *not* required.

Posterior Abdominal wall: muscles, vessels, nerves

General note

Required knowledge in this section focusses on those aspects of anatomy relevant to injury or disease in the emergency setting. A detailed knowledge of the course and many named branches of the abdominal aorta is not required, neither is knowledge of the course and relations of the IVC nor details of the umbilical, vitelline or cardinal veins.

Knowledge of the nerves of this region centres upon appreciation of the spinal nerve roots implicated in injury and disease. The detailed course of the individual named nerves (eg subcostal, ilioinguinal) is not required.

However, the prime importance of the femoral nerve mandates knowledge of its origin, position in the region and relations to psoas and iliacus.

Muscles

Psoas major: appreciation of its wide attachment and intricate relation to local nerves. Innervation. Actions on hip joint.

Quadratus lumborum: Relations to psoas major & transversus: actions & innervation.

Iliacus: actions & innervation.

Appreciation that each of these 3 muscles possesses strong fascial coverings. Detailed local anatomy *not* required.

Vessels

Surface markings of abdominal aorta and inferior vena cava.

The abdominal aorta as having 3 groups of branches in this region (single ventral gut arteries, paired visceral arteries, paired wall arteries).

Details of the named arterial branches (eg inferior phrenic) *not* required.

Inferior vena cava: primary tributaries (external iliac, lumbar, gonadal, renal, hepatic) and the areas drained by each.

Nerves

Branches of the lumbar plexus and the structures supplied by each of L1 - L4 (anterior & posterior divisions where applicable).

Overview only of the arrangement of the sympathetic & parasympathetic supply to the abdomen. Anatomical knowledge of the lumbar sympathetic trunk, lumbar ganglia & coeliac plexus *not* required.

Lymph nodes

Arrangement of nodes into pre- and para-aortic groups. Structures draining to each.

Kidneys, ureters and bladder

Note: anatomy of the suprarenals not required.

Kidney

Position & palpable aspects of the normal kidney. Movement of the kidney during normal respiration.

Appreciation of the intimate relation of the kidneys to diaphragm, abdominal wall muscles, pleural sacs & peritoneum; contribution of upper left kidney to stomach bed. Implications of these relations in injury and disease. Detailed anatomy of these relations *not* required.

The renal fascia as a determinant of the spread of perinephric abscess pus and the anatomical basis for this.

The renal arteries as fast-flowing vessels posterior to the pancreas. The segmental nature of renal arterial supply.

Lymphatic drainage to para-aortic nodes.

Understanding of the basis for renal colic pain: role of coeliac plexus, sympathetic trunk & spinal nerves.

Overview of the renal architecture: components of the nephron; medulla; cortex. Renin-secreting cells.

Details of kidney development are *not* required.

Ureters

Surface marking both clinically and radiographically.

Understanding of the basis of colic pain: see kidney.

Developmental and structural details are *not* required.

The potential for right ureteric proximity to the appendix and its consequences in disease.

Urinary bladder

Understanding of the broad structure: apex, base, inferolateral & superior surfaces. Points of entry of ureters.

The bladder in full & empty states: implications for injury.

Overview of control of micturition: effect of injury or disease above S2.

The basis of bladder pain via the lateral spinothalamic tract (see also later sections).

Developmental details *not* required.

The pelvic cavity

As before, knowledge requirements focus on the anatomical prrinciples for the emergency management of injury & disease.

You should examine and revise the bony components of the pelvis and know each bone's name, articulations with its neighbours and position on radiographs of the normal pelvis.

Obturator internus & piriformis: requirements stated in gluteal section above.

Appreciation of the pelvic floor as a muscular sheet: details of the muscles *not* required.

Understanding of the actions of the pelvic floor in postural and contractile tonus.

Knowledge of the pelvic fascia *not* required.

Rectum & anus

Candidates must know the general and gender-specific structures palpable on per rectal digital examination anteriorly, posteriorly and on either side.

Appreciation of the fact that the rectum arises from the sigmoid colon where the mesocolon ends, at the third sacral piece, without structural differentiation.

The anorectal junction as the point where muscle gives way to sphincters supported by puborectalis.

Location of the rectovesical fascia and its role in determining anterior carcinomatous spread from rectal neoplasms.

Innervation: sympathetic & parasympathetic supply: pain transmission.

The anal canal as the last 4cm of the adult alimentary tract: overview of the mechanism of defecation & its nervous control.

Detailed knowledge of the external & internal sphincters, ischiorectal fossa, perineal body, anococcygeal body and anal mucous membrane structure *not* required.

Lymph drainage: internal iliac & superficial inguinal (palpable in disease).

Cutaneous innervation of the anal skin: utilisation of anal reflex in neurological assessment.

Male internal genitalia: prostate

Size of normal adult prostate & immediate anatomical relations. Its penetration by the proximal urethra.

Knowledge of the lobular structure sufficient to appreciate the anatomical basis of prostatic hypertrophy (benign or potentially malignant).

Lymph drainage of the prostate: potential drainage to external iliacs and clinical implications if palpably enlarged.

Developmental details *not* required.

Anatomy of the vas (ductus) deferns & seminal vesicles *not* required.

Female reproductive system

Size and immediate prime anatomical relations (bladder, rectouterine pouch, ovary, intestine, ureter) of the adult uterus.

Division of the structure into fundus, body, cervix: detailed knowledge *not* required.

Uterine tubes: length, division into isthmus, ampulla, infundibulum. Locations of ectopic pregnancy.

Blood supply: the uterine arteries and their location in the broad ligament. Anastomosis with ovarian tubal arteries: implications for ectopic implantation.

Innervation of the uterus and tubes (*not* motor).

Knowledge of the internal uterine structure and its musculoligamentous supports *not* required.

Ovary: Location, and anatomical rationale for radiated pain to the medial thigh in disease.

Ovarian blood supply as derived from direct aortic branches.

Lymph draiange: para-aortic pattern, and additional potential for palpable inguinal lymphadenopathy in disease.

Innervation: to allow appreciation of the clinical presentations of ovarian pain.

Knowledge of the internal structure & development of the ovary *not* required.

Vagina: Size in the normal adult and immediate relations. Structures palpable on vaginal examination.

Details of blood supply, innervation & lymph drainage *not* required.

Knowledge of the anatomy of the female urethra is *not* required *except* for location of the opening into the vaginal vestibule.

Male urogenital region

It is important that candidates are aware of the anatomical complexity of the male urethra: this has implications in the management of pelvic trauma.

Although knowledge of the deep & superficial perineal pouches is *not* specifically required, understanding the nature of the perineal membrane & urogenital diaphragm allows a clearer understanding of the problems associated with damage to the male urethra.

Knowledge of the anatomy of the pudendal vessels and nerves is *not* required.

Specific knowledge requirements are shown below.

Urethra

Male urethra: its length in the adult. Division into prostatic, membranous & spongy parts.

Membranous urethra: anatomical extent, narrowness at the bladder neck, appreciation that it pierces the urogenital diaphragm.

Prostatic urethra: anatomical extent. appreciation that it is the widest part of the tube.

Penile (spongy) urethra: anatomical extent, curvature, mucosal folds.

Penis & scrotum

Scrotal lymph drainage and innervation (L1, S2, S3);

Appreciation of the cross-sectional anatomy of the penis: relative positions of corpora, blood vessels and urethra;

Penile innervation (S2).

Stability of the pelvis: joints and ligaments

Appreciation of the ligamentous factors enabling sacroiliac stability: locations of the sacrotuberous and sacrospinous ligaments.

Location of the iliolumbar ligament.

The sacrococcygeal joint: ligamentous stability.

Lumbar and sacral plexuses

Where appropriate, mention has been made of key knowledge requirements in relation to the lumbar plexus. A detailed knowledge of the courses of the derived nerves is *not* required. Likewise, although it is important to know the six branches which arise from the sacral segments (eg pudendal S2,3,4), the anatomy of these branches is *not* required.

Specific named nerves which *are* required knowledge are:

Sciatic (anatomical course and branches)

Common peroneal (anatomical course and branches)

Tibial nerve (anatomical course and branches in popliteal region & calf).

SECTION 5 HEAD AND NECK

Introductory comments

Key knowledge for the head and neck region relates to safe management of common injuries of the region, in particular the face. Appreciation of the anatomy of the neck facilitates an understanding of the causes of airway obstruction and the rationale for management of cervical spine injuries. There are several aspects of the anatomy of this region which are important to know in some detail, and some which are not required. These are highlighted throughout.

General topography: muscles, spaces & fascia

Appreciation of the topography in terms of:
Postvertebral extensor musculature;
Prevertebral flexor musculature;
Presence and function of prevertebral fascia;
The visceral of the neck as lying anterior to the prevertebral fascia;
The thyroid as being enclosed in pretracheal fascia;
trapezius & sternomastoid as lying withinn deep cervical fascia.

Specific requirements:

Deep cervical fascia as comprising 4 components (eg carotid sheath).

[Knowledge of the anatomy of each fascial component *not* required].

Tissue spaces of the neck: [prevertebral, retropharyngeal, parapharyngeal, submandibular]
Their locations;
The common pathways by which infection may spread from each;
Anatomical basis of Ludwig's angina.

Triangles of the neck: sternomastoid

Overview of its attachments;
Nerve supply [spinal accessory esp C2-3];
Actions [single muscle and action in pairs];
Clinical test of the muscle.

Triangles of the neck: anterior and posterior triangles

Knowledge of the boundaries and contents of the triangles is *not* required as a stand-alone item of knowledge, though an appreciation of the topography of the anterior triangle will benefit understanding of the specific structures within it which are highlighted below:

Suprahyoid and infrahyoid muscles:
Concept of suprahyoids acting as effectors of swallowing; individual detail *not* required.
Concept of infrahyoids acting as laryngeal depressors; individual detail *not* redquired.

Thyroid

Structural overview: lobes, isthmus. Relations (lateral, medial, posterior).
The position of the recurrent laryngeal nerve;
Attachment of isthmus to tracheal rings;
Blood supply - appreciation of risks of haemorrhage in trauma;
Lymph drainage pattern.

Developmental details *not* required.

Anatomy of the parathyroids *not* required.

Trachea

(see also earlier sections)
Its patency as being related to hyaline cartilage and trachealis;
Anatomical relations in the neck;
Landmarks for tracheotomy & trachesostomy.

Oesophagus

(see also earlier sections)
Anatomical relations.

Carotid sheath

See section on vasculature below: other details of its constituents *not* required.

Neck

Knowledge of the prevertebral muscles (recti, longus colli & capitis) *not* required *except* to appreciate that they act as weak neck flexors and lie beneath the prevertebral fascial layer.

Cervical sympathetic trunk:

The superior,middle and inferior cervical ganglia as the components of the trunk;
Appreciation of the somatic branches via grey rami sequentially from the three ganglia to C1-8;
Appreciation of the visceral branches to the cardiac plexuses;
Appreciation of the vascular branches especially to dilator pupillae;
Anatomical basis for Horner's syndrome (see also later sections).

Root of the neck:

Scalenus anterior as a syngergistic stabiliser of the neck: innervation from C5-6; attachments between C3-6 and the first rib.
Position of phrenic nerve across scalenus anterior: intimacy with the medial apex of the lung & vagus nerve;
Origin of right recurrent laryngeal nerve around subclavian artery;
Jugulo-omohyoid lymph node: location and role in drainage from tongue;
Subclavian vein: anatomical aspects of catheterisation in infraclavicular approach;
Subclavian artery: surface marking in the neck.

Knowledge of the detailed relations of scalenus anterior in the root of the neck is *not* required *except* in reference to the specific points highlighted above. Likewise, knowledge of scalenus medius and posterior is *not* required.

Face

Competent knowledge of facial anatomy is crucial to the safe management of injury and acute pathology. Failure to appreciate the anatomy can result in costly litigation.

Overview:

Facial muscle innervation as derived from the facial nerve (C7);
Generalised arrangement of orifice sphincters and dilators.

Eyelids:

Orbicularis oculi: position over frontal & zygomatic bones; innervation; actions.
Levaror palpebrae superioris & occipitofrontalis: see below.

Lips & cheeks:

Orbicularis oris: Appreciation of its incisive & mental slips and the integration with buccinator;
Innervation & actions of orbicularis oris.

Buccinator: Appreciation of its attachments to the jaws (detail *not* required); integration at modiolus; actions & innervation.
Modiolus: appreciation of its location & role in mastication.
Detail of the lip dilators (eg mentalis, risorius) *not* required.

Facial nerve in the facial region:

Emergence via stylomastoid foramen;
Appreciation of the named five branches emerging from the parotid: structures supplied by each and effects of paralysis:
Temporal
Zygomatic
Buccal
Marginal mandibular
Cervical

Sensory supply of the face:

Dermatomes of the face;
Named branches of the trigeminal nerve: appreciation of the anatomical basis of the clinical picture of herpes zoster / Sturge-Weber;
Ophthalmic nerve: named five cutaneous branches and territory supplied by each;
Maxillary nerve: named three cutaneous branches and territory supplied by each;
Mandibular nerve: named three cutaneous branches and territory supplied by each.

Arterial supply of the face:

Facial artery as being derived from external carotid;
Appreciation of its tortuous course to the medial angle of the eye;
Superficial temporal artery: derivation from external carotid; surface marking;

Venous drainage:

Appreciation that the facial vein communicates with the cavernous sinus;
Appreciation of the communication with the ophthalmic veins at the medial canthus;
Anatomical basis for cavernous sinus thrombosis: infections of upper lip & cheek.

Facial lymph drainage:

Pattern of drainage: submental, submandibular, preauricular.

Scalp

Occipitofrontalis: attachments, innervation & actions.

Arterial supply:

Appreciation of a rich anastomosing network between external & internal carotid branches.
Appreciation of profuse bleeding from scalp wounds due to the deep dermal attachments of the arteries in this region;
Named individual arterial territories (eg for posterior auricular artery) *not* required.

Venous drainage:

Appreciation that veins accompany arteries;
Communication between posterior auricular vein with mastoid vessels from sigmoid sinus: clinical implications.

Innervation:

Territories of occipital, auriculotemporal & zygomaticotemporal nerves.

Temporal fossa:

Location in terms of temporal lines & zygomatic arch;
Bony components of the zygomatic arch;
Appreciation of the vulnerability of key nerves in the fossa.

Temporalis: attachments, innervation & actions.

Parotid region

Masseter: attachments (overview- as being attached to zygomatic arch & mandible), innervation, actions.

Parotid gland:

Its anatomical location;
Awareness of its strong capsular covering (sheath) and clinical implications in gland swelling;
Knowledge of the relations of each surface *not* required;
The structures embedded in the gland: nerves (see above), artery, vein;
Parotid duct: anatomical course via masseter & buccinator; location of orifice;
Secretomotor innervation of the gland: preganglionic & vasoconstrictor pathways.

Infratemporal fossa

Overview only of the location of this region beneath the skull base between pharynx & mandible;
Appreciation of the key contents of this region: pterygoids, pteygoid plexus, mandibular nerve.

Pterygoids:

Appreciation of their role in opening the mouth (esp lateral) & chewing (medial);
Detailed anatomy of their attachments & heads *not* required.

Maxillary artery:

Appreciation of its derivation from external carotid (see also superficial temporal above);
Overview only (detail *not* required) of its many branches to local bone, ear, tympanum, nose & palate.

Pterygoid venous plexus:

Appreciation of potential injury in the administration local dental anaesthetics;
Drainage pattern: via maxillary veins to retromandibular vein;

Connections to deep facial vein/ cavernous sinus & inferior ophthalmic veins: clinical implications (see also face, above).

Knowledge of sphenomandibular ligament & mylohyoid nerve *not* required.

Mandibular nerve:

Anatomical course via middle cranial fossa, foramen ovale to region of lateral pterygoid;
Appreciation of division into anterior & posterior trunks (branches *not* required *but see below*);
Specific knowledge required:
Auriculotemoral nerve: territory supplied;
Inferior alveloar nerve: territory supplied;
Lingual nerve: territory supplied;
Chorda tympani: role in taste sensation.

Carotid sheath

Knowledge of the structures within the sheath and their local relations is *not* required.

Glossopharyngeal nerve

Appreciation of its emergence from the jugular foramen;
Branches of the nerve: Overview only of its supply to middle ear (sensory), parotid (secretomotor), carotid sinus, pharynx, tonsils and tongue.

Vagus nerve

Appreciation of its emergence from the jugular foramen;
The contribution of the accessory nerve to forming the nucleus ambiguus and the role of these fibres;
Branches of the nerve: Overview only of its supply to ear, pharynx, hypopharynx, larynx and cardiac plexus.

Accessory nerve

Appreciation of its emergence from the jugular foramen;
Its dual cranial (see vagus above) and spinal roots: territory of supply of spinal root.

Hypoglossal nerve

Appreciation of its emergence from hypoglossal canal;
Territory of supply: tongue.

Maxillary nerve

Appreciation of its emergence from the formen rotundum (sphenoid);
Its territory of supply.

Pterygopalatine fossa

Knowledge of the fossa and its contents is *not* required *except* for knowledge of the fact that sensory, secretomotor and sympathetic innervation of the nose and palate are derived from the pterygopalatine ganglion which sits within this fossa: potential for local clinical effects in trauma or disease.

Nose and paranasal region

Function:

Overview only of the rationale for ciliated epithelial lining of much of the cavity.

External nose:

Cutaneous innervation;
Blood supply as being derived from branches of ophthalmic and facial arteries in particular.

Nasal cavity:

Constituents of the floor & walls: the conchae (turbinates);
Appreciation of the potential role of the inferior turbinate in causing nasal swelling;
Position & function of nasolacrimal duct;
Appreciation (anatomy *not* required) of the ostia from the maxillary sinus & ethmoidal air cells;
Lateral wall: blood and nerve supply;
Septum: blood and nerve supply: contributing vessels to Little's area.

Detailed osteology of the nasal region *not* required;
Details of nasal lymph drainage *not* required.

Paranasal sinuses:

Overview of the arrangement of the sinuses as paired structures;
The locations of the maxillary, ethmoidal, frontal & sphenoidal sinuses on plain radiographs;
Appreciation of the developmental staging of sinus appearance from age 6-7yrs onwards.

Detailed knowledge of the innervation, blood aupply and lymph drainage of the sinuses is *not* required.

Mouth and hard palate

Mucous membrane and gingivae:

Sensory innervation.

Teeth:

Normal adult dentition and the approximate age at which adult teeth erupt;
Innervation of the upper & lower teeth: positions for effective anaesthetic infiltration;
Overview only of the tooth structure: basis of the pain of tooth disease.

Oral cavity:

Components of the hard palate;
Blood supply, sensory innervation & lymph drainage pattern of the hard palate.

See also later section on pharynx.

Tongue:

Overview only of its structure and the differences between the anterior and posterior elements;
[Details of the individual component muscles (eg hyoglossus) is *not* required]
Lymph drainage: clincal significance of the crossover drainage pattern to the cervical nodes;
Overview only of the sensory innervation of the tongue as being derived primarily from lingual & glossopharyngeal nerves;
Overview only of the taste pathway.

The development of the tongue and the anatomy of tongue movement are *not* required.

Floor of the mouth:

Knowledge requirements limited to an appreciation of the muscular nature of the floor, comprised in the main of tongue, and the fact that the submandibular duct, hypoglossal nerve, lingual artery & nerve, glossopharyngeal nerve and sublingual gland either end or are situated in the floor of the mouth.

Muscular pharynx

Appreciation of its location as being between the skull base and oesophagus (C6 level);
The relation posteriorly to preverterbral fascia & the potential for spread of local infection.

Muscles:

Overview of the structure as being three sheet-like constrictor groups which act in concert in swallowing.
Detailed knowledge of each constrictor and other small component muscles (eg salpingopharyngeus) is *not* required;

Lymph drainage: deep cervical groups.
Motor supply for swallowing: pharyngeal plexus of vagus, glossopharyngeal & sympathetic fibres;
Sensory mucosal supply: maxillary (nasal portion), glossopharyngeal (oral), laryngeal.

Interior of pharynx

Appreciation of its arrangement into nasal, oral & pharyngeal parts acting as a continuum;
Location of the adenoids;
Location of the opening of the auditory tube;
Location of the (palatine) tonsils;
Appreciation of the vascularity of the tonsillar bed: intimate arrangement of facial & internal carotid arteries;
Location of external palatine vein: role in local haemorrhage;
Tonsillar lymph drainage: deep cervical group.

The valleculae: location.

Laryngeal region of pharynx: this region is especially important as it contains the laryngeal inlet & piriform fossae. Candidates will be assumed to possess sufficient anatomical knowledge to be able to identify the key structures of this pharyngeal part as viewed via direct laryngoscopy.

Soft palate

Appreciation of its composition as a soft functional structure comprising paired muscles:
Details of the individual muscles (eg tensor palati) is *not* required.

Uvula: location & composition (mucoglandular);

Innervation: pharyngeal plexus (motor), pterygopalatine ganglion (secretomotor), maxillary division of V (sensory);

Gag reflex: appreciation of the causal pathway via glossopharyngeal (afferent) & vagus (efferent) nerves.

Larynx

Appreciation of its anatomical location as being inferior to hyoid and blending with the trachea at C6 vertebral level.

Skeletal framework:

Appreciation that the skeleton comprises single & paired cartilages, joints, ligaments and membranes;
Cartilages: the names and relative locations to neighbours of the thyroid, cricoid, epiglottic & arytenoid cartilages;
Joints: the cricothyroid & cricoarytenoid joints as the two prime laryngeal joints effecting normal function;
Membranes & ligaments: appreciation that a series of membranes contribute to laryngeal structure;
Cricothyroid membrane (conus elasticus): surface marking and role in emergency airway management.

Note that a detailed knowledge of laryngeal skeletal anatomy is *not* required for MCEM *except* for the points highlighted above. However, clinical airway management is greatly facilitated by the study of an articulated larynx and trainees are strongly encouraged to examine a prosected or artificial model in order to consolidate their basic anatomical knowledge.

Laryngeal muscles:

Appreciation that the musculature is functionally divided into intrinsic & extrinsic groups; the role of each group.

Intrinsic muscles:

Appreciation that these muscles alter the size & shape of the inlet and also move the vocal folds.
[A detailed knowledge of individual muscle names (eg thyroepiglottic, transverse arytenoid) and actions is *not* required].

Intrinsic laryngeal movements:

Appreciation that there are four principle functional roles of the larynx:
Phonation;
Sphincteric;
Coughing;
Breath-holding whilst straining (vocal cord adduction).

Innervation:

Role of the recurrent laryngeal nerve in supply to the intrinsic muscles;
The clinical effects of partial & complete recurrent laryngeal nerve paralysis.
Details of the supply to the mucous membrane and of laryngeal blood supply are *not* required.

Extrinsic muscles:

Appreciation of the need for elevators & depressors to effect swallowing: individual muscle names & actions *not* required.

Orbit and eye

Bony orbit:

Constituent bones of the orbital margin.
[Knowledge of the detailed anatomy of the orbital **walls** is *not* required].

Eyelids:

Appreciation of their composition as being one of orbital septum blending into tarsal plates;
Location of the Meibomian glands;
Innervation.

Conjunctiva:

Appreciation of its composition as being primarily one of fibrous tissue and stratified squamous epithelium;

Innervation.

Lacrimal apparatus:

Appreciation that this comprises glands, canaliculi, duct and sac;
Location of the lacrimal glands (lateral orbital roof);
Location & function of the lacrimal sacs;
Location & function of the nasolacrimal ducts.

Orbital muscles:

Overview of the anatomical arrangement of the muscles: the cone of orbital muscle.

The functions and innervation of each of the following named muscles:
Superior rectus;
Medial rectus;
Inferior rectus;
Lateral rectus;
Superior oblique;
Inferior oblique.

Orbital stability:

Anatomical factors exerting anteroposterior eye stability (eg bony attachment of the recti).

Orbital nerves:
(see also face above)

Optic nerve: its emergence through the sphenoidal optic canal with the ophthalmic artery;
Appreciation of its composition as an outdrawing of white matter with a subarchnoid space;
Understanding of this fact as the reason for the appearance of papilloedema in raised intracranial pressure;

Blood supply of the nerve as being a combination of anterior cerebral, ophthalmic & central retinal arteries.

A detailed knowledge of the anatomical course of the many other nerves with a presence in the orbit (eg lacrimal, nasociliary) is *not* required.

Orbital blood supply:

Ophthalmic artery as the prime artery of local supply;
Appreciation (detail *not* required) that it supplies all the orbital muscles, the lacrimal gland & the eye.

Orbital venous drainage:

Appreciation of the superior ophthalmic vein havinf communication with the cavernous sinus;
The additional role of the inferior ophthalmic vein.

Orbital lymph drainage:

Overview of the drainage pathway as being to deep cervical nodes via the preauricular & parotid groups.

Structural anatomy of the eye:

Overview of the derivatives of the eye: fibrous sclera/cornea, choroid, retina.
Sclera & cornea: function, innervation, pathway of the corneal reflex (via trigeminal ganglion);
Choroid & ciliary body: function;
Control of pupillary size: appreciation that control is a balance of sympathetic & parasympathetic activity; [Anatomical basis of Horner's syndrome & Argyll-Robertson pupil should be understood];
Retina: Appearance on normal fundoscopy; optic disc as the entry point of the optic nerve; macula & fovea; blood supply.
Refractive media: overview [detail *not* required] of the arrangement of aqueous humour, chambers, lens & suspensory ligament.

Functional anatomy of eye movement

Control of conjugate gaze, causes of nystagmus & the vestibulo-ocular reflexes are not within the scope of the anatomy curriculum.

However, knowledge of the following aspects of eye function *is* required:

Clinical effects of palsies of the III, IV and VI nerves;
Clinical effects of paralysis of a given extraocular muscle (eg superior rectus => diplopia on looking up).

Ear

Structural overview: meaning of the terms external, middle and inner ear.

External ear:

Pinna as a cartilaginous folded structure;
Innervation: great auricular & auriculotemporal nerves as prime innervators assisted by facial & lesser occipital nerves;
External acoustic meatus: adult length (3cm); innervation;
Tympanic membrane: functional overview; attachment of handle of malleus.

Middle ear:

Its structure as being one of air-filled cells in the petrous temporal bone;
Its function as one of a converter of airborne vibrations to liquid-borne pulses: role of the ossicles;
Structural details of the tympanic cavity, ossicles & joints, innervation & vascularity *not* required.

Auditory tube & mastoid antrum:

Appreciation of auditory tube as a connection between nasopharynx & mastoid air cells of the temporal bone;
Detailed tubal anatomy (eg bony *vs* cartilaginous parts, blood supply) *not* required.
Mastoid antrum & air cells: location, anatomical significance of venous drainage in spread of sepsis.

Internal ear:

Overview only of the role of the inner ear as the mediator of:
Hearing: via cochlea;
Kinetic balance: via semicircular canals;
Static balance: via saccule & utricle.
Although a more detailed understanding of the interplay of these inner ear structures is helpful in the interpretation of inner ear pathology, the anatomy of the inner ear is *not* required for MCEM.

Temporomandibular joint

The separate listing reflects its importance in mouth function.

Movements:

Appreciation of the movements possible: protraction/ retraction; passive and active opening; closing; grinding;
Its composition: synovial joint between mandibular head & squamous temporal bone;
The role of the lateral temporomandibular & spenomandibular ligaments in stability;
Comparative stability of the joint in open *vs* closed positions;
Role of the pterygoids, digastric, temporalis & masseter in joint function.

Vertebral column: bones, joints, muscles

A working knowledge of the anatomy of the vertebral column is essential for the correct interpretation of clinical symptoms & signs. Candidates are advised to revise the anatomy of this region by reference to an articulated vertebral column or at least a virtual computer-based model.

Note that knowledge of the blood supply of the vertebral column is *not* required.

Structural overview: general terminology of body, lamina, pedicle, articular processes and their locations on a typical vertebra.

Zones of the column: numbers of vertebrae in each zone (eg cervical, lumbar).

Vertebral joints:

Appreciation that adjacent vertebrae are held together by discs and anterior & posterior longitudinal ligaments;
Annulus fibrosus as a fibrous ring enclosing the gelatinous nucleus pulposus;
Appreciation of the anatomical rationale for herniation of the nucleus pulposus being predominantly posterior;
Anatomical basis of the way in which spinal nerve roots are irritated by herniation (the "one below" nerve root pattern);
Attachments of each of the anterior & posterior longitudinal ligaments;
Role of the ligamenta flava, supraspinous, interspinous & intertransverse ligaments.

Vertebral column (see also muscles below):

Appreciation of the possible planes of movement: flexion, extension, lateral flexion;
Appreciation of the fact that rotation occurs predominantly in the thoracic column.

Atlas & axis:

Main anatomical differences between these two bones: lack of centrum in atlas; dens & bifid spinous process of axis;
Role of atlanto-occipital and atlanto-axial joints in permitting free head movement;

Cruciform ligament as the prime stabiliser of the dens; appreciation of the clinical effects of ligamentous damage.

Muscles of the column:

Detailed knowledge is *not* required. However, an *overview* of the mechanics of vertebral movement *is* required as listed below:

Flexion of the column is provided predominantly by rectus abdominis assisted for rotation by the obliques;
A posterior mass of longitudinal extensor muscle runs the length of the vertebral column;
This muscle mass is termed *erector spinae* but actually comprises several different costituent muscles;
Innervation of erector spinae is via segmental posterior spinal root rami.

Vertebral canal:

Appreciation of its anterior, posterior & lateral boundaries;
Its contents: spinal meninges, cord and nerve roots;
Appreciation that the bony walls are separated from the meninges by the epi (extra-) dural space;
Appreciation of the fact that the spinal meninges consist of dura, arachnoid & pia;
Appreciation of the communication between the spinal subarachnoid space & that of the posterior cranial fossa;
The conus medullaris as the point below which the canal contains only the cauda equina & filum terminale;
Clinical landmarks for lumbar puncture; anatomical basis of the characteristic "give" of the needle.

Section 6 Central Nervous System

Overview

Detail in relation to CNS anatomy is limited to those aspects highlighted below. You should be aware, however, of the general structural arrangement of the brain and spinal cord.

The cerebral hemispheres essentially constitute the developed forebrain. The midbrain contains an aqueduct and acts as a connection to the hindbrain (pons, medulla oblongata and cerebellum). The cavity of the hindbrain is the fourth ventricle. The brainstem comprises the midbrain, pons and medulla. The medulla passes via the skull's foramen magnum to form the spinal cord, from which cervical nerve roots emerge. CSF forms within ventricular choroid plexuses and exits via the foramina in the roof of the fourth ventricle.

Cerebral hemispheres

Appreciation of the arrangement of a cortical covering of grey matter (cerebral cortical cells) and internal cell groupings including basal nuclei and thalamus. The gyri and sulci as structural features (names NOT required) and an appreciation that larger sulci are used as denominators of regions:

Frontal lobe – anterior to central sulcus and above the lateral sulcus;
Parietal lobe – behind central sulcus and above lateral sulcus;
Temporal lobe – below lateral sulcus;
Occipital lobe – below parieto-occipital sulcus.

Structural aspects of the cerebral hemispheres

Detailed anatomy of the sulci and gyri to be found on each of the main surfaces of the cerebral hemispheres is *not* required. Specific knowledge requirements are listed below:

Basal nuclei (basal ganglia): position within the lateral forebrain and function as a supraspinal control centre for skeletal muscle movement;

White matter: component fibres – commissural, arcuate and projection – and the role of the projectional fibres in making up the internal capsule;

Internal capsule: detailed anatomy (eg limbs, genu) *not* required, but an appreciation of its position and the significance of haemorrhage or thrombosis in this region;

Corpus callosum: its composition from commissural fibres; role as connector of symmetrical parts of the hemispheres.

Cortical areas

Appreciation of the key areas within which bodily function is determined is a fundamental part of the rationale for knowledge of CNS anatomy. The effects of traumatic and atraumatic brain lesions can be predicted based upon a working knowledge of the likely clinical signs, and this works in reverse such that typical neurological presentations infer typical areas of central damage.

The following specific examples are required knowledge. You should be aware of their anatomical site and functions.

Broca's area
Wernicke's area
Auditory area
Visual area (see also below)

Visual fields and pathways

A competent knowledge of the anatomical basis of vision is important. Knowledge is expected of the key components of the visual axis and the role of each in the generation of normal vision.

Note that there is a separate section on key cranial lesions at the end of this section.

Retinal bipolar and ganglion cells
Optic nerve
Optic chiasma
Optic tracts
Optic radiation and geniculate bodies
Visual cortex

Blood supply of the optic tract, chiasma and nerves.

Olfactory pathways

Knowledge *not* required.

Limbic system

Knowledge *not* required.

Ventricles

A working knowledge of the anatomy and function of the ventricular system is key to understanding the clinical effects of pathology within the cranial cavity.

The ventricles are the source of CSF. CSF is secreted by the choroid plexuses, which are vascular conglomerates of capillaries, pia and ependyma cells. The bulk of CSF arises from the plexuses of the lateral ventricles.

In cross sectional radiology, the midline cavities (3rd, 4th ventricles and the aqueduct) are symmetrical, but the lateral ventricles (the cavities of the hemispheres) are not.

Key required knowledge is listed below:

Lateral ventricle as a C-shaped cavity: the divisions of the cavity into a body, anterior, inferior and posterior horns;
The interventricular foramen (of Monro) as the communication to the 3rd ventricle.

Third ventricle as a slit-like space in the sagittal plane; the location of the hypothalamus below the ventricle and its key functions.

Fourth ventricle as lying around the pons and upper medulla. Detailed anatomy in relation to its pontine and medullary parts, and apertures and recesses, is *not* required.

Thalamus

Knowledge of the thalamus as collective cell groups (nuclei) and its key roles.
Anatomical location as a wedge-shaped structure around the 3rd ventricle.

Detailed anatomy (eg surfaces & their relations) is *not* required.

Cerebral blood supply

Appreciation of the role of the internal carotid and vertebral systems: the significance of the end-artery structure to vessels entering the brain surface in terms of occlusion.

Awareness of the anatomical basis (see below) of the clinical effects of occlusion of each of the main 3 cerebral arteries.

Arterial circle (of Willis): position around the optic chiasm: significance of the anastomotic potential of the circle and the significance of the circle as a source of subarachnoid bleeding.

The anterior & middle cerebral arteries as branches of the internal carotid; posterior cerebral as a terminal branch of the basilar.

Appreciation of the fact that anastomoses occur between the branches of the 3 cerebral arteries across the pia.

Internal carotid artery

Route of entry into the cranial cavity; as the source of the ophthalmic artery; as the source of the posterior communicating artery as well as two cerebral arteries.

Middle cerebral artery

Its susceptibility to embolism; appreciation of its role in supply of contralateral sensorimotor areas, and auditory and speech areas.

Anterior cerebral artery

Appreciation of its connection across the midline via the anterior communicating artery; appreciation of its areas of supply in terms of the clinical effects of interrupted flow.

Posterior cerebral artery

Appreciation of its key role in supply of the visual areas; anatomical basis of macular sparing in posterior cerebral thromboembolic disease.

Cerebral venous drainage

Details of the names and course of the cerebral veins (eg inferior anastomotic, deep middle cerebral) are *not* required, *however* the fact that venous drainage occurs via superficially-situated veins within the arachnoid should be understood.

Brainstem

General comments

This area comprises the midbrain, pons and medulla. It extends from the tentorial aperture to the level of C1. The medulla passes out via the foramen magnum and becomes the spinal cord as C1 roots emerge.

Anatomy I: nuclei

The cells of the brainstem are predominantly clumped into nuclei. The locations of these nuclei *within* the brainstem are *not* required.

You should be aware, however, of the named nuclei which lie within the brainstem and their roles in motor, sensory and somatic innervation. These are listed below:

Oclulomotor
Trochlear
Trigeminal
Abducent
Facial
Vestibulocochlear
Glossopharyngeal
Vagus

Accessory
Hypoglossal

Anatomy II: midbrain

The midbrain lies predominantly within the posterior cranial fossa. The aperture in the tentorium cerebelli lies on its dorsal surface. Details of the external appearance and relations of the midbrain are *not* required.

Blood supply: posterior cerebral and superior cerebellar arteries (ex-basilar).

Appreciation that dopaminergic cells sit within the midbrain within the *substantia nigra* and that loss of dopaminergic neurons is the basis of Parkinson's disease.

Anatomy III: pons

Detailed anatomy is *not* required but an awareness that the pons houses the nuclei of the motor part of the trigeminal nerve, the abducent nerve and vestibulocochlear nuclei allows prediction of the clinical effects of a pontine haemorrhage.

Blood supply: pontine branches from the basilar artery.

Anatomy IV: medulla oblongata

This is the upward continuation of the spinal cord.

Again, detailed local anatomy is *not* required. Required knowledge is listed below:

Blood supply: posterior inferior cerebellar arteries and branches of the vertebral and basilar arteries;

Anatomical basis of the 'medial medullary syndrome' and 'lateral medullary (PICA) syndrome'.

Cerebrospinal fluid

Its source via choroid plexuses has been mentioned. Total CSF volume is about 130ml of which the majority is in the subarachnoid space. Circulation / resorption is a dynamic process involving the arachnoid granulations.

There is small but significant CSF drainage via the cribriform plate of the ethmoid into the nasal tissues and the importance of this in head trauma should be understood.

The roles of the CSF in physiological terms should be understood.

Cerebellum

The detailed anatomy of this structure is *not* required. It sits in the posterior cranial fossa. Its functional significance should be understood. Postural reflexes, truncal stability and synergistic muscular movements all depend upon an intact cerebellum. Cerebellar lesions do not cause paralysis but do lead to disturbance of balance and movement.

Knowledge of the blood supply of the cerebellum facilitates understanding of the clinical effects of occlusion. Interruption of flow through any of the following will lead to ‘cerebellar signs’:

Posterior inferior cerebellar
Anterior inferior cerebellar
Superior cerebellar.

Spinal cord anatomy

Knowledge of the key anatomical elements of the cord is fundamental in clinical practice.

Extent

At birth, the conus medullaris lies at L3. By the age of 21, its sits at L1 or 2.

Enlargements

Cervical (for brachial plexus) and lumbosacral (for lumbar & sacral plexuses). These sit at the *vertebral* levels of C3-T1 (cervical) and T9 to L1 (lumbosacral.

Spinal nerve roots

Rootlets emerge from the cord in the subarachnoid space and amalgamate shortly afterwards into roots.

Anterior & posterior roots then emerge from their individual intervertebral foramina. After invaginating the dura they combine into mixed spinal nerves which then go off to their respective destinations.

The cord is shorter than the space available to it: below L1 level, the roots pass down near-vertically to form the *cauda equina.*

The lower a nerve root, therefore, the more steeply it slopes down before gaining its intervertebral foramen: this is an important anatomical fact when interpreting potential clinical signs in spinal trauma.

Internal anatomy

The cross-sectional anatomy of the *main features* of the cord should be known and understood as listed below:

Disposition of the cord into grey and white matter;

Grey matter as cell body collections; white matter as fibres;

The locations of the important white matter tracts:

Gracile / cuneate;

Lateral corticospinal;
Anterolateral;
Spinocerebellar.

Projectional tracts: impulse transmission

Appreciation of the ways in which afferent and efferent impulses are conveyed; the clinical effects of decussation;

The anatomical basis for clinical effects of division of the cord:
Complete transection;
Hemisection;
Central cord syndrome;
Anterior spinal artery syndrome.

Cord blood supply

Appreciation that the cord is supplied by a single anterior, and paired posterior spinal arteries, and the main territories supplied by these vessels.

Section 7 Cranial nerve lesions

Knowledge of the anatomical basis for the clinical effects of lesions of the cranial nerves reinforces the need to know key anatomy in everyday practice. For each of the following nerves, an appreciation of likely causes of disease or injury, the common clinical effects, and the anatomical rationale for these, is required. In particular, knowledge of the effects of interruption of the optic nerve along its course from retina to radiation is required:

Olfactory;
Optic – chiasma, tract and cortical damage and the clinical effects;
Ocular palsies;
Trigeminal;
Facial – commonest of all cranial nerve lesions;
Vestibulocochlear;
Glossopharyngeal;
Vagus;
Accessory (spinal part);
Hypoglossal.

Summary of the anatomy curricular content

The aim of providing this document is to enable trainees to focus their learning on those aspects of basic anatomy which will be of most clinical relevance in professional practice. This relevance has been established in a national research project involving over eighty senior emergency medicine clinicians. You can be confident that, if you have revised and understood the key anatomy outlined in the above document, you will be able to correctly answer the anatomy questions within MCEM. Moreover you will be extremely well-equipped to safely and speedily interpret many common clinical presentations.

Although this document is primarily a reference tool for the MCEM diploma, remember that learning must be lifelong. You are strongly advised to revisit the contents of this document periodically as you develop within the specialty: it constitutes a benchmark of knowledge of anatomy for your future continuing professional development.

Prepared by D A Kilroy on behalf of the College of Emergency Medicine
March 2006

Pathophysiology

Candidates need to demonstrate an understanding of physiological symptoms and be able interpret physiological parameters in patients admitted to the emergency department. Examples of presenting conditions for which such knowledge is important are:

- Normality
- Shock
- Infarction
- Infection
- Poisoning
- Trauma
- Metabolic disturbance
- Organ failure – esp. respiratory, cardiac, renal
- Cerebral disease

It is important to be aware that a number of generic influences on the specific systems will influence the interpretation of any changes seen. These include:

- Age (both extremes)
- Inter current illness (e.g. diabetes mellitus, COPD etc)
- Pharmacological treatment of intercurrent disease (e.g. hypertension, psychiatric disorders etc)
- Ethanol
- Pregnancy
- Environment – temperature, altitude and dysbarism

This physiological knowledge with be enhanced by a grounding in pharmacology / toxicology (drug interaction, concepts of half-life, agonsists & antagonists, competitive and non-competitive inhibitors, LD50 etc), statistics and interpretation of the literature.

Respiratory

a) Central and peripheral control mechanisms (afferent, central, efferent)
b) Lung volumes and their measurement
c) Pulmonary mechanics
d) Carriage of O_2 and CO_2 in blood
e) Carriage of CO
f) Oxy-Hb dissociation curve (& myoglobin)
g) Theory of pulse oximetry
h) DO_2/VO_2 relationship (cross ref to CVS)
i) Effect of altitude & dysbarism (cross ref neurology)

CVS

a) Control BP and HR (afferent, central, efferent)
b) Factors affecting cardiac output, pre and afterloads
c) Measurement of cardiac output
d) Frank Starling curves
e) Control of
    - Peripheral blood flow
    - Renal blood flow
    - Cerebral blood flow (cross ref with ICP)
    - Coronary blood flow
    - Pulmonary blood flow
f) Electrical & mechanical changes during cardiac cycle
g) ECG
h) Pharmacological manipulation of heart & peripheral circulation
i) Acute & delayed responses to intravascular fluid loss
j) DO_2/VO_2 relationship (cross ref to Resp)
k) Control of body fluid homeostasis
l) Crystalloid vs colloid
m) Exudate vs transudate

Neurology

a) Intra cranial pressure
   - Regulation
   - Measurement
   - Relationship with cerebral perfusion pressure
b) Sensory & motor pathways
c) Nerve conduction
d) Pain (mechanism & control)
e) Control of sight & hearing
f) Brain stem reflexes & death
g) Temperature:
   - Thermoregulation – central & peripheral
   - Fever
   - Measurement of core temperature
   - Hypothermia
   - Hyperthermia
h) Effect of altitude & dysbarism (cross ref pulmonary)

Renal

a) Renal function and its measurement
b) Control of electrolytes (Na, K, Cl, Ca) & water homoeostasis
c) Maintenance of intravascular vs extravascular gradients
d) Maintenance of intracellular vs extracellular gradients
e) Thirst
f) Control of micturition

Haematology

a) Erythropoiesis
b) Blood groups
c) Coagulation
d) Thrombolysis

Metabolic

a) Control of energy production
b) Metabolic responses to stress including injury, infection, infarction, temperature, burns

Physiological measurements

Candidates need to have a good understanding of the following assessments and measurements made in the emergency situation:

Respiratory

a) Pattern of breathing
b) Skin colour
c) Blood gases
d) Pulse oximeter
e) End tidal CO_2
f) Lung spirometry
g) ABG

CVS

a) Skin colour / CRT
b) Pulse (rate & strength)
c) BP – SBP, DBP, MAP
d) CVP
e) ECG
f) SvO2
g) PCWP
h) Response to fluid challenge, change in posture, Valsalva
i) Use of ultrasound

Neurology

a) Level of consciousness
b) Senses - all
c) Motor activity
d) Evoked responses

e) Reflexes – including pupillary
f) Temperature:
   - Core temperature
   - Skin temperature
   - Core – peripheral temperature gradient
g) Tests on brain stem integrity

Renal

a) Urine production – volume and rate of production
b) Urine & plasma electrolytes
c) Urine & plasma osmolality

Haematology

a) FBC – all components
b) Reticulocytes
c) Bleeding time
d) Coagulation
e) Specific clotting factors
f) Iron
g) Vitamin B12 & folate

Metabolic

a) Plasma substrate concentration:
   - Glucose
   - Lactate
b) Plasma hormone concentration
c) Liver function test
d) Anion gap

e) ABG

Pathology

The candidate needs to have a good understanding of the general pathological processes which present to the Emergency Department or under pin nationally accepted guidelines. The majority have already been addressed in the Pathophysiology section. The remaining include:

Inflammatory response

a) Normal v Abnormal
b) Inflammatory markers:
   - CRP
   - Rheumatoid factors
   - ANF

Immune response

a) Normal
b) Abnormal
   - Hypersensitivity including anaphylaxis & anaphylactoid reactions

Infection

The candidate should know the typical causes, pathological processes and investigation of the following infections presenting to an ED:

a) Upper respiratory tract
b) Lower respiratory tract & pneumonia
c) Meningitis & encephalitis
d) Myocarditis & endocarditis
e) Hepatitis
f) Gastro-enteritis
g) Urinary tract infection
h) STD

i) PID
j) Cellulitis
k) Infection of bones & joints
l) AIDS
m) PUO
n) Malaria
o) Fungal infection

Wound healing

a) General principles
b) Specific tissues:
    - Skin
    - Tendon
    - Peripheral nerve
    - Bone
    - Myocardial
    - Brain

Haematology

a) Anaemia – classification; causes; investigation
b) Leukaemia – classification; acute and chronic lymphoblastic leukaemia; acute and chronic myeloid leukaemia

c) Lymphoma and myeloma

d) Coagulation – platelet disorders; inherited and acquired coagulation disorder; thrombophilia

Pharmacology

Candidates need to have a detailed knowledge of the principles underlying the pharmacological management of conditions in the ED. In particular:

a) CNS – Analgesics (local & general); anaesthetics; sedatives
b) Respiratory – Beta agonists; anti-cholinergic agents
c) Cardiac – anti-arhythmics; inotropes; nitrates
d) Infection – antibiotics and antiviral agents for the infections listed above
e) Gastro-intestinal – antacids; proton pump inhibitors; anti spasmodics; laxatives; anti diarrhoeal
f) Coagulation – Heparin; warfarin; thrombolysis; FFP; protamine; aspirin;
g) Anti inflammatory – NSAID; steroids
h) Diabetes – oral hypoglycaemic agents; anti hyperglycaemic agents; glucagon; insulin
i) Antidotes

Recommended reading list

The best way of acquiring the knowledge required to pass the part A exam is by investigating the basic science aspects of the cases seen in a busy Emergency Department. To assist in this learning process the College lists below books that are cover specific topics relevant to the practice of EM. Unfortunately there is currently there is no single text that covers all the areas that the candidate is expected to know for the exam.

Candidates should use the latest versions of these books provided it has been available for at least 12 months from the time of the exam.

Anatomy

- Last's Anatomy – Regional & Applied. Churchill Livingstone, Edinburgh
- Clinical Anatomy. H Ellis. Blackwell, Oxford

Physiology

- Review of Medical Physiology. W.Ganong. Lange, New York
- Respiratory physiology – the essentials. J West. Williams and Wilkins.
- An illustrated colour text: Clinical biochemistry. A.Gaw et al. Churchill Livingstone, Edinburgh

Pathology

- Medical microbiology – made memorable. S. Myint et al. Churchill Livingstone, Edinburgh
- Haematology – an illustrated colour text. M.Howard et al. Churchill Livingstone, Edinburgh

Pharmacology

- Pharmacology for anaesthesia and intensive care. Peck & Williams

Epidemiology; examinations and evidence based medicine

- Oxford handbook of Accident and Emergency Medicine. J Wyatt et al. Oxford university press. Oxford
- BMJ's "ABC" series when relating to EM topics – e.g. ABC of Major trauma; ABC of Emergency Radiology

Appendix 2: - Radiology for the MCEM(B)/FCEM

a) Safety Issues/Requirements

b) Knowledge of and indications for the following common studies in Emergency Medicine (and interpretation where asterisked)

Plain radiology

- "Trauma" series*
- Chest*
- Abdomen*
- Limbs*
- Joints*
- Shoulder*
- Elbow *
- Wrist*
- Hand*
- Hip and Pelvis*
- Knee*
- Ankle*
- Foot*
- Spine (Cervical*, Thoracic*, Lumbo-sacral*)
- Skull*
- Soft tissue*

Contrast radiology

- Angiography (Limb, Abdominal, Pulmonary)
- IVP*
- Cystography and urethrography

Computed Tomography (CT)

- Brain
- C-spine

- Thoracic and lumbar spine
- Chest (including CT Pulmonary Angiography)
- Abdomen (including CT Urography)
- Limbs and joints
- Facial bones

Magnetic Resonance Imaging (MRI)

- Brain
- Spine
- Joints – wrist, knee

Ultrasound

- Focussed Abdominal Sonography In Trauma (F.A.S.T.)
- Vascular Doppler and Duplex
- Abdominal
- Pelvic, including pregnancy
- Limb
- Echocardiography
- Placement of central lines*

c) Knowledge of Normal Variants

- Chest X-ray
- Abdominal x-ray
- CT Brain
- C-spine x-ray
- Limb views

d) Medical precautions in Radiology

- Contrast and allergic reactions
- Pregnancy and shielding
- The unstable patient – transfer and monitoring in radiology

EMERGENCY MEDICINE ULTRASOUND (EMUS) CURRICULUM				
	Knowledge	**Skills/attitudes**	**Learning**	**Assessment**
Ultrasound physics	The basic components of an ultrasound system Types of transducer and the production of ultrasound, with an emphasis on operator controlled variables Use of ultrasound controls An understanding of the frequencies used in medical ultrasound and the effect on image quality and penetration The interaction of ultrasound with tissue including biological effects The safety of ultrasound and of ultrasound contrast agents The basic principles of real time and Doppler ultrasound including colour flow and power Doppler The recognition and explanation of common artefacts Image recording systems	Understand the physics of ultrasound, machine control, image formations manipulation and storage	ENLIGHTENme PS GT	ENLIGHTENme MCQ OSCE ME FFAEM
Ultrasound techniques	Patient information and preparation Indications for examinations Relevance of ultrasound to other imaging modalities The influence of ultrasound results on the need for other imaging	Understand rule in philosophy	ENLIGHTENme LP LT GT PS SL ODB	ENLIGHTENme OC MC DOPS Video OSCE FFAEM MFAEM
Administration	Image recording, storing and filing Reporting Medico-legal aspects – outlining the responsibility to practise within specific levels of competence and the requirements for training Consent The value and role of departmental protocols The resource implications of ultrasound use	Integrate EMUS into departmental clinical governance system Apply NICE guidelines re central cannulation	ENLIGHTENme LP LT GT PS ODB	ENLIGHTENme OC MC CBD

Sectional and ultrasonic anatomy	Kidneys, Liver, Spleen Heart and pericardium Retro-peritoneal structures (aorta, IVC) Recto-vesical, vesico-uterine and recto-uterine pouches Vessels: internal jugular veins, carotid arteries, femoral veins and arteries	Working knowledge of relevant anatomy	ENLIGHTENme LT GT PS	ENLIGHTENme MCQ OSCE ME
Pathology in relation to ultrasound	Kidneys: trauma/free fluid Liver and spleen: trauma/free fluid Retroperitoneal: presence or absence of abdominal aortic aneurysm (AAA) Vessels: vascular access Cardiac scan: trauma/pericardial tamponade, pericardial effusions, asystole	Working knowledge of relevant pathology	ENLIGHTENme LT LP GT PS	ENLIGHTENme OC MC DOPS FFAEM
Competencies in Emergency Medicine Ultrasound	Recognise normal anatomy Use focused ultrasound to assist in bedside emergency department decisions Recognise the limitations of a scan and be able to explain these limitations to patients/carers Recognise patients requiring formal specialist sonographic assessment Incorporate ultrasound findings with the rest of the clinical assessment Focused assessment by sonography for trauma (FAST) AAA screening/detection in symptomatic patients Peri-arrest scenario for pulseless electrical activity (PEA)/tamponade/effusion Vascular access Pleural and pericardial fluid Scanning techniques including the use of spectral Doppler and colour Doppler	Able to safely conduct FAST, AAA assessment, central and peripheral venous access	ENLIGHTENme LT LP GT SL	ENLIGHTENme OC MC DOPS CBD FFAEM

Appendix 3:- Procedures and Skills for MCEM(B) AND FCEM

Contents

Airway Techniques 223
Pulmonary Procedures 223
Cardiac Procedures 3183
Vascular Access Techniques and Volume Support Techniques 223
Vital Sign Measurement 224
Gastrointestinal Procedures 224
Musculoskeletal Techniques 224
Genitourinary Techniques 225
Obstetric and Gynaecological Procedures 225
Neurological Procedures 225
Ophthalmic Procedures 225
ENT Procedures 226
Emergency Dental Procedures 226
Emergency Department Diagnostic Ultrasound – F.A.S.T 226
Heat Emergency Procedures 226
Universal Precautions 226

Airway Techniques

a) Basic Airway Techniques
b) Bag Valve Mask Ventilation / Mapelson “C” circuit
c) Intermediate airways – laryngeal mask, other
d) Tracheal Intubation
    - Nasotracheal
    - Orotracheal
e) Rapid sequence induction (not in children)
f) Difficult intubation techniques (bougies, introducers and alternative laryngoscopes)
g) Mechanical ventilation (not in children)
h) Surgical Airway Techniques
    - Percutaneous transtracheal ventilation
    - Cricothyroidotomy
i) Techniques for upper airway obstruction
    - Heimlich manoeuvre
j) Pharmacological agents in airway management
k) Tracheal suctioning

Pulmonary Procedures

a) Oxygen delivery techniques
b) Needles thoracentesis
c) Tube thoracostomy
d) Non-invasive ventilation (not in children)
    - CPAP
    - BiPAP

Cardiac Procedures

a) Cardiopulmonary resuscitation (CPR)
b) Carotid Sinus Massage
c) Direct Current Electrical Cardioversion
d) Defibrillation
e) Emergency Transthoracic Cardiac Pacing

f) Pericardiocentesis
g) Resuscitative thoracotomy (not in children)

Vascular Access Techniques and Volume Support Techniques

a) Arterial puncture and cannulation
b) Peripheral intravenous access
c) High flow infusion techniques
d) Venous cutdown (not in children)
e) Central venous catheterisation techniques (including ultrasound guided)
   - Subclavian (not in children)
   - Internal jugular (not in children)
   - Femoral
f) CVP measurements
g) Intraosseous infusion
h) Endotracheal drug administration
i) Blood and Blood Product Transfusion
j) Accessing indwelling vascular lines

Vital Sign Measurement

a) Clinical vital signs
b) Non-invasive monitoring
c) Invasive monitoring

Gastrointestinal Procedures

a) Orogastric tube placement
b) Balloon tamponade of gastroesophageal varices
c) Diagnostic peritoneal lavage
d) Hernia reduction
e) Proctoscopy and sigmoidoscopy
f) Management of thrombosed external haemorrhoids

g) Management of rectal foreign bodies
h) Management of rectal prolapse

Musculoskeletal Techniques

a) Immobilisation techniques
   - Application of a Broad Arm Sling
   - Application of a Collar and Cuff
   - Application of a Knee Immobiliser
   - Application of a Donway / Hare Splint
   - Application of a Thomas Splint
   - Pelvic Stabilisation Techniques

b) Fracture/dislocation reduction techniques
   - Shoulder Dislocation
   - Elbow Dislocation
   - Pulled elbow
   - Phalangeal Dislocation
   - Supracondylar Fracture with limb threatening vascular compromise
   - Colles Fracture
   - Bennett's Fracture
   - Simple phalangeal fractures and dislocations
   - Patellar Dislocation
   - Knee Dislocation with limb threatening vascular compromise
   - Ankle, subtalar, toe dislocations

c) Plaster Techniques
   - Above and below elbow backslab and POP
   - Scaphoid POP
   - Bennett's POP
   - Volar Splint
   - U SLAB
   - Above and below knee backslab and POP

d) Spinal immobilisation techniques/log rolling
e) Arthrocentesis
f) Compartment syndrome Management

Genitourinary Techniques

a) Bladder catheterisation
    - Urethral catheter
    - Suprapubic catheterisation (not in children)
b) Testicular detorsion
c) Manual Reduction Paraphimosis
d) Needle Aspiration of Corpora Cavernosa

Obstetric and Gynaecological Procedures

a) Delivery
    - Normal delivery
    - Abnormal delivery
b) Examination of the sexual assault victim
c) Gynaecological Speculum Examination

Neurological Procedures

a) Lumbar puncture and CSF examination

Ophthalmic Procedures

b) Use of slit lamp
c) Rust ring removal
d) Ocular foreign body removal

ENT Procedures

a) Control of epistaxis
   - Anterior packing
   - Posterior packing and balloon placement
b) Foreign body removal
c) Aural toilet/wick insertion

Emergency Dental Procedures

a) Dental anaesthesia
b) Dental socket suture

Emergency Department Diagnostic Ultrasound – F.A.S.T

Heat Emergency Procedures

a) Management of Hypothermia
b) Management of Hyperthermia

Universal Precautions

Suggested Reading

- Rosen's Emergency Medicine – Concepts and Clinical Practice, by Marx, Hockburger & Walls Vol 1-3, 5th Edition.
- Emergency Medicine - A Comprehensive Study Guide, by Tintinalli, Kelen, Stapczynski 5th Edition.
- Medical Physiology by W.F Garnong.
- Anatomy for Emergency Medicine by Snell
- Accidents and Emergencies in Children, R.G. Morton & B.M. Phillips.
- The Management of Wounds & Burns, J. Wardrope & G.A.R Smith.
- Cardiopulmonary Resuscitation, D.V Skinner and R. Vincent.
- The Management of Head Injuries, D.G Curry.
- Anaesthesia and Analgesia in Emergency Medicine, K.A Illingworth & K.H Simpson
- Legal Problems in Emergency Medicine – Montague
- Acute Medical Emergencies – The Practical Approach. The Advance Life Support Group
- The ECG in Acute MI – An Evidence Based Manual of Re-perfusion Therapy by Smith et al.
- Evidence Based Medicine – How to Practice & Teach EBM, Sackett et al.
- Clinical Chemistry in Diagnosis & Treatment, by Zilva & Panell
- Manual of Emergency Airway Management, Walls et al.
- Lecture Notes on Emergency Medicine, Moulton & Yates.
- Advance Paediatric Life Support – The Practical Approach, 2nd Edition The Advance Life Support Group.
- The Oxford Handbook of Emergency Medicine – Wyatt et al.
- The Cambridge Textbook of Emergency Medicine, Skinner et al.

- The Textbook of Adult Emergency Medicine, Cameron et al.
- Clinical Procedures in Emergency Medicine, Roberts and Hedges.
- Practical Fracture Treatment. R. McRae
- Maxillo-facial and Dental Emergencies – J. Hawkesford & J.G. Banks
- Emergencies in Obstetrics and Gynaecology – L. Stevens
- The Management of Major Trauma – C. Robertson & A.D. Redmond
- Environmental Medical Emergencies – D.J. Steedman
- Psychiatric Emergencies – S.R. Merson & D.S. Baldwin
- History Taking, Examination, and Record Keeping in Emergency Medicine – H.R. Guly
- Emergency Management of Hand Injuries (Oxford Handbooks in Emergency Medicine) G.R. Wilson, P. Nee, J.S. Watson
- Acute Medical Emergencies – U. Guly & D. Richardson
- ABC of learning and teaching in Medicine. Cantillon et al

APPENDIX D
SAMPLE RESIDENT EVALUATION FORM
BASED ON ACGME CORE COMPETENCIES

Emergency Medicine Clinical Rotation

Resident Physician: _____ **Dates of Rotation:** _____

Patient Care

	Poor	Fair	Good	Very Good	Outstanding
Exhibits caring and respectful behaviors towards patients					
Uses directed history and physical examination in patient evaluation					
Demonstrates a systematic approach to developing basic treatment plans					
Demonstrates competence when performing basic procedures					

Medical Knowledge

	Poor	Fair	Good	Very Good	Outstanding
Understands the importance of vital signs in initial patient evaluation					
Generates a differential diagnosis based on patient history and physical exam					
Demonstrates a basic understanding of common disease processes					
Uses an analytic approach to evaluate undifferentiated complaints					

Practice-Based Learning and Improvement

	Poor	Fair	Good	Very Good	Outstanding
Appropriate use of information from published studies for patient care					
Facilitates the learning of students and colleagues					
Uses appropriate electronic resources to manage information and education					
Critically analyzes management decisions based on published literature					

Interpersonal and Communication Skills

	Poor	Fair	Good	Very Good	Outstanding
Uses effective techniques of communication with patients					
Works effectively with other members of the health care team					
Demonstrates ability to convey patient information to consulting physicians					
Facilitates conflict resolution using appropriate interpersonal skills					

Professionalism

	Poor	Fair	Good	Very Good	Outstanding
Demonstrates respect, compassion, and integrity when caring for patients					
Demonstrates a commitment to ethical principles in patient care activities					
Responsive and sensitive to patients' culture, age, gender, and disabilities					
Interacts with colleagues and other healthcare providers appropriately					

Systems-Based Practice

	Poor	Fair	Good	Very Good	Outstanding
Understands the community healthcare resources available for patients					
Practices cost-effective health care without compromising quality					
Advocates for patients and helps to arrange appropriate follow-up care					
Utilizes consulting services and resources appropriately in patient care					

	Poor	Fair	Good	Very Good	Outstanding
Overall performance on rotation					

Comments: