



Index

Page 2	-	Introduction
Pages 3 – 4	-	Medical Student Responsibilities
Pages 5 – 7	-	Student behaviour during CP3
Pages 8 – 11	-	ACE Module Aims
Pages 12 – 17	-	ACE Module Outcomes (mapped to Outcomes for Graduates)
Pages 18 -22	-	General Topic Learning Outcomes

Topics

Pages 23 – 29	-	Clinical Examination Skills
Pages 29 – 31	-	Evidence Based Medicine
Pages 32 - 39	-	Surgery
Pages 40 – 43	-	Cardiovascular Medicine
Pages 43 – 47	-	Vascular Medicine and Surgery
Pages 47 - 52	-	Respiratory Medicine
Pages 53 – 56	-	Endocrinology & Diabetes
Pages 56 - 57	-	Medical and Surgical Gastroenterology
Pages 57 – 59	-	Upper Gastrointestinal Tract
Pages 60 – 62	-	Small Intestine and Appendix
Pages 62 – 64	-	Colon and Rectum
Pages 64 – 67	-	Hepato-Biliary Disease
Pages 67 – 68	-	The Pancreas
Pages 69 – 71	-	The Abdominal Wall
Pages 71 – 75	-	Renal Medicine
Pages 75 - 88	-	Neurology
Pages 89 – 99	-	MDD
Page 100	-	Clinical Chemistry
Pages 101 - 105	-	Haematology
Page 105	-	Microbiology and Infectious Diseases
Page 106	-	Immunology
Page 107-111	-	Radiology
Pages 112 - 120	-	Pathology
Page 121	-	Therapeutics and Prescribing
Page 122	-	Overdose/Toxicology
Pages 123 -125	-	Student Formulary
Pages 126 – 132	-	Critical Illness
Pages 133 – 138	-	Accident and Emergency Medicine
Pages 138 – 140	-	Anaesthetics
Page 141	-	Palliative Medicine
Pages 142 – 144	-	Primary Care

This is a Study Guide for Clinical Phase 3

Welcome to the Advanced Clinical Experience (ACE) module.

In this phase of the course you will be developing and applying knowledge and skills to attain a level as expected of an FY1 doctor.

This study guide will complement the Portfolio/Logbook and Moodle in helping direct your learning.

Study Guide

This lists the Aims, Outcomes, and Topics that form the basis of the module and from which you can plan your studies.

Portfolio and Logbook

This is an immediate record of attainment and also contains signoffs from those supervising you in the attachments that form the module. It also contains important basic information related to the attachments.

MOODLE

Moodle will contain Learning Resources linked to the Topic Learning Outcomes. You should look at Moodle on a regular basis, at least weekly, as it will display important notices to students related to the course.



Medical Student Responsibilities

a. General attitude and behaviour

You are expected to:

Not allow your views about a person's lifestyle, culture, beliefs, race, colour, gender, sexuality, age or social status prejudice your interaction with patients, staff or colleagues.

Inform the Medical School if you have any disability or condition that might affect your studies, your fitness to be a medical student or doctor, or that might pose a risk to patients or colleagues and to take the relevant advice.

Maintain appropriate standards of dress, appearance, personal hygiene and conduct so as not to cause offence to patients, staff or colleagues, impair your performance or jeopardise safety and to conform to the dress code that operates where you are working.

Acknowledge that general appearance, facial expression and other non-verbal signals are important components of good communication in the UK and avoid wearing any form of dress which interferes with this. Specifically, your face should be exposed fully to patients, teachers and colleagues in all clinical and teaching settings and for identification purposes, including entry to examinations and the library.

Be honest and not abuse the trust of a patient or other vulnerable person. You should not enter into an improper relationship with a patient or staff colleague.

Demonstrate probity.

Above all, be professional

b. Attitudes and behaviour towards Patients

You are expected to:

Demonstrate respect for patients that encompasses, without prejudice, diversity of background and opportunity, language, culture and way of life. This includes treating patients professionally, politely and considerately, respecting patients' privacy and dignity and respecting their right to refuse to take part in teaching.

Always make clear to patients that you are a student and not a qualified doctor, and not give medical advice or recommend treatment unless under direct supervision.

Treat information about patients as confidential. This principle of confidentiality includes not discussing patients with other students or professionals outside the clinical or educational setting.

Not abuse a patient's trust.

Be willing to perform physical examinations on patients (which can include touching and intimate examinations) in order to establish a clinical diagnosis, irrespective of the gender, culture, beliefs, disability, or disease of the patient.

Act quickly to protect patients from risk if you have good reason to believe that you or a colleague may not be fit to practise, by reporting any concerns to a senior member of staff.



c. Attitudes and behaviour towards Staff

You are expected to:

Demonstrate respect for academic, clinical and support staff, and treat them with consideration whether in a taught class, administrative offices, the Library, Skills Lab, IT facilities, clinical or social settings.

Attend all classes and clinical teaching sessions promptly and in appropriate dress; not leave early (except by arrangement with the staff concerned); observe safety rules and not behave disruptively.

Notify the relevant teacher, in advance if possible, of teaching sessions you are unable to attend, with a valid explanation.

Report prolonged absence (>3 days) from the course to the QMC Student Service Centre: Undergraduate Programme Team with an explanation.

Follow rules and instructions about examinations, in particular by arriving promptly, bringing only permitted materials, and being silent on entering the exam room.

Submit coursework, logbooks, and other documentation as required and not pass off the work of another as your own.

Maintain communication with staff by:

- attending scheduled appointments with personal tutors and appraisers and initiating additional contact where necessary;
- responding promptly to requests for information and completing all appropriate forms, including those used to record extenuating circumstances which may have affected performance or caused absence from examinations;
- regularly reading your university e-mail and checking teaching notice boards and Moodle;
- participating responsibly in student feedback processes.

Actively engage in remedial work after poor academic or clinical performance.

d. Attitudes and behaviour towards students

You are expected to:

Demonstrate respect for other students that encompasses, without prejudice, diversity of background and opportunity, language, culture and way of life.

Support other medical students in academic, practical and clinical work and do nothing to disrupt their learning.

Be prepared to inform an appropriate member of staff if you observe behaviour in colleagues which is at variance with the standards outlined in this document.



Student Behaviour during CP3

Attendance

Please refer to the ACE Log Book for details and policies on Attendance.

Probity

The medical profession demands high standards of probity. Satisfactory completion of the logbook requires each student to obtain a number of signatures from clinical teachers. These signatures must be obtained from the appropriate clinical staff. The Faculty considers any attempt at forgery of signatures to be a very serious matter. Any student identified as having fabricated signatures, or any other aspect of their logbook data, may be referred to the Fitness to Practise Committee.

Dress

Students are reminded that they should maintain appropriate standards of dress, appearance and personal hygiene. This is particularly important when in contact with patients. More specific guidelines/dress codes will be issued locally in each placement. It is important that these are followed.

The Medical School's own dress code policy states that during medical training there are circumstances in which health and safety or clinical considerations take precedence over and individual's choice of dress:

1. Clothing obscuring an individual's face interferes with effective communication and is not allowed at any time except when required for health and safety reasons.
2. Infection control procedures require all staff and students to adopt a 'bare below the elbow' approach in clinical areas and areas used for clinical skills training. This includes avoidance of jewellery.
3. Health and safety requirements may mean that, for certain tasks, specific items of clothing such as overalls, face masks, protective clothing, etc must be worn.
4. When learning basic clinical examination skills, students are expected to practise on each other and to be prepared to remove clothing as needed for this purpose, subject to privacy and gender segregation if appropriate.
5. When attending clinical placements students are expected to dress smartly and not to wear clothing that is likely to cause offence to the patients that they will encounter by being inappropriate or revealing. Clothing should also be visibly clean. Students should ensure that their own clothing is regularly cleaned or laundered.

During their training students will spend a significant amount of time working within different NHS Trusts and general practices. Students are expected to comply fully with the dress codes of the Trusts or general practices in which they are based.

Where staff or students perceive that a particular slogan or symbol on clothing is offensive (for example, obscene, racist, sexist or sectarian), the wearing of such slogans or symbols will be considered as a potential disciplinary offence and dealt with accordingly.



Infection Control

A number of patients will develop an infection as a result of their in-patient stay. A proportion of these are due to poor infection control practice by healthcare professionals. It is mandatory that students obey local guidelines on interventions such as hand hygiene. Students need to be aware that this practice may well be audited without their knowledge by agencies within their Trust and evidence of non-compliance escalated.

Obligations and Responsibilities

Students

The Medical School, in collaboration with local Trusts and their doctors, has provided a clinical learning environment for you to acquire the knowledge, skills and attitudes you need on the ACE module. Clinical experience and opportunities surround you, but as a developing professional you must take responsibility for your own learning. Your Log Book and Portfolio and your Study Guide tell you what you need to learn; the doctors, nurses and patients provide you with the experiences from which you will learn. It is your responsibility to fill in your Log Book and Portfolio as required with your observations and reflections, to make it available to your teachers for discussion and to use it to provide evidence of your progress.

Students must adhere to all directives issued by those supervising them in NHS premises and in relation to contact with patients. The four UK health departments are responsible for deciding how students may have access to patients on NHS premises. Students are responsible for following guidance issues by the UK health departments and other organisations about their access to patients in NHS hospitals and community settings.

As future doctors, students have a duty to follow the guidance in the General Medical Council's 'Good Medical Practice' from their first day of study and must understand the consequences if they fail to do so. In particular, students must appreciate the importance of protecting patients, even if this conflicts with their own interests or those of friends or colleagues. If students have concerns about patient safety, they must report these to the medical school. The medical school has put in place a concerns form procedure and a whistle blowing procedure such that any concerns can be reported in confidence. Please visit the Medical Course Home Page on Moodle for details of these procedures.

Students must never allow a patient to believe that the student is a doctor. Under Section 49 of the Medical Act 1983 it is a criminal offence for a person to pretend to hold registration as a medical practitioner when they do not. It is also an offence under Section 49A of the Act for a person to pretend to hold a licence to practise when they do not.

Guidance is given in the joint GMC and Medical Schools Council publications *Achieving Good Medical Practice* and *Professional Behaviour and Fitness to Practise* about how the medical school will handle concerns about a medical student's performance, health or conduct. The medical school has established fitness to practise procedures specified in the University of Nottingham Quality Manual to deal with any such concerns.

Students must understand that if there are any concerns about any aspect of a student's performance or conduct, the medical school will share this information with other education providers including those in NHS partner organisations to ensure that clinical tutors and supervisors are appropriately informed.

Students have support for their academic and general welfare needs which is documented in the Course Handbook. If a student has a problem then the Clinical Sub Deans can always be contacted for support and advice.

Teachers

Your teachers know that you are on the ACE module and they are aware of its aims and objectives and its structure and organisation. They have been trained to supervise and appraise trainee doctors and medical students. They have accepted the obligation to provide you with feedback on your progress provided you maintain your Log Book and Portfolio in an up-to-date manner. They are responsible for assessing your clinical behaviour and your professional attitudes.

Patient Safety and Human Factors

10% of all medical admissions result in an adverse event, of which approximately 75% are attributable to Human Factors. Human Factors is about the relationship between people in the working environment, and the relationship between these people and equipment. By entering the clinical environment medical students become part of this process.

Human Factors contributing to Patient Safety can be broken down into six areas:

1. Situation Awareness
2. Risk Management and Decision-making
3. Feedback
4. Leadership and Motivation
5. Behaviour
6. Communication and Teamwork

Some of these areas are more pertinent to ACE students than others. We would not expect students to be involved in Leadership and Motivation necessarily; but they will, by virtue of the fact that they are in operating theatres, wards etc., be involved in teamwork and communication and begin to develop a consciousness of situation awareness and the importance of professional behaviour.

Information Governance

'Information Governance' is the broad term for all matters which relate to the professional, confidential and secure handling of information. There have always been risks associated with information being deliberately misused, treated without the required care or manipulated for the wrong reasons, but the widespread use of electronic information storage and manipulation has highlighted the ease with which information can be subject to these errors and abuses.

Management of information is controlled by Acts of Parliament, by professional guidance and by local policy, all of which apply to medical students as well as to qualified doctors.

With this in mind there will a requirement for all students to complete learning modules on information governance at particular points throughout the course. Full instructions will be posted on Moodle and a table to record your progress can be found in the ACE Log Book.



A14ACE Advanced Clinical Experience Module (ACE)

Module Aims

This section of your study guide describes in broad terms what the module will deliver.

The module is designed so that students can attain and demonstrate many of the outcomes specified by the GMC in Outcomes for Graduates (2015) in the areas of the Doctor as a Scholar and a Scientist, the Doctor as Practitioner, and the Doctor as a Professional. These are detailed in the Module Learning Outcomes.

During the ACE module in CP3 students will be building on previous learning and acquiring knowledge, skills and attitudes required for assessment and management of patients with a spectrum of clinical presentations and conditions. The level attained will be that expected of an FY1 doctor at the start of their employment. Learning will predominantly be within a hospital setting (wards, out-patients, and operating theatres) but also some in community practice (GP surgeries). There is also a requirement for significant private study using textbooks and online resources in order to acquire the knowledge and understanding required to perform as a registered medical practitioner. It will be essential to demonstrate appropriate professional attitudes and behavior.

A Transition to Practice (TTP) module will be taken after the final summative assessment in ACE. At the end of the CP3 phase students will demonstrate knowledge and skills commensurate with those expected of a Foundation Year 1 (FY1) doctor.

Building on Prior Knowledge and Experience

The ACE module builds upon knowledge and experience gained in CP1 and CP2. It is essential that students maintain familiarity with the learning outcomes specified in these phases, including all modules studied in each phase.

It is expected that the knowledge and skills developed in these earlier phases will be developed and applied in ACE. Students may find it helpful to revise elements of this previous work using the learning outcomes as listed on Moodle.

The doctor as a scholar and a scientist

Students will be expected to apply prior knowledge to clinical situations, recognising normal anatomy and normal physiological functions as a way of recognising when something is abnormal. During ACE students will build on acquired clinical examination skills and be expected to apply and develop further knowledge of normal structure and function. They will be expected to apply knowledge of normal structure and function to explain common disease presentations, including being able to present the pathophysiology of the disease. There is a significant amount of background reading required in ACE to acquire this knowledge.

Students will be expected to apply knowledge of disease along with history taking, clinical examination and investigation to reach differential diagnoses and to distinguish between these diagnoses with appropriate investigation. They will be expected to be able to justify selection of particular investigations in this context, with a view to making a diagnosis whilst considering cost and patient safety.



Clinical-physiological, imaging and laboratory investigations are very widely used in patient management. Students already have a working understanding of the basic principles that underpin such investigations. In ACE students will apply and further develop knowledge to be able to select basic investigations appropriate to common clinical presentations, explain why and how they work, and be able to interpret the results.

In ACE students will develop a thorough understanding and ability to select forms of management at a level expected of an FY1 doctor. In the module students will apply and extend knowledge on clinical pharmacology and therapeutics to develop skills of prescribing so that the student becomes a safe and effective prescriber as an FY1 doctor.

Students will build upon skills of clinical reasoning already gained and be able to create a reliable differential diagnosis based on clinical observations and critical analysis.

Students will continue to apply knowledge of psychological principles, acquired in earlier years, to clinical situations. Students will see patients who have dependence issues, addiction and substance abuse and will consider the issues involved and integrate these into the holistic care of the patient. They may witness death and see those affected by bereavement and how these issues are dealt with by healthcare professionals.

In ACE students will witness the behaviors of patients and their families and their response to illness. Students will be able to apply knowledge of behavioural sciences and explain the different responses students encounter. Students will be aware of occupational factors in disease and apply this knowledge in taking and interpreting a medical history involving an occupational history. They may witness patients who are non-compliant with their treatment and will be able to discuss relevant sociological aspects.

Students will apply the knowledge previously gained in relation to public health to clinical situations. They will be able to reflect upon public health matters as they apply to common clinical conditions and apply these using a structured approach. They should be able to apply knowledge of environmental, occupational and nutritional factors in disease in a clinical context. They should also be able to apply knowledge of health promotion and disease prevention in a clinical context. Students should be able to apply knowledge of infection control in a clinical context.

The doctor as a practitioner

Students will build on skills acquired in CP1 and CP2 to carry out a holistic consultation with a patient within an appropriate timescale. Students will be able to communicate effectively with patients, demonstrating empathy and sensitivity.

In ACE students will develop skills which will allow them to manage a full range of diagnoses and clinical presentations commensurate with being an FY1 doctor. Students will further develop awareness of how a doctor needs to deal with uncertainty. These skills will be further developed in the TTP course, where students will have responsibility for all medical aspects of care for a group of patients, under supervision.

Students will be able to discuss and agree a plan of investigation with a patient and know how to take informed consent and have experience of doing so under supervision. They will also know the principles of taking informed consent and when it is appropriate for students to do so at any stage of their career as a doctor.

In ACE students will become involved in all aspects of the patient journey to a level where students are able to function as an FY1. They will have knowledge of end of life pathways and the criteria for and process of certifying death.

Students are required to apply knowledge in relation to communication skills in a clinical context during ACE. The ability to communicate effectively is one of the core outcomes that is expected to be attained and demonstrated in this phase. Skills will be developed to facilitate communication in general and in difficult circumstances when they arise.

Students should be able to apply existing knowledge and skills in basic first aid, where required, working within the limits of their competence. They will receive instruction in aspects of immediate life support and recognition of features that indicate the need for immediate clinical intervention and care. Many of the aspects of immediate care will be taught in the Critical Illness (CI) block within ACE, but knowledge and skills learned will be applicable to patients in general.

In ACE students will build on existing knowledge of prescribing. Students will gain more knowledge of safe prescribing, drug interactions and detection and reporting of adverse drug reactions. By the end of the course students will be able to assimilate relevant information to write a safe and legal prescription for a patient and be familiar with the process of writing a prescription. Students will not actually prescribe until students begin work as an FY1.

Students will be required to demonstrate a range of practical procedures as Mandatory Clinical Competencies and Skills (MACCS). Some of these are diagnostic procedures, some are therapeutic procedures. The ACE MACCS are listed in the ACE logbook.

As part of the module, students will be required to maintain a portfolio and logbook and maintain accurate and legible records. They will demonstrate several specified outcomes as part of their clinical-based attachments through keeping a logbook record.

The doctor as a professional

Students already have knowledge in relation to many of the aspects that contribute to professionalism. In ACE students will both extend this knowledge and demonstrate its application while working in a clinical attachment and demonstrate a professional attitude and behavior during the module. This will be assessed through appraisal and logbook review while in the workplace.

In ACE students will be required to learn from their experiences and private study. Students should be able to demonstrate an ability to learn from experience by making high quality reflections on their experience in a portfolio. There will be a limited opportunity to demonstrate teaching of others in this phase, but students should take opportunities to facilitate the learning of others in small groups teaching sessions. Students should provide full and meaningful feedback on teaching and learning where required. Students should show an ability to work well in a group as a learner or teacher. In ACE students will be required to demonstrate through appropriate behavior that they are developing the outcome specified in this domain.

Students will witness and gain experience of working in a team with a range of health professionals. They should learn the roles of the health professionals which whom students interact. Students will take part in multiprofessional learning opportunities. They should demonstrate that they can work well with colleagues in a team



Students will observe examples of team building during clinical attachments in ACE and apply these skills themselves during the later TTP module.

Protecting patients is a core aspect of all clinical working and students will be required to demonstrate this through their behavior in all clinical placements. Students will be aware of the structures and organisations within the NHS protecting patient safety and the mechanisms for dealing with and learning from critical incidents. Students will already have some knowledge of how the NHS is organised and how medicine is practised from earlier learning. Students will be expected to develop this knowledge through private study and witnessing health care delivery in different settings in ACE. In all clinical phases students will be required to work within Health & Safety directives in the workplace. In ACE students will be required to further develop an awareness of clinical governance and quality assurance. Students will build upon existing knowledge and awareness of procedures used in quality improvement in ACE. They will continue to develop knowledge of resource management during clinical attachments and observe the role of the doctor as manager.

In ACE students will be able to incorporate clinical uncertainty into decision making and be able to manage this uncertainty effectively. Students will become reflective practitioners, and be able to listen to and act upon feedback to improve their performance as a healthcare professional.



Advanced Clinical Experience Module (ACE) Module Outcomes mapped to Outcomes for Graduates (GMC 2015)

This section of the study guide specifies the learning outcomes as they are listed in the Module Specification for ACE. They are 'high level' statements and link closely to the wording in the GMC document "Outcomes for Graduates (2015)". A later section will list more detailed "Topic Learning Outcomes" which can further help in directing study.

Assessments are linked to the Module Outcomes, listed below. The paragraph numbers are those taken from "Outcomes for Graduates (2015)".

Students may witness clinical cases that are outside of the specification in this study guide but which allow the student to develop in the domain of Doctor as Professional.

Outcomes 1 - The doctor as a scholar and a scientist

8. The student will be able to apply to medical practice biomedical scientific principles, method and knowledge relating to: anatomy, biochemistry, cell biology, genetics, immunology, microbiology, molecular biology, nutrition, pathology, pharmacology and physiology.

- (a) Explain normal human structure and functions.
- (b) Explain the scientific bases for common disease presentations.
- (c) Justify the selection of appropriate investigations for common clinical cases.
- (d) Explain the fundamental principles underlying such investigative techniques.
- (e) Select appropriate forms of management for common diseases, and ways of preventing common diseases, and explain their modes of action and their risks from first principles.
- (f) Demonstrate knowledge of drug actions: therapeutics and pharmacokinetics; drug side effects and interactions, including for multiple treatments, long-term conditions and non-prescribed medication; and also including effects on the population, such as the spread of antibiotic resistance.
- (g) Make accurate observations of clinical phenomena and appropriate critical analysis of clinical data.

9. Apply psychological principles, method and knowledge to medical practice.

10. Apply social science principles, method and knowledge to medical practice.

11. Apply to medical practice the principles, method and knowledge of population health and the improvement of health and health care.



Outcomes 2 - The doctor as a practitioner

13. The student will be able to carry out a consultation with a patient:

- (a) Take and record a patient's medical history, including family and social history, talking to relatives or other carers where appropriate.
- (b) Elicit patients' questions, their understanding of their condition and treatment options, and their views, concerns, values and preferences.
- (c) Perform a full physical examination.
- (d) Perform a mental-state examination.
- (e) Assess a patient's capacity to make a particular decision in accordance with legal requirements and the GMC's guidance (in Consent: Patients and doctors making decisions together).
- (f) Determine the extent to which patients want to be involved in decision-making about their care and treatment.
- (g) Provide explanation, advice, reassurance and support.

14. Diagnose and manage clinical presentations.

- (a) Interpret findings from the history, physical examination and mental-state examination, appreciating the importance of clinical, psychological, spiritual, religious, social and cultural factors.
- (b) Make an initial assessment of a patient's problems and a differential diagnosis. Understand the processes by which doctors make and test a differential diagnosis.
- (c) Formulate a plan of investigation in partnership with the patient, obtaining informed consent as an essential part of this process.
- (d) Interpret the results of investigations, including growth charts, x-rays and the results of the diagnostic procedures in Appendix 1.
- (e) Synthesise a full assessment of the patient's problems and define the likely diagnosis or diagnoses.
- (f) Make clinical judgements and decisions, based on the available evidence, in conjunction with colleagues and as appropriate for the graduate's level of training and experience. This may include situations of uncertainty.
- (g) Formulate a plan for treatment, management and discharge, according to established principles and best evidence, in partnership with the patient, their carers, and other health professionals as appropriate. Respond to patients' concerns and preferences, obtain informed consent, and respect the rights of patients to reach decisions with their doctor about their treatment and care and to refuse or limit treatment.
- (h) Support patients in caring for themselves.

(j) Contribute to the care of patients and their families at the end of life, including management of symptoms, practical issues of law and certification, and effective communication and team working.

15. Communicate effectively with patients and colleagues in a medical context.

(a) Communicate clearly, sensitively and effectively with patients, their relatives or other carers, and colleagues from the medical and other professions, by listening, sharing and responding.

(b) Communicate clearly, sensitively and effectively with individuals and groups regardless of their age, social, cultural or ethnic backgrounds or their disabilities, including when English is not the patient's first language.

(c) Communicate by spoken, written and electronic methods (including medical records), and be aware of other methods of communication used by patients. Appreciate the significance of non-verbal communication in the medical consultation.

(d) Communicate appropriately in difficult circumstances, such as breaking bad news, and when discussing sensitive issues, such as alcohol consumption, smoking or obesity.

(h) Communicate effectively in various roles, for example as patient advocate, teacher, manager or improvement leader.

16. Provide immediate care in medical emergencies.

(a) Assess and recognise the severity of a clinical presentation and a need for immediate emergency care.

(b) Diagnose and manage acute medical emergencies.

(c) Provide basic first aid.

(d) Provide immediate life support.

(e) Provide cardio-pulmonary resuscitation or direct other team members to carry out resuscitation.

17. Prescribe drugs safely, effectively and economically. (a) Establish an accurate drug history, covering both prescribed and other medication.

(b) Plan appropriate drug therapy for common indications, including pain and distress.

(c) Provide a safe and legal prescription.

(d) Calculate appropriate drug doses and record the outcome accurately.

(e) Provide patients with appropriate information about their medicines.

(f) Access reliable information about medicines.

(g) Detect and report adverse drug reactions.



ACE Study Guide 2018/19

(h) Demonstrate awareness that many patients use complementary and alternative therapies, and awareness of the existence and range of these therapies, why patients use them, and how this might affect other types of treatment that patients are receiving.

18. Carry out practical procedures safely and effectively.

- (a) Be able to perform a range of diagnostic procedures, as listed in ACE MACCS and measure and record the findings.
- (b) Be able to perform a range of therapeutic procedures, as listed in ACE MACCS
- (c) Be able to demonstrate correct practice in general aspects of practical procedures, as listed in ACE MACCS

19. Use information effectively in a medical context.

- (a) Keep accurate, legible and complete clinical records.
- (b) Make effective use of computers and other information systems, including storing and retrieving information.
- (c) Keep to the requirements of confidentiality and data protection legislation and codes of practice in all dealings with information.
- (d) Access information sources and use the information in relation to patient care, health promotion, advice and information to patients, and research and education.
- (e) Apply the principles, method and knowledge of health informatics to medical practice.

Outcomes 3 - The doctor as a professional

20. The student will be able to behave according to ethical and legal principles.

- (a) Know about and keep to the GMC's ethical guidance and standards including 'Good Medical Practice', the 'Duties of a doctor registered with the GMC' and supplementary ethical guidance which describe what is expected of all doctors registered with the GMC.
- (b) Demonstrate awareness of the clinical responsibilities and role of the doctor, making the care of the patient the first concern. Recognise the principles of patient-centred care, including self-care, and deal with patients' healthcare needs in consultation with them and, where appropriate, their relatives or carers.
- (c) Be polite, considerate, trustworthy and honest, act with integrity, maintain confidentiality, respect patients' dignity and privacy, and understand the importance of appropriate consent.
- (d) Respect all patients, colleagues and others regardless of their age, colour, culture, disability, ethnic or national origin, gender, lifestyle, marital or parental status, race, religion or beliefs, sex, sexual orientation, or social or economic status. Respect patients' right to hold religious or other beliefs, and take these into account when relevant to treatment options.
- (e) Recognise the rights and the equal value of all people and how opportunities for some people may be restricted by others' perceptions.



(f) Understand and accept the legal, moral and ethical responsibilities involved in protecting and promoting the health of individual patients, their dependents and the public including vulnerable groups such as children, older people, people with learning disabilities and people with mental illnesses.

(g) Demonstrate knowledge of laws, and systems of professional regulation through the GMC and others, relevant to medical practice, including the ability to complete relevant certificates and legal documents and liaise with the coroner or procurator fiscal where appropriate.

21. Reflect, learn and teach others.

(a) Acquire, assess, apply and integrate new knowledge, learn to adapt to changing circumstances and ensure that patients receive the highest level of professional care.

(b) Establish the foundations for lifelong learning and continuing professional development, including a professional development portfolio containing reflections, achievements and learning needs.

(c) Continually and systematically reflect on practice and, whenever necessary, translate that reflection into action, using improvement techniques and audit appropriately for example, by critically appraising the prescribing of others.

(d) Manage time and prioritise tasks, and work autonomously when necessary and appropriate.

(e) Recognise own personal and professional limits and seek help from colleagues and supervisors when necessary.

22. Learn and work effectively within a multi-professional team.

(a) Understand and respect the roles and expertise of health and social care professionals in the context of working and learning as a multi-professional team.

(b) Understand the contribution that effective interdisciplinary teamworking makes to the delivery of safe and high quality care.

(c) Work with colleagues in ways that best serve the interests of patients, passing on information and handing over care, demonstrating flexibility, adaptability and a problem-solving approach.

(d) Demonstrate ability to build team capacity and positive working relationships and undertake various team roles including leadership and the ability to accept leadership by others.

23. Protect patients and improve care.

(a) Place patients' needs and safety at the centre of the care process.

(b) Deal effectively with uncertainty and change.

(c) Understand the framework in which medicine is practised in the UK, including: the organisation, management and regulation of healthcare provision; the structures, functions and priorities of the NHS; and the roles of, and relationships between, the agencies and services involved in protecting and promoting individual and population health.



- (d) Promote, monitor and maintain health and safety in the clinical setting, understanding how errors can happen in practice, applying the principles of quality assurance, clinical governance and risk management to medical practice, and understanding responsibilities within the current systems for raising concerns about safety and quality.
- (e) Understand and have experience of the principles and methods of improvement, including audit, adverse incident reporting and quality improvement, and how to use the results of audit to improve practice.
- (f) Respond constructively to the outcomes of appraisals, performance reviews and assessments.
- (g) Demonstrate awareness of the role of doctors as managers, including seeking ways to continually improve the use and prioritisation of resources.
- (h) Understand the importance of, and the need to keep to, measures to prevent the spread of infection, and apply the principles of infection prevention and control.
- (i) Recognise own personal health needs, consult and follow the advice of a suitably qualified professional, and protect patients from any risk posed by own health.
- (j) Recognise the duty to take action if a colleague's health, performance or conduct is putting patients at risk.



ACE MODULE

GENERAL TOPIC LEARNING OUTCOMES APPLYING TO ALL ATTACHMENTS

CLINICAL PROBLEM SOLVING AND PROFESSIONAL ATTITUDES

During ACE students will be learning the clinical knowledge, skills and attitudes required for assessment and management of patients with a wide spectrum of clinical presentations and conditions. This will predominantly be within hospital (wards, out-patients, operating theatres, emergency rooms) and also in General Practice.

Certain elements of professional competence that are not specific to a patient's diagnosis will be discussed by teachers and observed, learnt and applied by students throughout ACE. Such generic professional, ethical and attitudinal attributes that should be acquired by the student are summarised in the GMC's Good Medical Practice. The generic skills that particularly relate to patient assessment and management in CP and ACE are listed here.

GENERIC SKILLS

- Communicate clearly, sensitively and effectively with patients and their relatives or carers, and with other health care providers.
- Identify and solve clinical problems by undertaking an appropriate patient assessment through enquiry and examination
- Identify and solve clinical problems by understanding why the patient is seeking advice
- Identify and solve clinical problems by ascertaining the most likely single diagnosis or differential diagnosis
- Identify and solve clinical problems by selecting, and interpreting, appropriate investigations
- Identify and solve clinical problems by developing a rational and practical individualized management plan
- Identify and solve clinical problems by monitoring appropriate patient outcomes and adjusting management if required
- Provide an understandable explanation to the patient of diagnosis, investigations, management options and prognosis.
- Make an adequate record and complete the administration related to investigations and treatment.



- Discuss and apply strategies to deal with more challenging consultations, including: breaking bad news; patients with barriers to communication (eg language, impaired cognition or hearing); management of multiple problems; angry or aggressive patients ; refusal of treatment or investigation; poor adherence to a management plan; terminal care and the End of Life Pathway.
- Analyse ethical problems that present in hospital and general practice and justify the decisions that are made.
- Analyse and reflect on their own and others consultation and management skills.
- Apply the principles of clinical governance to improve patient care.

Ethical Issues

Show familiarity with GMC's ethical guidance and standards including Good Medical Practice, the 'Duties of a doctor registered with the GMC' and supplementary ethical guidance which describe what is expected of all doctors registered with the GMC:

- Consent
- Confidentiality
- Professional duties
- Four principles and their scope in practice
- Key legal principles involved in health care

Structure of the NHS

Describe the organisation, management and regulation of healthcare provision; the structures, functions and priorities of the NHS and the roles of, and relationships between, the agencies and services involved in protecting and promoting individual and population health

Apply the principles of quality assurance, clinical governance and risk management to medical practice.

Describe responsibilities within the current systems for raising concerns about safety and quality.



CLINICAL HISTORY TAKING

Taking a medical history is fundamental to the diagnostic process. The main objectives are firstly, to explore the history of the patient's current symptoms and secondly, to ask specific questions to ensure other relevant features have not been left out. A well-conducted clinical interview provides information with which to formulate an hypothesis about what is wrong with the patient which helps to focus the clinical examination, investigations and management.

There are generic interview skills which are applicable to clinical situations, irrespective of the nature of the patient's complaints, whether physical or psychological, and irrespective of the discipline of the interviewer, whether a social worker, psychiatrist, surgeon or physician.

Information to be obtained

Your main aim is to find out what has brought this patient to come to see you at this point in time. You will want to find out details of their main problem as follows:

1. The nature of the symptoms
 - characteristics, including severity and precise location
 - onset (e.g. sudden, sub-acute, insidious)
 - course of the illness (eg progressive, non-progressive, intermittent)
 - help so far and support available
 - precipitating and relieving factors
 - response to any treatment taken

2. The impact on their daily life
 - activities of daily life
 - key relationships (e.g. immediate family, primary carer etc.)
 - participation restriction – work life, social life
 - mood

3. Risk factors
 - for development of the condition
 - for prognosis/outcome key relationships (e.g. immediate family, primary carer etc.)

4. Vulnerability factors (Personal history)
 - positive family history
 - personal history
 - status (economic, social, environmental)
 - similar illness in the past
 - premorbid personality
 - comorbidity
 - life events and difficulties
 - occupational history and environmental exposures



INTERVIEWING SKILLS

Beginning the interview

1. Self-introduction - state who you are and the purpose of the interview.
2. The seating arrangements - ensure privacy, chairs at an appropriate distance and angle.
3. Time limits - it is advisable to inform the patient of the amount of time available for the interview.
4. Notes - explain or ask permission to take notes. Most patients readily agree. Accurate recording of history and examination findings is essential. Ideally notes should be made during the interview and patient assessment, but in some circumstances they may be made immediately afterwards.
5. Ensure safety of yourself and patient.

Interview procedures (based on Calgary-Cambridge model)

1. Facilitation - Encourage the patient to use verbal and non-verbal cues.
2. Clarification - Tell the patient if you have not understood something. Avoid jargon. Get a systematic account of symptoms in chronological order. Use repetition. Summarise.
3. Control - Keep the patient to the point, appropriate use of open and closed questions.
4. Focus - Try to avoid premature focus on the initial problem. Consider psychological and social issues.
5. Cues - The patient has come to you for help. He/she will tell you what is wrong. Listen to what he/she says. Attend to verbal and non-verbal cues.
6. Question types - Avoid leading questions. Ask only one question at a time. Use initially open questions before going on to asking specific questions.

Ending the Interview

1. Summarise the problem.
2. Ask if there is anything else troubling the patient.
3. Would he/she like to ask any questions?



Writing up the History

The student should be able to write a medical history in the recommended format:

Presenting complaint	Focusing on the major complaint. e.g. chest pain, breathlessness, abdominal pain
History of presenting complaint	Onset, duration, progress, severity, associated symptoms, relevant precipitating factors, previous similar symptoms
Systems review	Systematic review of common symptoms of CVS/RS/GIT/GU/CNS/MSK/ENDO/disease if not included in history of presenting complaint
Drug history	Including doses/frequency/compliance Patient's understanding of their medication Any complementary therapies that interact with conventional medication should be noted.
Past medical history	Medical illness - details and dates Past surgery - details of procedure/dates/location Known allergies A number of conditions need to be specifically asked about. These include, hypertension, myocardial infarction, asthma, diabetes, CVA and HIV, Epilepsy.
Family history	Illness in immediate family Health of first degree relatives Known inherited illnesses within the family
Social history	Employment, both current and past Social circumstances, marital status, housing, assistance from family/social services Domestic pets Overseas travel
Substance use	Alcohol - quantify amount (units/week), pattern of drinking and duration, context, reason Smoking - quantify amount and duration Recreational (including illicit) drugs - habits and exposure, method of taking (smoke, IV, snort etc.)



CLINICAL EXAMINATION SKILLS

A major outcome of ACE is to demonstrate clinical examination skills. It is expected that the student will be competent in the systematic examination of all systems and will be able to detect and interpret abnormal findings. For intimate examination of female patients (breast, pelvic region) a chaperone should be present; intimate examination of a patient under general anaesthetic or epidural anaesthesia requires prior informed written consent from the patient.

PATIENT SAFETY, CONFIDENTIALITY AND CONSENT SKILLS

Introduce themselves to a patient, identify themselves as a student and seek verbal agreement to take a history and examine the patient	
Demonstrate adherence to dress codes operating in the clinical environment	
Demonstrate adherence to infection control measures, especially in relation to hand washing	
Demonstrate compliance with manual handling guidance for patient moving and handling	
Demonstrate compliance with guidance on patient confidentiality, especially in maintaining anonymised student records and in discussing patient-confidential issues only in an appropriate setting	
Demonstrate an ability to explain/describe what they are doing as they progress through the examination.	
Describe the application of the SBAR (Situation - Background - Assessment Recommendation) model to frame conversations, especially critical ones, requiring a clinician's immediate attention and action	

CARDIOVASCULAR SYSTEM

Make general observations about the appearance of the patient in relation to the cardiovascular system.	
Identify clubbing and list the relevant causes in relation to the cardiovascular system including endocarditis and cyanotic congenital heart disease. Examine the major peripheral pulses including listening for bruits over the carotid, femoral and renal arteries.	
Describe abnormalities of the pulse rate, rhythm, volume and character caused by cardiovascular disease, including the causes of an irregular pulse, small or large volume pulse, slow-rising and collapsing pulse.	
Measure blood pressure using an appropriate sized cuff. Describe the Korotkov sounds.	



ACE Study Guide 2018/19

Assess the internal jugular pressure and demonstrate hepato-jugular reflux.	
Localise the apex beat and comment on its position in relation to surface landmarks.	
Elicit a right ventricular heave, aortic and mitral thrills and describe their significance.	
Demonstrate cardiac auscultation including positioning the patient in the 'end-expired, leaned forward' position and the left lateral position to detect aortic regurgitation and mitral stenosis respectively.	
Demonstrate the presence of pitting ankle oedema.	
Present a concise summary of the results of a cardiovascular examination.	

RESPIRATORY SYSTEM

Make general observations about the appearance of the patient in relation to the respiratory system, including mechanical/anatomical observations such as chest wall deformity or kyphoscoliosis as well as cough or stridor.	
Count the respiratory rate and note any abnormalities including the use of accessory muscles of respiration, inspiratory recession and pursed lips breathing.	
List the causes of clubbing relevant to the respiratory system including bronchiectasis, lung abscess, lung cancer and fibrosing alveolitis.	
Examine the trachea to determine its position in relation to the midline.	
Examine the expansion of the upper and lower lobes of the lungs.	
Percuss the chest wall and correctly identify areas of resonance or dullness.	
Discuss the causes of a dull percussion note on auscultation on different areas of the chest.	
Demonstrate correct auscultation technique and describe the common abnormalities of breath sounds including bronchial breathing, crackles and wheeze and pleural rub. Demonstrate the appropriate use of tactile vocal resonance over an area of dullness to distinguish fluid from consolidation.	
Demonstrate the signs of respiratory failure including central cyanosis, a large volume pulse, confusion and a flapping tremor.	
Measure a patient's peak expiratory flow rate (PEFR).	
Present a concise summary of the findings of a respiratory system examination.	



ABDOMINAL EXAMINATION	
Make general observations about a patient in relation to the gastrointestinal system.	
Correctly demonstrate the signs of chronic liver disease including palmar erythema, leukonychia, clubbing, bruising, spider naevi, parotid enlargement, gynaecomastia, testicular atrophy and peripheral oedema.	
Describe the appearance of the abdomen in relation to scars, distension or visible masses.	
Palpate all areas of the abdomen lightly and more deeply whilst not hurting the patient.	
Systematically examine for enlargement of the liver, spleen and kidneys.	
Systematically examine for an abdominal aortic aneurysm.	
Demonstrate ascites using the technique of shifting dullness.	
Correctly examine hernial orifices.	
Correctly examine external genitalia.	
Auscultate the abdomen and describe abnormalities of bowel sounds.	
Be aware of the importance of digital rectal examination in abdominal examination.	
Present a concise summary of the findings of abdominal examination.	

CRANIAL NERVES	
Make general observations in relation to cranial nerve abnormalities.	
Describe/demonstrate how to examine the sense of smell.	
Examine visual acuity using a Snellen chart.	
Demonstrate pupillary reflexes and describe common abnormalities.	
Examine visual fields by confrontation, describe common abnormalities including homonymous and bi-temporal hemianopias and list the common causes.	
Perform fundoscopy using an ophthalmoscope and describe common appearances of diabetes, hypertension and papilloedema.	



ACE Study Guide 2018/19

Examine eye movements and describe features of 3rd, 4th and 6th nerve palsies.	
Demonstrate and describe nystagmus, and give a list of causes	
Examine the motor and sensory divisions of the 5th nerve.	
Elicit a corneal reflex.	
Outline the differences between an upper and lower motor neurone 7th nerve lesion.	
Demonstrate simple tests of hearing including Rinne's and Weber's tests.	
Elicit a gag reflex describe the cause of uvular deviation and outline the underlying cranial nerve innervation.	
Examine the 11th and 12th nerves.	
Demonstrate competence to communicate with people with physical and complex disability, including those with impaired speech.	
Classify abnormalities of speech including dysphasia (expressive/receptive/nominal), dysarthria and dysphonia.	
Summarise the findings following examination of the cranial nerves.	

LIMBS

Make general observations in relation to the limbs including abnormalities of posture/gait, weakness, wasting, and fasciculation.	
Describe and classify tremor including a postural tremor, rest tremor, intention tremor and a flapping tremor (asterixis).	
Examine limb tone and describe common abnormalities.	
Systematically examine the major muscle groups of the upper and lower limb.	
Elicit deep tendon reflexes and the plantar response and correctly classify upper and lower motor neurone lesions according to the findings.	
Demonstrate how to 'reinforce' a tendon reflex.	
Demonstrate ankle clonus and describe its significance.	
Outline the clinical features associated with parietal lobe disease including dysgraphia, apraxia and sensory inattention.	



ACE Study Guide 2018/19

Elicit signs of cerebellar disease including an intention tremor, dysdiadochokinesia, ataxia and nystagmus.	
Describe dermatomes, myotomes and the root values of the deep tendon reflexes.	
Describe the features of common 'entrapment' syndromes including carpal tunnel syndrome, ulnar nerve and common peroneal nerve (foot drop).	
Examine different modalities of sensation and describe distribution of common types of sensory loss including peripheral neuropathy and spinal cord lesions.	
Demonstrate Romberg's sign and list the causes.	
Summarise the findings following neurological examination of the limbs.	

MUSCULOSKELETAL SYSTEM

Make general observations about the appearance of the patient in relation to the MSK system, including abnormal swelling, deformity, muscle wasting, and abnormal body habitus and proportions.	
Undertake a "GALS" (Gait, Arms, Leg, Spine) screening examination.	
Describe the main phases of gait and characterise an abnormal gait (antalgic, Trendelenberg, spastic, Parkinsonian) in terms of phase of gait and abnormal locomotor characteristics.	
Identify and assess disability and handicap/disadvantage in any patient using the REPAIR screen (Review of pathology & impairment; Environment; Activities; Important other people, Risk & prevention).	
Summarise and record the findings of the GALS and REPAIR screens.	
Identify and characterise, through enquiry and regional examination, the symptoms and signs of arthropathy (ie. joint inflammation and/or damage) at the sternoclavicular joint, acromioclavicular joint, shoulder, elbow, wrist, hand, hip, sacro-iliac joint, knee, ankle/hindfoot, midfoot and forefoot. These signs may include increased heat, soft-tissue swelling, effusion, stress pain, joint-line tenderness, crepitus, bony swelling, restricted movement, deformity and instability.	
Identify through inspection, palpation, resisted active movements and stress tests, common periarticular lesions (bursitis, tendinitis, tenosynovitis, enthesopathy) including: shoulder: rotator cuff lesion, subacromial bursitis, bicipital tendinitis elbow: olecranon bursitis, lateral epicondylitis, medial epicondylitis wrist: de Quervain's tenosynovitis	



ACE Study Guide 2018/19

hip:	greater trochanter pain syndrome (includes trochanteric bursitis and abductor enthesopathy), adductor enthesopathy	
knee:	pre- and infra-patellar bursitis, anserine bursitis, collateral ligament enthesopathy	
ankle/foot:	plantar fasciitis, sub-calcaneal bursitis, Achilles tendinitis/enthesopathy, bunion, Morton's metatarsalgia	
Differentiate by patient enquiry and examination common mechanical neck/back pain (\pm root entrapment), inflammatory back pain (eg. spondylitis), destructive back pain (malignancy, sepsis) and pain from vertebral fracture.		
Determine a hyperalgesic response to palpation at 8 tender sites (lower cervical, lower lumbar, 2 nd /3 rd costochondral, mid-supraspinatus, trapezius skin-fold rolling, lateral elbow, gluteal, medial fat pad of knee) for diagnosis of fibromyalgia.		
Determine hypermobility syndrome using a modified 9-point Beighton score.		
Present a precise summary of the findings of a musculoskeletal examination.		

RECORD KEEPING

Record a comprehensive history and examination using a structured format.	
Based on the information obtained from a concise clerking and examination, design a management plan which would take account of: <ul style="list-style-type: none"> a diet b frequency of measuring vital signs c fluids to be given including IV fluids d investigations e therapeutic interventions 	
Be aware of the importance of updating the medical notes daily, including the date and time of each entry as a record of a patient's hospital care.	
Understand the process of drug prescribing including the use of generic drug names, legible entries, accurate dosing etc. Demonstrate awareness of common drug interactions and of the importance of the British National Formulary in guiding prescribing practice.	
Describe the documentation required when a patient is discharged from hospital including completion of the PRIDE card and discharge summary.	
Prepare a brief discharge summary for the medical records.	
Describe the process of certification of death of a patient including the clinical observations made to confirm death and how these are recorded in the medical notes.	



Demonstrate an understanding of the legal aspects of the medical record by writing appropriate entries, which reflect sound judgement and note only those elements relevant to the patient's clinical progress.	
---	--

EVIDENCE BASED MEDICINE

EVIDENCE BASED CLINICAL PRACTICE

Define evidence based clinical practice and the actions involved in its execution	
---	--

MEASUREMENT VARIATION IN CLINICAL PRACTICE

Describe the sources of variation in clinical measurement including regression to the mean and the importance of observer variation.	
Discuss the different approaches to defining abnormality and the arguments for and against them	

THE USE OF DIAGNOSTIC TESTS

Define sensitivity, specificity, predictive value and likelihood ratio, and discuss their inter-relationships, the effect of changes in disease prevalence, and the effects of combining tests in series or in parallel	
---	--

STUDY OF DISEASE PREVALENCE, INCIDENCE AND PROGNOSIS

Define relative risk, absolute risk, attributable risk fraction and population attributable risk.	
Describe the sources of bias that can arise in studies of disease prevalence, incidence and prognosis.	

CRITICAL APPRAISAL OF CLINICAL TRIALS

Define and discuss explanatory/management trial, different trial designs, randomisation and its effects, types of blinding, "intention to treat" versus "per protocol" analyses, and Type I and Type II errors.	
Describe the different types of bias that can influence trial results and their interpretation, and the problems of small trials and publication bias.	
Describe the benefits, and outline the steps involved, in a systematic review and meta-analysis.	



PLACEBO AND CONTEXTUAL RESPONSE TO TREATMENT	
Define placebo, nocebo and contextual responses to treatment and describe possible mechanisms that explain these effects	
Discuss the relevance of contextual responses in clinical practice and ways of optimising these effects for patient benefit.	

SCREENING FOR DISEASE	
Define screening and distinguish between mass proactive screening and opportunistic case finding.	
Describe the circumstances in which preliminary consideration of screening would be reasonable and how screening should then be evaluated.	
Describe how lead time bias, duration bias and selection bias affect the assessment of screening	
Discuss examples of the major screening programmes currently operating in the UK.	

HEALTH NEEDS ASSESSMENT	
Describe the main components of the health needs assessment process.	
Discuss the various ways of measuring ill health	
Describe how population characteristics may be measured and the effects of these on local outcome measures.	



CLINICAL AUDIT - KNOWLEDGE	
Define clinical audit and describe its purpose and what it involves (the audit loop).	
Describe the common measures of health care used (structure process, outcome and quality measures).	

ECONOMIC EVALUATION	
Define the terms cost-benefit analysis, cost-effectiveness analysis, cost utility analysis, QALY, efficiency and effectiveness.	
Discuss the difference between wants, demands and needs for health care.	

EVIDENCE BASED MEDICINE - SKILLS	
Calculate from suitable data the sensitivity, specificity, predictive value and likelihood ratio of a test.	
Critically appraise a published clinical trial and determine whether the results are valid and whether you should incorporate them into your clinical practice.	
Identify aspects of a particular service that could be assessed for audit purposes.	



Topic Learning Outcomes for Medicine & Surgery

SURGICAL ATTACHMENT

CLINICAL SKILLS (SURGERY)

THEATRE ROUTINE	
Demonstrate an understanding of operating theatre routine through adherence to the prescribed rules of conduct and dress.	
Demonstrate an understanding of the role of the surgeon in relation to that of other members of the theatre team.	
Demonstrate an understanding of the principles of safety in theatre (for patients and staff), including the place of pre-theatre team briefing and various safety checks.	
Demonstrate the proper technique for surgical scrubbing, gowning and gloving in the operating room, assisted and unassisted.	
Demonstrate knowledge of aseptic technique and discuss the microbiological principles involved.	
Identify areas that are considered part of the sterile operative field.	
Demonstrate the ability to function as an assistant in the operating theatre.	
Define the classifications of operative procedures with reference to their potential for infectious complications (clean, potentially contaminated, contaminated and dirty); discuss the importance of this classification system.	

PRE-OPERATIVE EVALUATION

Describe the optimal preoperative evaluation of a patient including clear documentation to include: <ul style="list-style-type: none"> • important identifying data about the patient; • diagnosis and proposed operative procedure; • a brief outline of the cardiac and respiratory examination; • a list of existing potentially complicating medical factors; • an outline of the results of relevant laboratory or diagnostic procedures; • indication of informed consent by the patient; • indication that the patient has been advised of the nature of the procedure; expected benefits and possible risks; • anticipates need for high dependency or intensive care post-operation; • understands the principles of discharge planning 	
---	--



OPERATIVE AND POSTOPERATIVE MANAGEMENT	
<p>Demonstrate an understanding of a surgical procedure by being able to describe the following:</p> <ul style="list-style-type: none"> • preoperative and postoperative diagnosis • important anatomical and physiological observations about the patient • operative procedure performed and incision used • type and method of anaesthetic used and any anaesthetic sequelae • estimated blood loss and type and amount of fluid given during the procedure. • results of any intra-operative examinations or tests (eg, operative cholangiogram, portal venous pressure) • complications or unusual events • tubes, drains, prosthetic material used and relevant information about these devices • disposition and condition of the patient at the end of surgery 	
<p>Describe the immediate postoperative care of the surgical patient by proposing a concise management plan, including but not necessarily limited to:</p> <ul style="list-style-type: none"> • diagnosis, condition; • disposition of the patient (eg ward, home, ITU); • frequency of vital signs; • requirements for analgesia; • activity restrictions; • wound care; • tube and drain care; • diet orders; • intake and output orders; • special nursing care orders; • pulmonary physiotherapy orders; • required fluids and medications; • the indications for prophylactic antibiotics; • necessary laboratory or radiological procedures; • special monitoring support and instructions for use of this equipment; • special circumstances under which the physician is to be notified 	
<p>Describe the typical arrangements for a cancer centre MDT meeting and attend a cancer centre MDT meeting for at least one tumour sites (Please refer to Vertical Learning themes on page 18 of the ACE Log Book)</p>	



MISCELLANEOUS SKILLS/TOPICS

Describe and perform the proper technique for intra-muscular and intravenous injections; as well as injection of local anaesthetics; discuss potential complications of the procedure.	
Describe the indications for proctoscopy and sigmoidoscopy.	
Describe the indications for tube thoracotomy and list the necessary steps in performing this procedure.	
List the indications and contraindications for peritoneal lavage; describe the characteristics of a positive or negative lavage in a patient who has sustained trauma.	
Describe the use of FAST (focused assessment with sonography for trauma) in trauma.	
Indicate the sites for central venous access.	
Watch or under supervision, perform a simple incision and drainage of a soft tissue abscess of the skin or a perianal area.	
Watch or under supervision, perform the routine care of an 'ostomy' including cleaning, preparing the site and applying an appropriate external appliance.	
Understand principles of day care or ambulatory surgery.	

SURGERY, GENERAL PRINCIPLES

URETHRAL CATHETERISATION

List the indications and contraindications for the passage of a urethral catheter	
By performing the requisite tasks and outlining them in written orders, demonstrate knowledge of the daily catheter care and maintenance necessary for preventing stricture formation and retrograde infection.	
List the alternatives for bladder drainage when urethral catheterisation is contraindicated including suprapubic catheterisation or ultrasound guided drainage.	
List and recognise the complications associated with urethral catheterisation including but not necessarily limited to urethral tear, false passage, retrograde infection and stricture formation; indicate the steps necessary to minimise these risks.	
Demonstrate the ability to insert a urethral catheter in a male and female patient.	
Demonstrate proper technique for sampling urine (for routine urinalysis and culture) through a catheter or spontaneously voided specimen.	



WOUND DRAINS	
Discuss the differences between closed suction and open drains.	
Outline the indications for drain placement, advancement and removal.	
Discuss the potential complications associated with wound drains and outline the steps taken to prevent them.	
Describe the appropriate care and management of a surgical drain.	
Watch the advancement and removal of surgical drains, including wound drains, sump drains, nasogastric tubes and urethral catheters and if possible perform this under supervision	
BLOOD SAMPLING	
Perform venepuncture for blood sampling.	
Demonstrate the ability to sample arterial blood by performing arterial puncture.	
Interpret blood gas analyser results from a patient with: metabolic acidosis; metabolic alkalosis; respiratory acidosis; respiratory alkalosis	
FLUIDS AND ELECTROLYTES	
In a simulated environment write prescriptions for Prescribe routine post-operative fluids, maintenance fluids and for fluid challenge.	
Prescribe maintenance IV fluids.	
In a simulated environment write prescriptions for Prescribe routine post-operative fluids, maintenance fluids and for fluid challenge.	
Prescribe maintenance IV fluids.	
SHOCK	
Given a patient with shock, interpret the cardiac output, central venous pressure, left atrial (wedge) pressure, blood pressure pulse and urine output and, using these values determine the category of shock.	
Recognise and initiate appropriate treatment for the following: hypoxia, oliguria, hypotension	
In an exsanguinating patient who has received a massive blood transfusion, identify the acute aetiological factors that may be responsible for the bleeding disorder.	
VASCULAR CATHETERISATION	
Outline the indications for the insertion of central venous catheters, Swan-Ganz catheters and arterial catheters.	



ACE Study Guide 2018/19

Describe the indications for arterial catheterisation and describe the necessary evaluation of a patient's circulatory status prior to catheterisation (eg Allens test).	
List the complications associated with vascular catheterisation and discuss the emergency management of each.	
Describe the routine care of central venous lines.	
Demonstrate the ability to insert intravenous catheters (Venflons and butterflies).	
Watch or assist in the insertion of a central venous or Swan-Ganz catheter.	
BLOOD SAMPLING	
Describe, identify and manage complications secondary to venepuncture or arterial puncture.	
WOUNDS AND WOUND HEALING	
Recognise the various phases of wound healing by evaluating the surgical and traumatic wound. Recognise the appearance of a wound that has healed by epithelialisation.	
Identify normal granulation tissue in a wound and describe its significance in terms of epithelialisation and defence against contamination.	
Recognise infected granulation tissue and discuss its clinical significance.	
Recognise and differentiate wounds that have resulted in loss of tissue and those that have not.	
Recognise and differentiate traumatic wounds that can be safely closed primarily and those that cannot.	
Describe the important components of abdominal wound closure to avoid dehiscence and herniation.	
Describe the functions of a dressing and demonstrate them on actual wounds including: assurance of cleanliness; environmental control; reduction of oedema; elimination of space.; tissue immobilisation; minimisation of scar formation; enhancement of epithelialisation	
Describe the special considerations necessary for dressing and bandaging wounds citing circumstances where it is necessary to protect the wound from the patient.	
Identify the development of inflammatory changes in a wound and around a suture.	
Demonstrate the ability to use aseptic techniques.	
Examine a post-operative wound to determine whether infection is present.	
Demonstrate an understanding of the principles of wound closure by watching and/or performing sterile preparation and draping of the wounded area.; administration of an	



ACE Study Guide 2018/19

appropriate local anaesthetic agent; re-approximation of the skin edge with suture, clips, staples or adhesive strips as appropriate; coverage of the wound with a dressing and bandage when appropriate	
Assess a wound for signs of infection, attending to local heat, erythema and excessive pain and outline the management of an infected surgical wound.	
Watch and/or tie a two-handed knot in suture and watch/demonstrate an instrument tie.	
Watch and/or perform the removal of skin sutures, skin clips or staples without trauma.	
FLUIDS AND ELECTROLYTES	
Demonstrate through discussion understanding of the importance of the 'aqueous environment' in body composition, the distribution of fluids and electrolytes in the body compartments, and the role of the kidney in regulating fluid and electrolyte balance.	
List the physiological limits of normal blood gases.	
List the electrolyte values in serum	
Given a patient's weight, calculate the extracellular, intra-cellular and intravascular volume.	
Calculate sensible and insensible fluid and electrolyte losses in routine post-operative care.	
Calculate sensible and insensible fluid and electrolyte losses in a febrile patient (Temp 40C).	
List the main endogenous factors that affect renal control of sodium and water excretion.	
Write post-operative fluid orders for an unstressed, uncomplicated 70kg patient who has had a gastric procedure.	
List the symptoms and physical findings of dehydration.	
List the electrolyte composition of the following solutions: Sodium chloride (0.9%); Ringers lactate; 5% glucose in water; glucose (4%) saline (0.18%); Hartmann's, Albumin solution	
Describe the common fluid and electrolyte and acid base abnormalities in patients with the following problems: excessive gastric losses; high volume pancreatic fistula; jejunal fistula; ileal fistula; bile fistula; diarrhoea; closed head injury; hypovolaemic shock due to GI blood loss or major trauma	
Describe the commonly observed serum and urinary electrolytes and osmolality in patients with the following conditions: acute renal tubular necrosis; dehydration; inappropriate ADH secretion; diabetes insipidus; congestive cardiac failure.	



SHOCK	
Define shock.	
List the types of shock and the causes for each type of shock.	
Contrast the effects of each category of shock on the: heart, kidney, brain, lung, gut, immune system.	
List the clinical findings that characterise each kind of shock.	
Name and briefly describe the monitoring techniques that help in the diagnosis and management of shock.	
For each type of shock outline the general principles of fluid, pharmacological and surgical management as appropriate.	

SURGICAL BLEEDING DISORDERS	
List the major congenital and acquired bleeding disorders and outline their definitive treatment.	
List questions that would identify potential bleeding disorders when taking a medical history.	
List physical findings that may suggest the presence of a bleeding disorder.	
List the laboratory tests that would be helpful in the diagnosis of disorders listed in 1.	
Name the common surgical conditions leading to disseminated intravascular coagulation (DIC).	

SURGICAL INFECTION AND ANTIBIOTICS	
List the factors that contribute to infection following a surgical procedure.	
Discuss the different types of skin disinfectants used in theatres and surgical wards.	
List the types of surgical infections.	
Discuss the principles underlying the use of prophylactic antibiotics in surgery.	
Describe the diagnostic features and treatment of common skin infections	
Describe common hand infections and discuss the treatment of each.	



ACE Study Guide 2018/19

Describe the clinical features and treatment of anaerobic and synergistic gangrene	
List the causes of post-operative fever and discuss the diagnostic steps for evaluation	
Describe the indications and methods for providing routine and reverse isolation.	
Describe the basis on which antibiotics are chosen for varying infections.	
Describe the diagnostic evaluation of an intra-abdominal abscess.	
Describe the steps in the drainage and culture of a superficial subcutaneous abscess.	

BREAST

BREAST	
Identify and describe the major types of breast lump (fibroadenoma, fibroadenosis, cyst, carcinoma). Outline the natural history of benign and malignant breast neoplasms. Present a classification of the main types of carcinoma of the breast.	
Describe the aetiology, morphology and pathological consequences of carcinoma of the breast.	
List the risk factors for carcinoma of the breast.	
Describe the diagnosis of a breast lump and the concept of triple assessment, including mammography, ultrasound and cytology/biopsy (core and open).	
Describe the principles of management of fibroadenoma, cyst, nipple discharge and breast pain.	
Describe the clinical staging of breast carcinoma.	
List and discuss the treatment options for breast cancer.	
Describe the rationale for adjuvant radiotherapy, chemotherapy, hormonal therapy and biological therapy in the treatment of breast cancer.	
Outline the current results (survival and recurrence rates) of treated breast cancer according to clinical stage.	
Outline the principles of management for local recurrence and metastatic breast cancer.	
In a patient with breast carcinoma, clinically stage the disease as appropriate.	



CARDIOVASCULAR MEDICINE

CHEST PAIN

Describe the characteristic, and contrasting, features of chest pain resulting from myocardial ischaemia, aortic dissection, pleural disease, oesophageal disease, musculoskeletal disease.	
Given a history of chest pain and its features, describe and interpret appropriate investigations and list a differential diagnosis in order of probability.	

ACUTE CORONARY SYNDROME

Describe the causes, morphology, pathological consequences, typical history, examination features, differential diagnosis, management and complications of the acute coronary syndromes ST-segment elevation myocardial infarction (STEMI), non-ST-segment elevation myocardial infarction (NSTEMI) and unstable angina (UA).	
Discuss the indications and contraindications for primary percutaneous coronary intervention and thrombolysis.	
Describe the complications of acute myocardial infarction (AMI) and describe their presentation:	
Describe pharmacological methods of secondary prevention	
Outline the principles of cardiac rehabilitation including advice given regarding driving and employment.	

ANGINA PECTORIS

Define stable and unstable angina and describe the typical history, risk factors, underlying causes/pathology, relevant investigations and treatments, including their side effects.	
Outline treatment options of angioplasty or coronary artery bypass grafting.	
Outline the employment and driving limitations of a diagnosis of angina (and other cardiac disease).	



CARDIAC SURGERY	
Describe the anatomy of the cardiac chambers, valves, coronary arteries, the great arteries and the cardiac conduction system.	
Describe the main incisions for cardiac surgery and outline the difference between open and closed heart surgery and outline the principles involved in cardio-pulmonary bypass.	
Outline the surgical principles and operative risks involved in the treatment of coronary artery disease and valvular disease including types of prosthetic valve and anticoagulation.	
Classify cardiac trauma (penetrating and non-penetrating).	
Outline the clinical presentation and treatment of myxoma and the surgical treatment of constrictive pericarditis.	

ACUTE PULMONARY OEDEMA	
Describe the typical history, clinical features, common causes, differential diagnosis, investigations and management of pulmonary oedema together with the morphology and histological changes of the lungs.	

CONGESTIVE CARDIAC FAILURE (CCF)	
Define heart failure and classify common causes. Describe the typical history and clinical examination findings, investigations and management together with morphology and histological changes in the lungs and liver.	
Outline the drugs used in the long-term management of CCF	

HEART VALVE DISEASE	
Classify the causes of valvular heart disease and outline the common symptoms and non-invasive assessment.	
Outline the reasons for performing right and left heart catheterisation.	
Outline the indications for medical or surgical treatment of valvular heart disease affecting the aortic and mitral valves.	



CONGENITAL HEART DISEASE	
Outline the pathophysiological complications that may occur as a result of adult cyanotic congenital heart disease.	
Define the Eisenmenger syndrome including the clinical features and underlying pathophysiology	

INFECTIVE ENDOCARDITIS	
Define bacterial endocarditis and who is at risk.	
Describe typical clinical examination features and list common infecting bacteria.	
Describe the morphology and histological changes seen and the pathological complications of infective endocarditis.	
Outline important investigations.	
Outline the common antibiotic regimen used to treat endocarditis and describe the indications and role of antibiotic prophylaxis in patients with pre-existing valve disease.	

THE ELECTROCARDIOGRAM AND ARRHYTHMIAS	
Describe the normal ECG and how the electrical changes of the cardiac cycle relate to the ECG.	
Interpret the ECG in suspected acute coronary syndromes and integrate interpretation with other relevant investigations	
Classify heart block and identify the ECG features of each type of heart block, describe ECG features of left and right bundle branch block and atrial and ventricular arrhythmias.	

ATRIAL FIBRILLATION	
Describe the risk factors, classification, clinical features and investigations for this condition.	
Discuss the management of atrial fibrillation, taking into account rate versus rhythm control strategies. Outline assessment for the need of anticoagulation using a recognized risk scoring system.	
List the different oral anticoagulant options, including any key advantages and disadvantages.	



VENOUS THROMBO-EMBOLIC DISEASE	
Identify the usual initial anatomic location of deep venous thrombosis. Describe the risk factors, clinical features and investigations for this condition. Describe the pathophysiology of chronic venous insufficiency and the post-phlebitic syndrome.	
Describe the range of clinical presentation and associated pathology of pulmonary embolic disease.	
Discuss the treatment of a deep vein thrombosis, the methods of administering and monitoring appropriate anticoagulants. Outline the indications for primary thrombo-prophylaxis.	
Administer a VTE risk assessment using a recognized risk scoring system.	

CARDIOVASCULAR SYSTEM SKILLS	
Perform an examination of the cardiovascular system and interpret the relevant investigations including electrocardiogram, cardiac biomarkers and exercise testing.	
Perform an ECG recording from a patient. Analyse the ECG and present their findings in a systematic way.	
Perform intravenous cannulation, basic life support and measurement of the ankle brachial pressure index.	
Discuss a diagnosis of angina with a patient in lay terms.	
Council a patient with angina on the importance of reducing cardiac risk factors.	

VASCULAR MEDICINE AND SURGERY

HYPERTENSION	
Outline the difficulties of defining hypertension and outline the levels of blood pressure defined as normal, borderline or raised including the need to confirm with a minimum of three measurements.	
Describe the features of 'accelerated phase' or 'malignant' hypertension, discuss differential diagnosis of hypertension and causes of secondary hypertension. Describe pathological consequences of hypertension as they affect the cardiovascular, cerebrovascular and renal systems.	



ACE Study Guide 2018/19

Discuss common investigations to exclude a secondary cause of hypertension and outline the common groups of drugs used to treat hypertension including indications, contraindications, side effects and rational combinations of drugs	
HYPERLIPIDAEMIA	
Outline epidemiological links between cholesterol and cardiovascular risk.	
Discuss the evidence and indications for using lipid-lowering drugs in the prevention of cardiovascular disease, together with their side effects	

ATHEROMATOUS AND VASCULITIC VASCULAR DISEASE

ANEURYSMS

Describe the common sites and relative incidence of atherosclerotic arterial aneurysms; list the symptoms, signs and differential diagnosis of a ruptured abdominal aortic aneurysm and outline an emergency management plan	
Discuss the methods available for treating abdominal and thoracic aortic aneurysms and discuss the indications, contraindications and risk factors for surgery in patients with an abdominal aortic aneurysm	
Describe the presentation, complications and treatment of popliteal aneurysm.	
Describe the pathophysiology of arterial dissection and outline clinical presentation, medical and surgical treatment, complications and causes of death.	
Differentiate true and false aneurysm	

CHRONIC PERIPHERAL ARTERIAL OCCLUSIVE DISEASE

List the clinical manifestations of chronic peripheral arterial occlusive disease and describe its investigation and management.	
Differentiate symptoms of ischaemic rest pain and neuropathy as a cause of foot pain and contrast gangrene in diabetic and non-diabetic patients.	
Describe the pathophysiology of intermittent claudication; differentiate claudication from other causes of leg pain.	
List criteria to help differentiate leg ulcers.	
Describe the radiological and surgical treatment choices for patients with occlusive arterial disease according to affected vessel.	



ACE Study Guide 2018/19

Describe the symptoms, signs, investigations, differential diagnosis and treatment of chronic mesenteric vascular occlusive disease	
Describe the clinical presentation, investigation and management of renal artery stenosis.	
List the surgically or radiologically curable causes of hypertension.	

ACUTE ARTERIAL OCCLUSIVE DISEASE

Describe the causes, symptoms, signs and initial management of acute arterial occlusion.	
Differentiate symptoms and signs of acute arterial from acute venous occlusion. Differentiate embolic and thrombotic occlusion.	
Describe the natural history of treated and untreated acute arterial occlusion.	
Contrast the indications for surgical and medical treatment of acute arterial occlusion.	

AMPUTATION

List the types of amputation of the lower limb and contrast their rehabilitation potential	
List the indications for amputation and discuss the selection of amputation site.	
Outline the rehabilitation of a patient with a below- or above-knee amputation.	

VASOSPASTIC DISORDERS

List the underlying diseases or disorders associated with vasospastic changes in the extremities.	
Specify and explain the defining clinical characteristics of Raynaud’s disease or phenomenon.	
List the clinical and investigational features that may distinguish primary from secondary Raynaud’s disease.	
List the laboratory investigations used to assess vasospastic disorders and describe the medical and surgical approaches.	
Describe anatomical mechanisms responsible for producing thoracic outlet compression syndromes and list the investigations for thoracic outlet syndrome. Describe the surgical principles for its correction.	



VASCULAR TRAUMA	
In a patient with recent trauma, outline the physical findings and diagnostic plan for suspected arterial injury together with indications for radiological investigation in the extremities.	
Differentiate the pathophysiology, findings and treatment in common types of arterial injury.	

VENOUS DISEASE	
Outline normal venous physiology and describe the roles of superficial, deep and perforating veins and venous valves.	
Recognise varicose veins and describe their anatomical distribution and potential complications.	
Describe the use of different investigations in diagnosing venous disease and be aware that the Trendelenburg test is no longer a recognised method.	
Outline the management of a venous ulcer.	
Outline the management of varicose veins including indications for surgery.	
Describe the treatments available to patients with venous disease	

LYMPHATIC DISORDERS	
Define lymphoedema.	
Differentiate primary from secondary lymphoedema and explain the pathophysiology and treatment of lymphoedema	

DIAGNOSTIC RADIOLOGY IN VASCULAR DISORDERS	
Describe the indications for Magnetic resonance angiography, Duplex ultrasound, CT angiography and invasive investigations of the arterial and venous system and list the common insertion sites for arterial catheter studies.	
List the risks and complications of angiographic studies and describe their management.	
Define and discuss transluminal angioplasty as used in coronary, visceral and peripheral vascular arterial beds. List the indications for pulmonary arteriography.	



SKILLS IN VASCULAR MEDICINE & SURGERY	
Measure blood pressure using a correct cuff size and interpretation of the Korotkov sounds.	
Discuss a diagnosis of hypertension with a patient in lay terms.	
Interpret an ECG.	
Test a urine sample for blood and protein using a standard test strip	
Demonstrate the site for palpation of all peripheral pulses and determine whether they are present or absent	
Given a patient with ischaemic rest pain in a foot, demonstrate the physical findings, including dependent rubor, pallor on elevation and delayed capillary refill.	
Measure the ankle-brachial pressure index and interpret the results.	
Demonstrate the use of unidirectional Hand Held Doppler to: auscultate the pedal arteries; Measure the systolic blood pressure in the arm and ankle ; Demonstrate reflux at the sapheno-femoral junction	
Describe the technique used to puncture the femoral artery for a blood sample including the necessary equipment and potential complications.	

RESPIRATORY MEDICINE

ASTHMA	
Define the classical features of asthma and outline common precipitants	
Discuss the importance of identifying occupational asthma.	
Classify asthma and discuss the characteristics of a typical patient who is likely to present with each type.	
Describe the morphology and pathological consequences of asthma.	
Describe the clinical features of acute asthma and the blood gas abnormalities associated with acute severe asthma.	
Describe the stepped approach to treatment of an acute asthma attack and create a management plan for a patient presenting with acute asthma	
Describe the mechanisms of actions of the main drugs used to treat asthma.	



CHRONIC OBSTRUCTIVE PULMONARY DISEASE (COPD)/EMPHYSEMA	
Define the term chronic obstructive pulmonary disease (COPD) and describe the pathology underlying COPD, list recognised risk factors	
Describe the typical history of a patient with COPD including complications and clinical features of acute presentations	
Describe a management plan for patients with stable COPD and for those presenting with an acute exacerbation of COPD	
Describe and interpret relevant investigations in a patient with suspected COPD	
Discuss smoking cessation methods	
Discuss the importance of monitored oxygen therapy in treatment and the indications for assisted ventilation, outlining how this is undertaken.	

BRONCHIECTASIS	
Describe the typical history of a patient with bronchiectasis and describe how it differs from COPD	
List recognised risk factors and outline the morphology and pathological consequences of Bronchiectasis	
Outline the investigations of a patient with suspected bronchiectasis and discuss treatment with postural drainage and physiotherapy and antibiotics for infective exacerbation.	

CYSTIC FIBROSIS	
Describe the clinical presentation of a patient with cystic fibrosis with respect to disease of the lung and pancreas; and describe its inheritance.	
Describe pathological changes in the lungs and the natural history of disease in a typical patient	
Outline the non-respiratory manifestations of cystic fibrosis	
List the usual organisms causing lung infection.	
Describe the main principles of treatment including physiotherapy, antibiotics, pancreatic enzymes DNase, and lung transplantation.	



PNEUMONIA	
Describe the typical presentation of a patient with a community-acquired pneumonia and the features that identify severe pneumonia. Describe the role of CURB-65 as a risk prediction tool. List the common pathogens causing community-acquired and hospital-acquired pneumonia and outline predisposing factors	
Describe the pathology of acute lobar pneumonia and bronchopneumonia.	
Describe the investigation of a patient presenting with a community-acquired pneumonia and interpret investigations	
Describe the complications of pneumonia including systemic sepsis, lung abscess and empyema.	
Create a treatment plan including specification of observations, general supportive measures, appropriate antibiotic regimens, analgesia and physiotherapy.	
Outline clinical management during recovery, emphasising the need for radiological follow-up until the consolidation has cleared.	

TUBERCULOSIS	
Describe the process of infection by the tubercle bacillus together with the route of spread and discuss the presentation of post-primary tuberculosis from reactivation of infection. Outline common predisposing factors and outline the principles of treatment of confirmed cases and the principles of contact tracing	
Outline the investigation of a patient with suspected TB	
List the common sites of non-pulmonary TB infection and outline the pathological features Describe in broad outline treatment changes between 1930 and 1970 and the implications of this for current treatment.	
Describe the global picture of TB, its relation to the AIDS epidemic and the causes and consequences of multidrug resistant tuberculosis	

PNEUMOTHORAX	
Describe its typical clinical presentation and the recognised risk factors together with the underlying pathology and investigations.	
Distinguish between simple and tension Pneumothorax including features that aid in recognition of critically ill patients presenting with a tension Pneumothorax	



ACE Study Guide 2018/19

Describe treatment options including chest aspiration or intercostal underwater chest drain	
Outline the indications for surgical pleurectomy and pleurodesis	
Describe the emergency treatment of a tension pneumothorax	

LUNG CANCER

Outline the major pathological classification of lung cancers and their prognosis	
Outline the epidemiology of lung cancer in developed countries.	
Describe the common clinical presentation and risk factors	
List relevant investigation for lung cancer and interpret results	
Outline local metastatic manifestations of lung cancer and describe systemic non-metastatic manifestations including paraneoplastic syndromes.	
Outline the treatment options for a patient with confirmed lung cancer.	

PLEURAL EFFUSION

Classify causes of a pleural effusion including infective, neoplastic, metabolic, and cardiac causes.	
Describe the typical examination features of a pleural effusion and describe the aetiology and clinical features of an empyema.	
Obtain a relevant history from a patient with a pleural effusion.	
Discuss the investigation of a unilateral pleural effusion	
Discuss the management of pleural effusion and empyema.	

INTERSTITIAL LUNG DISEASE/PULMONARY FIBROSIS

Describe the clinical and pathological features of interstitial lung disease. Outline the common causes and list the differential diagnosis in patients who present with established pulmonary interstitial fibrosis	
--	--



Outline the investigations and treatment options for a patient with suspected interstitial lung disease	
---	--

EXTRINSIC ALLERGIC ALVEOLITIS	
Outline the nature of the allergic reaction underlying EAA and how this is used to establish the diagnosis.	
Describe the typical clinical presentation and list common causes.	
Outline the pathological consequences of repeated allergen exposure.	
Outline the treatment options and monitoring of treatment response	

OCCUPATIONAL LUNG DISEASE	
Describe the clinical features of the main conditions associated with asbestos inhalation.	
Describe the natural history of pleural plaques, mesothelioma and asbestosis	
Discuss the effect of inhalation of coal dust on lung function and its relation to pneumoconiosis.	
Describe the pathology of simple and complicated coal workers pneumoconiosis.	
Demonstrate awareness that patients exposed to coal and asbestos can obtain industrial compensation	
Demonstrate awareness that that asthma can be due to occupational factors (see Asthma).	

OBSTRUCTIVE SLEEP APNOEA (OSA)	
Outline the clinical presentation of a patient with OSA, describe the use of sleep studies in its investigation and outline the principles of treatment.	

RESPIRATORY FAILURE	
Distinguish type-2 from type-1 respiratory failure and describe the implications of having a high arterial pCO ₂ .	
Distinguish between acute and chronic type II respiratory failure and respiratory and metabolic causes of acidosis	
Describe the causes of ventilatory failure and outline the effect of chest wall and spinal deformity on respiratory function.	



ACE Study Guide 2018/19

Outline the conditions that may cause ventilatory failure due to neuromuscular disease.	
Outline the treatment for acute ventilatory failure	

RESPIRATORY SYSTEM – SKILLS

Perform an examination of the respiratory system, including mechanical/anatomical observations	
Request and interpret relevant basic investigations including chest x-ray, blood gases and spirometry	
Interpret more advanced investigations	
Show a patient how to use a metered dose inhaler, dry powder inhaler and spacer device.	
Attend a bronchoscopy in order to be able to explain the procedure to a patient	
Demonstrate how a ventimask works	
Provide basic smoking cessation counselling and advice on nicotine replacement therapy	
Describe the key communication skills that underpin how a diagnosis of lung cancer should be given to a patient.	
Observe or assist in inserting a chest drain	



ENDOCRINOLOGY & DIABETES

DIABETES MELLITUS	
Describe the diagnostic criteria for diabetes mellitus and glucose intolerance with reference to laboratory glucose and HBA1c measurement.	
Understand the aetiological classification of diabetes mellitus including the usual presentations of type 1 and type 2 diabetes.	
Describe the important principles of the dietary and lifestyle interventions for the treatment of diabetes.	
Describe the methods of evaluating diabetic control.	
Describe the principles of insulin therapy. Classify the different types of oral hypoglycaemic drugs and non-insulin injectables used in Type 2 diabetes and outline their indications and contraindications.	
In a simulated environment write prescriptions for subcutaneous and intravenous insulin therapy.	
Describe the essential components of the annual review in diabetes care.	

DIABETES (METABOLIC COMPLICATIONS)	
List the two major hyperglycaemic complications of diabetes - diabetic ketoacidosis (DKA) and hyperosmolar hyperglycaemia syndrome (HHS) Outline the metabolic pathways that underlie DKA and HHS and understand the common reasons for their development.	
Describe the typical autonomic and neuroglycopenic symptoms of hypoglycaemia.. Outline the counter-regulatory hormone responses to hypoglycaemia and describe common reasons why hypoglycaemia occurs.	
Discuss the management principles underlying the treatment of DKA (fluid, insulin and potassium replacement) and HHS.	
Describe the treatment of hypoglycaemia.	

DIABETES (MICROVASCULAR AND MACROVASCULAR COMPLICATIONS)	
Discuss the microvascular complications of diabetes affecting the eyes, kidneys and nerves and outline their relationship to diabetic control and disease duration. Describe the features of diabetic sensorimotor neuropathy and associated risks.	



Describe the appearances of background retinopathy, proliferative retinopathy and maculopathy and recognise the appearance of these and of cataract on direct ophthalmoscopy. Outline the treatment of proliferative retinopathy and maculopathy	
Describe the pathology of renal complications of diabetes mellitus. Outline the natural history of diabetic nephropathy emphasising the importance of blood pressure control.	
Outline the treatment of painful diabetic neuropathy.	
Describe the clinical presentation and natural history of other neurological complications including ocular nerve palsies, diabetic amyotrophy, foot drop, impotence and autonomic neuropathy	
Discuss the macrovascular complications of diabetes; compare and contrast the distribution and severity of macrovascular disease in patients with and without diabetes (see also the section on Vascular Medicine and Surgery).	
Discuss additional cardiovascular risk factors in diabetic patients and outline their assessment and management.	

THYROID DISEASE

Describe the symptoms of hyperthyroidism and the typical examination findings. Classify the causes of hyperthyroidism and outline the pathological features of Graves' disease, toxic adenoma and toxic multinodular goiter	
Discuss medical therapy for hyperthyroidism. Discuss the indications for surgical treatment and the risks of post-operative complications. Discuss the indications for and complications of radioactive iodine therapy.	

HYPOTHYROIDISM

Describe the classical symptoms, examination findings and treatment of hypothyroidism. Classify the causes of hypothyroidism and outline the pathological features of Hashimoto's thyroiditis.	
Describe the morphology and pathological consequences of a nodular goitre.	

THYROID CANCER

Classify thyroid cancer and outline the clinical presentation, diagnosis and principles of treatment	
--	--



ACE Study Guide 2018/19

Outline the investigation and management of a patient presenting with a thyroid nodule/swelling	
---	--

PITUITARY DISEASE

Describe the local symptoms that result from a large pituitary adenoma and outline the clinical consequences of pituitary adenoma producing prolactin, growth hormone (acromegaly) or ACTH (Cushing's disease). Classify pituitary adenomas according to size and function.	
Outline other causes of hypothalamic-pituitary disturbance.	
Describe the laboratory assessment of pituitary function and outline the radiological techniques used to investigate pituitary disease	
Outline the treatment and treatment options of a prolactinoma, including the use of dopamine agonists as first line therapy.	

ADRENAL DISEASE

Discuss the possible clinical presentation of a pheochromocytoma and be aware of the syndromes of which it is a component.	
Summarise the clinical and biochemical features of Cushing's syndrome, Addison's disease, Conn's syndrome and congenital adrenal hyperplasia.	
Outline the common methods for imaging the adrenal glands including ultrasound, CT, and isotope scanning and outline the role of surgery in adrenal disorders.	
Describe the need for steroid cover in a patient undergoing adrenal surgery and in patients with inadequate endogenous steroid reserve.	

HYPERCALCAEMIA/PARATHYROID DISEASE

Discuss the normal control of serum calcium and outline the actions of PTH, vitamin D and calcitonin.	
List the causes of a raised serum calcium concentration including hyperparathyroidism and malignancy.	
Discuss the clinical presentation, laboratory features and complications of primary hyperparathyroidism. Outline the important clinical associations of hyperparathyroidism.	
Describe the investigation and early clinical management of a patient presenting with acute hypercalcaemia.	



HYPOCALCAEMIA	
List the causes of acute and chronic hypocalcaemia	
Describe the symptoms and signs, investigation and treatment of hypocalcaemia.	

SKILLS IN ENDOCRINOLOGY AND DIABETES	
Measure capillary blood glucose using a reflectance meter and test strip.	
Perform accurate urinalysis for glucose, protein and ketones using standard test strips.	
Interpret blood gases showing a metabolic acidosis due to DKA	
Interpret a Glucose Tolerance Test	
Interpret thyroid function test results to determine whether the abnormal function results from disease of the thyroid or pituitary gland.	
Interpret thyroid autoantibody test results.	
Interpret endocrine test results to determine whether there is pituitary or end organ failure	
Interpret the results of a Synacthen test and a dexamethasone suppression test	
Interpret laboratory data (Ca, phosphate, alkaline phosphatase, PTH and serum albumin) to make a diagnosis in a patient with hypercalcaemia.	

MEDICAL AND SURGICAL GASTROENTEROLOGY

NUTRITION

NUTRITIONAL ASSESSMENT	
List the daily requirements of fat, protein and carbohydrate utilised by the body. Knowing a patient's weight and level of stress, calculate the daily requirements for calories, protein and carbohydrates.	
List at least four parameters obtained from a patient's medical history that might indicate the presence of malnutrition. List appropriate anthropomorphic measurements.	



List the objective parameters that reflect a patient's nutritional state and their drawbacks.	
List the water soluble and fat-soluble vitamins	

UNDERNUTRITION AND NUTRITIONAL SUPPORT

List the indications for insertion and removal of a nasogastric tube and describe alternative methods of gastric intubation.	
List the incidence and complications of undernutrition.	
List the indications for enteral and parenteral nutritional support; for each condition, identify the appropriate route for administering support. Contrast the risks and benefits of enteral and parenteral nutritional support. List the trace elements that must be replaced in a patient on long-term parenteral nutrition.	
List the metabolic complications of total parenteral nutrition.	
Describe the complications that may be associated with the passage of a nasogastric tube; discuss their recognition and management.	
Discuss the ethical issues associated with artificial nutritional support.	

OBESITY

Specify the definition, approximate prevalence and the risk factors for obesity	
Discuss the clinical and social complications of obesity and specify the management strategies for obesity, including surgical options	
Outline the input from different healthcare professionals required in the treatment of obesity	

UPPER GASTROENTESTINAL TRACT

GASTRO-OESOPHAGEAL REFLUX DISEASE

List the anatomical and physiological factors predisposing to gastro-oesophageal reflux disease.	
--	--



ACE Study Guide 2018/19

Define hiatus hernia with regard to anatomical type (sliding and para-oesophageal).	
Name three typical symptoms of gastro-oesophageal reflux disease (GORD). Describe the investigations used to confirm a diagnosis of GORD.	
Discuss general measures and medical therapy for GORD. Outline the surgical measures used to treat GORD.	
Outline the possible long-term complications of GORD.	
Understand the presenting features, investigation and management of Barrett's oesophagus	

DYSPHAGIA

List the common causes and discuss investigations of dysphagia.	
List the symptoms suggestive of oesophageal malignancy. Describe the pathology and natural history of oesophageal malignancy.	
List the treatment options for an oesophageal malignancy. Discuss staging and assessment of fitness for operation for oesophageal malignancy.	
Outline the pathology, presentation and management of achalasia	

PEPTIC ULCER DISEASE

List the main causes, symptoms and investigation of peptic ulcer disease.	
Discuss differences between gastric and duodenal ulcer.	
Describe the relationship between <i>H. pylori</i> , smoking and non-steroidal anti-inflammatory drugs and peptic ulcer disease and the mechanisms by which they cause peptic ulceration. Be aware of other therapies which may increase GI bleed risk.	
Outline a regimen for <i>H. pylori</i> eradication and discuss its implications for ulcer recurrence.	
Discuss the symptomatic management of peptic ulcer disease. List the complications of peptic ulcer disease and describe subsequent treatment.	
Outline broadly how and why the indications for peptic ulcer disease have changed over time.	



GASTROINTESTINAL HAEMORRHAGE	
Specify the symptoms and common causes of acute upper gastrointestinal bleeding.	
List the common causes of acute lower gastrointestinal bleeding.	
List the commonest presentations of chronic GI blood loss.	
Discuss the initial management of a patient with gastrointestinal haemorrhage.	
List the criteria for endoscopic, surgical or radiological intervention.	

GASTRIC NEOPLASMS	
List risk factors for the symptoms suggestive of and investigations for gastric cancers.	
Describe the epidemiology, classification, morphology and natural history of gastric cancers.	
Outline the general principles of curative and palliative surgical procedures for gastric cancers and discuss the role of adjuvant and palliative therapy	
Quantify the prognosis for gastric cancer	

THE ACUTE ABDOMEN	
Define the acute abdomen.	
Identify the symptoms and signs of common causes of the acute abdomen.	
Discuss differential diagnosis, relating these to the pathology of the conditions.	
Select appropriate investigations to aid diagnosis and interpret these	
Outline initial management and identify the patient needing urgent resuscitation and operative intervention on the basis of their clinical presentation	



SMALL INTESTINE AND APPENDIX

ACUTE DIARRHOEA

List the common pathogens that may cause acute diarrhoea in the community and in travellers to tropical and sub-tropical countries. Outline the management of this problem.	
Indicate the risk factors associated with <i>C. difficile</i> infection and discuss its prevention and treatment.	

ACUTE APPENDICITIS

List the symptoms and signs of acute appendicitis.	
Formulate a differential diagnosis and outline appropriate investigations.	
List the common situations in which appendicitis is difficult to diagnose or manage.	
List the complications of a perforated appendix.	
List and discuss the common complications following appendectomy and explain how each can be prevented.	
List causes of a mass in the right iliac fossa and outline the assessment, investigation and management.	

MECKEL'S DIVERTICULUM

Describe the nature of a Meckel's diverticulum and its possible pathological effects.	
Describe the variable clinical presentations of a patient with a Meckel's diverticulum.	

INTESTINAL OBSTRUCTION

Describe the symptoms and signs in a patient with intestinal obstruction.	
List the common causes and the associated pathology of intestinal obstruction.	



ACE Study Guide 2018/19

Discuss the complications of small bowel obstruction and their recognition	
List the appropriate laboratory and X-ray tests to be employed in a patient with suspected small intestinal obstruction.	
Differentiate between mechanical small bowel obstruction and paralytic ileus.	
List the symptoms and signs suggestive of strangulation.	
Compare and contrast a large bowel obstruction and a small bowel obstruction.	
Outline a plan of treatment in a patient with small bowel obstruction including a consideration of fluid and electrolyte therapy, antibiotic therapy, intestinal intubation and operative therapy.	

MALABSORPTION & COELIAC DISEASE

Describe the clinical presentation of malabsorption and outline appropriate investigations. List causes of malabsorption, in addition to coeliac disease.	
Outline the pathology of malabsorption of key nutrients and consequent presentation and management for each.	
Describe the pathology underlying coeliac disease and list clinical conditions that may be associated with it. Outline the investigations undertaken to diagnose coeliac disease.	

IRRITABLE BOWEL SYNDROME

Describe symptoms that may suggest a diagnosis of IBS.	
Outline current theories regarding the pathophysiology of IBS.	
Discuss possible investigations and outline therapeutic approaches.	

INFLAMMATORY BOWEL DISEASE

Describe the morphology and pathological consequences of Crohn's disease and ulcerative colitis. Describe common presenting symptoms.	
Discuss the investigation of a patient with suspected inflammatory bowel disease.	



Describe the medical therapy available, including the management of acute flares of colitis and the use of immunosuppressives and biological treatments. Discuss complications of Crohn's disease and ulcerative colitis and indications for surgery.	
List the extra-colonic manifestations of inflammatory bowel disease and discuss the response to each to surgery.	
Outline the risk of colonic malignancy in inflammatory bowel disease	

COLON AND RECTUM

DIVERTICULAR DISEASE

Outline the theories on the aetiology of diverticulosis of the colon including age, diet and vascular anatomy of the colon.	
Describe the morphology and pathological consequences of diverticulosis of the colon.	
Describe the clinical features, symptoms and signs of diverticulitis.	
Outline the complications of diverticulosis.	
Describe the management of asymptomatic diverticulae of the colon.	
Discuss the presentation, differential diagnosis, investigations and management of complications of colonic diverticulae including diverticulitis, perforation, bleeding, stricture, abscess and fistula.	
Discuss indications for elective and emergency surgery.	

CARCINOMA OF THE COLON, RECTUM AND ANUS

Describe the aetiology, morphology and pathology of carcinoma of the large bowel. Describe the natural history of carcinomas affecting the large bowel. Describe Dukes and TNM staging systems.	
Discuss the frequency of each according to location of the carcinoma, particularly with rectal and carcinoma of the caecum. Identify the pathological differences between colorectal and anal cancer.	
Identify the common symptoms and signs of carcinoma of the colon, rectum and anus. List the clinical features that would raise suspicion of a carcinoma and indicate urgent patient referral.	



ACE Study Guide 2018/19

Discuss appropriate laboratory tests, radiological studies and endoscopic investigations to investigate a patient with a suspected colonic or rectal carcinoma.	
Outline the treatment of carcinoma of the colon, rectum and anus and define appropriate resection levels according to lymphatic drainage.	
Outline the management of carcinoma of the anus and contrast it to management of colorectal carcinoma.	
Discuss follow up recurrence and metachronous tumours.	
Outline management of an obstructing colonic cancer.	

INTESTINAL OBSTRUCTION	
List the symptoms and signs of large bowel obstruction.	
Discuss the diagnostic aids available for the diagnosis of large bowel obstruction.	
List the causes of intestinal obstruction in children and outline the diagnostic tests most appropriate for each: list the frequency of each cause of intestinal obstruction.	
Outline a diagnostic plan to identify aetiological factors of faecal impaction.	

HAEMORRHOIDS	
Discuss the anatomy of haemorrhoids.	
Describe the role of the anal sphincters in maintaining faecal continence.	
State the aetiological factors of haemorrhoids.	
Describe the symptoms and complications of haemorrhoids.	
Discuss the differential diagnosis of rectal bleeding.	
Describe the physical examination of a patient with haemorrhoids, including proctosigmoidoscopy.	
Outline the principles of management of patients with symptomatic haemorrhoids including investigation and differential diagnosis appropriate to patient factors including history and age.	
Describe symptoms and signs of perianal haematoma and outline management	



PERIANAL INFECTION	
Discuss the role of anal crypts in perianal infection.	
Outline the symptoms of patients with perianal infections.	
Describe the various types of perianal infections.	
Describe the physical examination of patients with perianal infections.	
Define fistula in ano.	
Outline the principles of management of patients with perianal infections including management of fistula in ano.	

FISSURE IN ANO	
Define anal fissure.	
Describe the symptoms and physical examination of patients with fissure-in-ano.	
Discuss current theories of the aetiology of anal fissure and describe the principles of management.	

HEPATO-BILIARY DISEASE

ACUTE and CHRONIC HEPATITIS	
Describe the morphology and pathological consequences of acute and chronic hepatitis.	
Describe the features of drug induced liver injury including paracetamol overdose.	
Describe the causes of acute and of chronic hepatitis, including infection.	
Discuss the diagnosis and investigation of a patient with jaundice.	



Outline the clinical presentation of acute and chronic hepatitis including relevant features in the medical history.	
Outline the treatment options for hepatitis due to autoimmunity, hepatitis B or C and paracetamol overdose.	
Outline the indications for and discuss the contraindications of liver biopsy in hepatitis. Be aware of other investigations including fibroscan, ultrasound and blood tests.	

LIVER NEOPLASMS, ABSCESS AND CYSTS

Compare and contrast the pathology and natural histories of liver neoplasia, abscesses and cysts.	
Describe the symptoms and signs associated with liver abscess. List the investigations that differentiate neoplasia, abscesses and cysts and outline their treatment options.	
Describe the aetiology and pathology of primary and secondary liver neoplasms.	

CHRONIC LIVER DISEASE

Define cirrhosis in pathological terms.	
Describe the morphology and pathological consequences of cirrhosis.	
Describe the investigation of a patient with suspected cirrhosis.	
Discuss how to establish the diagnosis of the cause of cirrhosis.	
Outline the pathophysiology underlying the clinical features of cirrhosis.	
Describe the clinical features of complications of cirrhosis and portal hypertension and outline their management.	

PORTAL HYPERTENSION

Describe portal venous anatomy.	
Define portal hypertension and classify its causes.	



Describe the clinical manifestations of portal hypertension.	
Outline the treatment methods available for bleeding oesophageal varices	

THE SPLEEN

List the common causes of splenomegaly including portal hypertension, lympho-reticular disease and chronic infection.	
Outline the haematological abnormalities correctable by splenectomy.	
Discuss the potential causes of splenic rupture.	
Discuss the potential adverse consequences associated with splenectomy and recommendations for preventing overwhelming post-splenectomy sepsis	

OBSTRUCTIVE JAUNDICE

Classify intrahepatic and extrahepatic causes of obstructive jaundice and outline underlying pathology.	
Describe the clinical features of obstructive jaundice and outline their pathophysiology.	
Describe the laboratory and radiological investigation of a patient presenting with obstructive jaundice.	
Describe the aetiology, morphology and pathological consequences of cholelithiasis (see under BILIARY DISEASE for more detail).	
Describe the clinical presentation, morphology and pathological consequences of carcinoma of the pancreas (see under PANCREAS for more detail).	
Discuss the methods relieving common bile duct obstruction.	

ACUTE AND CHRONIC GALLBLADDER DISEASE, CARCINOMA OF THE BILIARY TRACT

List the common types of gallstones and describe their pathophysiology	
--	--



ACE Study Guide 2018/19

Describe the symptoms and signs of biliary colic and contrast with acute cholecystitis.	
Describe the natural history of asymptomatic gallstones. List the common tests used in the diagnosis of gallstones.	
Discuss the management of gallbladder disease.	
Describe the symptoms and signs and management of bile duct stones.	
Define the following: Murphy's sign, Courvoisier's sign, T-tube (including purpose and circumstances of use), gallstone ileus.	
List the complications of gallstones and describe the history, physical examination and laboratory findings for each (see also OBSTRUCTIVE JAUNDICE)	
Outline the medical management of a patient with biliary colic and acute cholecystitis including appropriate antibiotic regimen.	
Outline carcinoma of the gallbladder, bile duct and ampulla of Vater with regard to presenting symptoms and survival.	

DIAGNOSTIC STUDIES IN BILIARY TRACT DISEASE

Contrast changes in liver function tests in obstructive and hepatocellular jaundice.	
List the most common bacteria cultured in acute cholecystitis.	
Outline the place of radiological and endoscopic investigation in the diagnosis of obstructive jaundice and in staging of pancreatic cancer.	
Describe the indications for, and risks of, ultrasound scanning, transhepatic cholangiography and endoscopic retrograde cholangiopancreatography (ERCP).	

THE PANCREAS

ACUTE PANCREATITIS

Describe the clinical presentation of acute pancreatitis.	
Describe the aetiology and pathology of pancreatitis.	



ACE Study Guide 2018/19

Classify pancreatitis on the basis of the severity of organ injury.	
Discuss the management of acute pancreatitis and potential early complications of acute pancreatitis.	
Outline the investigation of suspected acute pancreatitis, emphasising the timing, interpretation and reliability of currently available tests.	
Discuss the criteria used to predict the prognosis for acute pancreatitis.	
Outline the metabolic complications of pancreatitis.	

PANCREATIC PSEUDOCYSTS

Define pseudocyst and discuss mechanisms of their formation.	
List and discuss the symptoms and signs and natural history of an untreated pseudocyst.	
Discuss the indications for and sequence of investigations for suspected pseudocyst.	
Describe the treatment of pancreatic pseudocyst.	

PANCREATIC NEOPLASMS

Describe the symptoms and signs of pancreatic cancer depending on location of the tumour within the gland. Outline investigations indicated.	
List common pancreatic neoplasms; describe the pathology of each with reference to cell type and function.	
Discuss non-surgical management, indications for surgery and list common operations.	
Discuss the prognosis of pancreatic neoplasms with regard to histology	



THE ABDOMINAL WALL

HERNIAE

Define hernia and the descriptive terms reducible, irreducible, obstructed, strangulated and sliding.

Outline the principles of management of patients with hernia.

INGUINAL HERNIAE

Define indirect and direct inguinal hernia. List the factors that predispose to the development of inguinal hernia.

Discuss the relative frequency of indirect, direct and femoral hernia in children, women, young men and elderly men. Perform a physical examination of patients with inguinal hernia and describe signs of incarceration, obstruction and strangulation.

Outline the principles of management of reducible inguinal hernia in patients with obstructed or strangulated inguinal hernia.

FEMORAL HERNIAE

Define femoral hernia.

Define incarcerated, obstructed, strangulated femoral hernia and Richter's hernia.

Describe the symptoms and signs of patients with femoral hernia. Perform the physical examination of patients with femoral hernia.

UMBILICAL/PARAUMBILICAL HERNIAE

Define an umbilical hernia and relate it to the embryological origin of the umbilicus. List the factors that predispose to the development of umbilical and para-umbilical hernia.

Describe the symptoms of patients with umbilical hernia. Perform a physical examination of patients with umbilical hernia, differentiating reducible and non-reducible hernia; recognise the signs of strangulation.



Outline the principles on management of patients with umbilical hernia, including distinguishing those needing operative repair from those who do not.	

INCISIONAL HERNIAE	
Discuss the incidence of incisional hernia according to risk factors of patient comorbidity and previous surgery.	
Describe the symptoms of patients with incisional hernia.	
Describe the potential complications of incisional hernia including bowel obstruction and strangulation.	
Perform a physical examination of patients with incisional hernia and assess the risk of obstruction or strangulation.	
Outline the risk factors for recurrence after repair, including the size of the defect, obesity and chronic cough.	

EPIGASTRIC HERNIAE	
List common presenting features, including epigastric pain and/or a lump in the epigastrium.	
Distinguish on examination between an epigastric hernia and a divarication of the rectus abdominus muscle, and describe why one requires surgical treatment whereas the other doesn't.	

ABDOMINAL AND GASTROINTESTINAL EXAMINATION - SKILLS	
Perform an examination of the abdomen and gastrointestinal system (including rectal examination) Detect abnormalities and make interpretations.	
Interpret relevant laboratory investigations including abdominal x-ray and liver function tests	
Interpret, as relevant, plain abdominal x-rays, specific barium studies and cross sectional imaging to diagnose hiatus hernia, oesophageal cancer, achalasia, peptic ulceration, gastric cancer, air under the diaphragm, small bowel dilatation, intestinal obstruction, inflammatory bowel disease (including toxic megacolon).	



ACE Study Guide 2018/19

Calculate fluid requirements for the following situations: in a patient with intestinal obstruction, a patient NBM requiring maintenance, a patient with persistent vomiting. In a simulated environment write suitable prescriptions for each of the above.	
Interpret liver function tests, virology and immunology reports and radiological investigations to suggest a likely cause of jaundice or hepatitis.	
Demonstrate an understanding of the use of subhepatic drains and T-tubes in biliary surgery and indications and conditions for their removal	
Witness upper gastrointestinal endoscopy (OGD) and colonoscopy. So that a full explanation can be given to patients in the context of taking consent.	
Calculate and interpret a BMI and MUST score Demonstrate an understanding of how to ensure correct NG tube positioning prior to feeding Calculate Glasgow Blatchford and Rockall scores in GI bleed	

RENAL MEDICINE

RENAL FAILURE

Describe the normal functions of the kidneys. Classify renal failure into pre-renal, renal and post-renal causes, outlining the pathology of the common diseases that may cause each type.	
--	--

ACUTE RENAL FAILURE (ARF)

Describe the clinical features of ARF and the concept and causes of Acute Kidney Injury (AKI) leading to ARF	
Discuss the associated electrolyte abnormalities and describe the management of life threatening hyperkalaemia.	
Describe the assessment of a patient with renal failure including fluid balance	
Outline the investigation of a patient with acute renal failure. Outline the principles of treatment. Outline the indications for referral for a specialist opinion/renal replacement therapy.	

CHRONIC KIDNEY DISEASE (CKD)

Describe the clinical features associated with chronic renal failure.	
---	--



ACE Study Guide 2018/19

Discuss the possible physical signs and investigation of a patient with chronic renal failure.	
List and outline the pathology of the common causes of chronic renal failure.	
Describe the assessment of CKD using estimated glomerular filtration rate (eGFR) and the five stages of CKD.	
Describe the morphology and pathological consequences of pyelonephritis, interstitial nephritis, polycystic kidney disease, hypertensive renal damage and obstructive uropathy to the kidney.	
Discuss the effect of chronic renal failure on blood and bone based on disturbance of normal renal function. Outline the treatment options and discuss the indications for dialysis. Outline the options for anaemia management and the principles of managing renal bone disease	
Outline the different forms of renal replacement therapy.	
Describe the effect of declining renal function on drug clearance and discuss the need to adjust doses according to British National Formulary (BNF) guidelines.	

NEPHROTIC SYNDROME

Define the nephrotic syndrome and describe its relationship to conditions causing abnormal proteinuria	
List the three main primary renal causes and outline briefly the key pathological features.	
List secondary causes and outline investigations necessary to confirm the diagnosis	
Outline the investigation necessary to confirm the diagnosis.	
Outline the treatment including the need for diuretics and a low-salt diet.	

GLOMERULONEPHRITIS

Describe the clinical presentation of glomerulonephritis.	
Outline the main pathological processes affecting the glomerulus.	



Outline the investigation necessary to confirm the diagnosis and outline the treatment options including the role of immunosuppressive therapy for some forms of GN.	
--	--

UPPER URINARY TRACT INFECTION	
Describe the pathological features and complications of acute and chronic pyelonephritis	
Describe the symptoms and signs of urinary tract infection including the factors that may predispose to urinary tract infection.	
Describe the investigation of a patient with a suspected infection	
Discuss the general treatment measures and suitable antibiotic regimens for treatment.	

OBSTRUCTIVE AND NEOPLASTIC CONDITIONS OF THE KIDNEY AND URETER	
Describe the causes, symptoms and signs of acute and chronic ureteric obstruction and discuss their management.	
Discuss the aetiology and presentation of calculi in the kidney and ureter. Describe how renal stones are treated including use of non-operative methods of treatment.	
Describe the presenting clinical features of renal cell carcinoma, Wilm's tumour, transitional cell carcinoma or the renal pelvis and renal cysts. Outline the natural history of each together with the main options used in management.	

THE BLADDER AND PROSTATE	
Discuss the management of trauma to the bladder (both accidental and surgical).	
Describe the diagnosis and management of bladder calculi.	
Describe the pathology, clinical presenting features, diagnosis, management and follow-up of transitional cell carcinoma of the bladder.	
Discuss outlet obstruction of the bladder and list the main causes including mechanical and neurological causes.	



ACE Study Guide 2018/19

Describe the clinical presenting features, diagnosis and management of benign prostatic hyperplasia and outline possible complications.	
Discuss the diagnosis of bladder infection outlining the importance of confirming significant bacteriuria (>100,000 organisms/ml) and the importance of white cells in the urine.	
Discuss the management of bladder infections.	
Discuss the clinical presenting features, staging, pathology, natural history and clinical management of carcinoma of the prostate including a description of hormonal manipulation.	

THE URETHRA, PENIS AND SCROTUM

Discuss the clinical presenting features, diagnosis and management of urethritis and the urethral syndrome. Discuss clinical implications for those causes which can be sexually transmitted..	
Outline the management of trauma to the urethra.	
Describe the aetiology, clinical presenting features and management of a urethral stricture.	
Describe the pathology, presentation and management of: phimosis, paraphimosis; priapism; Peyronie's disease; carcinoma of the penis; varicocele, hydrocele, epididymal cyst	
Outline the cause of non-descent and mal-descent of the testis, the risks of this condition and its management.	
Discuss the pathology, clinical presenting features, diagnosis and management of torsion of the testis and epididymo-orchitis.	
Outline the pathological classification of the common tumours of the testis and their biological behaviour. Outline the investigation and management of seminoma and teratoma of the testis.	
Outline the causes of male erectile dysfunction, list screening investigations, and list the available treatments	



KIDNEY TRANSPLANTATION	
Outline the indications for transplantation in patients with chronic renal failure.	
Outline the complications of this procedure and the need for immunosuppressive therapy following surgery.	
Outline the moral and ethical issues associated with renal transplantation.	

NEUROLOGY

BASIC NEUROANATOMY AND NEUROPHYSIOLOGY	
Label the constituent portions of the cerebral cortex, (frontal, parietal, temporal, occipital.)	
Draw and label the circle of Willis and its branches	
List the cranial nerve nuclei in each constituent part of the brainstem (midbrain, pons, medulla)	
Describe the syndromes that would arise from a lesion in; Cerebral hemisphere; Brainstem; Cerebellum; Basal ganglia	
Name the location of the causative lesion in; Homonymous hemianopia; Homonymous quadrantanopia; Bitemporal hemianopia; Monocular visual field defect	
Describe the location of Broca's and Wernicke's areas and explain their function in language	
List the causes of dysarthria	
Explain the difference between a bulbar and pseudobulbar palsy	
List the causes of Horner Syndrome	
Describe the clinical difference between upper and lower motor neuron facial weakness	



ACE Study Guide 2018/19

Draw and label a cross section of the spinal cord, with specific reference to spinothalamic pathways, corticospinal tracts and dorsal columns	
Describe the clinical syndrome that would arise from; Cord transection at C3 and at T10; Cord hemisection; Posterior cord lesion	
Describe the clinical difference between upper and lower motor neuron limb weakness, with specific reference to findings on inspection, tone, deep tendon reflexes and pattern of weakness	
Describe the clinical syndrome that would arise from S1 root lesion; C5 root lesion; Median nerve compression at the carpal tunnel; Ulnar nerve palsy; Peripheral neuropathy; Neuromuscular junction disorders; myopathy	

INVESTIGATIONS IN NEUROLOGY

LUMBAR PUNCTURE	
Name the main anatomical landmark(s) used in guiding a lumbar puncture, and the coincident level in the spine.	
Describe the two different positions a patient may adopt to undergo a lumbar puncture, and advantages of each with respect to ease of success and measuring opening pressure	
List the potential complications of a lumbar puncture	
List the contraindications to a lumbar puncture	
List the acute clinical situations where a lumbar puncture would be indicated.	
Explain the term CSF xanthochromia.	
Explain the significance of CSF xanthochromia in a sudden onset headache.	
List the CSF findings that accompany multiple sclerosis	



IMAGING: CT & MRI	
Outline clinical situations where a CT scan of the head is indicated	
Explain how the results of a CT scan of the head would influence the management of an acute stroke	
Explain the advantages of MRI over CT scan of the head	
List the important contra-indications to an MRI scan	

NEUROLOGICAL EMERGENCIES

STATUS EPILEPTICUS AS A NEUROLOGICAL EMERGENCY	
Define status epilepticus and describe initial investigations and components of Management, including airway protection; use of anti-convulsants	

SPINAL AND ROOT EMERGENCIES	
Describe the clinical presentation of; Acute compression of the cauda equina; Acute lesion of the thoracic cord; L5/S1 root impingement due to disc prolapsed	
Describe the management of a suspected cord syndrome	

NEUROMUSCULAR EMERGENCIES	
Describe the clinical signs which point to neuromuscular ventilatory compromise	
Name the bedside respiratory test of most use in monitoring neuromuscular ventilatory function	



Describe the findings on arterial blood gas which reflect type II respiratory failure	
---	--

HEAD INJURIES

After the assessment of airway, breathing, circulation, describe the assessment of a patient with head injury	
List the features which reflect severe head injury	

EXTRADURAL HAEMORRHAGE AS A NEUROLOGICAL EMERGENCY

Describe the clinical presentation of an extradural haemorrhage	
Describe the acute investigation and management of a suspected extradural haemorrhage	
Explain how an extradural haemorrhage arises, including the artery involved.	

BASE OF SKULL FRACTURE AS A NEUROLOGICAL EMERGENCY

Describe the clinical signs present in a fracture of the base of the skull	
List the complications of a fracture of the base of the skull	

ACUTE HYDROCEPHALUS AS A NEUROLOGICAL EMERGENCY

Describe the clinical presentation of an acute hydrocephalus	
List 3 patient groups most at risk of developing an acute hydrocephalus.	



Describe the immediate investigation and management of suspected acute hydrocephalus	
--	--

MANAGEMENT OF THE SEMI-CONSCIOUS/UNCONSCIOUS PATIENT

Provide a differential diagnosis of a semi/unconscious patient	
Describe the scoring system of the GCS, including the individual grades of each of the three domains	
Apply the GCS in the assessment and monitoring of a semi-conscious patient	
Describe the clinical examination on a semi-conscious/unconscious patient, with specific reference to the initial assessment of ABC, and subsequent neurological and cardiological examinations	
Describe the investigation of a semi/unconscious patient.	
Describe the immediate management of an unconscious patient, including the protection of the patient's airway and maintenance of the patient's circulatory pressure.	

CEREBROVASCULAR DISEASE

Explain the following terms, with specific reference to time course; Stroke; Transient Ischaemic Attack; Amaurosis Fugax	
List the irreversible and reversible risk factors leading toward the development of ischemic stroke	
Describe the risk factors, clinical presenting features and pathological causes and consequences of ischaemic and haemorrhagic stroke.	
List the clinical differences between a stroke which arises from anterior circulation territory and one which arises from posterior circulation territory	
Explain the Bamford classification of stroke, describing the prognostic difference between each stroke type.	



ACE Study Guide 2018/19

Describe the acute management of stroke, with particular attention to Examination; Investigations; Consideration or initiation of Antiplatelet therapy, Anticoagulation, Thrombolysis, Blood pressure control, Statin therapy	
List Immediate non-pharmacological measures in management of stroke such as assessment of swallow, rehabilitative and nursing care.	
Outline measures undertaken in secondary stroke prevention	
Outline methods of evaluating and managing patients with carotid stenosis	
Outline medical and surgical management for TIA.	
Outline the commonest causes of disability in people with impaired mobility.	

VENOUS SINUS THROMBOSES

List the risk factors for the development of venous sinus thromboses	
Outline the clinical presentation of venous sinus thrombosis and how it differs from the presentation of arterial stroke	

SUBARACHNOID HAEMORRHAGE

Describe the clinical presentation of a subarachnoid haemorrhage, with specific reference to features in the history and examination including the rate of onset of symptoms, and signs arising from the event	
Describe the vascular abnormalities which may predispose a patient to developing a subarachnoid haemorrhage.	
Explain how one may investigate a suspected subarachnoid haemorrhage within the acute setting.	
Describe the acute management of the subarachnoid haemorrhage, including referral to the appropriate specialty, and management of	



electrolytes, glucose and blood pressure.	
List the potential complications of a subarachnoid haemorrhage.	

SUBDURAL HAEMORRHAGE	
List the predisposing factors which make a patient vulnerable to developing subdural haemorrhage	
Describe the clinical presentation of a chronic subdural haemorrhage	
Describe the CT scan appearance of a subdural haemorrhage, and how it would change with time.	
Describe the management of a patient once a subdural haemorrhage is detected, with specific reference to who's advice should be sought.	

INTRACEREBRAL HAEMORRHAGE	
List the structural lesions and predisposing factors which may predispose toward Deep intracerebral haemorrhage and Lobar cerebral haemorrhage	
Describe the clinical presentation of intracerebral haemorrhage, initial investigations and immediate patient management	

HEADACHE	
Outline the features and management of headache disorders including Tension Headaches, medication overuse headache, migraine and cluster headaches	
Describe features of the clinical presentation of a headache that might raise concern about a more sinister pathology, listing, in each case the relevant differentials and appropriate investigations including headache of Subarachnoid haemorrhage (see stroke/ cerebrovascular disease), Meningitis/Encephalitis (see CNS infection), and Raised Intracranial Pressure	



TEMPORAL ARTERITIS	
Describe the pertinent epidemiological features of temporal arteritis, including age at presentation and association with other inflammatory conditions	
Describe the pathological process involved in temporal arteritis	
Describe the clinical features of a headache arising from temporal arteritis and other associated symptoms and signs	
List the clinical investigations employed to confirm a clinical suspicion of temporal arteritis	
Describe the management of temporal arteritis	
Outline the main complication that arises from untreated or missed temporal arteritis	

RAISED INTRACRANIAL PRESSURE	
List the main causes of raised intracranial pressure	
List the features in a headache which reflect a raised intracranial pressure (with reference to variation with posture, coughing, visual symptoms and diurnal variation) List the pertinent examination findings in raised intracranial pressure	
List the potential complications of Acutely raised intracranial pressure and Chronically raised intracranial pressure	

NEURO-ONCOLOGY	
Describe the clinical presentation of an intracerebral space occupying neoplastic lesion	



Explain the term paraneoplastic syndrome, and describe two paraneoplastic syndromes involving the nervous system	
List the three most common adult primary brain tumours and outline their prognosis	
List the common somatic tumours which metastasise to the brain	

HYDROCEPHALUS	
Acute hydrocephalus (see neurological emergencies)	
Describe the clinical triad reflective of normal pressure hydrocephalus	

CNS INFECTION	
Outline the clinical presentation of bacterial meningitis and describe the appearance of the typical rash of meningococcal septicaemia	
Describe the common bacterial and viral organisms causing meningitis in adult life	
Outline the clinical features of encephalitis and list the common causes	
Describe the clinical presentation of an epidural spinal abscess	
Describe the pathological changes and complications seen in purulent leptomeningitis, lymphocytic meningitis and granulomatous meningitis.	
Discuss the aetiology, diagnosis and management of herpes simplex encephalitis.	
List the risk factors which may predispose a patient to TB or fungal meningitis.	



Discuss the investigation of a patient with suspected meningitis including indications and contraindications for lumbar puncture. Describe the normal CSF constituents and CSF dynamics.	
Compare the CSF findings in bacterial, fungal and viral meningitis/encephalitis	
Discuss an appropriate antibiotic regimen for treatment of bacterial meningitis	
Suggest additional agents which may be added in Suspected viral meningo-encephalitis	
Outline the long-term complications of bacterial meningitis	

EPILEPSY & LOSS OF CONSCIOUSNESS (LOC)

Describe the classical features of a generalised seizure.	
Outline the clinical types of syncope	
Outline the features that distinguish seizures from syncope	
Outline a classification of epilepsy and describe the differential diagnosis of epilepsy	
Outline the immediate 'first aid' treatment of a patient having a generalised seizure plus the drugs used to control an acute seizure	
Describe an appropriate investigation plan for a patient with recurrent syncope	
Outline the commonly used anti-epileptic drugs.	



Describe the current laws dictating epilepsy and driving.	
---	--

MULTIPLE SCLEROSIS (MS)

Describe the pathological lesions of multiple sclerosis, the common sites of involvement in the nervous system and outline the pathogenesis of the disease.	
Describe the epidemiological features of MS, with specific reference to gender, age of onset and geographic distribution	
List the different clinical patterns of MS and describe the different courses that MS can take. Describe commonly encountered clinical features of MS relapses	
List the investigations used in ascertaining a diagnosis in MS. Outline the diagnostic utility of magnetic resonance imaging (MRI), evoked potentials and CSF examination	
List the differential diagnoses of MS	
Describe the investigation and management of an acute MS relapse	
Outline the principles of treatment of: immuno-suppression; symptomatic management and rehabilitation of spasticity, bladder problems, pain, sensory symptoms, weakness, fatigue and depression	
Outline the disease modifying therapies available in MS, and their effect on relapse rate and long term disability.	

PARKINSON AND OTHER EXTRAPYRAMIDAL DISORDERS

Describe and recognize the clinical triad of parkinsonism	
Outline the pathological basis of classical Parkinson's disease and describe the common clinical features	



List non-motor features of Parkinson disease, with specific reference to disorders of sleep, mood and cognition	
Outline less common causes of Parkinsonism including drugs and the Parkinson-plus syndromes	
Outline commonly used drugs to treat Parkinson's disease and their common adverse effects	

DEMENTIA	
Provide a definition of dementia	
List the main clinical features of dementia including memory loss and global intellectual deterioration and relate these to different lobes of the cerebral hemisphere. Classify dementia according to cause	
Describe the difference between dementia and delirium	
List the potentially treatable causes of cognitive decline. Outline an investigation plan to exclude a treatable cause of dementia	
Perform and interpret a mini-mental state examination on a patient	
Describe the management of dementia, with particular reference to the multi-disciplinary approach and (where appropriate) control of risk factors	
Describe the pharmacological management of Alzheimer disease	
MOTOR NEURONE DISEASE (MND)	
Describe the clinical presentation of MND	
Describe the 2 commonest manifestations of MND leading to death	



NEUROPATHY	
List the common causes of peripheral nerve damage and classify peripheral neuropathy into demyelinating and axonal types	
Outline the main clinical patterns of peripheral nerve damage, and describe typical findings on examination.	
Discuss the diagnosis of the likely cause of peripheral neuropathy using relevant aspects of history, examination, electrophysiological and laboratory investigation.	
Discuss the clinical presentation, diagnosis and management of Guillain-Barre syndrome.	
Discuss the clinical features and management of shingles	

NEUROMUSCULAR JUNCTION DISORDERS	
Describe the clinical presentation of myasthenia gravis and outline the immunological basis of disease	

MYOPATHIES	
Describe the nature of primary diseases of muscle	
Outline the pathology and causation of the main muscular diseases	
Outline basic investigations that may be performed in the investigation of a suspected myopathy.	
Outline the assessment investigation and differential diagnosis of a patient with muscle weakness distinguishing between neurogenic and myopathic causes	
Outline the management of a patient with impaired motor function.	



NEUROLOGY - SKILLS	
Perform an examination of the cranial nerves, detect and interpret abnormalities	
Perform an examination of the peripheral nervous system detect and interpret abnormalities	
Examine the scalp and temporal arteries of a patient with headache	
Assess a patient's level of consciousness using Glasgow Coma Scale	
Complete a neurological assessment to determine the brain region affected by a stroke	
Demonstrate assessment of the swallowing reflex.	
Perform a mini-mental test score to determine intellectual function.	
Perform simple bedside tests to examine memory and cognitive function	
Interpret results from CSF laboratory investigations	



MUSCULOSKELETAL SYSTEM and MDD Attachment

MANAGEMENT OF MUSCULOSKELETAL (MSK) DISEASE	
Describe the indications, nature and benefits of core non-pharmacological interventions in people with MSK disease (including education and information access, aerobic and strengthening exercises, lifestyle modification, reduction of adverse mechanical factors, weight loss if overweight/obese).	
Describe the method of action, indications, contra-indications, benefits and side-effects of oral, parenteral, intra-articular and peri-articular corticosteroid.	
Outline the method of action, major indications, contra-indications, benefits and side-effects and monitoring of drugs used to modify inflammatory disease (including methotrexate, sulphasalazine, hydroxychloroquine and biologic agents such as anti-TNF).	
Outline the general indications, contra-indications, benefits, risks and complications of soft tissue and joint surgery (including soft tissue release, tendon repairs and transfers, synovectomy, osteotomy, excision arthroplasty, joint replacement arthroplasty, arthrodesis)	
Outline coping strategies for patients with chronic MSK pain.	
Describe the benefits of nutraceuticals and alternative medicines.	
Describe the factors that influence patient adherence to a management plan.	
REHABILITATION MEDICINE	
Describe the terminology of the International Classification of functioning, disability and health (ICF) and relate this to REPAIR	
Discuss how the social and physical environment can influence disability.	
Discuss the role social services and housing departments can play in improving participation in people with disabilities and to know when to refer to social services and housing departments.	
Describe the underlying principles of rehabilitation of a patient with disability and list the key methods of working that achieve successful rehabilitation	
Define assistive technology, outline the principles of orthoses, wheelchairs, mobility aids and aids for daily living, and outline how to refer for assistive technology and how to obtain multidisciplinary advice regarding assistive	



technology.	
Outline the principles of rehabilitation following lower limb amputation.	
Identify and assess disability and handicap/disadvantage using the REPAIR screen (Review of pathology & impairment; Environment; Activities; Important other people; Risk and prevention).	
Describe the main phases of gait and characterise an abnormal gait in terms of phase of gait and abnormal locomotor characteristics.	
Appreciate DVLA rules as they apply to drivers with disabilities	
Become familiar with some of the measurement scales available for measuring disability (e.g. ASIA, Barthel Index)	
Describe how to manage neurogenic bladder and bowel	
Understand pressure ulcer aetiology, risk, prevention and management	
Be aware of cognitive, behavioural and physical disabilities associate with brain injury	
REGIONAL PERI-ARTICULAR PAIN	
Describe the typical presentation, risk factors and outcome of a patient with a common peri-articular overusage/strain injury (enthesopathy, tendinitis, tenosynovitis, muscle strain, bursitis)	
Describe the specific symptoms and signs and outline an appropriate management plan for a patient presenting with common peri-articular syndromes, including: epicondylitis; de Quervain's tenosynovitis; rotator cuff lesions, subacromial bursitis and impingement; greater trochanter pain syndrome; pre and infra patellar bursitis; Achilles tendinitis and enthesopathy; plantar fasciitis and subcalcaneal bursitis	
Describe an appropriate differential diagnosis and plan of investigation of a patient presenting with multiple regional pain	



NECK AND BACK PAIN	
Classify causes of neck and back pain, including common mechanical, inflammatory, destructive and crush fracture; discuss the contrasting features in the history and examination between the different causes; and specify the major "red flags" that should lead to investigation for serious pathology.	
Describe the symptoms that may result from spondylolisthesis, spondylolysis and canal stenosis.	
Outline an appropriate management plan for chronic back pain and for patients with root entrapment.	

FIBROMYALGIA	
Describe the symptoms and signs and specify criteria for diagnosis of fibromyalgia.	
Outline appropriate screening investigations for co-morbid treatable conditions.	
Outline the prevalence and recognised associations of fibromyalgia, including other functional pain syndromes and psychosocial distress.	
Outline the abnormalities of sleep and pain physiology associated with fibromyalgia.	
Discuss an appropriate management and rehabilitation plan for a patient with fibromyalgia.	

JOINT PAIN	
Describe the typical presenting symptoms and signs of a patient presenting with joint inflammation and/or joint damage and construct an appropriate differential diagnosis and plan of investigation for a patient presenting with: acute monoarthritis, chronic monoarthritis, acute or chronic oligoarthritis and inflammatory polyarthritis	



OSTEOARTHRITIS	
Describe the symptoms and signs of osteoarthritis and specify the relative prevalence of knee, hip and hand osteoarthritis.	
Describe the main risk factors for development and progression of knee, hip and hand osteoarthritis and classify osteoarthritis according to presence of nodes, number of sites involved and presence of associated calcium crystal deposition.	
Discuss the correlation between symptoms, disability and structural change of osteoarthritis and specify the major associations of pain.	
Describe the pathology and the associated radiographic features of osteoarthritis.	
Outline an appropriate management (medical, surgical, rehabilitation) plan for a patient with knee, hip or hand osteoarthritis.	
Specify the indications for large joint replacement surgery, outline the procedure for hip and knee total joint replacement and list the complications (and approximate incidence) of hip and knee joint replacement.	

CRYSTAL ASSOCIATED ARTHRITIS	
Specify the risk factors and target sites for development of gout, calcium pyrophosphate crystal deposition, and calcific periarthritis.	
Describe the symptoms, signs, differential diagnosis and appropriate investigation of a patient with: acute crystal synovitis (gout, acute calcium pyrophosphate crystal arthritis); chronic (tophaceous) gout and acute calcific periarthritis.	
Outline the pathogenesis and associated imaging changes of crystal-associated disease.	
Outline an appropriate management plan for acute crystal-associated synovitis or periarthritis.	
Specify the indications, mechanism of action and side-effects of urate-lowering therapy and specify the objectives and monitoring of such treatment.	



RHEUMATOID ARTHRITIS	
Describe the symptoms, signs and pattern of joint involvement in rheumatoid arthritis and outline appropriate investigations for diagnosis and assessment of rheumatoid arthritis.	
Outline the pathology and associated radiographic changes of rheumatoid arthritis.	
Describe the clinical features relating to extra-articular rheumatoid disease including vasculitis, Sjogren's syndrome, scleritis, nodulosis, fibrosing alveolitis, pericarditis, peripheral neuropathy, entrapment neuropathy and amyloidosis.	
Describe the clinical presentation and assessment of a patient with atlanto-axial subluxation due to rheumatoid arthritis.	
Outline an appropriate management plan for a patient with rheumatoid arthritis, including the different options for early and late disease.	

SERONEGATIVE SPONDYLOARTHRITIS	
Discuss the overlapping clinical, pathological and genetic features of the seronegative spondyloarthritides (ankylosing spondylitis, reactive arthritis, psoriatic arthritis and arthropathy associated with inflammatory bowel disease).	
Describe the symptoms, signs, pattern of joint involvement, and associated extra-articular features that may occur in patients with seronegative spondyloarthritis.	
Describe the pathology and associated radiographic changes of seronegative spondyloarthritis.	
Describe the clinical features relating to associated extra-articular disease in this group including anterior uveitis, mucosal surface inflammation (conjunctivitis, buccal ulceration, urethritis, prostatitis bowel ulceration) pustular skin lesions, nail dystrophy, aortic root fibrosis (aortic incompetence, conduction defects), erythema nodosum.	
Outline an appropriate management plan for a patient with seronegative spondarthritis	



INFECTION OF LOCOMOTOR TISSUES	
Specify the risk factors and common target sites for bacterial infection of joints and bones, and specify the common organisms involved.	
Describe the symptoms, signs and appropriate differential diagnosis of a patient with acute or chronic joint or bone sepsis.	
Specify the immediate investigation and management of a patient with acute septic arthritis.	
Describe the pathology and associated imaging radiographic changes of locomotor sepsis.	
Describe the symptoms, signs and investigation of a patient with viral arthropathy.	

BONE DISEASE	
Define osteoporosis, describe its clinical consequences, and specify the risk factors for its development.	
Describe appropriate investigations to confirm and assess osteoporosis.	
Outline an appropriate management plan for a person who (1) is at risk of developing osteoporosis, or (2) has established osteoporosis, taking into account the different options according to sex and age. Define osteomalacia and specify the risk factors for its development.	
Outline the clinical presentation, investigation and treatment of a patient presenting with osteomalacia.	
Outline the histology and pathogenesis of Paget's disease of bone and list its clinical consequences.	
Outline the investigation and treatment of a patient presenting with Paget's disease.	
Describe the pathogenesis of (primary) osteonecrosis and specify the risk factors and target sites for its development.	



ACE Study Guide 2018/19

Describe the typical clinical presentation, differential diagnosis and appropriate investigation of a patient with osteonecrosis, and outline a management plan.	
--	--

FRACTURES	
------------------	--

Specify classification systems of fractures based on causation, site, fracture pattern and involvement of adjacent soft tissues.	
Specify the risk factors for fracture and outline the mechanisms of primary and secondary fracture repair.	
Describe the possible acute and long-term complications of fracture, including severe blood loss, infection, vascular injury, nerve injury, compartment syndromes, articular involvement, failure of normal repair, and complex regional pain syndrome (CRPS).	
Describe the relative prevalence, clinical features, classification, associations and complications, investigation, management, rehabilitation and outcome of common adult fractures including: Distal Radius fracture, Scaphoid fracture, Femoral neck fracture, Vertebral fracture, Tibial fracture, Ankle fracture	
Describe the important considerations in the management of the multiply injured patient with fractures	

MUSCULOSKELETAL MALIGNANCY	
-----------------------------------	--

Describe the symptoms, signs, differential diagnosis and investigation of a patient presenting with bone pain due to metastases or multiple myeloma.	
Outline the management of a patient with bone pain from bone metastases or myeloma. Outline the classification, morphology and pathological consequences of primary tumours of bone and soft tissue and describe their clinical presentation	

MULTISYSTEM CONNECTIVE TISSUE DISEASE	
--	--

Outline the clinical features, underlying pathology and outcomes of systemic lupus erythematosus (SLE) with respect to skin, MSK, renal, heart, lung and CNS involvement.	
---	--



ACE Study Guide 2018/19

Outline the investigation and management of a patient presenting with SLE.	
Define the antiphospholipid syndrome, describe its main presentations, and outline the investigation and management of this disorder	
Describe the clinical features, underlying pathology, and prognosis of diffuse systemic and limited systemic sclerosis.	
Describe the clinical features, underlying pathology and prognosis of Sjogren’s Syndrome and outline its investigation and management.	
Describe the clinical features that require consideration of Idiopathic Inflammatory Myopathies (IIM: polymyositis, dermatomyositis, inclusion body myositis) and outline the investigation and management principles for IIM.	
Describe the clinical features, investigation and management of Polymyalgia Rheumatica and Giant Cell Arteritis.	
Describe the clinical features that require consideration of systemic vasculitis and outline the investigation and management principles for systemic vasculitis.	

PAEDIATRIC ORTHOPAEDICS

ABNORMAL POSTURE

Be able to discuss the incidence, risk factors, screening tools, presentation and basic management of developmental dysplasia of the hip (DDH).	
Be aware of normality, causes and orthotic management of flat feet and forefoot adduction.	
Be aware of the causes, significance, principles of interventional management for scoliosis.	
List the causes for acute presentation and chronic conditions causing torticollis.	
Outline the management of acute torticollis.	



INFECTION OF BONES & JOINTS	
Understand clinical features, causative factors, investigations, immediate intervention and management of osteomyelitis.	
Know about atypical presentations; subacute and chronic osteomyelitis.	
Be aware of risks of undertreated/ untreated osteomyelitis.	
Describe the epidemiology, aetiology, pathogenesis, clinical features, investigations and management of septic arthritis.	
Be aware of special cases such as neonates, hip joint involvement, various organisms (such as tuberculosis), and septic arthritis in immunocompromised patients.	
FRACTURES	
Understand common types of fractures and principles of management.	
LIMP	
Outline the aetiology, presentation, investigations, prognosis and basic management of Perthe's disease.	
List the risk factors, age distribution, clinical presentation, and basic interpretation of radiological investigations of slipped upper femoral epiphysis (SUFE).	
Understand the causes, presentation, differential diagnosis and management of transient synovitis.	
SKELETAL DYSPLASIA	
Be aware of pathophysiology of skeletal dysplasia, broad classification, principles of physical and surgical management.	
Understand roles played by multi-professional team in management.	
MISCELLANEOUS MUSCULOSKELETAL CONDITIONS	
Outline the clinical features, investigation and management of a patient presenting acutely with joint dislocation (shoulder, elbow, finger, hip, knee, ankle).	



ACE Study Guide 2018/19

Specify the causes and describe the clinical and radiographic features of a neuropathic (Charcot) joint.	
Describe the clinical features and outline the management of complex regional pain syndrome (CRPS).	

MUSCULOSKELETAL SYSTEM - SKILLS

Perform an examination of the musculoskeletal system to identify and assess presence of joint abnormality (osteoarthritis, inflammatory arthritis, internal derangement), muscle disease and common peri-articular syndromes.	
Describe the main phases of gait and characterise an abnormal gait in terms of phase of gait and abnormal locomotor characteristics.	
Differentiate by patient enquiry and examination common mechanical neck/back pain (\pm root entrapment), inflammatory back pain, destructive back pain and pain from vertebral fracture.	
Identify and assess disability and handicap/disadvantage using the REPAIR screen (Review of pathology & impairment; Environment; Activities; Important other people; Risk and prevention).	
Determine a hyperalgesic response to palpation at the key tender sites for diagnosis of fibromyalgia.	
Determine hypermobility syndrome using a modified 9-point Beighton score.	
Interpret relevant investigations including synovial fluid analysis, the full blood count, ESR, CRP, auto-antibodies (rheumatoid factor, antinuclear antibody), serum uric acid, bone biochemistry, plain radiographs and other imaging modalities (see below) and bone DEXA scan.	
Plain radiography: Be able to <ul style="list-style-type: none"> • describe and identify demographics including labelling, markers and annotation; technical factors including rotation, projection (AP/PA, lateral), adequacy of field of view, exposure, site, side and bones visualised. • identify fractures (intra-articular or extra-articular / simple or multifragmentary), displacement of fracture, dislocation, subluxation and presence of air signifying open injury. • identify features of osteoarthritis, rheumatoid arthritis, psoriatic arthritis, radiographic changes seen in crystal deposition diseases, abnormal bone texture e.g. osteopenia, lytic or osteoblastic lesions, and abnormal soft tissue swelling or mass. 	



<p>Other imaging modalities: Be aware of and be able to describe role of CT scan in detection of occult fractures, ultrasonography in assessing articular and peri-articular lesions, MRI in detecting abnormalities in soft tissue (e.g. tendons), spinal pathology (fractures, spinal injury, spinal cord compression, nerve root compression, cauda equina, discitis), sacroilitis, early inflammatory arthritis, neoplasia, and osteomyelitis.</p>	
<p>Apply a broad arm sling, a semi-rigid cervical collar, and a limb gutter splint.</p>	
<p>Apply a plaster of Paris cast to immobilize a limb fracture.</p>	



CLINICAL CHEMISTRY

You will constantly be exposed to clinical chemistry results where they relate to patient management. You are encouraged to become familiar with normal and abnormal result profiles in this context and to seek guidance from clinical teachers on appropriate requesting and interpretation of biochemical investigations for individual patients under care. This teaching is underpinned by many specialities teaching and clinical chemistry seminars. A guide of topics wherein Clinical Chemistry learning is achieved as is listed below, please go to each topic's area within this guide for further details.

- Electrolyte and water homeostasis
- Acid-base balance
- Markers of myocardial damage
- Hypo- and hyper-calcaemia
- Diabetes and hypoglycaemia
- Thyroid function
- Adrenal function
- Liver function

A reading list is available in the specialty's area of Moodle/Topics and topic outcomes



HAEMATOLOGY

ANAEMIA	
List typical symptoms of a patient with anaemia.	
Classify anaemia in terms of red cell indices and list common causes of each type of anaemia.	
Discuss the common causes of confirm iron deficiency anaemia.	
Discuss appropriate investigations to confirm that a patient has iron deficiency	
Outline appropriate investigations for a patient with confirmed iron deficiency anaemia.	
Outline the physiological absorption of vitamin B12 and folate.	
Describe the pathophysiology and diagnosis of B12/folate deficiency causing a macrocytic anaemia	
Outline the clinical features and laboratory diagnosis of sickle cell anaemia.	
Outline the clinical management of sickle cell crisis and the importance of sickle cell	
Outline the clinical features and laboratory diagnosis of thalassaemia	
Screening prior to surgery.	
Describe the laboratory features of haemolysis. Outline the causes of haemolytic anaemia and their treatment.	
Outline the laboratory features of microangiopathic anaemia and list the common causes.	



Outline the features and causes of inherited red cell membrane defects and of red cell enzymopathies.	
---	--

THE WHITE CELL	
-----------------------	--

Interpret a blood count showing a leucocytosis and list common causes for neutrophilia and neutropaenia, lymphocytosis and lymphopaenia.	
Describe the clinical features of acute leukaemia and discuss the laboratory diagnosis.	
Distinguish between myeloid and lymphoid cell lineages in the classification of acute leukaemia; highlight differences between childhood and adult-onset leukaemia.	
Outline the general principles of treatment of acute leukaemias	
Describe the clinical features and laboratory diagnosis of chronic myeloid leukaemia and outline the principles of management.	
Describe the clinical features and laboratory diagnosis of chronic lymphatic leukaemia and outline the principles of treatment	
Describe the clinical features and laboratory diagnosis of multiple myeloma. Outline the associated laboratory abnormalities including changes in blood viscosity, renal function and serum calcium	
Describe the clinical features of lymphoma. Classify lymphomas into Hodgkin's and Non-Hodgkin's disease and to high- and low- grade groups. Outline the principles of treatment.	

THE PLATELET	
---------------------	--

Discuss the role of platelets in the pathophysiology of vascular disease including vascular thrombosis and platelet emboli	
Describe the mechanism of action of aspirin and outline its role in cardiovascular disease prevention.	
Outline the clinical features, investigation and treatment of immune thrombocytopenia.	



HAEMOSTASIS	
Describe the laboratory tests to assess the clotting system and recognise and interpret patterns of abnormality.	
Outline a plan of investigation for a patient complaining of easy bruising.	
Describe the role of the liver in normal clotting, including the role of vitamin K in the synthesis of some clotting factors	
Discuss the clinical features, diagnosis and management of inherited bleeding disorder including haemophilia and von Willebrands disease.	
Discuss the pharmacokinetics and clinical use of warfarin including laboratory tests used to monitor clinical effect.	
Outline the clinical management of over-anticoagulation with warfarin.	
Discuss the pharmacokinetics and clinical use of heparin including laboratory tests used in monitoring heparin therapy. Outline the clinical management of over-anticoagulation with heparin.	
Discuss the clinical use of direct oral anticoagulants and how they differ from warfarin and heparin.	
Discuss the clinical use of thrombolysis, including monitoring and complications.	
Outline the clinical indications for screening for thrombophilia and how this is done.	
Outline the clinical features of disseminated intravascular coagulation including laboratory tests used in diagnosis	

TRANSFUSION	
Describe the ABO blood group and outline its significance in blood transfusion.	
Describe the principles of cross matching blood.	



List the blood products available for transfusion and outline the rationale for using fresh frozen plasma, cryoprecipitate and platelets	
Outline the principles of treatment of massive blood loss (see also Gastro-intestinal haemorrhage objectives).	
Outline the management of a transfusion reaction.	
Describe the procedures that should be followed in taking a sample of blood from a patient and submitting it for cross matching and transfusion	
Describe the procedures that should be followed when prescribing blood or blood products for transfusion	

MISCELLANEOUS HAEMATOLOGY

Outline the clinical features and differential diagnoses of myelofibrosis, polycythaemia rubra vera and essential thrombocythaemia	
Outline the clinical features of aplastic anaemia and describe the laboratory diagnosis and principles of treatment.	
Describe the management of the splenectomised patient.	

SKILLS IN HAEMATOLOGY

Interpret a full blood count	
Interpret ESR	
Interpret tests of blood clotting	
I In a simulated environment write a prescription for anticoagulant therapy, interpret tests of clotting and adjust therapy appropriately.	



Complete a haematology laboratory request form to include all patient details and relevant clinical information	
Complete a transfusion request form (NB students cannot complete this as a real task but must simulate this)	

MICROBIOLOGY AND INFECTIOUS DISEASES

MICROBIOLOGY AND INFECTIONS DISEASES	
Describe the basic principles of prevention of infection in hospitals (isolation, cohort nursing) and in the community (notification of infectious diseases, vaccination and other prophylactic measures).	
Outline the features of specific pathogens that contribute to their pathogenicity (eg. exo and endo-toxins) and their propensity to spread.	
Outline the antimalarial spectra and modes of action of commonly used anti-microbial agents.	

SKILLS IN MICROBIOLOGY	
Take a blood culture using appropriate aseptic technique.	
Take a swab using appropriate aseptic technique	
Interpret microbiology laboratory reports including serology.	
Complete a microbiology laboratory request card to include all patient details and relevant clinical information, including about any antimicrobial therapy.	

A reading list is available in the specialty's area of Moodle/Topics and topic outcomes



IMMUNOLOGY	
Describe the main clinical features, immunopathology, investigation and principles of management of the following conditions: asthma, eczma, anaphylaxis, urticaria and angioedema; organ-specific autoimmune disease including autoimmune thyroid disease, insulin-dependent diabetes mellitus, pernicious anaemia, Addison's disease, autoimmune liver disease and bullous skin diseases; Lymphoproliferative disorders including myeloma; Connective tissue disease including systemic lupus erythematosus and scleroderma vasculitis, glomerulonephritis and coeliac disease	
Describe the indications for and interpretation of the following investigations: C-reactive protein, serum immunoglobulins, serum and urine electrophoresis, complement levels, autoantibodies (including autoimmune screen), total and specific IgE levels, lymphocyte phenotyping, skin prick and patch testing	
Outline the principles, benefits and risks of immunisation.	
Describe the ways in which the immune system may be manipulated therapeutically	
List the organs that are commonly transplanted and outline the main indications for transplantation.	
Outline the main immunological barrier to successful transplantation and how this may be overcome by tissue typing and immunosuppressive therapy	

SKILLS IN IMMUNOLOGY	
Complete an immunology laboratory request card to include all patient details and relevant clinical information, including current therapy	
Interpret immunology laboratory reports.	

A reading list is available in the speciality's area of MoodleTopics and topic outcomes



RADIOLOGY

- The purpose of the imaging teaching is to give medical students:
 1. The skills and knowledge required for interpreting basic radiological examinations relevant to Foundation Years.
 2. Understanding of the role of imaging within clinical investigation and management.
 3. Understand the different imaging modalities that are available as clinical diagnostic tools
 4. Knowledge of the legislation relating to the use of radiology in clinical practice.
- By the end of ACE, students should be able to detect common abnormalities on chest, abdominal and skeletal radiographs and relate the findings to differential diagnosis. Students should display a systematic approach to the interpretation of radiographs, including plain XRs and contrast studies.
- A basic understanding of cross sectional imaging is expected although detailed physics of imaging modalities or a comprehensive interpretation of pathology is NOT expected. Basic cross sectional anatomy knowledge is required.
- Identify and interpret significant abnormalities on a chest X-ray and understand how this investigation relates to the overall management of the patient.
- Identify and interpret significant abnormalities on an abdominal X-ray and understand how this investigation relates to the overall management of the patient.
- Describe the radiological appearances of common medical and surgical conditions.
- Identify and interpret significant abnormalities on bone and joint x-rays and understand how this investigation relates to the overall management of the patient.
- Demonstrate some practical knowledge of routine radiological procedures and how images are generated by x-ray, ultrasound, computed tomography (CT) and magnetic resonance imaging (MRI).



THE CHEST X-RAY

The student should be able to:	
<p>Describe;</p> <ul style="list-style-type: none">a) Demographics including labelling, markers and annotationb) Technical factors including rotation, inflation, projection (AP/PA, lateral), adequacy of field of viewc) Assessment of the heart (size, shape, contour)d) Assessment of the hilar and mediastinume) Systematic assessment of the lung parenchymaf) Review areas including the skeleton	
<p>Describe the methods of interpretation by which disease processes can be localised on the chest X-ray to include:</p> <ul style="list-style-type: none">a) Parenchymal<ul style="list-style-type: none">• Large airways: Trachea, Mainstem• Small airways: Alveolar, interstitial• Space occupying lesionsb) Pleuralc) Mediastinal: Anterior, Middle, Posteriord) Vasculare) Thoracic cagef) Skeletalg) Extra-thoracic, Soft-tissues	
<p>Recognise and describe the radiological appearances of commonly occurring conditions including the following:</p> <ul style="list-style-type: none">a) Parenchymal<ul style="list-style-type: none">• Cardiac failure• lobar collapse• bronchiectasis• consolidation (including pathophysiology)• COPD• Interstitial lung disease• space occupying single or multiple masses (including differential)b) Pleural<ul style="list-style-type: none">• effusion• pneumothorax• empyemac) Mediastinal masses<ul style="list-style-type: none">• anterior• middle• posterior	



<p>d) Vascular</p> <ul style="list-style-type: none"> • thrombo-embolic disease <p>e) Thoracic cage</p> <ul style="list-style-type: none"> • skeletal • trauma • malignancy <p>f) Extra-thoracic</p> <ul style="list-style-type: none"> • soft-tissues • mastectomy • soft-tissue masses • 	
<p>Discuss the most appropriate further investigation following the chest X-ray, including:</p> <p>a. Malignancy: CT</p> <p>b. Pulmonary embolus: CTPA, V/Q scan</p> <p>c. Aortic dissection: CTA</p> <p>d. Effusion / empyema: CT, ultrasound</p>	

NB Individual variation in the approach of describing a CXR is permitted

THE ABDOMINAL X-RAY

<p>Students should be able to:</p>	
<p>Describe the techniques relevant for obtaining abdominal x-rays on a patient including:</p> <p>a) position: AXR supine / erect CXR - erect AX decubitus</p> <p>b) contrast generation</p>	
<p>Discuss the localisation of disease processes as identified by the plain abdominal x-ray including:</p> <p>a) Intra-peritoneal</p> <p>b) Retro-peritoneal</p> <p>c) Hollow viscus: stomach, small bowel, large bowel, gallbladder bile ducts, bladder, ureters</p> <p>d) Solid organs: liver, spleen, kidneys, adrenals, pancreas, ovarian, uterine, prostate</p> <p>e) Vascular: aorta – branches, IVC – tributaries, portal venous system</p> <p>f) Skeletal</p> <p>g) Abdominal wall</p>	
<p>Recognise and describe the radiological appearances of commonly occurring conditions including the following:</p>	



ACE Study Guide 2018/19

<p>a) Intra-peritoneal: free gas, free fluid b) Retro-peritoneal: mass lesions c) Hollow viscus: stomach small bowel obstruction large bowel obstruction gall bladder, bile ducts, calculi bladder, ureters, calculi d) Solid organs: liver enlargement spleen enlargement kidneys enlargement, calculi adrenals calcification pancreas calcification ovarian calcification uterine calcification prostate calcification e) Vascular: aorta branches, calcification, dilatation IVC tributaries portal venous system, free gas f) Skeletal g) Abdominal wall</p>	
<p>Discuss the most appropriate further investigation following the abdominal X-ray including the following:</p> <p>a) Intra-peritoneal, retroperitoneal: US, CT, MRI b) Hollow viscus: stomach, small bowel, large bowel: barium, CT gall bladder, bile ducts: US, CT MRI bladder, ureters: IVU, US, CT, MRI c) Solid organs: liver, spleen: US CT MRI kidneys: IVU, US, CT, MRI adrenals: US, CT, MRI pancreas: US, CT, MRI ovarian, uterine: US, CT, MRI prostate: US, CT, MRI d) Vascular: aorta – branches: US, CT IVC – tributaries: US, CT portal venous system: US,CT, angiography e) Skeletal: CT, MRI, US f) Abdominal wall: US, CT, MRI</p>	



ROUTINE RADIOLOGICAL PROCEDURES

The student should be able to:	
<p>Describe the indications/contra-indications of:-</p> <ul style="list-style-type: none">• radiation exposure/ radiation protection theory, preparation, consent, how performed, patient stress, degree of invasion experienced by the patient.• after-care of commonly used radiological techniques including post biopsy observation.• commonly used radiological techniques including:<ul style="list-style-type: none">a) Chest CXR, CT chestb) Abdomen AXR, US, CT Barium studies:swallow/meal/small bowel study/enema IVU ERCP angiogram venogramc) Neurological radiology head CT MRI	



Pathology

A significant number of the learning outcomes in medicine, surgery and MDD relate to a knowledge and understanding of Pathology. These are integrated into the Topic Learning Outcomes and include

- Describe pathogenesis
- Describe aetiology
- Describe morphology
- Describe natural history
- Describe complications

In each site Pathology teaching is delivered for a selected set of these learning outcomes. The list of the Pathology Teaching Topics and the reading list is published in appendix A below.

In preparation for these teaching sessions you should read up about the specified learning outcomes as the session are designed to be tutorials, rather than didactic teaching

APPENDIX 1- PATHOLOGY

OUTLINE OF TEACHING

Students entering the clinical part of the course have had a strong grounding in general pathology, provided by teaching in years 1 and 2 as well as tutorial teaching and directed reading from Clinical Phase 1.

The teaching programme aims to provide the necessary expertise and experience required to practise as a pre-registration house officer. However, it should be seen as part of the overall training required to become a post-registration medical practitioner and as the start of continuing medical education which will be required to maintain high standards during the whole of a professional career.

Teaching in pathology involves the gradual acquisition of factual information, practical skills and attitudes such that the student will become familiar with the aetiology, pathobiology and clinical course of diseases. In addition, the student has to be familiar with the very wide range of clinical diseases in which Histopathology is used to establish a diagnosis and determine clinical management. In Clinical Phase 1 the pathology of common diseases was covered. In Clinical Phase 2 Histopathology learning was related as part of clinical experience special subjects of child health, obstetrics & gynecology, health care of the elderly, psychiatry, dermatology, and otorhinolaryngology. In Clinical Phase 3 the emphasis will be to increasing the breadth of your knowledge of the pathology of organ systems and apply this to differential diagnosis.

Clinicopathological co-operation in patient management is very important and the student should participate in clinicopathological meetings and multidisciplinary team meetings (MDTs) which are held as part of their firm-based activities. Such experience is vital in developing communication skills.

Students have to gain experience in medico-legal aspects of medicine. Towards the end of Clinical Phase 3, in the preparation for Foundation Course, students will become conversant with the medico-legal aspects of death certification and the histopathologist's and Coroner's role in the investigation of sudden and unnatural death, exclusive of criminal cases.

TEACHING IN CLINICAL PHASE 3

- **Tutorials.** Tutorials based on directed reading.



- **Post Mortem/Autopsy.** All students should make efforts to attend autopsy examinations on patients who have died if they have been in their care on admission to hospital. Any medical student is welcome to attend autopsy sessions at any time providing this is arranged with mortuary staff and the attending pathologist. Normally this can be done at short notice by a telephone call to the mortuary office. Post mortems generally take place between 9.00am and 1.30pm each day.
- **Firm-based clinico-pathological meetings and MDTs.** These sessions should be attended in the context of the working schedules which exist on different ward attachments. Not all clinical attachments will feature such an activity.

PATHOLOGY GENERAL OBJECTIVES

- To become familiar with natural history, macroscopic and histological features of common medical and surgical conditions.
- To become broadly familiar with the techniques involved in carrying out a full autopsy and arriving at a clinico-pathological correlation

RECOMMENDED READING

The recommended course textbooks are *Pathology* (Stevens & Lowe), 2nd Edition published in 2000 by Mosby and the new edition ***Core Pathology***, A Stevens, J Lowe, I Scott 978-0723434443 (2009) with student consult online access.

Apart from Stevens and Lowe, students may refer to standard pathology text books such as:

1. Underwood's Pathology: a Clinical Approach: by Simon Cross MD FRCPATH
2. Robbins Basic Pathology, 10th Edition, Authors: Vinay Kumar & Abul K. Abbas & Jon Aster

Please note, we recognise students will have purchased *Pathology* (Stevens & Lowe), 2nd Edition, the pages listed in the reading list below are taken from the 2000 publication. Students who have purchased ***Core Pathology (2009) with online access are reassured*** should refer to the relevant pages within this publication. We reassure students both publications have appropriate text for their BMedSci and BMBS studies. Copies of both publications are available in the library.

TUTORIAL SESSION DETAILS

Directed reading and small group tutorials Each student will be allocated to a pathology tutor (a list is provided by the teaching coordinator at each site). The time of teaching sessions is planned in the context of the working schedules which exist on different ward attachments and will be scheduled by the Teaching Coordinators in each Trust. The main method of learning is directed reading which is supported by tutorial-style teaching sessions. In preparation for each teaching session students must undertake directed reading (see schedule of topics later). Tutorials are **not** meant to be didactic teaching sessions but are meant to address problems which have been encountered in the course of directed reading. **Please prepare in advance for tutorials.**

SESSION OBJECTIVES

IT IS IMPORTANT THAT YOU READ THE CHAPTERS LISTED AS PART OF YOUR DIRECTED STUDY **as some topics may initially seem large, but in reality the objectives are quite limited. The pathology-specific objectives have been abstracted from the guide for use in the tutorials. Please note that several sessions include an OBJECTIVES CHECK — this is all work you have covered before and is designed to identify any small gaps in your knowledge so they can be clarified in a tutorial, hence the large number of objectives to check. We have listed 7 recommended areas of reading for each Medicine/Surgery attachment. We appreciate it may not be possible to deliver all as tutorial sessions so students are encouraged to be proactive in their learning needs and to discuss the direction of tutorial content in advance with their tutors to capture areas of concern.. Students should NOT need to be doing all this work from scratch.**



Tutorial topics and directed reading

Pathology Stevens &
Lowe, 2006 Edn.

Medical Tutorials

Session 1

OBJECTIVES CHECK: Revision. This session is designed for you to check for gaps in your attainment of the following objectives — there are a lot because this is all work you have covered in detail in the past related to Atherosclerotic vascular disease, Aneurysms, Ischaemic heart disease, and heart failure

161-166,175-
180, 173-175

- Define atherosclerosis and list the risk factors for its development.
- Distinguish between macrovascular disease and microvascular disease
- List the specific sites where there is a predilection to develop atheroma and explain why such predilections exist.
- List the clinical sequelae of atheroma.
- Describe the common sites and relative incidence of atherosclerotic arterial aneurysms.
- Describe non-atherosclerotic etiologies for aneurysms.
- Describe the pathophysiology of an aortic dissection aneurysm, complications and causes of death.
- Describe the anatomy of the cardiac chambers, valves, coronary arteries, the great arteries and the cardiac conduction system.
- Discuss the possible underlying causes of angina including coronary artery disease, valvular heart disease, cardiomyopathy and anaemia.
- List recognised risk factors for coronary artery disease and describe the pathology of the coronary arteries in patients presenting with angina.
- Describe the morphology and pathological consequences of AMI.
- Discuss the differential diagnosis of AMI.
- Describe the complications and their presentations/pathological consequences
 - immediate: arrhythmias particularly ventricular tachycardia and fibrillation
 - short term: pulmonary oedema, cardiogenic shock, thromboembolism, VSD, ruptured chordae tendineae
 - long term: heart failure, Dressler's syndrome
- Understand the spectrum of Acute Coronary Syndrome including the terms stable angina, unstable angina, NSTEMI and STEMI
- Understand the difference in prognosis between AMI (high early death rate, relatively good prognosis) and unstable angina/acute coronary syndromes (patients with elevated CK or troponin have a low early death rate but a high risk of death or AMI in the next three months).



ACE Study Guide 2018/19

- List the common causes of pulmonary oedema.
- Describe the morphology and histological changes of the lungs in pulmonary oedema.
- Discuss the differential diagnosis of pulmonary oedema including chest infection, pulmonary embolism and adult respiratory distress syndrome.
- Define heart failure and classify common causes.
- List the common causes of CCF.
- Describe the morphology and histological changes of the lungs and liver in heart failure

Session 2

152-159, 166-169, 169-171

OBJECTIVES CHECK: This majority of this session is designed for you to check for gaps in your attainment of the following objectives — there are a lot because this is all work you have covered in detail in the past related to Hypertension, Venous thrombosis and pulmonary thromboembolism. New work is on Vasculitis

- Describe the clinical and pathological features of 'accelerated phase' or 'malignant' hypertension.
- Discuss the differential diagnosis of hypertension and the causes of secondary hypertension including renal disease, endocrine disease and coarctation of the aorta.
- Describe the pathological consequences of hypertension as they affect the cardiovascular, cerebrovascular and renal systems.
- Identify the usual initial anatomic location of deep venous thrombosis.
- Describe the risk factors and pathophysiology of arterial and venous thrombosis
- .
- Describe the range of clinical presentation and associated pathology of pulmonary embolic disease depending on clot size and cardiopulmonary haemodynamics.
- Outline the pathophysiology of vasculitis and discuss the conditions associated with vasculitis including autoimmune disease (SLE, polyarteritis, temporal arteritis), infection, malignancy and haematological disease.

Session 3

183-186

Disease of heart valves

- Classify the causes of valvular heart disease into congenital (bicuspid aortic valve), rheumatic, ischaemic (mitral regurgitation), and infective (endocarditis).
- Define what bacterial endocarditis is
- Describe the morphology and histological changes seen on an affected heart valve in endocarditis.



ACE Study Guide 2018/19

- Describe the pathological complications of infective endocarditis including valve destruction with heart failure, embolic disease and glomerulonephritis.

Session 4

OBJECTIVES CHECK: This session is designed for you to check for gaps in your attainment of the following objectives — there are a lot because this is all work you have covered in detail in the past related to Infection, Bronchiectasis, Asthma, Chronic obstructive airways disease. Carcinoma of the lung

- Describe the pathology of acute lobar pneumonia and bronchopneumonia.
- Describe the complications of pneumonia including septicaemia, lung abscess and empyema.
- Describe the morphology and pathological consequences of asthma.
- Define the term chronic obstructive pulmonary disease (COPD).
- Describe the pathology underlying COPD and emphysema.
- List recognised risk factors for the condition including smoking, pollution and alpha-1 anti-trypsin deficiency.
- Outline the morphology and pathological consequences of bronchiectasis
- List recognised risk factors for bronchiectasis including inherited causes (Kartagener’s syndrome, cystic fibrosis-see separate section), post-infectious, and immunocompromised patients.
- Outline the major pathological classification of lung cancers and their prognosis.

194-200, 200-
205, 212-217
+220

Session 5

Fibrosing alveolitis, Extrinsic Allergic alveolitis, occupational lung disease

- Describe the pathological features of Interstitial lung disease
- List common causes of allergic Extrinsic Allergic alveolitis such as Farmer’ lung, bird fancier’s lung etc.
- Outline the pathological consequences of repeated allergen exposure in Extrinsic Allergic alveolitis
- Describe the main conditions associated with asbestos inhalation (pleural plaques, mesothelioma, asbestosis and lung cancer).
- Describe the natural history of pleural plaques, mesothelioma and asbestosis and outline the relation between these conditions and the duration of exposure to asbestos.
- Describe the pathology of simple and complicated coalworkers pneumoconiosis.

208-210



Session 6

OBJECTIVES CHECK: This majority of this session is designed for you to check for gaps in your attainment of the following objectives - there are a lot because this is all work you have covered in detail in the past related to Cerebrovascular disease

- Define what a stroke is and outline the three major causes: thrombotic, embolic and haemorrhagic.
- Outline the major factors that predispose to stroke disease including age, hypertension, cardiac disease and diabetes.
- Describe the morphology and pathological consequences of haemorrhagic and ischaemic stroke.
- Describe the pathology of subarachnoid haemorrhage and the predisposing factors including congenital berry aneurysms (80%), A-V malformations and other non-aneurysmal causes.

Session 7

Nervous system: multiple sclerosis, peripheral nerve disease. Tumours of peripheral nerves. Meningitis/ Encephalitis, Dementia, Parkinsons disease

- List the common sites of CNS involvement in multiple sclerosis
- Describe the nature of demyelination and axonal loss in the lesions of multiple sclerosis.
- Outline the causes of neuropathy such as diabetes, post-infectious demyelinating, vasculitis, drugs etc.
- Describe common tumours of peripheral nerve
- Outline the morphology and pathological consequences of leptomeningitis
- Discuss the aetiology of common types of viral encephalitis
- Distinguish between the disease entities that cause cognitive impairment
- Recognise the pathological differences behind the various presentations of neuro-degenerative disorders

450-451, 464-467, 446-450, 451-455

Surgical Tutorials

Session 1

OBJECTIVES CHECK: This session is designed for you to check for gaps in your attainment of the following objectives — there are a lot because this is mostly work you have covered in detail in the past on Oesophagitis, Peptic ulceration, Inflammatory bowel disease, Carcinoma of stomach, oesophagus, small bowel, colon and rectum.

- Describe the morphology and pathological consequences of oesophagitis
- List the main and rare causes of peptic ulcer disease.
- List the complications of peptic ulcer disease
- Describe the morphology and pathological consequences of Crohn's disease and ulcerative colitis.

250-252, 257-259, 252-254, 248-250, 259-264



ACE Study Guide 2018/19

- Describe the pathology and natural history of a malignant lesion of the oesophagus
- Describe the classification of gastric neoplasms and discuss their morphology and natural history.
- Discuss the relative frequency of the most common small bowel neoplasms and compare these frequencies with those of large bowel neoplasms
- Describe the aetiology, morphology, staging and pathological consequences of carcinoma of the colon. Using Dukes classification discuss the staging and five year survival of carcinoma of the colon and rectum. Be able to discuss the TNM system of staging cancer in respect of cancer of the colon.

Session 2

This session is designed for you to check for gaps in your attainment of the following objectives - there are a lot because this is mostly work you have covered in detail in the past on Pathology of hepatitis and cirrhosis. Complications of cirrhosis. Portal hypertension. Tumours of the liver

- Describe the morphology and pathological consequences of acute and chronic hepatitis
- Define cirrhosis in pathological terms.
- Describe the morphology and pathological consequences of cirrhosis.
- List the causes of cirrhosis including alcohol, post-hepatitis B/C infection, immunological, drugs and metabolic diseases (Wilson's disease and haemochromatosis).
- Outline the pathophysiology underlying the clinical features of cirrhosis including hypoproteinaemia, abnormal clotting, secondary hyperaldosteronism and portal hypertension.
- Discuss the complications of cirrhosis and portal hypertension including oesophageal varices, ascites and encephalopathy and outline their management.
- Define portal hypertension and classify its aetiology.
- List the complications of portal hypertension.
- Describe the aetiology and pathology of primary and secondary liver neoplasms.

281-290, 293-
295, 295-296,
280-181

Session 3

Diverticular disease. Diseases associated with malabsorption, Pancreatitis and carcinoma of pancreas

- Outline the common causes of malabsorption in the UK including coeliac disease, blind loop syndrome, pancreatic disease and terminal ileal disease
- Outline the morphology and pathological consequences of coeliac disease
- Classify pancreatitis on the basis of the severity of injury to the organ.
- Describe the aetiology and pathology of pancreatitis.

265-266, 264-
265, 255-256,
300-303



ACE Study Guide 2018/19

- Discuss the potential early complications of acute pancreatitis.
- List the pancreatic neoplasms; describe the pathology of each with reference to cell type and function.
- On the basis of pathology and cell type discuss the long-term prognosis of pancreatic cancers.

Session 4

Lymphomas. Carcinoma of the breast.

- Classify lymphomas into Hodgkin's disease and Non-Hodgkin's type and to high and low grade
- Outline the natural history of benign and malignant breast neoplasms.
- Describe the aetiology, morphology and pathological consequences of carcinoma of the breast.
- List the risk factors for carcinoma of the breast.
- Describe the diagnosis of a breast lump, including cytology, mammography and biopsy (trucut and open).

307-316 (NOTE
limited lymphoma
objectives despite
depth of reading)
424-430

Session 5

Carcinoma of the bladder. Carcinoma of the kidney, Obstruction of urinary tract. Hydronephrosis. Testicular tumours, prostatic carcinoma

- Describe the causes of hydronephrosis and obstruction to the pelviureteric junction.
- Describe the natural history of renal cell carcinoma, Wilm's tumour and transitional cell carcinoma.
- Discuss the natural history and pathology of carcinoma of the prostate. Outline the classification of testicular neoplasms and describe the natural history of malignant testicular tumours: seminoma and teratoma of the testis.

374-376, 378-
380, 377-378,
386-390, 392

Session 6

This session is designed for you to check for gaps in your attainment of the following objectives - there are a lot because this is all work you have covered in detail in the past related to . Acute Kidney Injury, Chronic Kidney disease, Nephrotic syndrome, acute tubular necrosis. Hypertension and the kidney. Diabetes and the kidney. Pyelonephritis.

- Classify renal failure into pre-renal, renal and post-renal causes and discuss common diseases that may cause each type (pre-renal, renal and post-renal). List the common causes of chronic kidney disease including diabetes, glomerulonephritis, hypertension, chronic interstitial nephritis, macrovascular disease, polycystic kidney disease, and obstructive uropathy.
- Describe the morphology and pathological consequences of pyelonephritis, interstitial nephritis, polycystic kidney disease, hypertensive renal damage to the kidney and obstructive uropathy.

350-353, 353-
356, 371-373,
368-371



ACE Study Guide 2018/19

- Describe the effect of chronic kidney disease on blood (anaemia of chronic disease) and bone (renal bone disease)
- Define the nephrotic syndrome. List the three main primary renal causes; minimal change nephropathy, membranous glomerulonephritis and proliferative glomerulonephritis and outline briefly the key pathological features. List secondary causes such as diabetes, amyloid disease etc.
- Describe the pathological features and complications of acute and chronic pyelonephritis.

Session 7

Glomerular diseases

- Outline the main pathological processes affecting the glomerulus including primary disease and those relating to systemic disease particularly the vasculitic illnesses.

356-359 (Note limited objectives - you do not need to know the details about glomerulonephritis - just broad concepts)



Therapeutics and Prescribing

A range of GMC Outcomes for Graduates which apply to developing knowledge and skills in Therapeutics and Prescribing

The Topic Learning Outcomes are integrated within this study guide in a disease or system-related context.

You should pay particular attention to developing your therapeutics knowledge and prescribing skills in each attachment.

The doctor as a scholar and a scientist

(e) Select appropriate forms of management for common diseases, explain their modes of action and their risks from first principles.

(f) Demonstrate knowledge of drug actions: therapeutics and pharmacokinetics; drug side effects and interactions, including for multiple treatments, long-term conditions and non-prescribed medication; and also including effects on the population, such as the spread of antibiotic resistance.

The doctor as a practitioner

14. Manage clinical presentations.

(g) Formulate a plan for treatment,

17. Prescribe drugs safely, effectively and economically.

(a) Establish an accurate drug history, covering both prescribed and other medication.

(b) Plan appropriate drug therapy for common indications, including pain and distress.

(d) Calculate appropriate drug doses and record the outcome accurately.

(f) Access reliable information about medicines.

(g) Detect adverse drug reactions.

(h) Demonstrate awareness that many patients use complementary and alternative therapies, and awareness of the existence and range of these therapies, why patients use them, and how this might affect other types of treatment that patients are receiving.



OVERDOSE/TOXICOLOGY	
Outline the general principles in the assessment and treatment of a patient who has taken an overdose.	
Describe the clinical features, investigation and treatment of alcohol intoxication.	
Describe the clinical features, investigation and treatment of paracetamol overdose including the importance of monitoring of hepatic and renal function.	
Describe the clinical features and management principles of other overdoses that present commonly to the Emergency Department, including tricyclic antidepressants, benzodiazepines, opiates, cocaine and aspirin.	
List the antidotes available to treat specific poisons, eg n-acetylcysteine for paracetamol, naloxone for opiates, flumazenil for benzodiazepines, glucagons for beta-blockers, sodium bicarbonate for tricyclic antidepressants	
Describe Toxbase and the function of the National Poisons Information Services	
Describe the features suggesting a high risk of suicide in a patients presenting with self harm or overdose.	



Student Formulary

You will be expected to be familiar with the use and prescribing details of a range of drugs. The student formulary is on Moodle and is a guide to many of the drugs that you will prescribe or administer in clinical practice. It is provided so that you may become familiar with certain classes of drugs and specific agents in your undergraduate studies. As part of your studies you should regularly consult the online formulary and make sure that you are knowledgeable in the pharmacology and prescribing details for the drugs specified.

You will be expected to know the common indications, contra-indications and side effects for the most frequently prescribed drugs, including the following:

Cardiology

- | | |
|--------------------------------|-----------------------------------|
| • Thrombolytic drugs | Streptokinase Alteplase |
| • Cardiac glycosides | Digoxin |
| • Thiazide-like diuretics | Indapamide |
| • Loop diuretics | Furosemide |
| • Aldosterone antagonist | Spirololactone |
| • Nitrates | GTN, Isosorbide mono/dinitrate |
| • Potassium channel activators | Nicorandil |
| • ACE inhibitors | Ramipril |
| • Beta-blockers | Bisoprolol |
| • Calcium Channel blockers | Diltiazem, amlodipine , verapamil |
| • Alpha-blockers | Doxazosin |
| • HMG-CoA reductase inhibitors | Atorvastatin |
| • Anticoagulants | Unfractionated heparin |
| | LMWH: Enoxaparin, |
| | Oral anticoagulants: warfarin, |
| | DOACs: eg rivaroxaban, apixaban |

Respiratory

- | | |
|---|---------------------------------|
| • Short and long acting beta-2 agonists | Salbutamol, salmeterol |
| • Antimuscarinic drugs | Ipratropium bromide, tiotropium |
| • Methylxanthines | Aminophylline |
| • Inhaled corticosteroids | Beclometasone |
| • Oral steroids | Prednisolone |
| • Oxygen | Controlled oxygen therapy. |

Endocrine

- | | |
|--------------------------------|---|
| • Insulin | Commonly encountered insulins include:
Lantus, Levemir, Tresiba,
Mixes such as Novomix 30, Humulin M3
Insulin pumps. |
| • Sulphonylureas | |
| • Gliclazide | |
| • Biguanides | Metformin |
| • Alpha-glucosidase inhibitors | Acarbose |
| • Thiazolidinedione | Pioglitazone |
| • DPP4 class | Sitagliptin |
| • GLP1 mimetic class | Exenatide |
| • Thyroid | Carbimazole, levothyroxine |



ACE Study Guide 2018/19

- Corticosteroids
- Bone metabolism: bisphosphonates

Hydrocortisone, prednisolone,
dexamethasone, fludrocortisone.
alendronic acid

Gastrointestinal disease

- Antacids/alginate
- Motility stimulants
- Laxatives
- Anti-diarrhoeals
- H2-receptor blockers
- Proton pump inhibitors
- Helicobacter eradication
- Aminosaliclates
Local and systemic steroids
- Immunomodulators

Gaviscon / Peptac
Metoclopramide, domperidone
Senna, docusate, macrogol, ispaghula
husk
loperamide
Ranitidine
Omeprazole, lansoprazole
amoxicillin, clarithromycin,
metronidazole
Mesalazine
hydrocortisone foam enema, prednisolone
foam enema TNF-alpha inhibitors
Infliximab
Methotrexate

CNS / Neurology

- Anti-epileptics
- Antidepressants (SSRI)
- Antidepressants (TCA)
- Antidepressants (other)
- Antidepressant (MAOI)
- Dopamine precursors
- Dopamine receptor agonists
- Anticholinesterase
– Glutamate antagonist
- Mood stabilisers
- Antipsychotics
- Migraine

Phenytoin, carbamazepine,
levetiracetam, sodium valproate,
lamotrigine
Citalopram, sertraline
Amitriptyline, trazadone
Mirtazapine, venlafaxine
Phenelzine (RIMA: Moclobemide)

Co-beneldopa, Co-careldopa
Rotigotine, ropinirole
donepezil
memantine
lithium, valproic acid
haloperidol, risperidone, quetiapine,
clozapine
Sumatriptan

Antimicrobials / antinfectives

You should know the commonly used antimicrobials for treating:

- respiratory infections
- tuberculosis
- urinary infections
- biliary tract infection
- diverticulitis
- surgical wound infections
- cellulitis
- bacterial meningitis
- infective endocarditis.
- C.diff



ACE Study Guide 2018/19

- MRSA
- Shingles
- Common fungal infections

Genitourinary system

oxybutynin, alfuzosin, finasteride

Should contraceptives and HRT be included here?

Musculoskeletal

DMARDs

methotrexate, hydroxychloroquine
sulphasalazine

Anaesthesia and analgesia

- Local anaesthetics
Opioids
diamorphine, buprenorphine,
tramadol
 - "Simple" analgesia
 - Benzodiazepines
 - Anti-emetics
 - Anti-cholinergics
 - Sympathomimetics
- Lidocaine, bupivacaine, EMLA cream
Morphine, oxycodone, fentanyl
codeine, dihydrocodeine,
Paracetamol, ibuprofen,
naproxen
Diazepam, temazepam,
midazolam
Ondansetron, cyclizine, metoclopramide,
prochlorperazine
Atropine, glycopyrronium
Adrenaline, ephedrine



CRITICAL ILLNESS ATTACHMENT

Learning Opportunities

The Critical Illness Attachment may involve placements in

- A&E
- Anaesthetics including preoperative operative and post operative care
- Simulation environments
- Acute admissions environments
- Intensive Care unit
- Placements will vary according to the Trust in which you are attached

High level objective

- Students will be able to provide appropriate care to patients with critical illness

Intermediate level objectives:

- Recognise the critically ill patient
- Manage the critically ill patient
- Communicate within and between teams
- Understand the role of multiprofessional teams
- Understand the ethical issues in the management of the critically ill patient

RECOGNITION OF THE CRITICALLY ILL PATIENT

Describe the concept of the Early Warning System score and the use of this tool to trigger senior review and / or admission of the patient to the augmented care areas (HDU/ITU).	
Identify risk factors for critical illness such as mechanisms of injury, comorbidities, past medical and surgical history.	
Describe the use and limitations of risk scoring systems for common critical illnesses such as GI bleeding, pancreatitis, trauma.	
Take an appropriate history and use method of examination appropriate to a critically ill patient (ABCDE).	
Make accurate observations of clinical phenomena and appropriate critical analysis of clinical data including patterns of deterioration as documented on observation charts	
Define the various grades of shock and their effects on the major organ systems: brain; heart; kidneys; gut; blood; lungs.	
Justify the selection of appropriate investigations for common clinical cases, explain the fundamental principles underlying such investigative techniques	
Interpret the results of such investigations, including imaging and the results of diagnostic procedures.	



ACE Study Guide 2018/19

Recognize the presentation of the unconscious patient (presenting to ED or as an inpatient)	
Recognize Patients presenting with shock, distinguishing between: Hypovolaemia Sepsis Cardiogenic shock Anaphylaxis	
Recognize Suspected severe sepsis	
Recognize Acute severe renal injury	
Recognize Acute respiratory failure	
Recognize Acute left ventricular failure	
Recognize Severe / multiple trauma	
Recognize Acute traumatic brain injury	
Recognize Suspected bacterial meningitis	
Recognize Acute severe asthma	
Recognize Acute severe exacerbation of COPD	
Recognize Post-operative bleeding	
Recognize Major gastrointestinal haemorrhage	
Recognize Diabetic emergencies (DKA; Hypoglycaemia)	
Recognise clinical features in patients at risk or cardio-respiratory arrest (ILS)	



SKILLS IN RECOGNITION OF THE CRITICALLY ILL PATIENT	
Perform a physical examination appropriate to a critically ill patient	
Take venous blood samples	
Obtain an arterial blood sample and interpret arterial blood gas results.	
Justify the use of and interpret the following monitoring in the critically ill; <ul style="list-style-type: none"> • Full blood count • Blood glucose • U&E • Coagulation tests • Blood cultures 	
Justify the use of and interpret urinalysis in the critically ill	
Justify the use of and interpret the following imaging in the critically ill: <ul style="list-style-type: none"> • Chest X-ray • Trauma series x-rays, CT head 	

MANAGEMENT OF THE CRITICALLY ILL PATIENT	
Synthesise a full assessment of the patient's problems and define the likely diagnosis or diagnoses (based on conditions listed under topic outcome 'Recognition of the critically ill patient').	
Make clinical judgements and decisions, based on the available evidence, in conjunction with colleagues and as appropriate for your level of training and experience. This may include situations of uncertainty.	
Formulate a plan for investigation, treatment, management and discharge, according to established principles and best evidence, in partnership with the patient, their carers, and other health professionals as appropriate.	
Describe the importance of appropriately timed reassessment of the patient (FROM SIM OUTCOMES)	



Describe the reasons for patient's admission to ITU / HDU	
Describe situations when it is inappropriate to refer a patient to ITU / HDU.	
Describe the role of clinical guidelines and care bundles in the management of the critically ill: NICE and AAGBI Head injury; sepsis bundle; diabetic emergencies; major haemorrhage	
Understand the importance of, and the need to keep to, measures to prevent the spread of infection, and apply the principles of infection prevention and control.	

SKILLS IN MANAGING THE CRITICALLY ILL PATIENT	
Maintain an airway (also covered by anaesthesia objectives within surgical attachment)	
Obtain venous access	
Perform Basic Life Support and cardio-pulmonary resuscitation	
Conduct an initial assessment and management survey on a patient with multiple injuries, using the correct sequence of priorities and explanation of the management techniques for primary treatment and stabilisation.	
Conduct a neurological examination and determine the Glasgow Coma Scale in a patient with head trauma	
Safely prescribe and administer the following in a variety of critical illness situations, in a simulated environment: <ul style="list-style-type: none"> • Oxygen, Intravenous fluids, Analgesia (intravenous titration of strong opioids) • Safely prescribe and administer Emergency anti-microbial therapy in a variety of critical illness situations: meningitis, community and hospital acquired pneumonia, urinary sepsis, abdominal sepsis. 	
Formulate an initial management plan with timely re-evaluation for the critically ill patient based on clinical guidelines and published evidence	



Describe how to call for the cardiac arrest team	
Demonstrate effective CPR with appropriate airway adjuncts	
Recognise heart rhythms at cardiac arrest that require or do not require defibrillation	
Demonstrate safe defibrillation with an automated and/or manual defibrillator	
Describe the potentially reversible causes of cardiac arrest and their immediate management	
Describe the indications, doses and actions of the principal drugs used during management of a cardiac arrest	
Describe appropriate post resuscitation care	

COMMUNICATION WITHIN AND BETWEEN TEAMS

Describe the importance of accurate and concise communication within and between professionals caring for the critically ill	
Describe the rationale of tools such as SBAR for communication	
Demonstrate ability to build team capacity and positive working relationships and undertake various team roles including leadership and the ability to accept leadership by others.	

SKILLS IN COMMUNICATION RELATED TO CRITICAL ILLNESS

Demonstrate the use of communication tools / techniques to support effective communication between healthcare professional and within teams.	
Make an appropriate referral for escalation of care.	



Communicate and document a management plan for a stable patient	
Demonstrate a strategy for appropriately challenging decisions made by other members of the multi-professional team.	

PERSONAL DEVELOPMENT AND LIFELONG LEARNING SIM DAY OUTCOMES	
Perform self-assessment by reflecting on their own performance and observation of others within the simulator environment	
Develop critical evaluation and feedback skills by taking part in facilitated peer appraisal	
Produce a personal development plan identifying key issues (including clinical / technical and non-technical skills) that are worthy of attention prior to graduating from Medical School	

THE ROLE OF MULTIPROFESSIONAL TEAMS IN CRITICAL ILLNESS	
Describe the benefits and limitations of: Trauma teams; Resuscitation teams; Critical care outreach; Physiotherapists in critical illness	
Discuss the impact of effective and ineffective team working on patient safety	

SKILLS & PRACTICE	
Observe the following teams: Trauma team; Resuscitation team; Critical care outreach	
Simulate team behaviours and reflect on individual contribution	



ETHICAL ISSUES IN THE MANAGEMENT OF THE CRITICALLY ILL PATIENT

Discuss issues of consent in patients with impaired capacity	
Discuss how ethical principles are involved in decisions to escalate or limit treatment (Patient and family wishes, Quality of life, Futility)	
Recognise the rights and the equal value of all people and how opportunities for some people may be restricted by others' perceptions including Alcohol, Drug misuse or self-neglect	
Demonstrate familiarity with the GMC's ethical guidance and standards including Good Medical Practice, the 'Duties of a doctor registered with the GMC' and supplementary ethical guidance which describe what is expected of all doctors registered with the GMC in the context of Critical Illness (Respect patient's dignity and privacy, Recognise the limits of your professional competence, Ensure that your personal beliefs do not prejudice your patients' care)	

SKILLS & PRACTICE

Observe members of the multi-professional team breaking bad news to patients and / or their relatives	
Demonstrate ability to respect patient's dignity and privacy during assessment and management	



ACCIDENT & EMERGENCY MEDICINE

TRAUMA	
Identify the correct sequence of priorities of emergency medical care to be followed in assessing the multiply injured patient including: Primary survey, Parallel resuscitation, Secondary survey, The use of near-patient testing, The role of x-ray and CT imaging	
Describe the common causation, types, assessment and management of the following types of injury: Head, Chest, Abdomen and pelvis, Limbs, Spine	
Describe the common causation, types, assessment and management of more minor injuries including: Bony injury to the upper and lower limbs, Soft tissue injury to the upper and lower limbs, Injuries to the ankle, knee, hip, wrist, elbow and shoulder	
Describe the initial assessment and management of a patient with multiple injuries, using the correct sequence of priorities; explain the management techniques for primary treatment and stabilisation.	
Discuss the basic principles of emergency treatment of haemorrhagic shock; outline steps to be taken in fluid therapy of victims of haemorrhagic shock.	
Identify each of the following common life threatening chest injuries (ATOMFC) and discuss their pathophysiology: A irways injuries, T ension pneumothorax, O pen pneumothorax, M assive haemorrhage, F lail chest, C ardiac tamponade	
Describe the following potentially life threatening injuries and outline their initial management: pulmonary contusion, aortic disruption, tracheobronchial disruption, oesophageal disruption, diaphragmatic disruption, myocardial contusion	
Outline diagnostic and supportive therapeutic actions for abdominal trauma including the indications and contra-indications for FAST (focused assessment with sonography for trauma).	
Discuss the general management and initial investigation of the unconscious traumatised patient	
Describe the pathology of head injury, classifying into focal and diffuse. Describe the delayed complications that can follow head injury, classifying into focal and diffuse, and outline the basic principles of rehabilitation in those with cognitive impairment	
Describe the Glasgow coma scale and discuss its value in neurological assessment.	



ACE Study Guide 2018/19

Describe the main causes, pathophysiological mechanisms and effects of increased intracranial pressure.	
Outline the therapeutic interventions that, when initiated in the early phases of management, can help to reverse or delay undesirable effects of raised intracranial pressure.	
Specify the principles of acute management of the patient with spine or spinal cord injury.	
Given a patient with spine or spinal cord injury, describe how to stabilise the injury.	
Specify the principles of rehabilitation of a patient with spinal cord injury.	
Identify the various types of limb injuries and list the priorities of assessment and management of each.	
Discuss the principles of limb immobilisation.	
Describe the clinical features and management of acute soft tissue injuries including neck, wrist/hand, knee and ankle sprains, and animal and human bites; and specify the indications for tetanus prophylaxis.	
Discuss the aetiology, presentation and emergency management of a compartment syndrome.	
Outline the general principles of management on the transportation or transfer of the trauma patient.	

SKILLS IN EMERGENCY MEDICINE

Conduct an initial assessment and management survey on a patient with multiple injuries, using the correct sequence of priorities and explanation of the management techniques for primary treatment and stabilisation.	
Conduct a neurological examination and determine the Glasgow Coma Scale on a patient with head trauma.	
Demonstrate the ability to immobilise the spine on a patient with a back injury.	



Demonstrate the ability to immobilise a fractured limb.	
Interpret the CXR in a patient with severe closed chest trauma.	
Interpret the pelvis and cervical spine radiographs in a trauma patient.	
Observe the performance of a FAST scan in a trauma patient and understand the interpretation of the results.	

BURNS

List and differentiate the categories of burn injury; thermal, chemical, electrical, cold, irradiation.	
Describe the pathophysiology of each burn category.	
Classify the depth of burn injury.	
Describe and apply the rule of nines.	
List the causes, symptoms and signs of inhalation injury.	
Outline the fluid resuscitation of burns patients, including composition, volume and timing of fluid.	
List the other management steps in the initial 24 hours following a burn injury, including general support, wound management and antibiotics.	
Discuss the management of a burns patient after the first 24 hours including fluids, wound management, metabolic needs and rehabilitation.	
Discuss the methods used to prepare a full thickness burn for grafting and the factors relevant to the successful take if the graft on the wound surface.	
Identify patients who require specialised burns centre management.	



ACE Study Guide 2018/19

Define the maximum extent to which a patient can be burned and still be managed on an outpatient basis.	
Describe a type of burn of < 10% that would require hospitalisation.	

SKILLS IN BURNS ASSESSMENT

Given the area of the burn and its depth, calculate the fluid resuscitation requirements for the first 24 hours.	
Describe the necessary steps in the outpatient management of a patient with a small burn.	

EMERGENCY MEDICINE

Describe the immediate assessment and management of acute presentations of Cardiac arrest and life threatening arrhythmias	
Describe the immediate assessment and management of acute presentations of the unconscious patient	
Describe the immediate assessment and management of Myocardial infarction and acute coronary syndrome	
Describe the immediate assessment and management of acute presentations of The breathless patient including asthma, COPD and pulmonary oedema	
Describe the immediate assessment and management of acute presentations of Cerebrovascular accident	
Describe the immediate assessment and management of acute presentations of Diabetic complications – hypoglycaemia, hyperglycaemia, DKA and HHS	
Describe the immediate assessment and management of acute presentations of generalised and focal seizures	
Describe the immediate assessment and management of acute presentations of severe sepsis	
Describe the immediate assessment and management of acute presentations of Anaphylaxis	



PSYCHIATRY AND MENTAL HEALTH	
Discuss the backgrounds to and presentation of patients who self harm	
Describe the main aspects of a mental state examination in the setting of acute self harm	
Describe the general approach to the management of patients who have taken an overdose (including main agents of overdose and antidotes etc)	

SURGICAL EMERGENCIES	
Discuss the differential diagnosis of patients presenting with abdominal pain and the acute abdomen	
Describe the assessment and management of patients presenting with testicular pain	
Discuss the approach to patients with vascular emergencies including abdominal aortic aneurysm, aortic dissection and limb-threatening ischaemia	
Describe the common acute conditions and emergencies that present to the emergency department in the following areas: ENT - epistaxis, earache, foreign bodies, difficulty swallowing; Ophthalmology – foreign body, painful eye, altered vision; Maxillofacial – facial injuries, tooth pain	

WORKING IN EMERGENCY CARE	
Describe the relationship of the Accident & Emergency Department to the inpatient specialties and to external agencies (GP, Ambulance Service, Social Services, Community Mental Health Services etc)	
Describe the roles of the different staff groups within the emergency department	
Describe the different patient flows through an emergency department and how patients are assessed and prioritised	
Describe the role of blood investigations, imaging etc in decision-making in the emergency setting	



Discuss the role of the A&E and acute admissions ward	
Describe common A&E interventions e.g: suturing, plaster application, wound care, removal of foreign body etc. and where possible participate under supervision	

ANAESTHETICS

The student should spend time with allocated anaesthetists caring for patients on their surgical team and should discuss / practise the following topics and skills. There is some overlap with the critical illness attachment which provides students with the opportunity to revise/ enhance their learning.

TOPICS:

- Pre-operative assessment
- Analgesia
- Peri-operative care

PRE-OPERATIVE ASSESSMENT	
Discuss the principles of general, regional and local anaesthesia.	
Describe the role of the anaesthetist in: the theatre team; labour suite; the pain team; the critical care (ITU/HDU/outreach) team; the cardiac arrest and trauma team	
Describe the effects of general and spinal anaesthesia on normal cardiac and respiratory physiology.	
Describe the common and major risks associated with general and spinal anaesthesia	
Describe the indications for common pre-operative tests and their potential impact on peri-operative care including: Full blood count, Urea and electrolytes, Liver function tests, Coagulation tests, Chest X-ray, ECG and Echocardiography, Lung function tests	
Describe the ASA classification and methods used to classify urgency of operation.	
Specify appropriate starvation times for food and clear fluids	



Describe the principles of management of the diabetic patient presenting for surgery	
--	--

ANALGESIA

Define pain	
Describe the adverse effects of pain	
Describe the WHO pain ladder	
Describe indications, contra-indications, complications, routes and doses for commonly used drugs for acute pain: Paracetamol, Non-steroidal anti-inflammatory drugs, Weak and strong opioids, Local anaesthetics	
Describe the principles, risk and benefits of patient controlled analgesia (PCAS)	
Describe the principles, risk and benefits of epidural analgesia	
Describe methods of non-drug analgesia (eg heat/cold, TENS, splinting)	

PERI-OPERATIVE CARE

Describe causes of postoperative nausea and vomiting (PONV)	
Describe indications, contra-indications and doses for commonly used drugs for PONV: antihistamines (e.g. cyclizine), 5HT ₃ antagonists (e.g. ondansetron), Dopamine antagonists (e.g. droperidol), Dexamethasone	
Describe the principles of intravenous fluid therapy in the postoperative period.	
Describe the indications for oxygen therapy in the postoperative period	
Describe the methods of providing increased inspired oxygen.	



ACE Study Guide 2018/19

Describe the benefits and limitations of pulse oximetry.	
Recognize and manage a patient with an obstructed airway (also covered in critical illness attachment): Undertake appropriate head / neck positioning, sizes and insert an appropriate oropharyngeal (Guedel) airway	
Safely set-up an intravenous fluid (MACCS in critical illness attachment)	
Recognize and manage a patient with suspected anaphylaxis	

SKILLS IN RESUSCIATION

The student will complete a life support course during their final year. Refer to www.resus.org for current guidelines.	
Maintain an airway	
Obtain venous access	
Perform Basic Life support and cardio-pulmonary resuscitation	
Recognise the critically ill patient	
Recognise triggers for admission to ITU	



PALLIATIVE MEDICINE

Define supportive palliative care and specialist palliative care. Describe the role and contributions of the individual members of the multidisciplinary team. Describe services commonly available in the UK.	
Discuss the importance of communication skills in palliative care.	
Discuss the various psychological responses of patients and their relatives to illness and bereavement. Reflect upon their own and other professionals' attitudes and responses to death and dying.	
Discuss the aetiology of pain in patients with cancer. Discuss an approach to relieving cancer pain that takes into account diagnosis, different types of pain and range of treatments available, monitoring response and psychological factors that influence pain.	

SKILLS IN PALLIATIVE MEDICINE	
Demonstrate appropriate communication skills that facilitate a therapeutic relationship for both the patient and themselves.	
Take a pain history, including the use of a pain chart and pain scores.	
Apply the World Health Organisation analgesic stepladder.	



PRIMARY CARE ATTACHMENT

The Primary Care attachment provides an opportunity to widen your clinical experience and gain a greater insight into conditions managed in the GP surgery. It is anticipated that with the recently proposed changes to the NHS, more health care will move from secondary care to be delivered in the community.

Aims of the attachment

Student as a scholar and a scientist

- To develop knowledge and understanding of the prevention, presentation, assessment and management of illness in primary care - this will include the psychosocial and physical aspects
- To develop knowledge and understanding of palliative care
- To develop knowledge and understanding of the organisation of primary care in the NHS and the practical constraints within which services are delivered

Student as a practitioner

- To develop clinical problem solving skills including the ability to formulate management plans with patients within the consultation
- Further develop effective communication skills especially when dealing with more challenging consultations
- Safely carry out some clinical tasks relevant to primary care

Student as a professional

- To develop knowledge, understanding and appreciation of the role of the different members of the primary health care team
- To apply an ethical decision making framework in a primary care setting
- To develop knowledge of principles and demonstrate the practice of clinical governance
- To develop knowledge and understanding of the career opportunities in general practice
- To further develop professional attitudes consistent with the GMC's Good Medical Practice



Primary Care Topic Learning Objectives

STUDENT AS A SCHOLAR AND A SCIENTIST	
Describe the main health promotion and disease prevention activities in primary care	
Formulate an appropriate management plan for the common conditions seen in primary care	
Discuss the main requirements for effective palliative care in primary care	
State and apply the principles of chronic disease management to one of the following: <div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>Coronary Heart Disease Congestive Cardiac Failure Hypertension Stroke/TIA</p> </div> <div style="width: 45%;"> <p>Mental health (depression) Neurodegenerative diseases, such as Parkinson's and Alzheimer's disease Asthma/COPD Epilepsy</p> </div> </div>	
Describe the structure of NHS and the different methods in which primary care is delivered	
Apply the principles of public health in primary care	

STUDENT AS A PRACTITIONER	
Carry out a consultation with a patient and formulate a management plan using a consultation model <ul style="list-style-type: none"> • Taking an appropriate history and examination • Identifying why the patient attended • Identifying the most likely diagnosis • Formulating a relevant primary care management plan • Providing an understandable explanation to the patients • Making an adequate record and completing the administration associated with the consultation (e.g. referral letters, prescription) 	
Communicate effectively with patients and colleagues, especially in challenging circumstances, such as breaking bad news, dealing with aggressive patients	



ACE Study Guide 2018/19

Support patients in caring for themselves in the context of minor and chronic illness	
Contribute to care of patients and their families at the end of life	
Use information effectively in a medical context, including effective written communication and effective use of computer and other information systems	
Carry out practical procedures appropriate to primary care safely and effectively	

STUDENT AS A PROFESSIONAL

Analyse ethical problems that present in primary care and justify the decisions that are made in terms of the ethical principles and Good Medical Practice	
Apply principles of continuing professional development: Devise your own learning objectives for the attachment, based on your current learning needs and previous knowledge and experience	
Analyse and reflect on their own and others consultation skills	
Demonstrate understanding and respect for the roles and relationships between members of the Primary health care team e.g. the practice nurse, health visitor, district nurse, midwife and practice administrative staff in the context of working and learning as a multi-professional team	
Demonstrate understanding and apply the principle of clinical governance to improve patient care	
Respond constructively to the outcomes of appraisals and assessments	
Outline the training required to become a GP and the range of possible career options in general practice	
The student should continue to behave according to ethical and legal principles. By the end of the attachment the student should be able to demonstrate: A caring and responsible professional attitude; Respect for patients and health care staff; Integrity and honesty (probity); Interest and enthusiasm	