



Royal College
of Surgeons
of England
ADVANCING SURGICAL CARE

National Undergraduate Curriculum in Surgery

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FOREWORD

Who and what is this curriculum for?

This updated curriculum of surgery for undergraduates has been produced in order to conform to standards required of medical graduates qualifying from UK medical schools. Revised standards have been published by the General Medical Council (GMC), and a new universal assessment, the Medical Licensing Assessment (MLA), will be required to be taken by all qualifying medical students, prior to registration, from 2024 onwards. The areas of learning to be assessed by the MLA with respect to surgical practice, have been set out, as in the *MLA Content Map*, in the syllabus which forms the second part of this curriculum.

In the first edition of this curriculum, published in 2015, a broad group of surgical educators had selected 35 topics deemed to be of primary importance for medical students about to take up practice as Foundation Year 1 doctors. The importance of these topics has not diminished in the intervening years and 36 topics have now been included in the Syllabus in Part 2, together with relevant, updated learning objectives. These topics are regarded as essential learning by the Royal College of Surgeons of England (RCS England) and should be assimilated in conjunction with the additional topics of the *MLA Content Map*.

This curriculum is written for medical students, their surgical teachers, and those organising medical school curricula. As a secondary theme, it provides evidence for the GMC, of RCS England's commitment to, and engagement with national undergraduate standards, and the desire to provide uniform and quality education for all our future doctors.

This curriculum establishes the base of a continuum in surgical education which extends on into the Foundation Years curriculum, through to core surgical training, and on to the intercollegiate specialty curricula for higher surgical training, which are overseen by the Joint Committee on Surgical Training (JCST) through the Intercollegiate Surgical Curriculum Programme (ISCP).

The accompanying document "[Learning in Operating Theatres](#)" is a practical resource for all members of the team to support learners and new staff. There are more resources for learners and others on: www.rcseng.ac.uk/study

The Royal College of Surgeons of England
2023

PART 1: Introduction

In 2015, responding to a need to produce a unified, relevant and contemporary surgical curriculum for medical schools in the UK, RCS England published a *National Undergraduate Curriculum for Surgery*.¹ This set out topics and learning objectives required at the minimum standard expected of all students graduating with a medical degree in the UK, including a Bachelor of Surgery (BS, ChB, BCh, BChir, etc). At that time this reflected the required standards outlined in the General Medical Council's (GMC) *Tomorrow's Doctors* (2009).²

This publication, the updated 2023 *National Undergraduate Curriculum for Surgery* reflects developments in UK medical undergraduate education which have occurred in the interim.

The GMC is introducing a two-part test, The MLA, designed to set a common threshold for safe medical practice in the UK, which all medical students graduating from UK universities from the academic year 2024-25 onwards will be required to pass as part of their medical degree, before they can join the medical register. International doctors who want to practise in the UK and who currently take the PLAB will also need to take the MLA from 2024.

The MLA will consist of an Applied Knowledge Test (AKT) and a Clinical and Professional Skills Assessment (CPSA), both run by medical schools. The *MLA Content Map*³ provides information about topics and areas that the AKT and CPSA assessments will cover and is based on the GMC document *Outcomes for Graduates* (2018)⁴, which supersedes *Tomorrow's Doctors*, and sets out what newly qualified doctors from medical schools in the UK must know and be able to do.

This updated 2023 *National Undergraduate Curriculum for Surgery* maps onto *Outcomes for Graduates*⁴ and the *MLA Content Map*³, and also covers the surgical skills required by the GMC for newly qualified doctors described in *Practical Skills and Procedures* (2019).⁵ In addition, it provides the context for a curriculum for surgery and establishes a continuum in surgical education which will extend from the undergraduate years, through the Foundation Programme, and into postgraduate training.

[Appendices 1 & 2](#) provide further information relating to *Outcomes for Graduates* and the *MLA Content Map*, respectively.

Rationale for undergraduate exposure to surgery

Given the existence of surgical principles in all aspects of medicine, the learning objectives and topics described in this document are relevant to all students, irrespective of subsequent career path.

Exposure to surgery is essential for all medical students, for several reasons:

- Surgical conditions are responsible for a significant proportion of elective and emergency referrals. All graduating doctors require knowledge of surgical principles and an understanding of the management of common surgical conditions to deal with patients in their future careers. A minimum level of competency is required to ensure good care for future patients seen within any branch of medicine.
- Surgery is the exemplar interventional specialty. All doctors need to understand

the challenges for both patients and doctors, of diagnostic and therapeutic interventions, including how they should be planned, discussed, agreed and delivered, while maintaining patient dignity, privacy and safety. Patient choice and informed consent form an important part of this process. Shared decision making is now mandated by NICE and requires doctors to understand risks and options, including doing nothing.⁶

- An understanding of potential interventions allows doctors to put each investigation into context for each patient, avoiding unnecessary tests, and helps to deal with expectations.
- In current postgraduate medical training, many doctors not pursuing a career in surgery will have little exposure to surgery after graduation. It is therefore important that undergraduates have adequate exposure to surgery during their training.⁷ The skills and knowledge gained are transferable to other interventional specialties and are also relevant to the care of patients provided by general practitioners and those in other specialties.⁸

Surgery within the National Health Service

The public expects doctors to have an awareness and understanding of conditions that are common and/or urgent. Surgery is one of the most important treatments offered by the NHS in secondary care within the UK. Surgical staff and the resources they need to practise account for a substantial proportion of NHS activity and front-line care for patients. With continuing innovation an increasing number of medical conditions are being remedied or managed by surgery.

Following the COVID-19 pandemic, in 2023, there are currently in excess of seven million patients awaiting consultant-led elective care in the NHS, of which a significant number require surgical intervention.⁹

There are ten recognised surgical specialties in the UK and Ireland:

- Cardiothoracic surgery
- General surgery
- Neurosurgery
- Oral and maxillofacial surgery
- Otolaryngology
- Paediatric surgery
- Plastic surgery
- Trauma & orthopaedic surgery
- Urology
- Vascular surgery

Whilst the undergraduate student is unlikely to be allocated to attachments to all, or even several, of these specialties during their time at medical school, there are common conditions and medical presentations across these specialties with which students should become familiar. These are outlined in the Syllabus in [Part 2](#). The Syllabus lists conditions deemed essential for every graduating doctor to understand, with learning objectives defined for each.

Undergraduate exposure to surgery and a surgical curriculum

Medical students currently have varied exposure to surgery. Several good qualitative and quantitative studies demonstrate that personal contact with surgeons and practical experience are the most valued aspects of learning in surgery.^{10, 11}

It is essential that qualifying doctors have the knowledge, skills and attitudes to equip them for changes during their future careers. Various factors have reduced the traditional learning of surgery 'on the job' after qualifying. These include reduction in surgical foundation posts, restrictions on doctors' working time, the burden of administration, and the increased role of nurse specialists and allied healthcare professionals in the delivery of surgical care.

Other factors have increased the level of awareness of surgical conditions that non-surgeons are required to have. Most notably, for general practitioners, a thorough understanding of surgical possibilities and pathways is required to treat and to know whether and when to refer. Postoperative patients, particularly after rapid discharge pathways, will benefit from GPs with understanding of surgery, postoperative care and complications, reflecting the increased demand for community-delivered care.

Medical students' preparedness for work as doctors suggests that experience helps preparation, increases confidence and reduces stress.¹² With this in mind, the following (surgery-specific) outcomes should be achieved by all undergraduates:

- Understanding of those surgical conditions that are common, urgent or easily missed (for example, all doctors should know the features of an early cancer diagnosis)
- Recognition and understanding of emergency surgical presentations
- Recognition of the sick patient and understanding of the principles and pathways of escalation of care
- Awareness of available treatment possibilities, including non-operative
- Ability to explain in general terms to a patient, the implications of a common surgical diagnosis
- Understanding of the principles of informed consent
- Understanding of principles of optimisation of a patient for surgical treatment
- Understanding of the principles of perioperative care
- Understanding of types and risks of anaesthetics
- Understanding of normal postoperative courses and deviations from these
- Understanding of postoperative complications
- Basic understanding of surgery and different surgical specialties, to inform future career choices

Students need to make the most of any time that they spend within surgical specialties, and to appreciate surgical aspects whilst experiencing other specialties. This curriculum is presented as a way of maximising the benefits of this exposure.

Expectations of all doctors

All medical graduates are required to develop key professional values and behaviours, professional skills, and to acquire the professional knowledge necessary to undertake practice as a Foundation Doctor. The GMC's *Outcomes for Graduates*⁴ provides a summary of the outcomes that are expected from a modern curriculum (Figure 1, Appendix 1). That document is supplemented by *Practical Skills and Procedures*⁵ which outlines the core set of practical skills, procedures and the minimum levels of performance that newly qualified doctors must have when they start work, so they can practise safely.

Surgical practice provides a wealth of clinical material and opportunities for observation of expertise for medical undergraduates. Since there are often limited surgical opportunities in the Foundation Programme, undergraduates should attempt to assimilate as much exposure to surgery and surgical disciplines as possible during their time at medical school.

A surgical attachment provides a clinical environment in which generic outcomes expected of medical graduates in the UK by the GMC⁴ can be achieved ([Appendix 1](#)). The three overarching outcomes are:

- Outcomes 1 - Professional values and behaviours
- Outcomes 2 - Professional skills
- Outcomes 3 - Professional knowledge

How Outcomes relate to the GMC Generic professional capabilities framework

The GMC *Generic professional capabilities framework*¹³, published in May 2017, describes the interdependent essential capabilities that underpin professional surgical and medical practice in the UK and sets these out as educational outcomes. The generic professional capabilities are integrated into the Foundation Programme Curriculum¹⁴ and all postgraduate specialty training curricula.

Capabilities and educational outcomes are reflected in this undergraduate surgical curriculum so that there will be recognisable progression through undergraduate education into postgraduate surgical training.

The structure of the three Outcomes listed above ([Appendix 1](#)) reflects the Generic professional capabilities framework. The three main sections of the Outcomes match the three fundamental domains of the *Generic professional capabilities framework*. The subsections map to other targeted domains in the *Generic professional capabilities framework*.

What does the future hold for surgeons?

If you are contemplating a career in surgery, be assured, the future is bright and exciting. Advances will continue to occur on all fronts: biological, technological and therapeutic. In the last generation of surgery, entirely new pathologies have come into existence (eg HIV and COVID-19), giving rise to novel surgical challenges. More are likely to occur in the future.

Some surgical procedures have become obsolete as a result of therapeutic developments (eg the discovery of proton pump inhibitors and the demise of surgical vagotomy to treat gastric ulcers; diminished varicose vein surgery in the presence of guided laser and radiofrequency treatments), and all areas of surgery have been changed radically by advances in imaging, minimally invasive technology, endoscopy, miniaturisation and new pharmaceuticals.

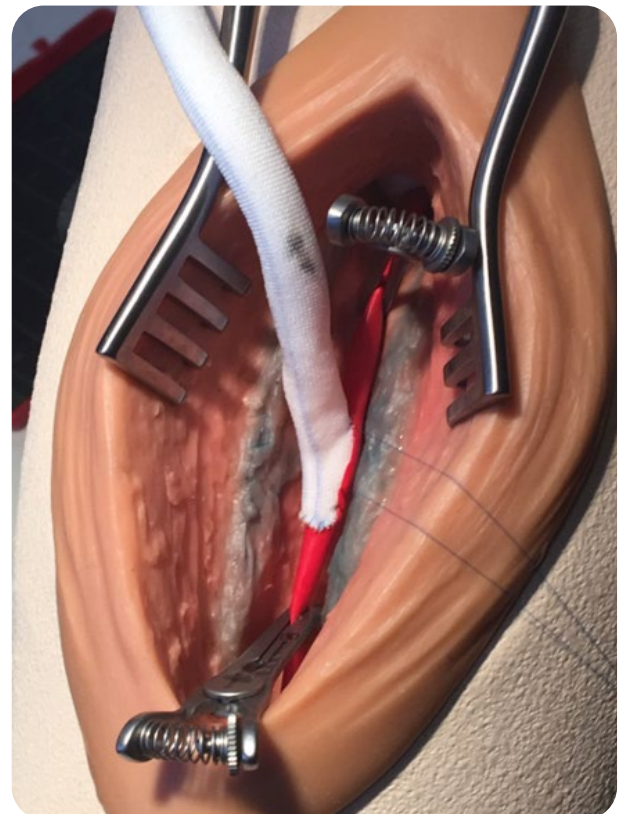
The future surgeon will have to grapple with change and embrace development. Below, are a few exciting areas likely to impact on surgical practice. By the time this curriculum is rewritten, many others are likely to be on the horizon!

Simulation in surgical education: Virtual Reality; Augmented Reality and Mixed Reality

Medical education is evolving across surgical specialties. Training hours are reduced whilst the necessity to provide excellent patient care continues to underpin surgical practice. Training has moved from an apprenticeship model to a more standardised competency-based evaluation model. With increasingly specialised surgical practice, more patients with comorbidities, and prevalent ethical challenges for surgical training, surgical simulation has emerged as a practical tool for developing surgical skills in a safe environment and providing a means of assessing these skills in a structured fashion.



Simulation has been demonstrated to effectively reduce training risks and costs. Simulation is already employed in medical schools, for instance using basic anatomical models to learn principals of physical examination such as breast and rectal examination. Basic skills including urinary catheterisation, skin lesion biopsy, abscess drainage and drain insertion are practised in mannequins. Bowel and vascular anastomoses can be simulated using animal tissues and synthetic models.



There is continuing effort however, to develop high-fidelity surgical simulators.^{15,16} Applying Virtual Reality (VR), Augmented Reality (AR) and Mixed Reality (MR) in surgical simulators increases the fidelity, level of immersion and overall experience of these simulators. Simulators can be used to practice surgical operations and have the potential to advance surgical education, enhance procedural planning, and provide intraoperative guidance. Training platforms are being developed that include smartphones, tablets, and VR headsets with, and without, the addition of digital cameras. Training models include cadaver specimens and physical mock-ups.

AR has potential to improve clinicians' understanding of 3D anatomy and aid the processing of real-time information. AR aims to enhance clinicians' abilities by offering intuitive augmentation of the real environment with computer-generated real-time input of virtual information. AR lies on the continuum from VR, in which the user is immersed in a completely virtual setting, to real life. AR allows for minimal interaction between the virtual and real worlds, whereas MR involves a combination of the real and virtual worlds where both elements interact.

Both VR and AR have been successfully applied to surgical simulation. However, the superimposition of real-time information onto the real world and the flexibility offered by AR could make it a more realistic and adaptable simulation tool. Key components for incorporating VR into surgical simulators are visual and haptic rendering. These components ensure that the user is completely immersed in the virtual environment and can interact in the same way as in the physical world. The key components for the application of AR and MR into surgical simulators include tracking systems as well as the visual rendering. Models employing these techniques are providing increased fidelity in skills training across a range of diverse specialty surgical procedures.



Robotics

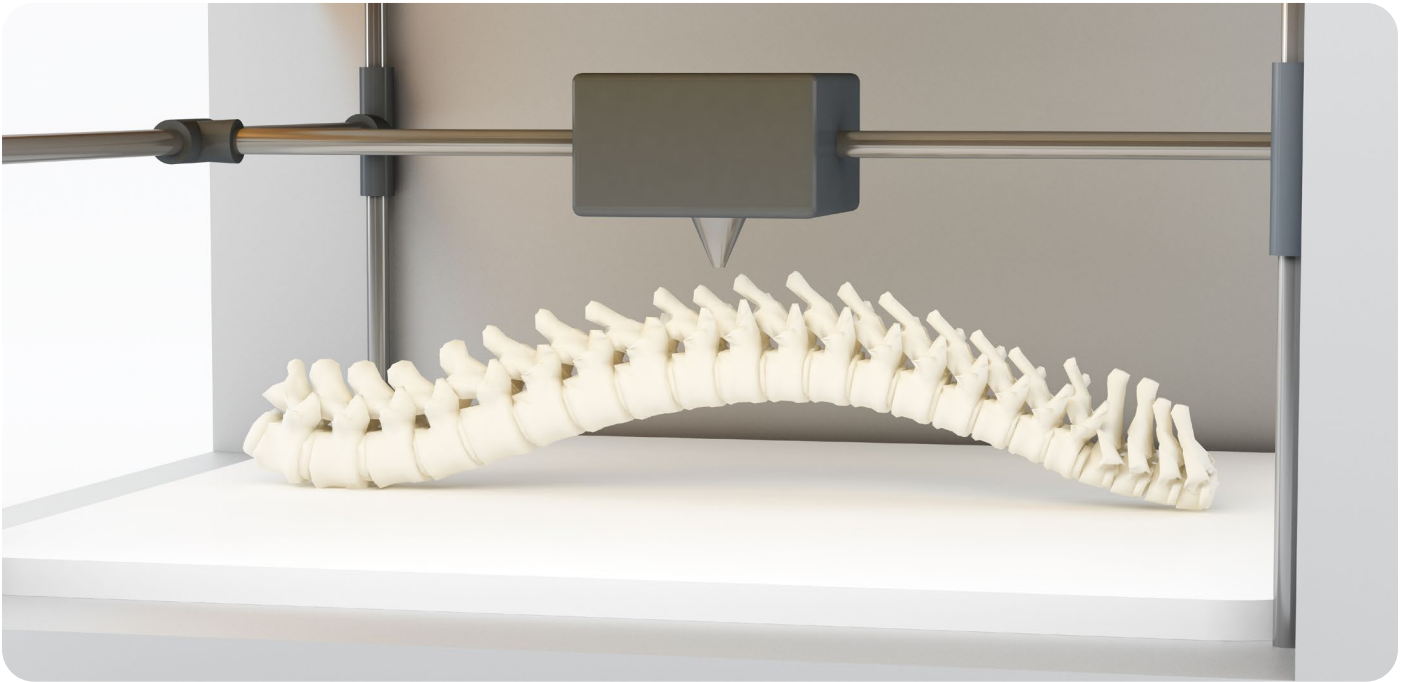
Robots have been helping surgeons for some years. Robots are currently used in various spheres of surgery, particularly in prostatic and uterine surgery, but also increasingly in other areas including cardiac, thoracic, bowel and kidney surgery. A robot may be able to help a surgeon wield his or her instruments more precisely, particularly in a confined space, than if they were holding them themselves. The robot

may filter out inadvertent movements or tremor and the system employs minimally invasive techniques, with instruments introduced through small holes. Haptic feedback (the ability to determine tissue texture and resistance to handling – analogous to aircraft fly-by-wire systems) is improving. Controls may include joysticks or pedals, and miniaturisation of robotic limbs has meant that robots can even be used for microsurgery, with operator joystick movements scaled down to meet the fine tasks required such as joining small blood vessels. In the future, robots may learn from each other through networks in which data and videos are collated and fed through algorithms to work out optimal approaches for individual operations, and to help surgeons with complex procedures. The concept of remote surgery, where an operating surgeon is distant from the operating theatre in which the patient is undergoing surgery, sometimes even on another continent, already exists.



3D Printing

3D printing is already used in many areas but also has recent applications to surgery. Surgeons can practice and prepare for surgery, through the creation of patient-specific organ replicas, minimising likelihood of trauma and allowing the surgeon to rehearse the anatomy likely to be encountered. Sterile surgical instruments, such as forceps, scalpel handles and surgical clamps can be produced using 3D printing, often with considerable cost savings. The process can also be used to produce prosthetic limbs, customised to suit the patient. Research is being undertaken to produce sterile 3D bone replacements. Perhaps one of the most innovative areas of development is that of bioprinting in which computer-guided pipettes layer living cells, bio-inks, on top of one another to create synthetic living tissues. This allows the creation of organoids in the laboratory, which can be used for medical research, and may in future provide alternatives to human organ transplants.



Genomics

Increasing understanding of molecular and cellular biology has had significant impact on our insight into disease processes. Technology arising from this area of research will revolutionise the practice of surgery. The completion of the sequencing of the human genome has spawned much research into gene therapy and RNA interference therapy in animal models, providing us with increased understanding of the molecular basis of human pathologies and the ability to develop targeted treatments. In the future, sequencing of individual patient's genomes may aid prediction, prevention, diagnosis and treatment of disease, allowing personalisation of surgery. Examples of prophylactic surgery to remove potentially harmful tissues, directed by recognition of genomic mutations (eg BRCA and RET proto-oncogene mutations) already exists. Molecular engineering leading to cancer gene-specific therapies may have the potential to provide adjunctive treatments to surgery, in shrinking and combating malignant disease.



Sustainable and frugal surgery

Recognition of the carbon footprint and impact on the environment of modern surgery has led to concepts of sustainable and frugal surgery which will become integrated into future surgery and surgical careers. Climate-sensitive infectious diseases are linked with changes in the geographical spread of zoonotic vector-borne diseases, increased waterborne disease transmission following extreme weather events, and loss of biodiversity.¹⁷ In England, the NHS is thought to be responsible for approximately 25% of national public sector greenhouse gases, principally due to CO₂ emission. Operating theatres and supply chains contribute to a significant proportion of these gas emissions. Currently, operating theatres produce 50-70% of hospital waste. Healthcare demands increase greenhouse gas emissions, in turn impacting on climate change, further leading to healthcare threats: a vicious cycle.



Tomorrow's surgeons will adopt principles of surgical sustainability. More focus will be applied to prevention of surgical disease through education, targeting specific patient groups, improving fitness for surgery, offering lifestyle advice, and enhancing medicines compliance. Streamlining surgical pathways and supply chains, and optimising resource utilisation (for instance, reducing use of consumables), contributes to the concept of leaner surgery. This aims to improve cost efficiencies, enhance patient outcomes and reduce CO₂ emissions. Clinically appropriate low-carbon models of surgical care and minimisation of variables in surgical interventions, with increased use of reusables and appropriate recycling will reduce carbon and plastic footprints and enhance patient care over time. There is ample opportunity for future surgeons to play their role in development of these processes to enhance planetary healthcare.



Global Surgery

'Global surgery' is the term adopted to describe a rapidly developing multidisciplinary field aiming to provide improved and equitable surgical care across international health systems.¹⁸

The global burden of surgical disease is massive, of which much is un-diagnosed and untreated.¹⁸ All doctors need to understand which options are possible and many of the treatments are basic and well-established in higher-income countries ([Table 2](#)). The graduating medical student should have an awareness of health services beyond the NHS, including the place of surgery in global healthcare. This relates to Outcomes 3, Professional Knowledge in *Outcomes for Graduates*.

Summary of Global Surgery¹⁹

Billions of people worldwide lack access to even basic surgical care. Out of the roughly 250 million operations performed each year, only 3.5% are performed on the poorest third of the world's population. Fifteen per cent of the world's disability is due to surgically treatable conditions. Injuries alone cause 5.7 million deaths yearly, much more than the 3.8 million deaths caused by malaria, HIV/AIDS and tuberculosis combined.

Other prominent conditions that demand surgical treatment are cancer, congenital anomalies such as club foot and cleft lip, cataract and obstetric complications. Surgery has a crucial role to play in achieving universal health coverage including the United Nations Millenium Development Goals, a set of goals set by the UN in 2000. Lack of surgical treatment puts a significant economic burden on the millions who cannot work or function due to conditions for which the treatment has been known for decades.

Surgical treatment has been identified as a cost-effective intervention in resource-poor settings, on a level with vaccination programmes and 10-15 times more so than antiretroviral medication for HIV. This is not to say that surgery is any more important than other types of treatment, but it is certainly as important as other global health priorities. The goal is to achieve an equitable distribution of treatment options, and to integrate different aspects of healthcare, from prevention and primary care to antibiotics and surgery.

The areas of progress outlined above are just few of the many areas in which future surgeons can expect to see developments. It is likely that future surgeons will have portfolio careers in which their focus will be directed across various fields within surgery during a lifetime of practice. Other aspects of innovation that they will encounter include: healthcare economics; surgical safety and human performance; artificial intelligence, machine learning and deep learning; Big Data and ethical implications; biomechanics; and software engineering and coding.

The future is bright and surgical development knows few limits!



Health promotion and prevention of disease including surgical conditions

All doctors need to understand that many common conditions are preventable. This includes surgical conditions; for example, 80% of amputations are performed as a result of preventable chronic conditions (principally Type 2 diabetes and peripheral vascular disease). The incidence of Type 2 diabetes, vascular disease, stroke, heart disease, breast cancer, dementia, bowel cancer and prostate cancer recurrence can be reduced by 25–45% with regular moderate exercise. Measures that improve nutrition, increase exercise, reduce smoking, reduce alcohol consumption and reduce traffic collisions would have significant health benefits.²⁰ It is estimated that 28% of adults in England are obese and a further 36.2% are overweight. The spectrum of obesity affects both children and adults. Students should understand factors affecting obesity, and have comprehension of the psychological and social stigmata associated with the condition. Students should also have a basic awareness of management of obesity and principles of bariatric surgery.

Students need to understand the principles of screening for disease in susceptible populations and to be familiar with common screening programmes in the UK, including those for aortic aneurysm, colorectal cancer, breast cancer and prostate cancer.

All doctors, not just future surgeons, need to feel empowered discussing these issues with patients, especially those who have least access to choices. Any doctor who might manage services in the future needs to consider a surgical approach to interventions at a community level. This relates to Outcomes 3, Professional Knowledge in *Outcomes for Graduates*.

Consent, ethics, risk and clinical judgement

The consent process for a surgical operation crystallises elements of ethics, risk, benefit, choice, complications, communication and mental capacity. Emergency surgery, resuscitation discussions, and consent for paediatric surgery are also relevant issues. Although medical students cannot sign for consent, they need a firm understanding of risks, benefits and the decision-making process, assessing each patient as an individual. Explaining risk to patients is a complex intervention in which adjuncts exist to augment communication.²¹ This also helps with discussion around alternative treatment options and whether to pursue specific lines of investigation.

Students should take the opportunity to practice explaining procedures to patients, and to obtain consent, under direct supervision. Within their coursework they will need to seek patient consent for performing examinations and investigations and should understand when evidence of consent in patient records forms part of required professional practice. This relates to learning outcome domains in both Outcomes 1, Professional Values and Behaviours, and Outcomes 2, Professional Skills, in *Outcomes for Graduates*.

Team-based working and avoiding bullying behavior

Surgery requires a team-based approach as outlined in *Good Surgical Practice*.²² Surgery has embraced the WHO team briefing to improve patient safety. Many surgeons who are educators will be interested in the suggestions within the new *Surgical Tutor Handbook 2022*.²³ This also contains guidance on how to modify behaviour so that students and other staff do not perceive behaviour as negative or bullying. In general terms, understanding the skills and needs of each student and team member gives the best clinical care and the best learning experience.

Professor Neil Mortensen, RCS England President, commenting on the findings of the 2021 Kennedy Report²⁴ stated “*Medical students choose surgery as a profession knowing they will have to study and work incredibly hard, often under great pressure. No one should expect on top of those demands, to be subject to demeaning or hurtful behaviour at work...this College has developed unconscious bias guidance and e-learning to combat this risk.*”

This aspect of the curriculum maps onto the domain of Professional and Ethical Responsibilities of Learning Outcome 1, Professional Values and Behaviours, in *Outcomes for Graduates*.

Embracing diversity and careers in surgery

Surgery has historically been the domain of white males.^{25, 26} There are many role models now for surgeons from a variety of backgrounds. Protectors of the status quo can fail to see that society has changed dramatically. Wider access to higher education has opened opportunities for many who had previously been excluded. Medical students come from diverse backgrounds and most UK universities have widening participation programmes. Educational opportunities have totally changed the status and aspirations of women across society. More than half of the students in UK medical schools are female. A third of surgeons are women and this proportion is increasing. Our society is multi-ethnic, greatly enriched by generations of immigration and the medical profession includes surgeons from a great variety of different backgrounds: including all nationalities, genders, religions, beliefs and identities.

The desire for diversity within the leadership of institutions is being felt across most fields and RCS England is leading in this area, with initiatives to address the concerns outlined in the 2021 Kennedy Report: *The Royal College – Our Professional Home: An independent review on diversity and inclusion for the Royal College of Surgeons of England*.²⁴

It is hoped that this curriculum will encourage and support all those who want to be surgeons, or who want to develop a career in similar interventional or related specialties. Those intending a career in surgery are advised to consider the suggested resources for further study and support in [Part 2](#). Pre-clinical, and undergraduate clinical exposure to surgery, positive role models, mentorship, simulation training, and exposure to global health have all been demonstrated to be influential factors in surgical career choice.²⁶

Learning and teaching in surgery

Optimising medical student educational experiences is important because of often limited resources arising, for instance, from restricted availability of teaching staff, and limited time in crowded curricula. In addition to the global needs of an educational programme, it must be recognised that individual students learn in different ways.^{27, 28} Accordingly, a good curriculum allows students to access a variety of learning opportunities and mixed teaching methodologies to enhance acquisition of knowledge and skills.

It is also recognised that “surgery” does not exist in isolation, and in common with other branches of medicine, the surgical team interacts with many other disciplines to provide holistic patient care. During surgical attachments, students should recognise these interactions and should begin to understand how specialties and teams work together to achieve the best possible outcomes for their patients. For instance, a student in a general surgical attachment should note collaboration of surgeons with other specialists such as interventional radiologists, care of the elderly teams, medical specialties, pathologists, palliative care doctors, intensivists and anaesthetists, as well as with nursing and theatre staff, physiotherapists and occupational therapists. Observing how clinicians communicate with each other and depend on each other’s skills will provide the basis of an understanding of delivery of effective healthcare in NHS hospitals.

Perioperative care is the whole pathway from the moment an operation is contemplated until full recovery.²⁹ A “whole pathway” approach can halve complications, reduce length of stay and costs, improve patient experience and enhance staff wellbeing; this requires focus on factors such as prehabilitation, sharing skills between staff, following clear standards, using checklists consistently and encouraging communication around patient safety.³⁰

Organisation of the Syllabus

RCS England recognises that the nature of undergraduate medical courses across the UK varies, and that the way teaching is delivered in different medical schools is also subject to differences. Some schools, for instance, may favour a problem-based learning approach to curriculum delivery, whilst other adopt a more traditional pre-clinical and clinical course divide. It is emphasised that the basic sciences of anatomy, physiology and biochemistry lay the foundations for understanding clinical conditions and pathologies, and that however clinical knowledge and understanding is developed, these basic sciences must be integrated into educational programmes.

This curriculum concentrates on the clinical aspects of surgical knowledge and skills required of undergraduates and assumes the teaching of these basic sciences in medical courses. In clinical teaching, every opportunity should be taken to reinforce these sciences, for instance with respect to the understanding of the anatomy in a surgical procedure, or the principles of physiology applied to the sick surgical patient.

The Anatomical Society core regional anatomy syllabus for undergraduate medicine was published by the Anatomical Society in 2016.³¹ A physiology syllabus, *Physiological objectives for medical students*, has also been published by the Physiological Society (2020).³² These texts outline the core basic science knowledge which underpins clinical undergraduate surgical learning.

Conditions included in the Syllabus

Recognising limited time in the undergraduate course, it has been necessary to prioritise a realistic number of surgical conditions deemed vital for graduates to be conversant with. The 36 topics listed in the syllabus have been prioritised according to the following criteria:

1. **Importance** – have potential significant detrimental impact for the patient
2. **Frequency** – how commonly the undergraduate student is likely to encounter these conditions

The GMC has included a wider range of topics that students may expect to be tested on in the MLA. For the sake of completeness, those topics with surgical relevance have also been set out in the *MLA Content Map* in [Appendix 2](#) in this curriculum, which follows on from the learning objectives of the 36 conditions in the syllabus.

Learning Opportunities

Much of the curriculum can be covered in surgical placements, but important and rare conditions will need additional reading and formal teaching. These conditions are highlighted in the syllabus. Course administrators should ensure that students on attachments are provided with a timetable of activities to maximise effective learning opportunities. Where students are expected to join clinical activities such as ward rounds, theatre lists and clinics, course administrators should try to ensure that the teachers in those areas expect students, so that teaching is integrated into service delivery and students' learning experiences are enhanced.

Opportunities for learning exist in:

- Outpatient clinics (general and specialist)
- Ward rounds
- Operating theatre
- Emergency department
- Surgical Admissions Unit
- Preoperative assessment clinics
- Intensive Care Unit (ICU) and High Dependency Unit (HDU)
- Multidisciplinary Team Meetings (MDT)
- Morbidity and mortality meetings
- Patient discharge suites
- Shadowing roles (shadowing junior doctors to understand their roles)

Students' contacts with patients form the mainstay of undergraduate surgical education. Students should take every opportunity to take histories and to examine patients. Only through cumulative experience will they begin to recognise patterns of illness and pathologies. This cannot be overemphasised.

William Osler's quote, (paraphrased with apologies) remains as relevant today as when it was written: *"He (or she!) who studies medicine without books (or multimedia teaching aids and simulation) sails an uncharted sea, but to study medicine without patients is not to go to sea at all."*

Reflection, to assimilate what has been learned from patient encounters, is an important component of learning. Students should be encouraged to compile a portfolio of written case histories with learning points, a useful exercise which promotes deep learning, provides a source for revision and may be useful in formative and summative assessments.

Keeping a logbook of skills performed and practiced is a further source of reflection, providing objective evidence of student progression. This forms part of the continuum into postgraduate education where trainee surgeons keep logbooks of their procedures, as do qualified surgeons, who also contribute cases to data registries, and who are expected to provide evidence of outcomes for appraisal and revalidation.

The following are examples of ways in which students may broaden their understanding of surgical topics and practice:

- Following a patient from admission to discharge, recording case history to clerking portfolio
- Assessing and presenting patients on ward round
- Assessing and presenting patients in clinic
- Presenting cases at the Multi-Disciplinary Team (MDT) meeting
- Attending and contributing to ward meetings
- Participation in the operating theatre, including gowning and gloving; assisting at surgery; and participation in team briefs and WHO checks
- Shadowing F1 and F2 doctors
- Becoming familiar with standards of medical record keeping
- Becoming familiar with discharge paperwork
- Discussion of protocols and guidelines for management of common surgical conditions
- Becoming familiar with principles of thromboprophylaxis and antibiotic prophylaxis
- Shadowing allied health professionals contributing to surgical care on the ward, including physiotherapists and occupational therapists
- Case-based discussions (CBDs)
- Being observed examining clinical systems (mini-CEXs)
- Direct observation of procedural skills (DOPS) training on simulators (including suturing; male and female catheterization; and performance of intimate examinations including breast and rectal)
- Attendance at, and discussions around, informed consent
- Involvement with team audits
- Undertaking Student Selected Components (SSCs) in surgical topics
- Undertaking an intercalated degree on a surgical theme

Expected Learning Outcomes

Whilst specific surgical learning outcomes are described earlier in this introduction, it is expected that by the time of qualification a medical student will be able to demonstrate the following generic competences that apply to surgery:

1. Take a history and perform a mental state and physical examination
2. Communicate clearly, sensitively and effectively with patients and relatives, verbally and by other means
3. Prioritise a differential diagnosis and initiate appropriate management and self-management with a patient
4. Recommend and interpret relevant common diagnostic and screening tests
5. Prescribe appropriately and safely
6. Document a clinical encounter in the patient record
7. Provide an oral presentation of a clinical encounter
8. Form clinical questions and retrieve evidence to advance patient care and/or population health
9. Give or receive a patient handover to transitional care, responsibly
10. Communicate clearly and effectively with colleagues verbally and by other means
11. Collaborate as a member of an interprofessional team, clinically and educationally
12. Obtain informed consent for tests and / or procedures
13. Contribute to a culture of patient safety and improvement and recognise and respond to system failures
14. Undertake appropriate practical procedures
15. Adhere to the GMCs guidance on good practice and function as an ethical, self-caring, resilient and responsible doctor.

PART 2: Syllabus

Background

What follows is a list of 36 conditions deemed essential for every graduating doctor to understand, with learning objectives defined for each. There are also 44 skills that RCS England considers essential for all doctors to learn and practise. These comprise the 23 skills mandated by the GMC some of which are easiest to learn in a surgical setting, and 21 other essential skills, including examination skills. The list of conditions was agreed through discussions with senior surgeons, doctors in training, medical students and others involved in medical education, using criteria including those conditions considered important or common, and those where early recognition and potential surgical treatment is important to the patient's outcome. The learning objectives have been discussed and re-edited with surgical trainees and medical students. For those wanting to learn or teach in more depth, further resources are recommended ([page 39](#)).

In terms of formatting, the conditions are mainly listed by common symptomatology, for ease of use by medical schools with a problem-based learning (PBL) structure; we hope this will be adaptable also for use by courses with a more traditional structure. Each medical school will develop its own curriculum tailored to trainers, the educational environment and local opportunities. Furthermore, we have listed most conditions in groups by surgical specialty in order to help those planning student placements and to help students within each placement to focus on the important topics. Where a student will not be passing through a particular specialty, the student and the medical school should consider how to focus on the 'missing' topics.

Medical student learning in different surgical specialties

There are 10 GMC-defined surgical specialties. Students should learn generic care of surgical patients and find a way of developing an understanding of these 36 conditions and surgical specialties, even if they are not passing through the primary specialty in which the conditions typically occur. For example, those students with a placement in cardiothoracic surgery can develop understanding of the management of the critically ill, applied physiology, basic surgical skills, consent, decision-making and team-working. Many conditions have been omitted to avoid overloading the students at a basic level.

Key in table:

- Cardiothoracic surgery (Cardio)
- General surgery (Gen)
- Neurosurgery (Neuro)
- Oral and maxillofacial surgery (MaxFac)
- Otolaryngology (Otol)
- Paediatric surgery (Paed)
- Plastic surgery (Plast)
- Trauma & orthopaedic surgery (T&O)
- Urology (Urol)
- Vascular surgery (Vasc)

The key surgical conditions	Usual surgical capacity	Also seen in
1 Abdominal pain	Gen	Vasc
2 Abdominal swelling		Paed
3 Change in bowel habit / rectal bleeding		
4 Vomiting blood		
5 Difficulty swallowing / dyspepsia /dysphagia		
6 Jaundice		
7 Lumps in groin		
8 Lumps in scrotum / scrotal pain	Urol	Paed
9 Pain in loin		
10 Urinary retention or flow obstruction		
11 Haematuria (including stones and tumours)		
12 Leg ulceration	Vasc	Neuro
13 Painful and/or paralysed limb and aortic aneurysm		T&O Plast
14 Breast lumps and nipple discharge	Gen (Breast)	Plast
15 Lumps in the neck	Otol	MaxFac
16 Nose bleeds (epistaxis)		
17 Ear discharge / pain		
18 Deafness		
19 Acute airway obstruction in adults and children		
20 Upper airway infection and rhino-sinusitis		
21 Fractures or dislocations with displacement or wound	T&O	Plast
22 Fractures without displacement		
23 Swollen painful joint		
24 Back pain and/or sciatica (including cauda equina)	Neuro	T&O
25 Peripheral nerve injuries / palsies		Plast
26 Raised intracranial pressure / Intracranial blood clots and intracranial mass lesions	Neuro	
27 Limping child	Paed	T&O
28 Groin lump in child		
29 Coronary artery disease and heart valve dysfunction	Cardio	
30 Consent for surgery including mental capacity	ALL	
31 Caring for the post-operative patient, including nutrition, enhanced recovery and the critically ill patient; advice re return to activities	ALL	
32 Understanding wound healing	ALL	
33 Trauma including head injury	ALL	
34 Sepsis and infection	ALL	
35 Surgical safety (WHO checklist, minimising complications, errors, communication and team-working)	ALL	
36 Preparing the patient for surgery including fitness	ALL	

Condition		Learning objectives	Specialties
1	Abdominal pain	<ol style="list-style-type: none"> 1. Describe the symptoms, signs, and differential diagnosis for patients presenting with an acute abdomen. 2. Discuss the investigations and management of patients with acute abdominal pain (including conditions such as peritonitis, obstruction, diverticulitis, pancreatitis, acute cholecystitis and ruptured abdominal aortic aneurysm). 3. Describe pre and postoperative management of an acutely unwell patient who requires emergency surgery. 4. Discuss fluid management and electrolyte derangements, including oliguria and acute kidney injury. 5. State the essential pathology of: appendicitis, acute pancreatitis, acute cholecystitis, abdominal aortic aneurysm, diverticular disease and inflammatory bowel disease. 	Gen
2	Abdominal swelling	<ol style="list-style-type: none"> 1. Compare and contrast pathophysiological causes of abdominal swelling and outline relevant investigations. 2. Describe the aetiology, presentation and management of intestinal obstruction. 3. Discuss the differential diagnosis, investigation and management of patients presenting with left or right iliac fossa masses. 4. Describe the pathophysiological causes of a swelling in the epigastrium (including those arising from the liver). 5. Explain the appropriate imaging in the investigation of acute abdominal pain including: plain radiography (erect chest X-ray and abdominal X-ray), abdominal ultrasound scan, CT scanning and contrast studies. 6. List differential diagnoses for bowel obstruction. 7. Summarise complications that can result from bowel obstruction including: ischaemia, perforation and biochemical derangement. 	Gen
3	Change in bowel habit/rectal bleeding	<ol style="list-style-type: none"> 1. Describe the blood supply to the gastrointestinal tract. 2. List potential causes of change in bowel habit. 3. List potential causes of rectal bleeding. 4. Summarise the aetiopathology of the common causes of change in bowel habit: irritable bowel syndrome, coeliac disease, colorectal cancer, inflammatory bowel disease, thyroid disease, diverticular disease and bowel obstruction. 5. Explain the aetiopathology of the common causes of rectal bleeding including: colorectal cancer, diverticular disease, haemorrhoids, anal fissures and inflammatory bowel disease. 6. List the common causes of diarrhoea and constipation. 7. Recognise the signs and symptoms for colorectal cancer and its pathological development. 8. Explain the management of rectal bleeding, including relevant investigations and indications for surgical intervention. 	Gen

Condition	Learning objectives	Specialties
4 Vomiting blood	<ol style="list-style-type: none"> 1. Assess and describe resuscitation of a patient with acute gastrointestinal haemorrhage. 2. State the aetiopathology of the common causes of upper GI bleeding including: duodenal ulcer, gastric ulcer, gastric erosions, oesophageal varices, Mallory Weiss tear and oesphagogastric cancer. 3. Explain the role of oesophago-gastro-duodenoscopy (OGD) and colonoscopy in the management of GI bleeding. 4. List risk factors for upper gastrointestinal bleeding and the role of the GP in its prevention. 5. Discuss the role and indication for investigations, interventional radiology and surgery in the management of GI bleeding. 	Gen
5 Difficulty swallowing/ dyspepsia / dysphagia	<ol style="list-style-type: none"> 1. Explain the terms dysphagia and dyspepsia. 2. Identify the different causes of dysphagia, including strictures, malignancy, achlasia, and neurological causes. 3. Explain 'red flag signs' and the role of blood tests, endoscopy and contrast studies in the assessment of dysphagia. 4. Explain the presentation of and risk factors for oesophageal cancer. 5. List the medical and surgical treatments of oesophageal cancer including palliative care. 6. Know the NICE clinical guidelines for managing new-onset dyspepsia. 7. List the different causes of dyspepsia and identify their risk factors. 8. Describe the different causes of gastro-oesophageal reflux disease. 9. Describe the Los Angeles classification of GORD. 10. Describe the conservative, medical and surgical treatment of GORD. 11. State how to investigate and treat Helicobacter Pylori. 12. Describe the aetiology, pathogenesis and pathology of Barrett's oesophagus. 13. Explain the management of Barrett's oesophagus and its complications. 14. Describe a hiatus hernia. 	Gen
6 Jaundice	<ol style="list-style-type: none"> 1. Describe the physiology and anatomy of the liver and gallbladder. 2. List the causes of jaundice. 3. Describe the presentation of a patient with obstructive jaundice. 4. Explain the investigation and management of obstructive jaundice. 	Gen

Condition		Learning objectives	Specialties
7	Lumps in groin	<ol style="list-style-type: none"> List possible causes of groin lumps including: hernias, lymph nodes, saphena varix and femoral artery aneurysm. Explain the anatomy of the inguinal canal with respect to the presentation and management of hernias. List the different types and causes of hernias and describe their surgical and non-surgical management. Discuss complications of hernia surgery. 	Gen Urol
8	Lumps in scrotum/ scrotal pain	<ol style="list-style-type: none"> Describe the anatomy of the testes including blood supply and contents of the spermatic cord. Diagnose different causes of scrotal lumps/swelling/pain including: varicocele, hydrocele, epididymal cysts, epididymo-orchitis, testicular torsion, hernias and cancer. List investigations that should be performed in patients presenting with scrotal lumps/swelling/pain. Recognise testicular torsion as a urological emergency and understand its management. 	Urol
9	Pain in loin	<ol style="list-style-type: none"> Describe the symptoms and signs that distinguish between the different causes of loin pain. State the role of urine microscopy and bedside urinalysis in determining cause of loin pain. Describe the role of CT KUB in identifying radio-opaque renal stones, and the role of ultrasound in identifying hydronephrosis. Discuss the role of conservative management and interventions, including lithotripsy, in managing renal calculi. List risk factors, aetiology, treatment and complications of acute pyelonephritis. Explain diagnosis, assessment and treatment of tumours arising within the urinary tract. 	Urol
10	Urinary retention or flow obstruction	<ol style="list-style-type: none"> Explain anatomy of the male urinary tract and the physiology of voiding. Classify the causes of urinary outflow obstruction by the site of obstruction: <ol style="list-style-type: none"> Within the lumen Within the wall Extrinsic compression Distinguish between symptoms of upper and lower urinary tract obstruction. Describe the range of laboratory tests and imaging techniques used in investigation of patients with urinary outflow obstruction, in particular the role of the PSA test. Explain pathology of the following common causes of urinary tract obstruction, and their medical or surgical management: <ol style="list-style-type: none"> Urinary tract calculi Benign prostatic hyperplasia Malignant tumours of the urinary tract. State complications of untreated urinary tract obstruction. 	Urol

Condition	Learning objectives	Specialties
11 Haematuria	<ol style="list-style-type: none"> 1. Define and classify microscopic and macroscopic haematuria and be able to describe common causes of each. 2. Know the NICE urgent referral guidelines for haematuria. 3. Interpret the results of a urine dipstick test in a patient with haematuria. 4. Discuss the range of laboratory tests and imaging techniques used in investigation of patients with haematuria, and their specific indications. 5. Explain the pathology of the following common causes of haematuria, as well as their medical and surgical management: <ol style="list-style-type: none"> a. Infective: Cystitis; pyelonephritis; prostatitis; urethritis b. Urinary tract calculi c. Benign prostatic hyperplasia d. Malignant tumours of the urinary tract e. Glomerular diseases f. Polycystic kidney diseases. 	Urol
12 Leg ulceration	<ol style="list-style-type: none"> 1. List causes of chronic leg ulcers and describe differences in appearance. 2. Compare and contrast the presentation of venous and arterial leg ulcers. 3. Describe the pathogenesis of ischaemic, venous and diabetic ulcers. 4. Discuss appropriate investigations and treatment options for a patient with chronic leg ulcers including: <ol style="list-style-type: none"> a. management of underlying cause b. dressings and bandaging and c. reconstruction. 5. Describe gangrene associated with chronic ischaemia. 	Vasc Plast

Condition	Learning objectives	Specialties
13 Painful and/or paralysed limb and abdominal aortic aneurysm (AAA)	<p>Chronic Limb Ischaemia:</p> <ol style="list-style-type: none"> 1. Describe symptoms and signs of chronic limb ischaemia including intermittent claudication and rest pain. 2. Describe the pathogenesis of peripheral vascular disease. 3. List risk factors for the development of peripheral vascular disease. 4. Describe investigations that should be performed to determine the presence and severity of peripheral vascular disease. 5. Discuss with a patient lifestyle management to prevent complications of peripheral vascular disease. 6. Know best medical treatment of vascular disease, including appropriate treatment of hypertension, hyperlipidaemia, diabetes, use of antiplatelet agents and use of supervised exercise programmes. 7. Know the aetiology, pathology and management of the diabetic foot. 8. List indications for percutaneous transluminal angioplasty and arterial reconstruction surgery. 9. Describe percutaneous transluminal angioplasty, stenting and arterial reconstruction surgery to a patient, including risk of complications. 10. Discuss indications for limb amputation. 11. Describe types of, and operations for limb amputation and list possible complications. 12. Discuss rehabilitation for patients following limb amputation and list mobility aids available. 13. Explain the options available for pain control and palliative support in a patient with intractable limb ischaemia. <p>Acute Limb Ischaemia:</p> <ol style="list-style-type: none"> 1. Describe symptoms and signs. 2. Discuss mechanisms leading to acute limb ischaemia. 3. Explain the nature and timing of pathological changes that will occur in an acutely ischaemic limb if the ischaemia is not relieved. 4. Describe the emergency investigation of a patient with acute limb ischaemia. 5. Discuss the options available for emergency management of acute limb ischaemia including anticoagulation, thrombolysis, angioplasty and embolectomy. <p>Abdominal Aortic Aneurysm (AAA):</p> <ol style="list-style-type: none"> 1. Know signs and symptoms of a tender or ruptured abdominal aortic aneurysm (AAA). 2. Be able to examine abdomen competently to detect the expansile mass of an abdominal aortic aneurysm 3. Know investigations for AAA including ultrasonography and CT angiography 4. Know principles of management of AAA including open and endovascular surgery and have an understanding of when palliative care is appropriate. 	Vasc T&O Neuro Plast

Condition	Learning objectives	Specialties
14 Breast lumps and nipple discharge	<ol style="list-style-type: none"> 1. Describe the anatomy of the breast including blood supply, venous drainage and lymphatics. 2. Analyse presenting symptoms and management of benign breast disease. 3. Explain the rationale in treatment decisions for patients with genetic predisposition to cancer. 4. Discuss how and when to take a family history and to request genetic tests, to discuss the significance of this and how this guides surveillance and gene testing. 5. Explain the patient pathway for breast screening and subsequent cancer management, including one-stop clinics, triple assessment and multidisciplinary team management. 6. Identify staging of breast cancer including the principles behind sentinel node biopsy. 7. Explain different types of surgical operations available and indications for mastectomy and breast conservation operations. 8. Describe the scientific basis for current breast cancer therapies. 9. Define the principles behind adjuvant / hormone therapy and radiotherapy. 10. Explain the need and indications for oncoplastic breast surgery. 11. List reconstructive options available to patients undergoing mastectomy. 	Breast Plast
15 Lumps in the neck	<ol style="list-style-type: none"> 1. Describe aetiology and pathology of common benign and malignant lumps occurring in the neck, including those arising from the salivary/thyroid/parathyroid glands and lymph nodes. 2. Identify which lumps require referral (non-urgent and urgent) to Otolaryngology and which can be left alone. 3. Recognise high-risk symptoms eg dysphagia, voice change and throat/mouth/neck pain. 4. Describe investigations including ultrasound, CT, MRI, naso-endoscopy, video contrast swallow and tissue biopsy. 5. Explain different treatment modalities, including antibiotics, surgery and chemotherapy/radiotherapy. 	Otol MaxFac
16 Nose bleeds	<ol style="list-style-type: none"> 1. List local and systemic causes (including drugs) as well as common anatomical sites of nasal bleeding. 2. Perform first aid measures to reduce or stop bleeding, including nose pinching and patient positioning. 3. State possible options for treating more persistent bleeding, including nasal packing and cautery. 4. Summarise when to refer for specialised intervention/ assessment, recognising that patients with severe epistaxis may require surgical ligation of the sphenopalatine artery. 	Otol

Condition		Learning objectives	Specialties
17	Ear discharge / pain	<ol style="list-style-type: none"> 1. Describe the management of otitis externa. 2. List the different types of otitis media and their management, including tympanic membrane perforations. 3. Describe risk factors for significant disease, eg diabetes and immunocompromise. Describe simple measures to aid resolution. 4. Know of local complications of ear infections including mastoiditis, meningitis and brain abscess. 5. List the complications of cholesteatoma and its surgical management. 6. Explain the principles of managing “glue ear” (otitis media with effusion). 7. Recognise common sources of referred otalgia. 	Otol
18	Deafness	<ol style="list-style-type: none"> 1. Demonstrate the simple assessment/examination of the ear and hearing 2. Explain the difference between conductive and sensorineural deafness, with common examples of each. 3. List the implications of hearing loss with children and with adults eg. behaviour issues, disordered speech and language development, effect on the elderly and effect on dementia. 4. Describe possible strategies to aid hearing loss which may be surgical or non-surgical. 5. Explain the basic pathophysiology, diagnosis and management of presbycusis, otosclerosis, noise-induced hearing loss, Meniere’s syndrome, impacted wax, tinnitus and acoustic neuroma. 6. Summarise effective approaches to the prevention of deafness. 	Otol
19	Acute airway obstruction in adults and children	<ol style="list-style-type: none"> 1. Summarise the aetiology and treatment of acute airway obstruction in adults and children. 	Otol MaxFac
20	Upper airway infection and rhino-sinusitis	<ol style="list-style-type: none"> 1. Summarise management of infection of the upper airway and its complications. 2. State the aetiology and management of acute and chronic rhino-sinusitis. 	ENT MaxFac
21	Fractures or dislocations with displacement or open wound	<ol style="list-style-type: none"> 1. State the general principles of fracture management. 2. Describe and classify different types of fractures, including pathological fractures. 3. Describe radiological principles in fracture diagnosis. 4. List complications from fractures. 5. Describe the basic surgical management of fractures, including femoral neck, femoral, tibial, radius and humerus fractures. 6. Describe the management of a dislocated joint. 7. Explain the management of open fractures and soft tissue injury necessitating reconstructive surgery. 	T&O Plast

Condition		Learning objectives	Specialties
22	Fractures without displacement	<ol style="list-style-type: none"> 1. Describe the cellular process of fracture healing. 2. Describe the principles behind the general management of a fracture. 3. Explain the differences between different types of undisplaced fractures - stress, paediatric. 4. Summarise the concept of "stability" of a fracture, explain that undisplaced fractures may not be benign fractures. 5. Describe the soft tissue component of a fracture. 	T&O Plast
23	Swollen painful joint	<ol style="list-style-type: none"> 1. Describe the differential diagnosis of a swollen joint, including osteoarthritis, gout, pseudo gout, rheumatoid arthritis, neuropathic arthritis, septic arthritis and traumatic causes. 2. List the common pathological processes of a swollen joint. 3. Describe the systematic manifestations with some swollen joints. 4. State the logical assessment and principal investigations for patients with swollen joints. 5. Explain the emergency nature of an infected joint. 6. Describe the different management approach for native and prosthetic joints with infections. 7. Describe the principal non-operative and operative treatments of a swollen joint. 8. Summarise common complications of joint surgery. 9. Understand principles of replacement surgery. 	T&O
24	Back pain and/or sciatica (including cauda equina syndrome)	<ol style="list-style-type: none"> 1. List common causes of back pain. 2. Describe red and yellow flag signs. 3. Discuss causes which may be mechanical, non-mechanical, inflammatory and other causes of back pain, including vertebral fractures and neoplasia. 4. Describe clinical examination and investigations for back pain, including where there is nerve involvement. 5. Identify patients who may need referral to physiotherapy or similar therapy. 6. Describe indications for imaging and for surgical management of back pain, particularly emergency surgical management of back pain. 	T&O Neuro

Condition		Learning objectives	Specialties
25	Peripheral nerve injuries / palsies	<ol style="list-style-type: none"> 1. Describe the cellular process of peripheral nerve injuries. 2. List the different causes of peripheral nerve palsies and describe the classification of peripheral nerve injuries. 3. Compare and contrast symptoms and management of different mechanisms of peripheral nerve injury (eg the difference between upper and lower motor nerve lesions). 4. Describe the anatomy of the brachial plexus and its terminal branches. 5. Describe the dermatomal arrangement and corresponding terminal branches of sensory innervation to upper and lower limbs. 6. Explain compartmental motor innervation of the upper and lower limbs and important exceptions. 7. Describe physical features of radial, ulnar, medial and brachial plexus injuries, carpal tunnel syndrome, cubital tunnel and thoracic outlet syndrome. 8. Describe physical features of peroneal nerve injuries and other causes of foot drop. 	T&O Neuro Plast
26	Raised intracranial pressure / Intracranial blood clots and intracranial mass lesions	<ol style="list-style-type: none"> 1. List the symptoms and signs of raised intracranial pressure (eg vomiting). 2. Describe the pathophysiology of raised intracranial pressure (including the Munro-Kelly doctrine). 3. Explain the assessment of a patient with possible raised intracranial pressure, intracranial blood clot or mass lesion. 4. Describe monitoring and interventions that may be possible, including decompressive craniotomy. 5. Describe hydrocephalus, its causes and treatment including shunts and external drainage. 6. Know the anatomy and differences between sub-arachnoid and sub-dural haemorrhage. 	Neuro
27	Limping child	<ol style="list-style-type: none"> 1. Discuss the differential diagnosis of musculoskeletal causes of limp. 2. Describe the common neurological conditions which cause limp. 3. Explain the significance of referred pain. 4. Discuss the reasons why a child may limp with reference to age. 5. Explain the genetics of the muscular dystrophies and the common hereditary ataxias. 6. Describe presentations of Non-Accidental Injury in relation to the musculoskeletal system. 7. Describe the investigations required to differentiate causes of limp in children. 8. Describe the causes of limp associated with joint or bony problems and their treatments. 9. Describe the developmental anatomy of epiphyses and bones in the limbs. 10. Discuss issues around consent and children. 	Paed T&O

Condition	Learning objectives	Specialties
28 Groin lump in child	<ol style="list-style-type: none"> 1. Assess and initiate management of a child presenting with groin pathology (including undescended testis, hernia, hydrocele and painful swellings of the genitalia) including appropriate communication with relevant family or carers. 2. Distinguish between, through history, physical examination and laboratory testing, testicular torsion, torsion of testicular appendices, epididymitis, testicular tumour, scrotal trauma and hernia. 3. Know relevant imaging studies to differentiate diagnoses of the acute scrotum. 4. Determine which acute scrotal conditions require emergency surgery and which may be handled less urgently or electively. 5. Explain the embryological descent of the testicles from the abdomen into the scrotum with reference to the anatomical structures in this path of descent (eg, tunica vaginalis, epididymis). 6. Differentiate testicular tumour from a mass of inguinal origin (not possible to get above it, may reduce), cystic lesion (trans-illuminates), and a varicocele (easier to palpate with patient erect). 7. Describe the anatomy of the inguinal canal. 	Paed Urol

Condition	Learning objectives	Specialties
29 Coronary artery disease, heart valvular dysfunction and	<ol style="list-style-type: none"> 1. Know the developmental embryology of the heart and cardiac anatomy. 2. Know common cardiac developmental malformations. 3. Take a cardiac history and perform clinical examination of the heart and cardiovascular system. 4. Describe and interpret common cardiac investigations including cardiac enzymes and troponins, ECG, echocardiography, coronary angiography and CT angiography. 5. Understand risk factors for, and pathologies and clinical presentations of coronary artery disease and valvular dysfunction. 6. Understand the principles of coronary artery angioplasty and stenting, coronary artery bypass (on and off-pump cardiopulmonary bypass), surgical valve replacement, types of prosthetic valves, and Transcatheter aortic valve implantation (TAVI). 7. Understand the classic presentation of aortic dissection, investigation and treatment. 8. Understand the aetiopathology, history, and findings on examination of pneumothorax, including the surgical emergency of tension pneumothorax and principles of treatment including underwater seal chest drainage. 	
30 Consent for surgery including mental capacity	<ol style="list-style-type: none"> 1. Explain the need for informed consent. 2. Apply the principles of informed consent. 3. Describe the elements necessary for mental capacity to give informed consent. 4. Check for mental capacity and recognise when an individual does not have capacity to give consent. 5. State the importance of written documentation, both for giving consent and documenting the information given to the patient and their supporters. 6. List the exceptional circumstances when you can rely on oral consent, and the need to document this. 7. List the common risks associated with all surgery (for example blood loss, infection and reaction to drugs used in surgery) 8. Describe the potential risks and benefits for common surgical procedures. Be able to change your explanation to ensure patient understanding. 9. Discuss issues with consent in children, how to assess competence and what steps to take if the parents' wishes are not in the best interests of the child. 10. Select and know how to complete the appropriate consent form for adults, children, patients lacking capacity and local anaesthetic cases. 	ALL

Condition	Learning objectives	Specialties
31 Caring for the post-operative patient, including nutrition, enhanced recovery and the critically ill patient; advice re return to activities	<ol style="list-style-type: none"> 1. Describe the major fluid compartments of the body, the effect of osmolality and explain what may happen in common conditions (eg. acute blood loss, dehydration, excessive fluid replacement). 2. Describe clinical (bedside) assessment of hypovolaemia and hydration. 3. Discuss the rationale for routine intravenous fluid replacement in surgical patients and describe commonly prescribed intravenous fluids. 4. Discuss principles of blood transfusion of a surgical patient. 5. Know principles of analgesia including use of oral, topical and injectable drugs including local anaesthetics and drug toxicity. 	ALL
32	<ol style="list-style-type: none"> 1. Describe the process and stages of wound healing. 2. State primary, secondary and tertiary wound healing. 3. Explain reasons for conducting a wound assessment. 4. Identify wound bed tissue types. 5. Describe the skin surrounding the wound and how this gives you information about the underlying disease and the effectiveness of current treatments. 6. Measure a wound. 7. State the need to assess pain in wound care. 8. Explain extrinsic and intrinsic factors which impact on wound healing eg nutrition. 9. State basic principles of wound dressing. 10. Identify patients at risk of pressure sore development using the Waterlow score. 11. Summarise pressure ulcer classification. 	ALL

Condition	Learning objectives	Specialties
33 Trauma	<ol style="list-style-type: none"> 1. List interventions that may be required for head injury. 2. Explain importance of nerve or vessel injury in trauma. 3. Describe the physiological response to injury. 4. State principles of surgical treatment in a multi-injured patient. 5. Assess priorities during all phases of management following ATLS principles. 6. Know importance of re-assessment of the patient with regards to earlier interventions. 7. Know meaning and significance of a patient with polytrauma. 8. Discuss issues of missed injuries, management and documentation. 9. Explain primary and secondary survey. 10. Define triage and its importance. 11. State the importance of analgesia in the management of these patients. 12. Explain the different mechanisms of trauma injury (blunt v penetrating v crush v blast). 13. Discuss the importance of a continuum of care for the injured patient by a multi-disciplinary team in which responsibility is actively shared. 14. Explain the importance of the ATLS Strategy & systematic approach: rapid primary survey, concurrent resuscitation, secondary survey, continued re-evaluation and monitoring, investigation and definitive care. 15. Explain the role of radiological investigations (eg CT scanning) and interventions. 16. Know the role of investigation and treatment and their dependence on the haemodynamic status of the patient. 	ALL

Condition	Learning objectives	Specialties
34 Sepsis and infection	<ol style="list-style-type: none"> 1. Define the following terms: systemic inflammatory response syndrome, sepsis, severe sepsis, septic shock, and acute respiratory distress syndrome (ARDS). 2. Differentiate between systemic inflammatory response syndrome (SIRS), sepsis, severe sepsis and septic shock. 3. Explain the seriousness of sepsis. 4. Describe the typical clinical presentation, including signs, symptoms, vital signs, hemodynamic measures, and laboratory tests, for each condition above. 5. Describe the microbiologic causes of sepsis. 6. Describe the pathophysiology and mechanism of sepsis. 7. Describe the priorities for treatment of sepsis. 8. Know the NICE guidance on Sepsis: recognition, diagnosis and early management. 9. Give a description of a patient with sepsis and select the most appropriate treatments. 10. Determine appropriate fluid resuscitation for sepsis with colloids or crystalloids. 11. Recommend an appropriate antibiotic regimen for treatment of sepsis based on patient characteristics and site of primary infection. 12. Explain the role of vasoactive agents in supporting the physiologic function of a patient with sepsis and be able to select the appropriate agent given details of a patient's condition. 13. Describe an appropriate monitoring program for patients with sepsis. 14. List the principles of diagnosis and management of sepsis. 15. State when to involve the infection control team 16. State when to take appropriate microbiological specimens 17. Follow local guidelines/protocols for antibiotic prescribing. 18. Be able to undertake Sepsis Six Care Bundle (BUFALO) recommendations within the first hour to reduce mortality (Sepsis UK): B - blood cultures U - urine output F - fluids A - antibiotics L - lactate (and haemoglobin) O - oxygen 	ALL
35 Surgical safety	<ol style="list-style-type: none"> 1. Discuss the importance of a culture of safety: WHO checklist, minimising complications, learning from errors, incident reporting to disseminate learning, communication and team-working, Mortality and Morbidity (M&M) meetings 2. Know how to manage a complication with the patient and family and understand the principles of "Duty of Candour" 	ALL

Condition	Learning objectives	Specialties
36 Preparing the patient for theatre/ surgery including fitness	<p>Fluid optimisation:</p> <ol style="list-style-type: none"> 1. Identify patients in need of fluid optimisation, especially pertaining to: <ul style="list-style-type: none"> • acute presentations with diarrhoea & vomiting • acute presentations where the patient has been Immobile / debilitated for a prolonged period prior to admission (which has decreased fluid intake) • elderly patients with reduced renal function that makes fluid balance maintenance more challenging • drugs that lower renal fluid exchange functions • low BMI patients in whom 'normal' fluid loss volumes will be more significant 2. Recognise the different types of fluid used for optimisation especially Hartmann's, Normal 0.9% Saline and Dextrose. 3. Determine the correct volume and rate of administration 4. Assess the volume of body fluid depletion, and how to administer fluid resuscitation to patients especially according to them being elderly / unfit / with impaired cardiac and/or renal function. 5. Monitor progression of fluid optimisation. <p>Nutritional optimisation:</p> <ol style="list-style-type: none"> 1. Identify patients in need of nutritional optimisation, especially pertaining to BMI, serum albumin, frailty or triceps skin fold thickness. 2. List the physiological effects of protein-calorie malnutrition. 3. Identify the different types of nutritional support - oral, nasogastric, gastro/jejunostomy and parenteral. 4. Describe what Total Parenteral Nutrition (TPN) entails, associated risks, and additional and particular parameters of care for these patients. <p>Safety issues and booking patients for surgery:</p> <ol style="list-style-type: none"> 1. List administrative steps to book a patient into the operating theatre and ensure inclusion of relevant investigation results (as well as drug chart and consent form details) and relevant past surgical history. 2. Describe details of safe operative site marking. 3. Explain details of any specific patient preparation including whether cross matched blood is needed. 4. List the different types of bowel preparation indicated for operations to the large bowel. 5. Describe the principles of and drugs used for anaesthetic premedication. <p>Antibiotic & thromboprophylaxis:</p> <ol style="list-style-type: none"> 1. Explain the principles behind antibiotic prophylaxis (including the specifics relating to high-risk patients) and the typical course duration. 2. State standard prophylactic regimens established for operative procedures and appreciate that these may be specific to individual hospital trust policies and protocols. 	ALL

Condition	Learning objectives	Specialties
36 (continued)	<p>The aims of pre-operative assessment:</p> <ol style="list-style-type: none"> 1. Including explaining procedures, their associated risks and after-care so that patients can make informed decisions. 2. Identifying co-existing medical conditions and how to optimise the patient's health, whilst appreciating the urgency of their operation. 3. Discuss improvable factors, to help support patients to be as fit as possible (including smoking cessation, reducing alcohol, better nutrition and taking regular moderate physical exercise). 4. Identify patients with a high risk of peri-operative complications and identifying their appropriate level of post-operative care. 5. Describe the process of discharge planning. 6. Identify the variables which provide prognostic information for all patients planning to undergo surgery. <p>Explain details of the pre-operative anaesthetic history and assessment: Including airway assessment, previous anaesthesia exposure (and any adverse reactions)</p> <ol style="list-style-type: none"> 1. List the basics of the ASA (American Society of Anaesthesiologists) Classification especially pertaining to individual comorbidities (such as angina, hypertension, diabetes, COPD, asthma) and understand that this accurately predicts morbidity and mortality or more broadly the 'fitness of patients' prior to surgery. 2. State the basics of assessing functional capacity and mouth opening. <p>Pre-operative Investigations</p> <p>Identify the essential pre-operative investigations required for all surgical patients, including blood tests (FBC, U+Es, creatinine) and ECG, also pregnancy test, sickle cell test and chest X-ray, if appropriate.</p> <ol style="list-style-type: none"> 1. Identify and explain the more specific pre-operative investigations required for individual patients according to condition, comorbidities or procedure being performed. 2. State the basic fasting guidelines for children and adults. 3. Explain essential management of associated medical conditions: difficult airway, obesity, cardiac disease, respiratory disease, gastrointestinal disease, renal failure, diabetes, haematological disorders, obstructive jaundice, anaemia, sickle cell anaemia, allergic reactions, and those rendering patients at high risk; includes the appropriate additional investigations for specific illnesses - such as cardiopulmonary exercise testing to evaluate both cardiac and pulmonary function, as well as survival prediction indices - age, socioeconomic status and aerobic fitness. 	ALL

Key skills and interventional procedures

The GMC document *Outcomes for Graduates* (2018)⁴ sets out what newly qualified doctors from all medical schools must know and be able to do. The *Practical Skills and Procedures* (2019)⁵ document outlines the core set of practical skills and procedures, and minimum level of performance that newly qualified doctors must have when they start work for the first time so they can practice safely. These skills may be assessed in the Clinical & Professional Skills Assessment (CPSA) of the MLA.

It is important to remember that newly qualified doctors who enter the Foundation Programme will work under educational and clinical supervision and in a multidisciplinary team. In accordance with the Foundation Programme Curriculum¹⁴, they will need to demonstrate that they are refining their skills and that they are able to take responsibility appropriately whilst recognising and working within the limits of their competence.

RCS England offers a one-day course, Surgical Skills for Students and Health Professionals, designed for medical students preparing to embark on a surgical career, and health professionals in roles relating to surgery, which covers certain aspects of the necessary requisite skills.

<https://www.rcseng.ac.uk/education-and-exams/courses/search/surgical-skills-for-students-and-health-professionals/>

What must newly qualified doctors demonstrate for satisfactory completion?

Three levels of competence

1. Safe to practise in simulation

The newly qualified doctor is safe to practise in a simulated setting and is ready to move to direct supervision. This means that the newly qualified doctor will not have performed the procedure on a real patient during medical school, but on a simulated patient or manikin. They will have some knowledge and skill in the procedure but will require direct supervision when performing the procedure on patients.

2. Safe to practise under direct supervision

The newly qualified doctor is ready to perform the procedure on a patient under direct supervision. This means that the newly qualified doctor will have performed the procedure on real patients during medical school under direct supervision. Direct supervision implies that the medical student or newly qualified doctor will have a supervisor with them, observing their practice as they perform the procedure. As the newly qualified doctor's experience and skill becomes sufficient to allow them to perform the procedure safely, they will move to performing the procedure under indirect supervision.

3. Safe to practise under indirect supervision

The newly qualified doctor is ready to perform the procedure on a patient under indirect supervision. This means that the newly qualified doctor will have performed the procedure on real patients during medical school under direct supervision at first and, as their experience and skills became sufficient to allow them to perform the procedure safely, with indirect supervision. Indirect supervision implies that the newly qualified doctor can access support to perform the procedure if they need to – for example, by locating a colleague and asking for help.

Generic requirements

There are both generic requirements and specific procedural requirements for each procedure. Newly qualified doctors should comply with local and national guidelines, and employers will also typically have protocols for the safe performance of each procedure, which should be followed.

Generic requirements for each procedure and list of skills

The following generic requirements apply to each procedure:

- students should introduce themselves
- check the patient's identity
- confirm that the procedure is required
- explain the procedure to the patient, including possible complications and risks, (under direct supervision where appropriate)
- gain informed consent for the procedure (under direct supervision where appropriate)
- understand the role of the chaperone when carrying out clinical examinations,
- particularly those of a sensitive or intimate nature
- follow universal precautions to reduce the risk of infections, including:
 - » control risk of cross infection, and take appropriate steps for personal safety
 - » follow approved processes for cleaning hands before procedures or surgical operations
 - » correctly use personal protective equipment (for example gloves, gowns and masks)
 - » safely dispose of clinical waste, needles and other sharps
 - » dispose of all equipment in the appropriate receptacle
 - » know local procedural processes in the event of needlestick or sharps injury
 - » label samples appropriately according to local guidelines
 - » accurately document the procedure according to local guidelines
 - » ensure confidentiality
 - » interpret any results and act appropriately on them (with assistance if necessary)
 - » arrange appropriate aftercare / monitoring (with assistance if necessary)

The following specific skills are taken from the GMC document *Practical Skills and Procedures* (2019)⁵ as generic skills required of all doctors at qualification. These are directly relevant to care of the surgical patient and are therefore fully reiterated below. However, some of these skills will be learned and practised in components of the medical undergraduate course other than surgical attachments (eg respiratory function tests, use of inhalers, ophthalmoscopy, otoscopy, ECG, etc).

GMC no.	Procedure	Description	Level of competence
Assessment of patient needs			
1	Take baseline physiological observations and record appropriately	Measure temperature, respiratory rate, pulse rate, blood pressure, oxygen saturations and urine output	Safe to practise under indirect supervision
2	Carry out peak expiratory flow respiratory function test	Explain to a patient how to perform a peak expiratory flow, assess that it is performed adequately and interpret results	Safe to practise under indirect supervision
3	Perform direct ophthalmoscopy	Perform basic ophthalmoscopy and identify common abnormalities	Safe to practise under indirect supervision
4	Perform otoscopy	Perform basic otoscopy and identify common abnormalities	Safe to practise under indirect supervision
Diagnostic procedures			
5	Take blood cultures	Take samples of venous blood to test for the growth of infectious organisms	Safe to practise under direct supervision
6	Carry out arterial blood gas and acid base sampling from the radial artery in adults	Insert a needle into a patient's radial artery (in the wrist) to take a sample of arterial blood and interpret the results	Safe to practise under direct supervision
7	Carry out venepuncture	Insert a needle into a patient's vein to take a sample of blood for testing. Make sure that blood samples are taken in the correct order, placed in the correct containers, that these are labelled correctly and sent to the laboratory promptly	Safe to practise under indirect supervision
8	Measure capillary blood glucose	Measure the concentration of glucose in the patient's blood at the bedside using appropriate equipment. Record and interpret the results	Safe to practise under indirect supervision
9	Carry out a urine multi dipstick test	Explain to patient how to collect a midstream urine sample. Test a sample of urine to detect abnormalities. Perform a pregnancy test where appropriate	Safe to practise under indirect supervision
10	Carry out a 3- and 12-lead electrocardiogram	Set up a continuous recording of the electrical activity of the heart, ensuring that all leads are correctly placed	Safe to practise under indirect supervision

GMC no.	Procedure	Description	Level of competence
11	Take and/or instruct patients how to take a swab	Use the correct technique to apply sterile swabs to the nose, throat, skin and wounds. Make sure that samples are placed in the correct containers, that these are labelled correctly and sent to the laboratory promptly and in the correct way	Safe to practise under indirect supervision for nose, throat, skin or wound swabs
Patient care			
12	Perform scrubbing up	Follow approved processes for cleaning hands and wearing appropriate personal protective equipment (PPE) before procedures or surgical operations. Follow approved PPE removal procedures to avoid contamination of self or environment	Safe to practise under direct supervision
13	Set up an infusion	Set up and run through an intravenous infusion. Have awareness of the different equipment and devices used	Safe to practise under direct supervision
14	Use correct techniques for moving and handling, patients, including those who are frail	Use, and/or direct other team members to use, approved methods for moving, lifting and handling people or objects, in the context of clinical care, using methods that avoid injury to patients, colleagues, or oneself	Safe to practise under indirect supervision
Prescribing			
15	Instruct patients in the use of devices for inhaled medication	Explain to a patient how to use an inhaler correctly, including spacers and nebulisers, and check that their technique is correct	Safe to practise under indirect supervision
16	Prescribe and administer oxygen	Prescribe and administer oxygen safely using a delivery method appropriate for the patient's needs and monitor and adjust oxygen as needed	Safe to practise under indirect supervision
17	Prepare and administer injectable (intramuscular, subcutaneous, intravenous) drugs	Prepare and administer injectable drugs and prefilled syringes	Safe to practise under direct supervision
Therapeutic procedures			
18	Carry out intravenous cannulation	Insert a cannula into a patient's vein and apply an appropriate dressing	Safe to practise under direct supervision

GMC no.	Procedure	Description	Level of competence
19	Carry out safe and appropriate blood transfusion	Following the correct procedures, give a transfusion of blood (including correct identification of the patient and checking blood groups). Observe the patient for possible reactions to the transfusion, and take action if they occur	Experienced in a simulated setting; further training required before direct supervision
20	Carry out male and female urinary catheterisation	Insert a urethral catheter in both male and female patients	Experienced in a simulated setting; safe to practise under direct supervision
21	Carry out wound assessment, care and basic wound closure and dressing	Provide basic care of surgical or traumatic wounds and apply dressings appropriately	Safe to practise under direct supervision
22	Carry out nasogastric tube placement	Pass a tube into the stomach through the nose and throat for feeding and administering drugs or draining the stomach's contents. Know how to ensure correct placement	Safe to practise in simulation
23	Use of local anaesthetics	Inject or topically apply a local anaesthetic. Understand maximum doses of local anaesthetic agents	Safe to practise under direct supervision
RCS England required skills			
24	Skin suturing	Knowledge of principles of skin closure and practical closure of simple wounds using basic suturing techniques	Experienced in a simulated setting; further training required before direct supervision
25	Removal of skin sutures and staples	Knowledge of principles of aseptic techniques, using appropriate equipment to remove skin sutures and staples	Experienced in a simulated setting; further training required before direct supervision
26	Safe disposal of clinical waste including needles and sharps	Ensuring that these materials are handled carefully and placed in a suitable container for disposal	Safe to practise under indirect supervision
27	Use of hand-held Doppler ultrasound to detect pulses	Familiarity with hand-held Doppler ultrasound apparatus and its use to detect pulses	Safe to practise under direct supervision

Undergraduates should be able to demonstrate competence in the following

examination skills by the time of qualification as a doctor:

28	Examination of cardiovascular system including pulses
29	Examination of respiratory system
30	Examination of abdomen
31	Digital rectal examination
32	Examination of groin
33	Examination of scrotum
34	Examination of soft tissues of neck
35	Examination of the breast
36	Examination for regional lymphadenopathy
37	Examination of a lump (eg size; site; shape; consistency; mobility; tenderness; pulsatility; transillumination; and local lymph nodes)
38	Examination of spine and gait
39	Examination of limbs including major joints: shoulder; elbow; wrist; hip; knee; ankle
40	Examination of cranial and peripheral nerves
41	Examination of ear
42	Examination of nose
43	Examination of throat
44	Examination of fitness for surgery (chest; heart; neck and mouth opening)

Resources for Enhanced Surgical Training

This curriculum provides details of the expectations of medical students and opportunities for learning in surgery. For those who wish to explore and enhance their learning about specific specialties the following resources are available:

- Royal College of Surgeons of England - Careers in Surgery:
<https://www.rcseng.ac.uk/careers-in-surgery/medical-students/>
- Royal College of Surgeons of England - Learning in operating theatres:
<http://www.rcseng.ac.uk/learning-in-operating-theatres>
- Royal College of Surgeons of England. Duty of Candour. RCS 2015
<https://www.rcseng.ac.uk/standards-and-research/standards-and-guidance/good-practice-guides/duty-of-candour/>
- Intercollegiate Surgical Curriculum Programme:
<https://www.iscp.ac.uk>
- Surgical Research Society:
<https://surgicalresearch.org.uk>
- General Medical Council. Good Medical Practice. GMC 2020
https://www.gmc-uk.org/-/media/documents/good-medical-practice---english-20200128_pdf-51527435.pdf
- Centre for Perioperative Care. Guidelines.
www.cpoc.org.uk
- Royal College of Surgeons of England. Surgical Skills for Students and Health Professionals, (one day course designed for medical students preparing to embark on a surgical career, and health professionals in roles relating to surgery).
<https://www.rcseng.ac.uk/education-and-exams/courses/search/surgical-skills-for-students-and-health-professionals/>

Basic Science Syllabi

- The Anatomical Society. The Anatomical Society Core Regional Anatomy Syllabus for Undergraduate Medicine. *J. Anat* 2016; **228**: 15-23
<https://onlinelibrary.wiley.com/doi/10.1111/joa.12405>
- The Physiological Society. Physiological objectives for medical students. Physiological Society 2020.
<https://static.physoc.org/app/uploads/2021/07/14093346/Medical-curriculum.pdf>

Surgical Specialty Trainee organisations:

- Association of Otolaryngologists in Training (AOT):
<https://aotent.org>
- Association of Surgeons in Training (ASiT):
<https://www.asit.org>
- British Association of Oral & Maxillofacial Surgeons (BAOMS) Junior Trainees Group:
https://www.baoms.org.uk/professionals/junior_trainees_group.aspx
- British Association of Paediatric Surgeons (BAPS):
<https://www.baps.org.uk/trainees/>
- British Association of Plastic Reconstructive and Aesthetic Surgeons (BAPRAS):
<https://www.bapras.org.uk/professionals/training-and-education/careers-in-plastic-surgery/the-training-pathway>
- British Association of Urological Surgeons (BAUS):
<https://www.baus.org.uk/professionals/bsot/>
- British Orthopaedic Trainees Association (BOTA):
<https://www.bota.org.uk>
- British Neurosurgical Trainees Association (SBNS):
https://www.sbns.org.uk/index.php/education-and-training/specialty_trainees/
- Mammary Fold (National Association for trainees in breast and oncoplastic breast surgery)
<https://associationofbreastsurgery.org.uk/professionals/mammary-fold/about-the-mammary-fold/>
- Rouleaux Club (UK & Ireland Vascular Trainees Association)
<https://rouleauxclub.com>
- The Dukes Club (Colorectal trainee section of the Association of Coloproctology of Great Britain and Ireland)
<https://www.thedukesclub.org.uk>
- The Roux Group (Trainee section of the Association of Upper Gastrointestinal Surgeons – AUGIS)
<https://www.rouxgroup.org.uk>
- Society for Cardiothoracic Surgery:
<https://scts.org/professionals/committees/22/trainees/public>

Appendix 1 - Outcomes for Graduates (GMC 2018)

Purpose of the outcomes

The document sets out what newly qualified doctors from all medical schools who award UK primary medical qualifications must know and be able to do and it is:

- a guide for students on what they need to learn during their time at medical school
- a basis for medical schools to develop their curricula and programmes of learning
- a blueprint or plan for assessments at medical schools
- a framework used to regulate medical schools
- a summary of what newly qualified doctors will know and be able to do for those designing postgraduate training.

Newly qualified doctors who enter the Foundation Programme will work under educational and clinical supervision and in a multidisciplinary team. In accordance with the Foundation Programme Curriculum, they will need to demonstrate that they are refining their skills and that they are able to take responsibility appropriately whilst recognising and working within the limits of their competence

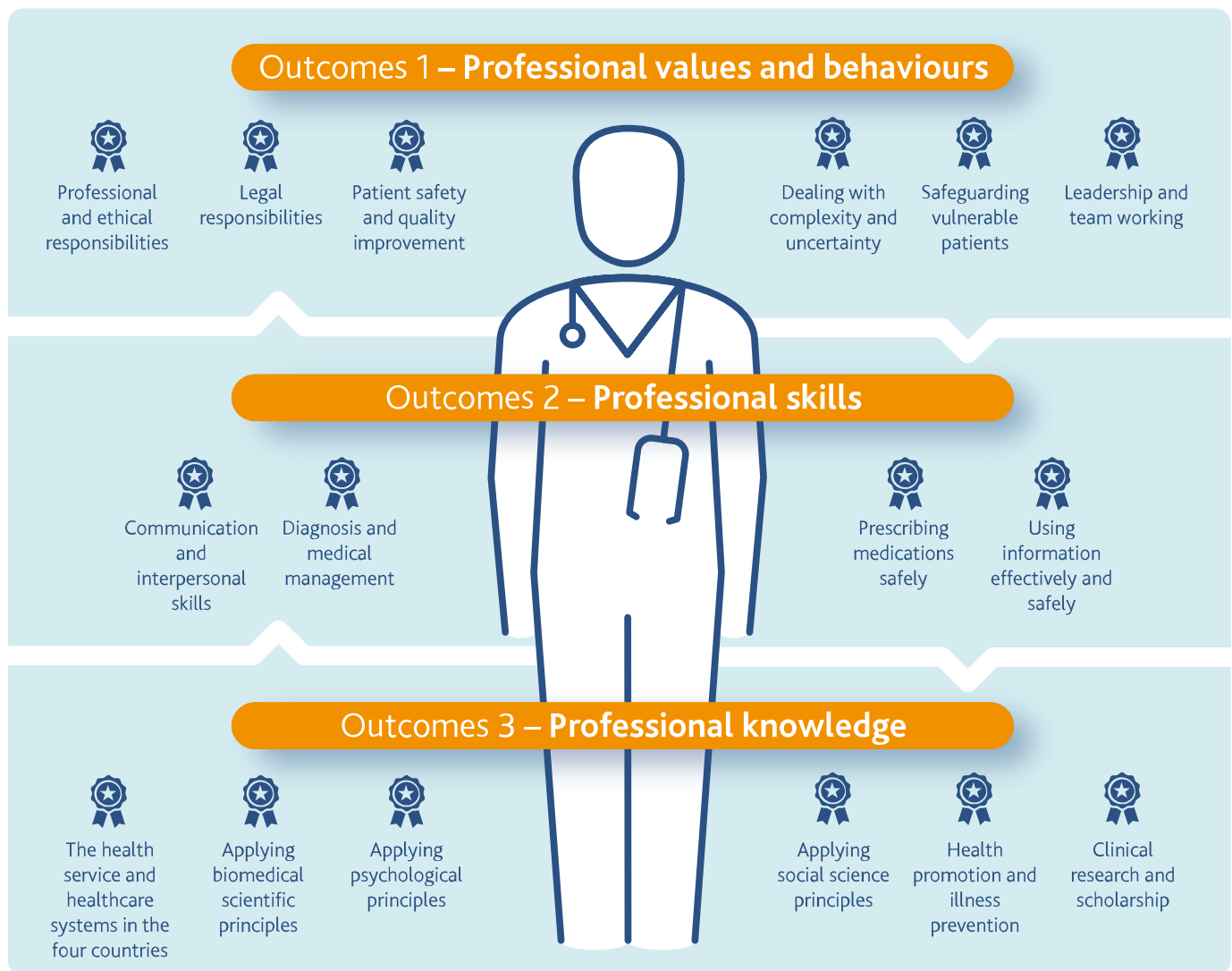
Outcomes for Graduates is the updated version of *Tomorrows Doctors (2009)*, which reflects changes in the organisation of care and patterns of disease such that newly qualified doctors are able to:

- care for patients in a variety of settings, including the patient's home and community
- care for growing numbers of patients with multiple morbidities and long term physical and mental health conditions
- provide integrated care, including mental health care, with social care
- apply principles of health promotion and disease prevention at population level to the care of individual patients
- commit to lifelong learning to keep up to date with developments in medical practice and trends in disease at population level.

The three sections of *Outcomes for Graduates* match the three fundamental domains of the *Generic professional capabilities framework*, which is integrated into the Foundation Programme Curriculum and all postgraduate specialty training curricula. This provides recognisable progression through undergraduate and postgraduate medical education and training.

The *National Undergraduate Curriculum in Surgery* is closely mapped onto *Outcomes for Graduates*, providing the foundations for the continuum of postgraduate surgical training.

Structure of the outcomes



Appendix 1. Figure 1. Outcomes expected of medical graduates in the UK (from *Outcomes for Graduates*, GMC 2020⁴)

Each of the 26 key outcomes below is further qualified in the *Outcomes for Graduates* document and this appendix therefore serves as a brief summary. Medical students are tomorrow's doctors. In accordance with good medical practice the following outcomes are requisite:

Outcomes 1 - Professional Values and Behaviours

Newly qualified doctors:

1. must make the care of patients their first concern, applying their knowledge and skills in a competent, ethical and professional manner and taking responsibility for their own actions in complex and uncertain situations.
2. must behave according to ethical and professional principles.
3. must demonstrate awareness of the importance of their personal physical and mental wellbeing and incorporate compassionate self-care into their personal and professional life.

4. must demonstrate knowledge of the principles of the legal framework in which medicine is practised in the jurisdiction in which they are practising and have awareness of where further information on relevant legislation can be found.
5. must demonstrate that they can practise safely. They must participate in and promote activity to improve the quality and safety of patient care and clinical outcomes.
6. the nature of illness is complex and therefore the health and care of many patients is complicated and uncertain. Newly qualified doctors must be able to recognise complexity and uncertainty, and through the process of seeking support and help from colleagues, learn to develop confidence in managing these situations and responding to change.
7. must be able to recognise and identify factors that suggest patient vulnerability and take action in response.
8. must recognise the role of doctors in contributing to the management and leadership of the health service.
9. must learn and work effectively within a multi-professional and multi-disciplinary team and across multiple care settings. This includes working face to face and through written and electronic means, and in a range of settings where patients receive care, including community, primary, secondary, mental health, specialist tertiary and social care settings and in patients' homes.

Outcomes 2 - Professional Skills

Newly qualified doctors:

10. must be able to communicate effectively, openly and honestly with patients, their relatives, carers or other advocates, and with colleagues, applying patient confidentiality appropriately.
11. must be able to carry out an effective consultation with a patient.
12. must work collaboratively with patients and colleagues to diagnose and manage clinical presentations safely in community, primary and secondary care settings and in patients' homes. Newly qualified doctors must, wherever possible, support and facilitate patients to make decisions about their care and management.
13. must be able to perform the core set of practical skills and procedures safely and effectively, and identify, according to their level of skill and experience, the procedures for which they need supervision to ensure patient safety.
14. must be able to work collaboratively with patients, their relatives, carers or other advocates to make clinical judgements and decisions based on a holistic assessment of the patient and their needs, priorities and concerns, and appreciating the importance of the links between pathophysiological, psychological, spiritual, religious, social and cultural factors for each individual.
15. must demonstrate that they can make appropriate clinical judgements when considering or providing compassionate interventions or support for patients who are nearing or at the end of life. They must understand the need to involve patients, their relatives, carers or other advocates in management decisions, making referrals and seeking advice from colleagues as appropriate.
16. must be able to give immediate care to adults, children and young people in medical and psychiatric emergencies and seek support from colleagues if necessary.
17. must be able to recognise when a patient is deteriorating and take appropriate action.
18. must be able to prescribe medications safely, appropriately, effectively and economically and be aware of the common causes and consequences of prescribing errors.
19. must be able to use information effectively and safely in a medical context, and maintain accurate, legible, contemporaneous and comprehensive medical records.

Outcomes 3 - Professional Knowledge

Newly qualified doctors:

20. must demonstrate how patient care is delivered in the health service.
21. must demonstrate how patient care is delivered in the health service.
22. must be able to apply biomedical scientific principles, methods and knowledge to medical practice and integrate these into patient care. This must include principles and knowledge relating to anatomy, biochemistry, cell biology, genetics, genomics and personalised medicine, immunology, microbiology, molecular biology, nutrition, pathology, pharmacology and clinical pharmacology, and physiology.
23. must explain and illustrate by professional experience the principles for the identification, safe management and referral of patients with mental health conditions.
24. must be able to apply social science principles, methods and knowledge to medical practice and integrate these into patient care.
25. must be able to apply social science principles, methods and knowledge to medical practice and integrate these into patient care.
26. must be able to apply scientific method and approaches to medical research and integrate these with a range of sources of information used to make decisions for care.

Appendix 2 - The Medical Licensing Assessment (MLA)

The purpose of the MLA is to ensure that doctors seeking registration with a licence to practise medicine in the UK have met a common threshold for safe practice that is appropriate to their point of entry to the medical register.

The MLA has two components: the applied knowledge test (AKT)³³ and the clinical and professional skills assessment (CPSA)³⁴, through which candidates can demonstrate they are ready for safe practice, able to manage uncertainty, and deliver patient-centered care.

These are the three themes underpinning the *MLA Content Map*, which sets out the core knowledge, skills and behaviours needed for UK practice.

The AKT is a written assessment of applied clinical knowledge. The CPSA is a performance-based assessment of clinical and professional skills, knowledge and behaviours. It is set and delivered by:

- UK medical schools for medical students in their penultimate or final year of undergraduate education
- the GMC for those international medical graduates (IMGs) who wish to practise medicine in the UK and must demonstrate their knowledge and skills through taking the MLA.

The *MLA Content Map* doesn't exactly replicate *Outcomes for Graduates* because not all the values and behaviours expected of a new doctor can be tested in an examination. For example, engaging in induction and orientation activities or maintaining a professional development portfolio.

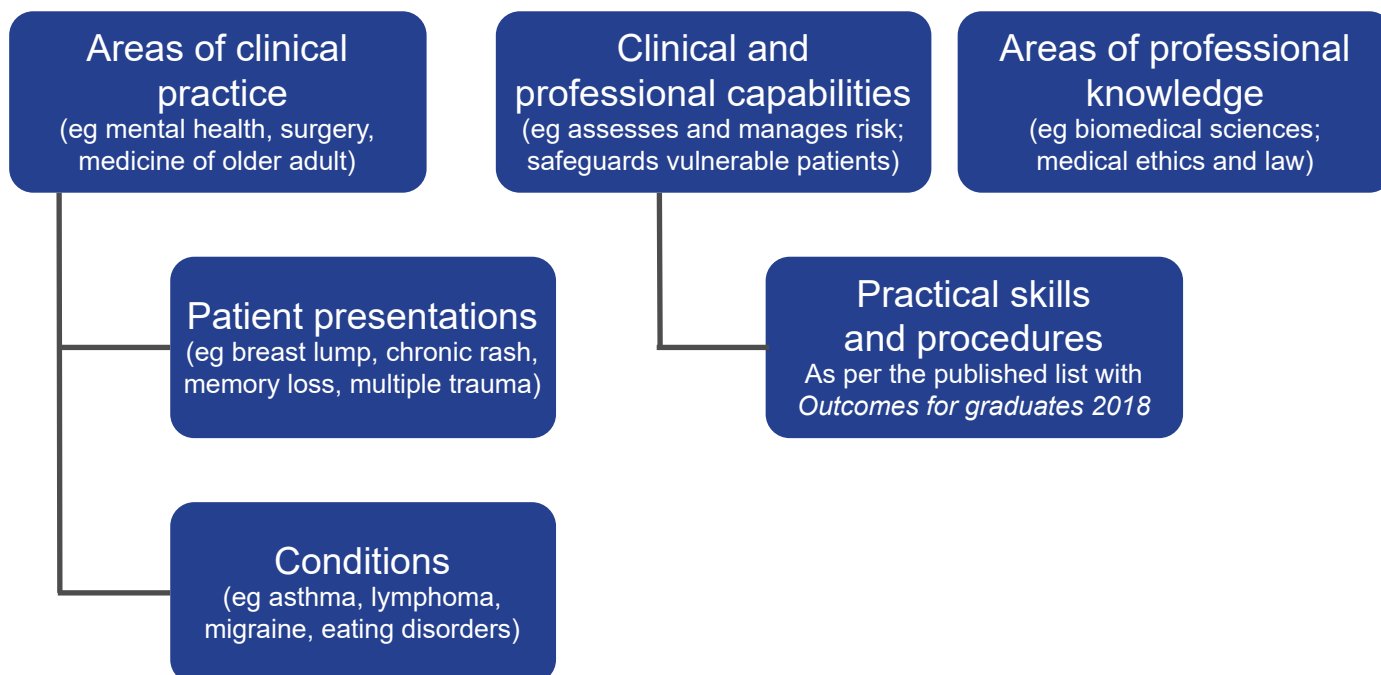
Because the MLA focuses on areas that doctors are likely to encounter during the UK Foundation Programme, not all specialty areas are covered equally in the content map. The content map concentrates on the knowledge, professional skills, and behaviours that are essential for safe practice – for example, effective communication, recognising risk, and diagnosis and management of common or acute presentations and conditions.

The MLA won't test knowledge of the NHS and its local arrangements.

Three themes guided what to include in the *MLA Content Map*, which reflect the overarching outcomes, specified in *Outcomes for Graduates*:

- a. Readiness for safe practice: the ability to manage emergencies and acute health issues, as well as common chronic health and wellbeing issues
- b. Managing uncertainty: the ability to cope with uncertainty over diagnosis, prognosis, response to therapeutic interventions; medical science; and when to call for help
- c. Delivering person-centered care: listening to, and hearing patients' values; taking account of comorbidities and frailty and social context; working effectively within a multi-professional and multi-disciplinary team and across multiple care settings; and demonstrating shared decision-making that takes account of patients' expectations and wishes.

The MLA content map is organised into six domains:



Appendix 2. Figure 1. Organisation of *MLA Content Map*, GMC 2021³.

Areas of clinical practice

This domain is about the context of delivery of care. The headings in this domain contain a mixture of specialties, body systems and patient types, reflecting the complexity of medical practice and the range of care settings and patient scenarios that a doctor is likely to encounter in a first appointment within the UK Foundation Programme. Where necessary, a heading descriptor has been included to provide additional information on what it covers. Every item in the “Patient presentations” and “Conditions” domains falls under one or more of these headings.

Areas of professional knowledge

This domain sets out generic areas of professional clinical and scientific knowledge as applied to the care of patients, at the level expected of a doctor entering the UK Foundation Programme. Where necessary, a heading descriptor has been included to provide additional information on what it covers.

Clinical and professional capabilities

This domain sets out the abilities required to provide clinical care for patients in line with the values and behaviours in *Good medical practice* (GMC), *Outcomes for Graduates* (2018) and the *Generic professional capabilities framework* (2017). The GMC expects doctors passing the MLA to behave with civility and kindness, and to demonstrate a holistic, compassionate and individual approach to each patient encounter. The GMC also expects them to take account of the views and values of their patient and wider society when assessing and providing care. The headings in this domain are capabilities that might be assessed through the AKT or CPSA in line with these underlying principles.

Practical skills and procedures

This domain is the list of practical skills and procedures that supplements the GMC's *Outcomes for Graduates* (2018). It sets out the skills, procedures and levels of competence newly qualified doctors must have, so they can practise safely when they start work. This domain (along with the clinical and professional capabilities) has particular relevance for CPSAs.

Patient presentations

This domain is defined as signs, symptoms, investigation results and other relevant patient-related issues typically seen by doctors in a first appointment within the UK Foundation Programme. Every presentation relates to one or more of the areas of clinical practice. For example, the presentation "Confusion" might relate to "Medicine of older adult", "Endocrine and metabolic", "Mental health" or "Neurosciences".

Conditions

This domain is defined as pathophysiological diseases or clinical diagnoses typically seen by doctors in a first appointment within the UK Foundation Programme. Every condition relates to one or more of the areas of clinical practice.

Surgical Conditions listed in the MLA Content Map

The following "Presentations" and "Conditions" are mapped (alphabetically) to areas of surgical practice*. Where the MLA content map lists conditions that will be covered in areas of undergraduate education other than surgery, eg medicine, cardiology, dermatology, haematology, ophthalmology, obstetrics and gynaecology, mental health, those conditions are not provided as lists in this syllabus.

*Those relating to more than one area of practice are listed under each and may therefore appear more than once.

Acute and emergency

Presentations	Conditions
Abnormal urinalysis	Acid-base abnormality
Acute and chronic pain management	Acute kidney injury
Acute kidney injury	Anaphylaxis
Anaphylaxis	Aortic aneurysm
Bleeding from upper GI tract	Compartment syndrome
Bleeding from lower GI tract	Deep vein thrombosis
Burns	Dehydration
Dehydration	Ectopic pregnancy
Deteriorating patient	Epistaxis
Electrolyte abnormalities	Extradural haemorrhage
Epistaxis	Gastrointestinal perforation
Facial/periorbital swelling	Necrotising fasciitis
Head injury	Non-accidental injury
Lacerations	Pneumothorax
Massive haemorrhage	Post-partum haemorrhage
Melaena	Pulmonary embolism

Presentations	Conditions
Post-surgical care and complications	Raised intracranial pressure
Scrotal/testicular pain &/or lump/swelling	Sepsis
Shock	Spinal cord compression
Soft tissue injury	Spinal cord injury
	Spinal fracture
	Subarachnoid haemorrhage
	Subdural haemorrhage
	Testicular torsion
	Transfusion reactions

Cancer

Presentations	Conditions
Abdominal distension	Basal cell carcinoma
Abdominal mass	Bladder cancer
Acute and chronic pain management	Brain metastases
Ascites	Breast cancer
Bleeding from upper GI tract	Cervical cancer
Bleeding from lower GI tract	Colorectal tumours
Bone pain	Endometrial cancer
Breast lump	Gastric cancer
Breathlessness	Hypercalcaemia of malignancy
Change in bowel habit	Leukaemia
Cough	Lung cancer
Decreased appetite	Lymphoma
Electrolyte abnormalities	Malignant melanoma
Fatigue	Multiple myeloma
Haematuria	Metastatic disease
Haemoptysis	Multiple myeloma
Headache	Oesophageal cancer
Jaundice	Ovarian cancer
Limb weakness	Pancreatic cancer
Lump in groin	Pathological fracture
Lymphadenopathy	Patient on anti-coagulation
Neck lump	Prostate cancer
Pain on inspiration	Spinal cord compression
Painful swollen leg	Squamous cell carcinoma
Pelvic mass	Testicular cancer
Pleural effusion	Thyroid cancer
Scrotal/testicular pain/lump/swelling	
Swallowing problems	
Weight loss	

Cardiovascular

Presentations	Conditions
Acute abdominal pain	Aneurysms
Acute change in or loss of vision	Aortic aneurysm
Blackouts & faints	Aortic dissection
Breathlessness	Aortic valve disease
Cardiorespiratory arrest	Arterial thrombosis
Chest pain	Arterial ulcers
Cold, pale, pulseless, painful leg/foot	Cardiac arrest
Cough	Cardiac failure
Cyanosis	Deep vein thrombosis
Dizziness	Gangrene
Driving advice (eg aneurysm; TIAs)	Infective endocarditis
Erectile dysfunction	Intestinal ischaemia
Fever	Ischaemic heart disease
Heart murmurs	Ischaemic limb
Hypertension	Mitral valve disease
Limb claudication	Peripheral vascular disease
Limb weakness	Pulmonary embolism
Low blood pressure	Stroke
Pain on inspiration	Transient Ischaemic Attack (TIA)
Painful swollen leg	Venous ulcers
Peripheral oedema and ankle swelling	
Skin ulcers	

Surgical problems in child health

Presentations	Conditions
Common congenital abnormalities	Appendicitis
Constipation	Biliary atresia
Dehydration	Coeliac disease
Deteriorating patient	Constipation
Diarrhoea	Dehydration
Fever	Downs Syndrome
Haematuria	Epididymitis and orchitis
Jaundice	Gastro-oesophageal reflux disease
Limp	Hernias
Lymphadenopathy	Inflammatory bowel disease
Musculoskeletal deformities	Intestinal obstruction and ileus
Scrotal/testicular pain and lump/swelling	Intussusception
Shock	Non-accidental injury
Trauma	Otitis media

Presentations	Conditions
Urinary symptoms	Peptic ulcer disease and gastritis
	Peripheral nerve injuries
	Peritonitis
	Pyloric stenosis
	Pneumothorax
	Raised intracranial pressure
	Septic arthritis
	Subarachnoid haemorrhage
	Subdural haemorrhage
	Testicular torsion
	Urinary tract infection
	Volvulus

Clinical imaging

Presentations	Conditions
Misplaced nasogastric tube	Aneurysms
Trauma	Bladder cancer
	Breast cancer
	Bronchiectasis
	Cardiac failure
	Colorectal tumour
	Extradural haemorrhage
	Intestinal ischaemia
	Intestinal obstruction and ileus
	Intussusception
	Lower limb fractures
	Lower limb soft tissue injury
	Lung cancer
	Osteomyelitis
	Pathological fracture
	Pneumonia
	Pneumothorax
	Pulmonary embolism
	Raised intracranial pressure
	Spinal cord compression
	Spinal cord injury
	Spinal fracture
	Stroke
	Subarachnoid haemorrhage
	Subdural haemorrhage
	Surgical site infection
	Upper limb fractures
	Upper limb soft tissue injuries
	Volvulus

Ear, nose and throat

Presentations	Conditions
Anosmia	Acoustic neuroma
Cough	Epiglottitis
Dizziness	Epistaxis
Ear and nasal discharge	Meniere's disease
Epistaxis	Otitis externa
Facial pain	Otitis media
Facial/periorbital swelling	Sinusitis
Hearing loss	
Hoarseness and voice change	
Nasal obstruction	
Neck lump	
Painful ear	
Stridor	
Swallowing problems	
Tinnitus	
Vertigo	

Endocrine and metabolic

Presentations	Conditions
Bone pain	Addison's Disease
Confusion	Cushing's Syndrome
Electrolyte abnormalities	Diabetes insipidus
Erectile dysfunction	Diabetes mellitus
Fatigue	Hypercalcaemia of malignancy
Gynaecomastia	Hyperlipidaemia
Hoarseness and voice change	Hyperosmolar hyperglycaemia
Hypertension	Hyperparathyroidism
Nausea	Osteomalacia
Neck lump	Osteoporosis
Nipple discharge	Parathyroid disease
Urinary symptoms	Pituitary tumours
Weight gain	Thyroid disease
Weight loss	

Gastrointestinal disease (including liver)

Presentations	Conditions
Abdominal distension	Acute cholangitis
Abdominal mass	Acute pancreatitis

Presentations	Conditions
Acute abdominal pain	Alcoholic hepatitis
Ascites	Anaemia
Bleeding lower GI tract	Anal fissure
Bleeding upper GI tract	Appendicitis
Change in bowel habit	Ascites
Change in stool colour	Cholecystitis
Chronic abdominal pain	Cirrhosis
Constipation	Coeliac disease
Decreased appetite	Colorectal tumours
Diarrhoea	Constipation
Faecal Incontinence	Diverticular disease
Jaundice	Gallstones and biliary colic
Lump in groin	Gastric cancer
Melaena	Gastrointestinal perforation
Nausea	Gastro-oesophageal reflux disease
Organomegaly	Haemochromatosis
Perianal symptoms	Haemorrhoids
Pruritus	Hepatitis
Rectal prolapse	Hernias
Swallowing problems	Hiatus hernia
Vomiting	Hyposplenism / splenectomy
	Infectious colitis
	Infectious mononucleosis
	Inflammatory bowel disease
	Irritable bowel syndrome
	Liver failure
	Malabsorption
	Malnutrition
	Mesenteric adenitis
	Necrotising enterocolitis
	Oesophageal cancer
	Pancreatic cancer
	Peptic ulcer disease and gastritis
	Perianal abscess and fistulae
	Peritonitis
	Vitamin B12 and / or folate deficiency

Infection

Presentations	Conditions
Acute rash	Acute cholangitis
Anosmia	Brain abscess
Chest pain	Breast abscess / mastitis
Diarrhoea	Candidiasis

Presentations	Conditions
Facial / periorbital swelling	Chlamydia
Fever	Covid-19
Haematuria	Encephalitis
Haemoptysis	Epididymitis and orchitis
Neck pain / stiffness	Folliculitis
Night sweats	Gangrene
Painful swollen leg	Gonorrhoea
Petechial rash	Hospital acquired infections
Pleural effusion	Human immunodeficiency virus
Sore throat	Human papilloma virus
Stridor	Impetigo
Urinary symptoms	Infectious colitis
Vomiting	Infectious mononucleosis
Weight loss	Infective endocarditis
	Influenza
	Lower respiratory tract infection
	Malaria
	Mumps
	Necrotising fasciitis
	Osteomyelitis
	Otitis media
	Perianal abscesses and fistulae
	Periorbital and orbital cellulitis
	Peritonitis
	Pneumonia
	Sepsis
	Septic arthritis
	Surgical site infection
	Syphilis
	Tonsillitis
	Toxic shock syndrome
	Tuberculosis
	Upper respiratory tract infection
	Varicella zoster
	Viral gastroenteritis
	Viral hepatitis

Medicine of older adult

Presentations	Conditions
Blackouts and faints	Cardiac failure
Chest pain	Dementias
Confusion	Hypo- and hyperthermia
Constipation	Lower limb fractures
Dizziness	Malnutrition

Presentations	Conditions
Electrolyte abnormalities	Osteoporosis
Faecal incontinence	Parkinson's disease
Falls	Pressure sores
Frailty	Stroke
Hearing loss	Urinary incontinence
Hypertension	
Immobility	
Mental capacity concerns	
Peripheral oedema and ankle swelling	
Skin ulcers	
Struggling to cope at home	
Trauma	
Urinary incontinence	
Urinary symptoms	
Vertigo	

Musculoskeletal

Presentations	Conditions
Acute joint pain /swelling	Ankylosing spondylitis
Back pain	Bursitis
Bone pain	Compartment syndrome
Bruising	Crystal arthropathy
Chronic joint pain / stiffness	Fibromyalgia
Congenital abnormalities	Idiopathic arthritis
Eye pain / discomfort	Inflammatory bowel disease
Fever	Lower limb fractures
Limp	Lower limb soft tissue injuries
Muscle pain /myalgia	Metastatic disease
Musculoskeletal deformities	Non-accidental injury
Neck pain / stiffness	Osteoarthritis
Red eye	Osteomalacia
Soft tissue injury	Osteomyelitis
Trauma	Osteoporosis
	Pathological fracture
	Polymyalgia rheumatica
	Psoriasis
	Radiculopathies
	Reactive arthritis
	Rheumatoid arthritis
	Sarcoidosis
	Septic arthritis
	Spinal cord compression
	Spinal cord injury

Presentations	Conditions
	Spinal fracture
	Systemic lupus erythematosus
	Upper limb fractures
	Upper limb soft tissue injuries

Neurosciences

Presentations	Conditions
Abnormal development	Acoustic neuroma
Acute and chronic pain management	Bell's palsy
Acute change in or loss of vision	Brain abscess
Altered sensation, numbness, paraesthesia	Brain metastases
Anosmia	Cerebral palsy and hypoxic encephalopathy
Back pain	Dementias
Behaviour / personality change	Diabetic neuropathy
Blackouts and faints	Encephalitis
Breathlessness	Extradural haemorrhage
Confusion	Febrile convulsion
Decreased / loss of consciousness	Malaria
Diplopia	Meniere's disease
Dizziness	Meningitis
Driving advice	Metastatic disease
Eye pain / discomfort	Motor neurone disease
Facial pain	Myaesthesia gravis
Facial weakness	Parkinson's disease
Fasciculation	Peripheral nerve injuries / palsies
Fits / seizures	Radiculopathies
Head injury	Raised intracranial pressure
Headache	Spinal cord compression
Limb weakness	Spinal cord injury
Limp	Spinal fracture
Muscle pain /myalgia	Stroke
Neuromuscular weakness	Subarachnoid haemorrhage
Ptosis	Subdural haemorrhage
Speech and language problems	Transient ischaemic attacks
Swallowing problems	Trigeminal neuralgia
Trauma	Wernicke's encephalopathy
Tremor	
Urinary symptoms	
Vertigo	

Palliative and end of life care

Presentations	Conditions
Acute and chronic pain management	Cardiac failure

Presentations	Conditions
End of life care / terminal illness	Metastatic disease
Nausea	Multi-organ dysfunction
Neuromuscular weakness	

Perioperative medicine and anaesthesia

Presentations	Conditions
Acute and chronic pain management	Acute and chronic kidney disease
Acute and chronic kidney injury /disease	Anaemia
Back pain	Anaphylaxis
Bone pain	Aortic valve disease
Breathlessness	Arrhythmias
Cardiorespiratory arrest	Asthma
Confusion	Cardiac arrest
Decreased / loss of consciousness	Cardiac failure
Dehydration	Chronic obstructive pulmonary disease
Electrolyte abnormalities	Deep vein thrombosis
End of life care /terminal illness	Dehydration
Frailty	Diabetes mellitus
Head injury	Drug overdose
Learning disability	Epiglottitis
Massive haemorrhage	Gastro-oesophageal disease
Misplaced nasogastric tube	Hypertension
Nausea	Intestinal obstruction and ileus
Neuromuscular weakness	Necrotising fasciitis
Overdose	Obesity
Post-surgical care and complications	Obstructive sleep apnoea
Shock	Patient on anti-platelet therapy
Substance misuse	Respiratory arrest
Trauma	Respiratory failure
	Sepsis
	Substance abuse
	Surgical site infection

Renal and Urology

Presentations	Conditions
Abnormal urinalysis	Acute kidney injury
Acute kidney injury	Benign prostatic hyperplasia
Chronic kidney disease	Bladder cancer
Dehydration	Chronic kidney disease
Electrolyte abnormalities	Dehydration
Erectile dysfunction	Diabetes insipidus
Haematuria	Diabetic nephropathy
Hypertension	Epididymitis and orchitis

Presentations	Conditions
Oliguria	Multiple myeloma
Peripheral oedema and ankle swelling	Nephrotic syndrome
Scrotal / testicular pain /swelling /lump	Prostate cancer
Urinary symptoms	Testicular cancer
	Urinary incontinence
	Urinary tract calculi
	Urinary tract infection

Respiratory

Presentations	Conditions
Allergies	Acute bronchitis
Breathlessness	Asbestos-related lung disease
Cardiorespiratory arrest	Asthma
Chest pain	Bronchiectasis
Cough	Bronchiolitis
Cyanosis	Chronic obstructive pulmonary disease
Fever	Covid- 19
Haemoptysis	Cystic fibrosis
Hoarseness and voice change	Fibrotic lung disease
Pain on inspiration	Influenza
Pleural effusion	Lower respiratory tract infection
Snoring	Lung cancer
Stridor	Metastatic disease
Wheeze	Obstructive sleep apnoea
	Occupational lung disease
	Pneumonia
	Pneumothorax
	Pulmonary embolism
	Pulmonary hypertension
	Respiratory failure
	Sarcoidosis
	Tuberculosis
	Upper respiratory tract infection

Surgery

Presentations	Conditions
Abdominal distension	Acute pancreatitis
Abdominal mass	Anal Fissure
Acute abdominal pain	Aortic aneurysm
Ascites	Aortic dissection
Bleeding lower GI tract	Aortic valve disease
Bleeding upper GI tract	Appendicitis
Breast lump	Breast abscess/ mastitis
Breast tenderness/pain	Breast cancer
Change in bowel habit	Breast cysts

Presentations	Conditions
Change in stool colour	Colorectal tumours
Haematuria	Fibroadenoma
Lacerations	Fibroids
Loin pain	Gastrointestinal perforation
Lump in groin	Hernias
Nipple discharge	Intestinal ischaemia
Painful sexual intercourse	Intestinal obstruction and ileus
Post-surgical care and complications	Intussusception
Rectal prolapse	Oesophageal cancer
Scrotal/testicular pain &/or lump/swelling	Ovarian cancer
Subfertility	Pancreatic cancer
Trauma	Pelvic inflammatory disease
Urinary incontinence	Perianal abscess and fistulae
Urinary Symptoms	Peritonitis
	Postpartum haemorrhage
	Surgical site infection
	Testicular cancer
	Testicular torsion
	Varicose veins
	Volvulus

All areas of clinical practice

Presentations	Conditions
Death and dying	Adverse drug effects
Family history of possible genetic disorder	
Incidental findings	

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