

## Report on involvement of Anatomy in contributing to the learning outcomes of The Scottish Doctor

Following the meeting between the Scottish Anatomists and The Scottish Deans Medical Curriculum Group in Dundee 13<sup>th</sup> November 2001 the Scottish Anatomists convened a meeting in St Andrews 9<sup>th</sup> January 2002 to discuss links between the Learning Outcomes for the Medical Undergraduate in Scotland: A foundation for competent and reflective practitioners and Anatomy teaching.

A draft document was prepared and distributed to all Scottish Anatomists for additions/amendments before final discussion and amendment at a meeting of Scottish Anatomists in Glasgow 24<sup>th</sup> April 2002.

The final document is attached.

Points to note:

The Scottish Anatomists have attempted to assess the involvement of Anatomy teaching as provided by the various anatomy courses in the Scottish medical schools. It was recognised that Anatomy provided the only, or a major, input towards satisfying some outcomes but in other cases provided a more supportive role. To distinguish these levels of input each entry has been classified into one of three groups:

**Detailed in Bold — Anatomy teaching directly relevant to this outcome. In determining this group we asked the question** Would this outcome be satisfied if there was no anatomy teaching?

Detailed in normal type — Anatomy makes significant contribution towards this outcome but is not the only contributor

*Detailed in italics - Anatomy not prime source but makes supportive contribution — this group would include generic skills such as data retrieval IT etc*

It was evident during the discussion that many of the non-anatomical factual contributions were derived from the practical dissection room activity, including surface anatomy sessions.

The involvement of Anatomy in contributing to the learning outcomes detailed in the document - Learning Outcomes for the Medical Undergraduate in Scotland: A foundation for competent and reflective practitioners indicates our opinions relating to this document. It does not attempt to indicate the amount of Anatomy teaching, or the times in the curriculum when the anatomy should be taught. These are matters about which the Scottish Anatomists will be discussing in the near future and, in turn, would welcome discussion with the Scottish Deans Medical Curriculum Group. In a time of increasing litigation, and when there is concern from clinical colleagues of the level of anatomical knowledge achieved by undergraduates in the modern curricula we feel it is important to have clarity on the expected learning outcomes in terms of detailed anatomical knowledge. It is essential that the undergraduate student is provided with a sufficient 3-D anatomical framework to carry out basic clinical procedures and without risk of damage to the target structures, or any associated structures. We aim to provide a basis for the continued development of the clinical programmes of the undergraduate curriculum, and the integration of anatomy at appropriate stages, as well as providing a framework for the development of postgraduate training opportunities.

# What the doctor is able to do

## Outcomes for Clinical Skills

The new medical graduate should be able to demonstrate competency in a range of clinical skills unsupervised and to a predetermined standard.

	<b>Anatomy contribution</b>	<b><i>This could include:</i></b>
<ul style="list-style-type: none"> <li>Take a history from patients, relatives and others.</li> </ul>	<p><b>Anatomy provides language and vocabulary of medicine</b></p>	<p><i>All age groups; local multicultural/multiethnic factors; a wide range of different contexts and a patient-centred, sensitive, structured and thorough approach with demonstration of principles of good communication.</i></p>
<ul style="list-style-type: none"> <li>Undertake physical, and mental state examination of patients.</li> </ul>	<p><b>Knowledge of human anatomy provides understanding of 3-D of human body as essential basis of clinical examination; Surface anatomy; Surface projections - NB. Cadaver is student's first patient !</b></p>	<p><i>General and systems-based; appropriate for patient's age, gender and state of mental and physical health, in a thorough, sensitive, efficient and systematic manner.</i></p>
<ul style="list-style-type: none"> <li>Interpret results of history taking, physical examination and investigations.</li> </ul>	<p><b>Understanding of variation in normal anatomy v. abnormality; Changes in normal anatomy with age</b></p>	<p><i>Recognition of abnormality and correct interpretation of common investigative tests. Requesting appropriate investigations.</i></p>
<ul style="list-style-type: none"> <li>Make a diagnosis</li> </ul>	<p>Understanding of variation in normal anatomy v. abnormality; Changes in normal anatomy with age</p>	<p><i>Gathering and analysis of all available information. Recognition of important, life threatening conditions requiring immediate treatment.</i></p>
<ul style="list-style-type: none"> <li>Formulate a management plan</li> </ul>	<p><i>Planning dissection of cadaver/learning programme provides support for this aim</i></p>	<p><i>Focus on patient's needs including the patient's competence to cooperate, prioritise, involve patients and other members of the healthcare team and recognise own limitations.</i></p>
<ul style="list-style-type: none"> <li>Record findings</li> </ul>	<p>Anatomical language and vocabulary used correctly; <b>Anatomy fosters precision of language for note-taking; learning to describe succinctly and accurately</b></p>	<p><i>Records concerning all relevant communications with patients / relatives and colleagues. At a minimum records are legible, dated, signed, concise and contemporaneous.</i></p>

# What the doctor is able to do

## Outcomes for Practical Procedures

Mastery of appropriate practical procedures at the time of graduation is an essential part of the smooth transition from undergraduate to PRHO. The following are suggested procedures that the new graduate should be able to carry out unsupervised. Some of these procedures also feature in the domain of Patient Investigation and many others are not specifically mentioned here as they should be covered by normal physical examination e.g. fundoscopy, visual field testing, otoscopy, rectal examination etc.

	<b>Anatomy contribution</b>	<b><i>This could include:</i></b>
<ul style="list-style-type: none"><li>Measuring and recording</li></ul>	<b>3-D anatomy to identify structures central to each test and associated structures which may be at risk of damage if test not carried out appropriately; Anatomical variation / abnormality / age related changes which may impact on tests</b>	<ul style="list-style-type: none"><li><i>radial pulse rate</i></li><li><i>peripheral pulses</i></li><li><i>blood pressure</i></li><li><i>body temperature</i></li><li><i>peak expiratory flow rate</i></li><li><i>blood glucose using Reagent sticks with and without a glucometer</i></li><li><i>urinalysis using Multistix</i></li><li><i>faecal occult blood testing</i></li><li><i>pregnancy testing</i></li><li><i>perform and interpret a 12 lead ECG</i></li><li><i>manage an ECG monitor</i></li><li><i>height and weight of adults and children</i></li><li><i>interpretation of growth charts</i></li><li><i>CVP measurement</i></li><li><i>Transcutaneous O<sub>2</sub> saturation</i></li></ul>
<ul style="list-style-type: none"><li>Administering and doing</li></ul>	<b>3-D anatomy to identify structures central to each test and associated structures which may be at risk of damage if test not carried out appropriately; Anatomical variation / abnormality / age related changes which may impact on tests; Use of basic instruments with confidence (scalpel, scissors, forceps) — in dissection based courses to develop manual dexterity; Safety — sharps disposal</b>	<ul style="list-style-type: none"><li><i>First Aid</i></li><li><i>basic resuscitation and basic life support for adults and children/infants</i></li><li><i>administration of oxygen therapy</i></li><li><i>venepuncture</i></li><li><i>take a blood culture</i></li><li><i>establish intravenous access and set up a giving set</i></li><li><i>male and female urinary catheterisation</i></li><li><i>collection of MSU</i></li><li><i>arterial puncture</i></li><li><i>scrub up and gown for surgical and sterile procedures;</i></li><li><i>skin suturing</i></li><li><i>wound care and basic wound dressing</i></li><li><i>make up drugs for parenteral administration</i></li><li><i>administration of intravenous, intramuscular and subcutaneous injections</i></li><li><i>dosage and administration of insulin and use / prescribing of sliding scales</i></li><li><i>use iv infusion and volumetric pumps</i></li><li><i>take nose, throat and skin swabs</i></li><li><i>cervical smear</i></li><li><i>writing drug kardex</i></li></ul>

# What the doctor is able to do

## Outcomes for Patient Investigation

As with practical procedures there are different categories of patient investigation depending on whether or not we would expect a new graduate to be able to undertake the task themselves or simply to know how the investigation is carried out and when it is appropriate to use it. Competency in the general principles of patient investigation is essential.

	<b>Anatomy contribution</b>	<b>This could include:</b>
<ul style="list-style-type: none"> <li>• General principles of patient investigation</li> </ul>		<p><i>Appropriate choice and use of investigation.</i>  <i>Requesting/ordering of investigations according to local protocols / guidelines.</i>  <i>Obtaining informed consent for investigations.</i>  <i>Preparing patients for investigations practically and with adequate information.</i>  <i>Communicating the results of investigations to patients / relatives.</i>  <i>Interpreting reports / results of investigations.</i>  <i>Providing all necessary demographic and clinical information on request forms.</i></p>
<ul style="list-style-type: none"> <li>• Laboratory-based investigations :</li> </ul>	<p><b>3-D anatomy to identify structures central to each procedure and associated structures which may be source of contamination if procedure not carried out appropriately;</b>  <b>Anatomical variation / abnormality / age related changes which may impact on procedure to correctly obtain uncontaminated samples;</b>  <b>Basic cell and tissue organisation to support the investigative disciplines in adjacent column</b></p>	<p><i>Demonstrable knowledge of the circumstances in which the commoner laboratory-based investigations are indicated and the procedures required to obtain the necessary material for investigation. To include:</i></p> <ul style="list-style-type: none"> <li><i>Biochemistry</i></li> <li><i>Haematology</i></li> <li><i>Microbiology</i></li> <li><i>Pathology</i></li> <li><i>Cytology</i></li> <li><i>Genetics</i></li> <li><i>Immunology</i></li> <li><i>Virology</i></li> <li><i>Toxicology</i></li> </ul>
<ul style="list-style-type: none"> <li>• Radiological investigations</li> </ul>	<p><b>Normal 3-D anatomy / anatomical variation/abnormality/age related changes which underpin the interpretation of images;</b>  <b>Early exposure to modern imaging techniques and awareness of existence of specialised procedures for visualisation of specific anatomical structures</b></p>	<p><i>Demonstrable knowledge of the range of radiological investigations available and their appropriate use in different circumstances.</i></p>
<ul style="list-style-type: none"> <li>• Clinical investigations</li> </ul>	<p><b>3-D anatomy to identify structures central to each investigation and associated structures which may be at risk of damage if test not carried out appropriately;</b>  <b>Anatomical variation / abnormality / age related changes which may impact on investigation eg lumbar puncture (relationship of distal end spinal cord with vertebral level)</b></p>	<p><i>A number of system-specific investigations which the graduate should know about and may have observed, but would not routinely be expected to perform c.f. Practical Procedures.</i></p> <ul style="list-style-type: none"> <li>• <i>Exercise tolerance test</i></li> <li>• <i>Pleural tap/biopsy</i></li> <li>• <i>Upper and lower GI endoscopy</i></li> <li>• <i>EEG</i></li> <li>• <i>Lumbar puncture</i></li> <li>• <i>Cystoscopy</i></li> <li>• <i>Colposcopy</i></li> <li>• <i>Skin biopsy</i></li> <li>• <i>Joint aspiration</i></li> <li>• <i>Core biopsy</i></li> <li>• <i>Fine needle aspiration</i></li> <li>• <i>Laryngoscopy — direct and indirect</i></li> <li>• <i>Nasal endoscopy</i></li> </ul>

# What the doctor is able to do

## Outcomes for Patient Management

New medical graduates cannot be expected to have had unsupervised experience of all aspects of patient management as many are restricted by law, e.g. drug prescribing. However, it is reasonable to expect that they will have a demonstrable knowledge of the important aspects of management in the areas outlined below and that they will have had supervised involvement in such activities.

	<b>Anatomy contribution</b>	<b>This could include:</b>
<ul style="list-style-type: none"> <li>General principles of patient management</li> </ul>	-	<p><i>Use of patient-centred, holistic approach with careful consideration of all information available from history, physical examination and investigations and in full consultation with patient, relatives etc.</i></p> <p><i>Immediate assessment and illness acuity/severity rating with appropriate intervention, investigation and monitoring.</i></p> <p><i>The principles of patient support (physiological, psychological, social, spiritual) and symptom management whilst a definitive diagnosis is reached and specific treatment is started.</i></p> <p><i>The ability to recognise the need for specialist help, appropriate environment and the speed with which these two are required.</i></p> <p><i>Patient referral: as above and lines of communication, keeping the patient/family/carers informed.</i></p>
<ul style="list-style-type: none"> <li>General principles of teamwork</li> </ul>	Group dissection of cadaver; Group learning activities eg surface anatomy	<p><i>The roles and relationships of the multidisciplinary team</i></p> <p><i>Accepting corporate decisions and priorities.</i></p>
<ul style="list-style-type: none"> <li>Drugs</li> </ul>	-	<p><i>Knowledge of prescribing and practical demonstration of prescribing ability.</i></p> <p><i>Knowledge of common adverse effects and their treatment.</i></p> <p><i>Selecting method of delivery.</i></p> <p><i>Calculating dosages.</i></p> <p><i>Consideration of dependence, interactions and adverse effects.</i></p> <p><i>Post-op pain relief</i></p>
<ul style="list-style-type: none"> <li>Surgery</li> </ul>	<p><b>3-D anatomy to identify structures central to understanding surgical procedures;</b></p> <p><b>Anatomical variation / abnormality / age related changes which may impact on the understanding of surgical procedures;</b></p> <p><b>Framework for development of surgical training;</b></p>	<p><i>Recognition of indications for intervention and the available surgical interventions.</i></p> <p><i>Knowledge of principles and practice of ( to replace Appropriate use of) informed consent.</i></p> <p><i>Knowledge of common surgical problems and complications and remedies.</i></p> <p><i>Understanding of principles of pre-, peri and post-operative care.</i></p>
<ul style="list-style-type: none"> <li>Psychosocial</li> </ul>	-	<p><i>Recognition of specialist availability and of interventions and their use.</i></p> <p><i>Role of psychosocial factors in precipitating and perpetuating illness.</i></p> <p><i>Consideration of patient s social circumstances, work, family etc, when determining treatment options.</i></p> <p><i>Available interventions</i></p> <p><i>The role of other organisations.</i></p>

*Identification of child physical and sexual abuse*

- Radiotherapy      **3-D anatomy to identify structures central to each procedure and associated structures which may be at risk if procedure/shielding not carried out appropriately; Anatomical variation / abnormality / age related changes which may impact on procedures**

*Knowledge of options available and their appropriate use.  
Understanding the effect on the patient.*
- Therapy services      3-D anatomy to identify structures central to each therapy;  
Anatomical variation / abnormality / age related changes which may impact on therapy

*What these are.  
Appropriately access, refer and interact.  
An understanding of what can be achieved and what is involved for patient and physiotherapist / occupational therapist / speech therapist etc.*
- Nutrition      -

*Nutrition, nutritional support and specialist dietitians.  
Appropriately access, refer and interact.  
Understanding the role of nutrition as a major non-drug therapy in some medical conditions.  
Selecting appropriate method of ensuring adequate nutrition to meet individual patient s needs.  
Promoting healthy eating as a means to improve and maintain health as well as preventing disease.*
- Emergency medicine      **3-D anatomy to identify structures central to each emergency procedure and associated structures which may be at risk / prevent effective intervention if procedure not carried out appropriately; Anatomical variation/abnormality/age related changes which may impact on interventions eg larynx**

*Adequate assessment, risk stratification and provision of immediate management to life threatening adult emergencies (to replace - Management of life threatening conditions whether due to trauma or disease e.g. acute MI, diabetic ketoacidosis, acute asthma, haemorrhage, anaphylaxis, etc.)  
Management of adult cardiac arrest utilising UK Resuscitation Council algorithms.  
Performance of paediatric basic life support.  
Demonstrating systematic approach with appreciation of local protocols/guidelines and working effectively as part of emergency care team.*
- Acute care      3-D anatomy to identify structures central to conditions;  
Anatomical variation / abnormality / age related changes which may impact on conditions and give rise to complications

*Management of a variety of medical and surgical and psychiatric conditions that are not immediately life-threatening but which require early treatment, or management of more serious, life-threatening conditions in the period following emergency management e.g. uncomplicated cerebrovascular accident, exacerbation of chronic obstructive airways disease, deliberate self-harm or acute confusional states etc.*
- Chronic care      -

*Consideration for:  
patient s age; nature of chronic disease; effect on patient e.g. loss of mobility, psychological impact  
Appropriate use of drugs, appliances/aids, etc.*
- Intensive care — to include high dependency      -

*To recognise the circumstances under which an individual patient might require referral / admission to these areas.*

	care, coronary care and other specialist intermediate care e.g. renal, neurological.		<p><i>Knowledge of the criteria for referral and local guidelines, protocols and mechanisms.</i></p> <p><i>Appreciation of the range of facilities and services available.</i></p> <p><i>The implications for patient and family, including psychological, of this form of care.</i></p>
• Palliative care	-		<p><i>Recognition of what palliative care can offer, where it can be delivered and by whom.</i></p> <p><i>Knowledge of how to involve patient, family, friends as well as healthcare professionals and other relevant bodies.</i></p>
• Pain control	<b>Nerve distribution; determining source of pain — referred pain</b>		<p><i>Ability to select and initiate appropriate analgesia using local protocols. ( to replace - Selecting the most appropriate method and knowledge of when to initiate pain relief.)</i></p> <p><i>Specific knowledge of pharmacological, physical and psychological interventions.</i></p> <p><i>Understanding the role of the pain management specialist and demonstrating ability to access/interact with pain management specialists/teams.</i></p>
• Rehabilitation	Anatomy of musculoskeletal system		<p><i>Understanding of the integral role of rehabilitation in recovery especially after major illness, significant trauma or surgery e.g. myocardial infarction, spinal injury, transplantation, chronic mental illness such as schizophrenia.</i></p> <p><i>Appreciation of the need for a specific programme of rehabilitation and the role of other healthcare professionals in providing this.</i></p>
• Complementary therapies	General anatomical knowledge		<p><i>Appreciation of what is available.</i></p> <p><i>Outline of what is involved in most commonly practised therapies; how alternative and conventional therapies might be combined.</i></p> <p><i>Keeping an open mind and remaining non-judgemental regarding the use of complementary therapies.</i></p>
• Patient referral	-		<p><i>Making appropriate referrals to the right professionals.</i></p> <p><i>Assessing at what stage of management referral may be indicated.</i></p> <p><i>Giving and receiving the appropriate information.</i></p> <p><i>Keeping the patient informed.</i></p>
• Blood Transfusion Services	-		<p><i>Nature and extent of service.</i></p> <p><i>How blood products are obtained through donors and by manufacture including issues of safety.</i></p> <p><i>Diversity of blood products available and how they are used in different circumstances.</i></p> <p><i>Making the most efficient and appropriate use of the Blood Transfusion Service in the care of patients</i></p> <p><i>Importance of sample / patient / blood product identification.</i></p> <p><i>Management of transfusion reactions.</i></p>
• Management of Death	(Often) First exposure to cadavers; Understanding of value of post-mortem investigations to knowledge		<p><i>Death certification</i></p> <p><i>Cremation</i></p> <p><i>Post-mortem examination — both practicalities of consent and specific sensitivities of different religious groups</i></p>

# What the doctor is able to do

## Outcomes for Health Promotion and Disease Prevention

Every contact between a doctor and a patient can be seen as an opportunity for health promotion and disease prevention. It is therefore essential that the new graduate knows how to make the most of these opportunities through demonstrable knowledge of the principles involved both for individual patients and populations.

	Anatomy contribution	<b><i>This could include:</i></b>
<ul style="list-style-type: none"> <li>• Recognition of the causes of disease and the threats to the health of individuals and populations at risk</li> </ul>	<p>Opportunities in cadaver to see disease processes eg black lungs, atheroma in arteries</p>	<p><i>Definition of health, disease and disability. Assessment of distribution of risk factors in the population. Risk identification and reduction policies for populations taking into account diversity, ethnicity and social inequality.</i></p>
<ul style="list-style-type: none"> <li>• To be able to implement, where appropriate, risk reduction strategies for individual patients</li> </ul>	-	<p><i>Knowing how to change risk factors. The use of evidence-based medicine and effective interventions. Helping patients to modify behaviour whilst respecting their autonomy. Managing and implementing change.</i></p>
<ul style="list-style-type: none"> <li>• Appreciate that health promotion and disease prevention depend on collaboration with many other professionals and agencies</li> </ul>	-	<p><i>Identify who the other professionals and agencies are and what their role is.</i></p>
<ul style="list-style-type: none"> <li>• Plan health promotion taking into account barriers to preventing disease and promoting health both in the individual and the population</li> </ul>	-	<p><i>Consideration of; political, economic, behavioural and organisational barriers. Importance of audit of health promotion and disease prevention activities.</i></p>
<ul style="list-style-type: none"> <li>• Screening</li> </ul>	-	<p><i>Criteria for determining appropriate implementation of screening programmes.</i></p>

# What the doctor is able to do

## Outcomes for Communication

Good communication underpins all aspects of the practice of medicine. All new graduates must be able to demonstrate effective communication skills in all areas and in all media e.g. orally, in writing, electronically, by telephone etc.

<ul style="list-style-type: none"><li>• General principles of good communication</li></ul>	<b>Anatomy contribution Language and vocabulary of medicine;</b> Participation in small group tutorials and in planning groups for dissection of cadaver	<b><i>This could include:</i></b>  <i>Being able to listen and use other appropriate communication techniques including an appreciation of non-verbal communication / body language (one's own and the interviewee's). Gathering and giving information with good record keeping and correspondence skills. Mediating, negotiating and dealing with complaints. Making oral presentations and writing reports / papers. Telephone usage Taking into account the age and mental ability of the patient / relative. Taking into account religious / spiritual beliefs that may affect a consultation. Recognising when communication is unsuccessful and another strategy e.g. use of an interpreter, is required</i>
<ul style="list-style-type: none"><li>• Communicating with patients / relatives</li></ul>	-	<i>Answering questions and giving explanations and/or instructions. Strategies for dealing with the difficult consultation including defusing aggression, breaking bad news and admitting lack of knowledge or mistakes. Making requests e.g. post-mortem, organ donation. Obtaining informed consent. Confidentiality. Educating patients and facilitating self-management of illness</i>
<ul style="list-style-type: none"><li>• Communicating with colleagues</li></ul>	<b>Language and vocabulary of medicine;</b> Discussion groups around cadaver; Developing powers of description; Importance of using correct language	<i>Transfer of information orally, in writing and electronically. The art of the good discharge summary and patient referrals. Providing all necessary clinical information on request forms to laboratory-based colleagues.</i>
<ul style="list-style-type: none"><li>• Communicating with Police and Procurator Fiscal/Coroner</li></ul>	-	<i>Under what circumstances there is a legal obligation to contact such authorities. Proper procedure when such communication is necessary and how to relay appropriate information without breaking rules of confidentiality. Providing evidence in court</i>
<ul style="list-style-type: none"><li>• Communicating with media and press</li></ul>	-	<i>A clear understanding of who should give information to the media and press and what form it should take including the need to maintain confidentiality where individual patients are concerned.</i>
<ul style="list-style-type: none"><li>• Communicating as a teacher</li></ul>	Developing skills in identifying what you know/don't know as a valued contribution in discussion groups around cadaver; developing powers of	<i>Recognising the importance of sticking to what you know, knowing your own limitations and admitting when you don't know. Some basic teaching techniques e.g. demonstrating practical procedures, using various teaching aids, etc. Preparation of content for electronic presentation</i>

description;  
importance of using  
correct language

- Communicating as a patient advocate

*How to recognise when this is appropriate and how it may be accomplished effectively.*

# What the doctor is able to do

## Outcomes for Medical Informatics

Collecting, storing and using information has always been an integral part of the practice of medicine. It has, however, become more complex and technology-based thereby creating an increasing need for medical graduates to be competent in information handling skills ranging from simple record-keeping to accessing and using computer-based data. As well as having the technical skills to undertake such tasks it is important that graduates appreciate the role of informatics in the day-to-day care of patients and the advancement of medical science in general.

	<b>Anatomy contribution</b>	<b><i>This could include:</i></b>
<ul style="list-style-type: none"><li>• Keeping patient records</li></ul>	<b>Early awareness of anonymity (confidentiality) of cadaveric material as step towards development of appropriate confidentiality attitudes</b>	<i>Maintaining high quality of recording (whether in writing or on computer); accuracy and data quality; legibility. Knowledge of: the different types of records and how records are stored and retrieved (manually and electronically); coding and classification; confidentiality — including legislation governing access to medical records and data.</i>
<ul style="list-style-type: none"><li>• Accessing data sources</li></ul>	<b>Use of library resources; Web based materials</b>	<i>Using library and on-line information sources, including internet and intranet systems accurately, systematically and in sufficient depth. How routinely collected health information is used in service planning and delivery of care. Using information in evidence-based practice. Identifying and using professional guidelines.</i>
<ul style="list-style-type: none"><li>• IT Skills / Computing skills</li></ul>	<b>WWW based anatomical learning aids; email to communicate with teachers;</b>	<i>Use of E-mail, word-processing, databases, statistical packages, spreadsheets, Medline, Cochrane, Embase, Cinahl, Web of Science, on-line journals and etc. Participation in videoconferencing. General principles of telemedicine.</i>
<ul style="list-style-type: none"><li>• Personal record keeping for professional development</li></ul>	<b>To monitor anatomy learning</b>	<i>The role and use of log books and portfolios.</i>

# How the doctor approaches their practice

## Outcomes for Basic, Social and Clinical Sciences and Underlying Principles

The competent graduate recognises, explains and manages health problems using the principles of current scientific knowledge and understanding that underpin medicine and understands the tenuous nature of knowledge.

	<b>Anatomy contribution</b>	<b><i>This could include:</i></b>
<ul style="list-style-type: none"> <li>• Normal structure and function of the individual as an intact organism and of each of its major organ systems</li> </ul>	<b>Topographical and systems based anatomy teaching</b>	<i>Anatomy, physiology, psychology/psychiatry, biochemistry, genetics. Molecular, biochemical, cellular and immunological mechanisms that are important in maintaining homeostasis</i>
<ul style="list-style-type: none"> <li>• The life cycle</li> </ul>	<b>Topographical and systems based anatomy teaching, including embryology</b>	<i>The different stages and how these affect normal structure and function e.g. the foetus; the neonate / infant; childhood; adolescence; adulthood; old age; death.</i>
<ul style="list-style-type: none"> <li>• Behaviour and relationships between an individual and his/her:               <ul style="list-style-type: none"> <li>• Family / partners</li> <li>• Immediate social groups</li> <li>• Society at large and the general population</li> <li>• Physical environment</li> <li>• Health professionals</li> <li>• Responses to illness</li> </ul> </li> </ul>	-	<i>Behavioural sciences, psychology and sociology</i>
<ul style="list-style-type: none"> <li>• Beliefs and understanding of health and illness</li> </ul>	-	
<ul style="list-style-type: none"> <li>• The mechanisms of diseases and the ways in which these diseases affect the body (pathogenesis)</li> </ul>	<b>Embryology; Topographical and systems based anatomy teaching as baseline for understanding disease processes including cell and tissue organisation and embryology</b>	<i>Knowledge and understanding of the following causes of disease: genetic, developmental, metabolic, toxic, microbiological, autoimmune, neoplastic, degenerative, traumatic, environmental, social, occupational.</i>
<ul style="list-style-type: none"> <li>• The alteration in structure and function of the body and its major organ systems resulting from various diseases and conditions</li> </ul>	<b>Topographical and systems based anatomy teaching as baseline for understanding disease processes</b>	<i>Appropriate pathology and pathophysiology.</i>
<ul style="list-style-type: none"> <li>• Pharmacological principles of treatment using drugs</li> </ul>	-	<i>Pharmacokinetics and pharmacodynamics. Mechanisms of action / interaction. Side effects / adverse reactions.</i>

- Principles of therapeutic measures in the management and symptomatic relief of diseases - *Drugs, surgery, radiotherapy, complementary therapies.  
Evidence base for use of therapeutic measures.*
- Public health - *Knowledge and understanding of scientific reasoning in the practice of public health in the NHS.  
Principles of healthcare planning, prioritisation of service and communicable disease control.*
- Health economics - *Knowledge and understanding of basic concepts including the cost of patient management to NHS, other care systems and society and rationing.*
- Disease prevention - *Knowledge and understanding of causes of disease and evidence of causes.  
Disease aetiology and relationships between risk factors and disease — high risk approach and population approach*
- Epidemiology - *Knowledge and understanding of principles of demography, biological variability and clinical trials.*
- Education - *Knowing about and applying basic theories of learning and teaching.  
Basic organisation of medical teaching and training in the UK.*

# How the doctor approaches their practice

## Outcomes for Attitudes, Ethical Understanding and Legal Responsibilities

The demonstration of appropriate attitudes by new medical graduates, as shown by their professional behaviour, is a key area of concern for educators and employers alike and is obviously also of great importance to patients and the public in general. It is therefore important to have attitudes as an outcome for undergraduate medical education even if it is more difficult to define what we mean by this in comparison to some of the other outcomes. The legal responsibilities of even new graduates are numerous and relate to all aspects of practice. A firm grasp of ethical principles and their appropriate application must be gained before graduation.

	<b>Anatomy contribution</b>	<b>This could include:</b>
<ul style="list-style-type: none"> <li>Appropriate professional attitudes</li> </ul>	<p><b>Respect for the cadaveric material used in anatomy teaching and awareness of the contribution made by the deceased, and their relatives, to their training</b></p>	<p><i>Establishing trust between doctor and patient and respect for patients and colleagues.</i>  <i>Adopting an empathic, holistic approach to patients and their problems.</i>  <i>Valuing and preserving patient autonomy and involving patients in decisions affecting them.</i>  <i>Respect for professional institutions and health service bodies.</i></p>
<ul style="list-style-type: none"> <li>Basic ethical principles and standards</li> </ul>	<p>Proper and full use of cadaveric material; discretion in public discussion of anatomical studies</p>	<p><i>Knowledge and understanding of contemporary medical ethics and the main ethical principles of autonomy, beneficence, non-maleficence and justice.</i>  <i>The duties of a doctor.</i>  <i>Practical application of theories e.g. consequentialism, deontology (duty) and double effect.</i>  <i>The importance of confidentiality, truthfulness and integrity.</i>  <i>Knowing under what circumstances the breaking of confidentiality can and should occur</i>  <i>Dealing effectively with complaints about own performance.</i></p>
<ul style="list-style-type: none"> <li>Legal responsibilities</li> </ul>	<p>Anatomy Act 1984 — confidentiality, restriction of access, security etc</p>	<p><i>Particularly with respect to:</i></p> <ul style="list-style-type: none"> <li><i>Death</i></li> <li><i>Drug prescribing</i></li> <li><i>Physical and sexual abuse of children and adults</i></li> <li><i>Use of the Mental Health Act</i></li> <li><i>Reporting of adverse medical care / standards involving other practitioners</i></li> <li><i>Codes of conduct</i></li> <li><i>Human rights issues</i></li> <li><i>Disclosure of patient information</i></li> </ul>
<ul style="list-style-type: none"> <li>Practice of medicine in a multicultural society</li> </ul>	<p><b>Early exposure to practical cultural and gender sensitivities in surface anatomy classes</b></p>	<p><i>Knowledge of and respect for differing cultures, views, beliefs and practices relating to the human body and healthcare.</i></p>
<ul style="list-style-type: none"> <li>Psychosocial issues</li> </ul>	<p>-</p>	<p><i>Those arising from patients and colleagues and relating to the multitude of differing characteristics making up the human personality.</i></p>
<ul style="list-style-type: none"> <li>Economic issues</li> </ul>	<p><b>Early indication of financial constraints limiting anatomical studies</b></p>	<p><i>Knowledge and appreciation of financial constraints affecting the NHS and their impact on delivery of care.</i></p>
<ul style="list-style-type: none"> <li>Contributing to the advancement of</li> </ul>	<p>Awareness of the continuing contribution of anatomy to</p>	<p><i>Progress in medical science and how it is achieved, particularly the potential for every</i></p>

medicine

the progress of medical  
science

*doctor to contribute to such progress.  
The doctor's role in ethical regulated clinical  
trials.*

# How the doctor approaches their practice

## Outcomes for Decision Making Skills, and Clinical Reasoning and Judgement

Decision making, and clinical reasoning and judgement are activities in which medical undergraduates should be proficient. The new medical graduate must continue to display such skills with the additional burden of increasing responsibility for their decisions and actions. This is undoubtedly one of the most stressful aspects of the transition between undergraduate and PRHO and therefore the achievement of these outcomes to a high standard is essential.

	<b>Anatomy contribution</b>	<b>This could include:</b>
• Clinical reasoning	<b>Provides the structural basis of function/malfunction eg carpal tunnel syndrome</b>	<i>How to recognise and define the problem, analyse and interpret information and cope with limitations of information and personal limitations.</i>
• Evidence-based medicine	<b>Eg analysis of joint structure and movement</b>	<i>How to seek the best available evidence and keep up to date. How to analyse and interpret evidence and work with guidelines and protocols. Recognising the link between evidence-based medicine and audit and the reasons for variation in clinical practice. Recognising the limitations of EBM</i>
• Critical thinking	Analysis of cadaveric material eg muscle orientation in relation to joint and movements induced by muscles	<i>The importance of adopting an inquisitive and questioning attitude and applying rational processes. Recognising irrationality in oneself and others. The importance of own value judgements and those of patients.</i>
• Research and scientific methodologies	Contribution to SSM s and intercalated BSc courses provides opportunities for exposure to scientific method;	<i>Knowledge and appreciation of quantitative and qualitative methodology including the differences between them and their appropriate usage. Using research and scientific methodologies to interpret investigations.</i>
• Statistical understanding and application	Anatomical study provides exposure to actual variation and provides a basis for the need for statistics in medical research;	<i>How to think and communicate quantitatively. Choosing and applying appropriate statistical tests with some understanding of the underlying principles and their strengths and weaknesses.</i>
• Creativity / resourcefulness	Understanding the basis of anatomical variation and anomalies; Interpretation of the effects of the disease process on normal 3-D structure	<i>Creative use of techniques, technologies and methodologies. Demonstration of self-reliance, initiative and pragmatism. The importance of sometimes looking outwith conventional boundaries.</i>
• Coping with uncertainty and error in decision making	Anatomical study requires constant reappraisal to accommodate individual lack of knowledge, and uncertainty due to biological variation and effects of disease process.	<i>Appreciating that uncertainty exists and that sources of uncertainty might include: oneself the environment the patient limits of knowledge How to use cognitive and intellectual strategies when dealing with uncertainty and the need to be adaptable to change. How to harness one's own emotional resilience and courage. The importance of making decisions in</i>

*partnership with colleagues and patients.  
An outline of levels of responsibility in the  
healthcare system.*

- **Prioritising**

Assessment of dissection  
guidelines in relation to time  
available; anatomical knowledge  
available has to be prioritised  
into what must be learned

*Knowledge and understanding of the factors  
influencing priorities.*

*How to prioritise one's own time as well as  
prioritising the care of patients both of which  
include management of tasks, events, time and  
stress.*

*How to use protocols to aid prioritisation.*

# The doctor as a professional

## Outcomes for The Role of the Doctor within the Health Service

This is a rapidly changing area of medical education and practice, which is subject to many external influences including political, legal and economic. However, there are a number of key outcomes applicable to the new graduate, awareness of which should provide a firm basis for dealing with future developments and changes within the health service.

### Anatomy contribution *This could include:*

- |   |  |  |
|---|--|--|
| <ul style="list-style-type: none"> <li>Healthcare systems -</li> </ul>  |  | <p><i>An outline of:</i></p> <ul style="list-style-type: none"> <li><i>the structure of the medical profession in the UK</i></li> <li><i>the professions allied to medicine</i></li> <li><i>roles and relationships of primary, secondary and tertiary care</i></li> <li><i>NHS organisation</i></li> <li><i>the origin and history of medical practice</i></li> <li><i>systems that impact on the NHS e.g. private medicine, EU, complementary therapies, etc.</i></li> <li><i>Other health care systems</i></li> </ul> |
| <ul style="list-style-type: none"> <li>The clinical responsibilities and role of a doctor -</li> </ul>  |  | <p><i>The Duties of a Doctor as defined by the General Medical Council.</i></p> <p><i>Appreciation of the medical profession as a voice in society and an agent of change.</i></p> <p><i>The importance of valuing and participating in professional audit.</i></p> <p><i>The doctor as an employee within a corporate organizational entity or as an independent contractor.</i></p>  |
| <ul style="list-style-type: none"> <li>Code of conduct and required personal attributes</li> </ul>  | Dissecting room guidelines as to personal conduct and security within legal framework (Anatomy Act 1984)   | <p><i>Duties of a Doctor (GMC)</i></p> <p><i>Local codes where applicable.</i></p>   |
| <ul style="list-style-type: none"> <li>The doctor as researcher</li> </ul>  | Discipline contributes actively to medical research  | <p><i>Appreciation of the value of medical research and how this is organised and funded in UK and Europe.</i></p> <p><i>Outlining the potential role of research in career progression and the opportunities for research even as an undergraduate.</i></p>   |
| <ul style="list-style-type: none"> <li>The doctor as mentor and teacher</li> </ul>  | Early exposure to anatomical knowledge that will need to be continuously developed as career progresses  | <p><i>The importance of reflecting on and analysing own experience of mentors and teachers identifying the positive and the negative and how to use this in one's own practice as a teacher of others.</i></p> <p><i>The importance of adopting a culture of life-long learning and fostering this in the health service.</i></p>  |
| <ul style="list-style-type: none"> <li>The doctor as manager -</li> </ul>   |  | <p><i>Managing people and resources e.g. financial.</i></p>  |
| <ul style="list-style-type: none"> <li>The doctor as a member of a multi-professional team and the roles of other healthcare professionals</li> </ul> | Learn benefits of being taught by anatomists, other scientists and clinicians from various disciplines - linkages that will be important in their professional lives; Appreciation that matters can be studied from different perspectives and with different outcomes | <p><i>The opportunity to learn with and be taught by other healthcare professionals during undergraduate education with an understanding of the benefits to be gained by all concerned including patients.</i></p> <p><i>Working with other healthcare professionals in the context of patient care as an undergraduate in order to better develop team-working, leadership and facilitative skills.</i></p>   |

## The doctor as a professional

### Outcomes for Personal Development

Personal development within the context of undergraduate medical education is a complex issue. The underlying personality of the individual graduate and his/her life experiences outwith the university have a major influence on personal development, as do experiences relating specifically to their training. Personal development is, of course, an ongoing, life-long process but it is possible to identify a number of important outcomes for the undergraduate period.

#### Anatomy contribution

#### *This could include:*

- Self-awareness      Small group work encourages contributions to common goals and acceptance of other points of view  
*The ability to conduct oneself as a reflective and accountable practitioner including seeking out sources of informed criticism and valuing, reflecting and responding to them appropriately. Enquiring into own competence and evaluating own capabilities and personal effectiveness*
- Self-learner      Use of anatomy textbooks, models, skeletal material, museum specimens as valuable self learning and continuous learning tools; CAL packages  
*The ability to manage own learning as demonstrated by:*
  - *searching out and selecting appropriate learning resources of all types*
  - *making use of all available technical aids*
  - *employing appropriate and effective study skills*
  - *recognising limitations of current personal understanding and capabilities and identifying areas needing refreshed or extended*
  - *setting realistic and appropriate personal learning goals*
  - *selecting learning strategies that take account of personal learning preferences and that are likely to succeed*
  - *setting challenging personal learning goals as a basis for personal growth*
- Self-care      Anatomy learning provides early standard by which lifestyle balances can be based  
*Recognition of the pressures of a demanding professional life on health, well-being and relationships with others and the need to maintain a balance between personal, professional and social goals and activities. Evidence of attention to lifestyle, diet, exercise and relaxation. Making use of available help and advice in stressful circumstances. Recognition of the hazards of self-medication or substance abuse in dealing with stress.*
- Career choice      -  
*Identify short and long-term career and personal plans and aspirations and work towards these by establishing realistic development plans involving relevant activities. Participate fully in the life of the professional community and make use of professional and other networks of all types.*
- Motivation      -  
*Recognising key personal motivating factors and their importance in sustaining a high level of motivation.*
- Commitment      -  
*Demonstrating dedication to one's chosen career pathway through adherence to the codes of conduct and behaviour expected of undergraduate medical students and doctors and an acceptance of any limitations that might be associated with them.*