The Ophthalmic Physician of Tomorrow

Curriculum for Medical Ophthalmology (Ophthalmic Medicine)

Federation of the Royal Colleges of Physicians

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How to Use This Curriculum

This curriculum is for doctors training in Medical Ophthalmology (Ophthalmic Medicine), their tutors and Educational Supervisors. This training programme runs from entry into Core Medical Training up to the award of a Certificate of Completion of Training (CCT). Trainees must have successfully completed a Foundation Programme and attained the core competencies outlined in the Foundation Curriculum1.

The outcome of the training programme will be a clinician equipped with a broad grounding in Internal Medicine and Ophthalmic Medicine, who is able to deliver effective patient-focused care.

This curriculum is set out as follows:

**Section 1 - Rationale**

This section describes the background to the development of the curriculum, the structure of training, and the purpose of the curriculum in medical training.

**Section 2 – Content of Learning**

This is the syllabus section of the curriculum, describing the knowledge, skills and attitudes that trainees need to learn.

**Section 3 – The Learning Process**

This section discusses the model of learning and the learning experiences for the training programme.

**Section 4 – Assessment Strategy**

This section outlines the systems for assessment of competencies for the curriculum.

**Section 5 – Trainee Supervision and Feedback**

This section recommends how a trainee should be supervised during the training programme and how feedback on learning should be given.
Section 6 – Curriculum Implementation

This section discusses how the management and implementation of the curriculum within training programmes will be achieved.

Section 7 – Curriculum Review

It is intended that the curriculum is a fluid document and will evolve as feedback is offered from trainers, trainees and laypersons. In this section the plans for curriculum review, evaluation and monitoring is laid out.

Section 8 – Equality and Diversity

This section describes how the curriculum complies with anti-discriminatory practice.
Section 1 - Rationale

This curriculum defines the medical competencies, which trainees must acquire to deliver the effective practice of Ophthalmic Medicine in the 21st century, with emphasis on the out-patient setting. These competencies are transferable, if required, to pursue other postgraduate training pathways, in accordance with the principles of Modernising Medical Careers.

1.1 – What is Medical Ophthalmology (Ophthalmic Medicine)?

Ophthalmic medicine has been defined as that part of General (Internal) Medicine concerned with the specialist management of adult patients with a wide range of medical conditions who present with visual symptoms.

Medical ophthalmologists are physicians trained in the specialist management of medical disorders affecting vision. The predominant workload consists of:

- Inflammatory disorders affecting vision (e.g. uveitis)
- Neurological disorders affecting vision (e.g. multiple sclerosis)
- Ophthalmic procedures particularly laser therapy and local injection therapy
- Retina specific disorders affecting vision (e.g. age-related macular degeneration)
- Vascular disorders affecting vision (e.g. diabetes)

These disorders are also the main causes of permanent visual impairment in the United Kingdom.

1.2 - Background

The specialty of ophthalmology has been revolutionised over the last fifteen years. New surgical techniques have seen major advances in the therapeutic options available to patients with structural abnormalities affecting the globe. Whereas in the past most ophthalmologists regarded themselves as generalists, many presently regard themselves as an advanced cataract surgeon and a specialist in one of the six to seven distinct surgical sub-specialities of ophthalmology.

Medical aspects of ophthalmology are starting to catch up with new developments in inflammatory disorders (anti-TNF therapy and other biologics), in neurological disorders (radiotherapy and immunosuppression for thyroid eye disease), in retina specific disorders (photodynamic therapy and intravitreal injection therapy for age-related macular degeneration) and in vascular disorders (retinal screening for people with diabetes, stroke prevention for patients with symptomatic carotid artery disease).
Whereas before the medical workload was insufficient to justify the presence of ophthalmic physicians within an eye department, the evidence now suggests that at least 50% of new referrals to ophthalmology requiring specialist care are medical in nature (British Journal Ophthalmology 2003; 87; 933-935). In the United Kingdom in 2004 there were 793 consultant ophthalmic surgeons but only 8 consultant ophthalmic physicians (medical ophthalmologists). The 2000 Royal College of Ophthalmologists Survey of Demand for Medical Ophthalmology in the UK, however, revealed that 50% of units wished to have an ophthalmic physician to help them to deliver effective care for diabetes, age-related macular degeneration, uveitis and neuro-ophthalmology.

Currently few surgical ophthalmologists elect to train in specific aspects of medical ophthalmology, which include the main causes of permanent visual loss. In particular, few train in inflammatory eye disease (uveitis). A 2005 survey, conducted by uveitis specialists in seven Scottish health boards, revealed a marked variation in patients receiving appropriate immunosuppression for sight-threatening uveitis, the commonest cause of treatable blindness in young adults. In part, this is reflected in variation in service provision (in NHS Grampian there were two consultants providing sub-specialist care in uveitis for a population of 526,000, while NHS Greater Glasgow had only one for a population of 858,000).

Surgical ophthalmology redesign of the United Kingdom workforce has led to an imbalance between the number of training posts and consultant vacancies. In 2006, the Workforce Review Team in England noted that the “Speciality (surgical) is now predicting an oversupply in 2012”, whilst at the same time the capacity to train ophthalmic physicians is limited. The increasing medical workload within ophthalmology now gives the option for doctors to train specifically in its medical aspects and to benefit from the same training in internal medicine that other medical specialties receive. From the patient with a medical condition’s point of view, rather than being co-managed by ophthalmology and another medical specialty, they now have the opportunity to be managed by a physician trained in all aspects of their care.

1.3 - Curriculum Development

Medical ophthalmology is an emerging specialty in the United Kingdom. Dr John Olson, Consultant Ophthalmic Physician and Dr Graeme Williams, Specialist Registrar in Medical Ophthalmology at Aberdeen Royal Infirmary, were asked to develop the curriculum in 2006 by the Medical Ophthalmology Specialist Advisory Committee. A draft curriculum was written and circulated to the Medical Ophthalmological Society United Kingdom, the Medical Ophthalmology Specialist Advisory Committee and the Royal College of Ophthalmologists for their input. The curriculum has been presented to the Medical Ophthalmology Specialist Advisory Council and the chairs of the Training and Education Committees of the Royal
College of Ophthalmologists. Every opportunity has been taken to involve key stakeholders in the development of the curriculum at several stages prior to implementation.

This curriculum is trainee-centred, and outcome-based. This curriculum follows on from Core Medical Training; a spiral approach has been adopted, as in the Foundation Programme. A spiral curriculum describes a learning experience that revisits topics and themes, each time expanding the sophistication of the knowledge, attitudes and decision-making regarding that topic. This approach aids reinforcement of principles, the integration of topics, and the achievement of higher levels of competency.

This visiting of topics is key to ensuring deep learning. This principle underpins the ethos of a spiral curriculum and effective life-long learning beyond Specialty Training. In this way an individual progresses from being 'competent' to becoming 'expert'.

1.4 - Training Structure

Entry into Medical Ophthalmology (Ophthalmic Medicine) training is possible following successful completion of a Foundation Programme and either Core Medical Training, (CMT) or Acute Care Core Stem – medicine (ACCS(M)).

1.5 - Generic Competencies

Every physician in training needs to acquire a professional, moral and legal framework for practice, as described by the GMC’s Good Medical Practice. These competencies are not specific to any particular medical specialty and are termed Generic Competencies'.

These competencies are defined in a separate document, the Generic Curriculum for the Medical Specialties, which complements the competencies of Core Medical Training, Specialist Training in GIM (Acute), and all medical specialties. This has avoided repetition of these values and competencies in each of the separate curricula. Attainment of the competencies defined in the Generic Curriculum for the Medical Specialties will be essential for the award of a CCT in any of the medical specialties.
specialties.

1.6 - Core Medical Training

This curriculum is for doctors training in General Internal Medicine (Acute Medicine), their tutors and Educational Supervisors. Trainees must have successfully completed a Foundation Programme and attained the core competencies outlined in the Foundation Curriculum.

The outcome of the training programme will be a clinician equipped with a broad grounding in Internal Medicine, who is able to deliver effective patient-focused care.

1.7 - Academic Medical Ophthalmology

The curriculum will facilitate the training of academic ophthalmic physicians in accordance with the Savill report

Academy of Medical Sciences. The tenure-track clinician scientist: a new career pathway to promote recruitment in clinical academic medicine (The Savill report. March 2000. (http://www.acmedsci.ac.uk/Clinic.pdf)).

As such trainees from AF2 programmes that lead into Academic fellowships will accrue training competencies and following successful higher degrees (during which further core competencies can be gained during their MD/PhD programme) can enter academic the Department of Health lectureship programme. Such candidates will be able under the following training accrue competencies within a structured training programme whilst further their research and academic career.
1.8 - Relationship of Postgraduate Medical Curricula

The following diagrams explain the relationship between the postgraduate medical training programmes and curricula. The *Generic Curriculum for Medical Specialties* spans training from entry into Core Medical Training, to the award of a CCT in medical ophthalmology, and so runs in conjunction with the other medical curricula.

**Relationship with the Royal College of Ophthalmologists’ Curriculum**

(Description of the diagram and the text below the diagram)
Trainees who enter from Surgical Ophthalmic Specialist Training will have to undergo Core Medical Training or Acute Care Common Stem. Where comparable competencies in specialist training in medical ophthalmology have already been obtained through ophthalmic specialist training, then these will be counted towards completion of specialist training in medical ophthalmology.

1.8 – Rotations

Core Training (core medical training- CMT or acute care common stem (ACCS): The two-year programme will consist of 4- or 6-month placements in a variety of medical specialties and include experience in Acute Medicine. This should take the form of at least 12 months contributing to the acute medical take with ongoing exposure to unselected medical patients in an in-patient or out-patient environment. The programmes should be structured to fit the needs of the trainee, both in terms of training needs and career aspirations.

Specialty Training in Medical Ophthalmology (Ophthalmic Medicine): The training structure for Medical Ophthalmology (Ophthalmic Medicine) will vary between Deaneries. However, specialist competencies require at least (indicative) 4 years of experiential learning.

1.9 - Experience versus Competence

This curriculum outlines the competencies required by clinicians to practise to different levels of competence in Medical Ophthalmology (Ophthalmic Medicine). The time taken for competence to be achieved will vary between individuals within and across programmes. To enable construction of a training programme, however, an indicative time likely to be required and for Medical Ophthalmology (Ophthalmic Medicine) this is four years.

This is a guide to the time that the majority of trainees will require to attain the necessary competencies. This indicative period of time assumes that although an individual can achieve basic competence in a specific skill, further experience is desirable to refine and improve a trainee’s performance. This principle reinforces the ethos of the spiral curriculum and effective life-long learning beyond specialty training. In this way it has been shown that an individual will progress from being ‘competent’ to becoming ‘expert’.
Section 2 – The Content of Learning

This section lists the specific knowledge, skills, attitudes and behaviours to be attained throughout training in Medical Ophthalmology (Ophthalmic Medicine). An explanation of the levels of training is provided in section 1.4: Training Structure. Each stage of learning in the curriculum has defined the competencies to be attained by the trainee, which are defined within the domains of knowledge, skills and attitudes. The competencies are presented in four parts:

**Part 2.1 – Core ophthalmic competencies** - define the additional ophthalmic skills required to assess the visual system.

**Part 2.2 - System specific competencies** - define competencies to be attained by the end of Specialist Training, and also lists the conditions and basic science of which the trainee must acquire knowledge.

**Part 2.3 - Investigation competencies** - lists investigations that a trainee must be able to describe, order, and interpret by the end of Specialist Training.

**Part 2.4 – Procedural competencies** - lists procedures that a trainee should be competent in by the end of Specialist Training.
2.1 Core Ophthalmic Skills

Assess vision acuity

All trainees must be able to assess visual acuity for near and distance using an appropriate method and interpret the results. They must be aware of and be able to interpret and apply newer methods of assessing visual acuity when they are introduced into clinical practice. They must be able to test colour vision using an appropriate method and interpret the results. They should also know the principles of the assessment of contrast sensitivity. They must be able to assess vision in children and in adults who have language and other barriers to communication. They must be able to assess vision in circumstances outside the out-patient department environment.

Assess and interpret visual fields by confrontation

All trainees must be able to make an assessment of normal and abnormal visual fields using an appropriate confrontational method. They must then be able to interpret any abnormality and the possible causes. They should be aware of the reliability of this method of visual fields assessment and know when to arrange for more detailed visual field analysis.

Assess macular function using the Amsler chart

All trainees must be able to use the Amsler chart for the assessment of macular function and be able to interpret the results. They must be aware of the reliability of the test. They must be able to instruct a patient in the use of the chart at home.

Perform a complete external eye examination of both eyes

All trainees must be able to perform an examination of the external eye, ocular adnexae, eyelids and orbits using appropriate equipment and illumination. They must be able to modify the examination and utilise other techniques as indicated by the clinical findings.

Examine the pupils and perform diagnostic pharmacological tests

All trainees must be able to assess the pupil for abnormalities of shape, size and reactions and interpret their findings. They must also be able to perform and interpret appropriate pharmacological tests for specific pupil abnormalities.
Perform a cover test and assess ocular motility

All trainees must be able to perform a cover test, assess ocular movements and interpret the findings. They must be able to perform a prism cover test. They must also be able to recognise and describe nystagmus if present.

Measure intraocular pressure using applanation tonometry

All trainees must be able to measure the intraocular pressure accurately using a variety of applanation techniques and understand the limits of each. They must be able to check the calibration of the tonometer.

Perform slit lamp biomicroscopy of the anterior segment using appropriate illumination techniques and stains, and diagnostic contact lenses

All trainees must be able to examine the eye and adjacent structures using the slit lamp and interpret their findings. They must be able to employ all of the functions of the slit lamp and use accessory equipment when indicated. They must know how to care for the equipment properly and prevent cross infection.

Examine the fundus using appropriate techniques

All trainees must be able to examine the fundus of the eye using appropriate techniques and interpret their findings. They must be able to use the direct and indirect ophthalmoscopes. They must be able to use a variety of lenses for binocular fundus examination with the slit lamp. They must be able to use appropriate indentation techniques.

2.2: System Specific Competencies

This curriculum describes the competencies required to practise Medical Ophthalmology (Ophthalmic Medicine) in a patient-centred way

Common and / or Important Problems

Learning to manage each mode of presentation does not avoid the need for a trainee to have a solid grounding of knowledge in specific medical conditions. It is also the case that patients very often already have a ‘diagnostic label’, for example a GP referring ‘a diabetic patient with maculopathy’. In the age of better patient education and patient involvement in their chronic disease management, frequently today’s clinician needs to refer to disease-specific knowledge earlier in the consultation. Therefore, listing the specific conditions aims to advise the trainee on the conditions that require detailed comprehension. The list also gives a guide...
to the topics that will form the basis for formal and work-place assessments. A framework for the knowledge required for specific conditions is set out below, and should continue to improve with time in line with the principles of a spiral curriculum:

- Definition
- Pathophysiology
- Epidemiology
- Features of History
- Examination findings
- Differential Diagnosis
- Investigations indicated
- Detailed initial management and principles of ongoing management (counselling, lifestyle, medical, surgical, care setting and follow up)
- Complications
- Prevention (where relevant to condition)

Clinical science

As trainees proceed through training they must pass formal summative assessments, the most notable of which is the MRCP (UK) examination. Part 1 of this examination in particular investigates knowledge of the science that underpins clinical medicine. This section of the curriculum defines the specialist areas of clinical science that the trainee is expected to recall for the specialty MRCP examination of Ophthalmic Medicine. This encourages a trainee’s deeper learning of some of the clinical concepts that have already been described in this curriculum, and offers an insight into the content of knowledge-based assessments.

Anatomy

All trainees must understand and apply specialist knowledge of the anatomy of the eye, adnexae, visual pathways and associated aspects of head, neck and neuro anatomy. It extends to applied anatomy relevant to clinical methods of assessment and investigation relevant to ophthalmic practice. They must be able to use this knowledge when interpreting clinical investigations and in the practice of medical ophthalmology (ophthalmic medicine).

Pathology

All trainees must understand and apply specialist knowledge of pathology, especially the specialist pathology of the eye, adnexae and visual system. This includes histopathology, microbiology and immunology and other branches of pathology. They must be able to use this
knowledge when interpreting clinical symptoms, signs and investigations and in the practice of ophthalmic medicine.

**Growth, development and senescence**

All trainees must understand and apply specialist knowledge of growth, development and senescence, and the anatomical, physiological and developmental changes that occur during embryogenesis, childhood and ageing relevant to ophthalmic practice. They must be able to use this knowledge when interpreting clinical symptoms, signs and investigations and in the practice of ophthalmic medicine.

**Optics and Medical Physics**

All trainees must understand and apply knowledge of optics, ultrasound and electromagnetic wavelengths relevant to ophthalmic practice. They must have a basic understanding of medical physics. They must be able to use this knowledge when interpreting clinical symptoms, signs and investigations and in the practice of ophthalmic medicine.

**The safe use of ophthalmic lasers**

All trainees must understand and apply knowledge of lasers relevant to ophthalmic practice. They must be able to use this knowledge when recommending laser treatment in the practice of ophthalmic medicine. They must be fully versed in local laser safety procedures. Trust-based laser safety certificate

**Instrument technology**

All trainees must understand and apply knowledge of instrument technology relevant to ophthalmic practice. They must be aware of the limitations of technology and the risks involved in their use. They must be able to maintain an understanding of new developments in relevant technologies.

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**Inflammatory Disorders Affecting Vision**

**Competencies**

- Outline the indications, contraindications and side effects of the major immunosuppressive drugs used in inflammatory disorders affecting vision
- Recognise the need for long term review in many cases of inflammatory disorders affecting vision and their treatments
- Recognise that infection and malignancy can masquerade as inflammation
• Recognise systemic involvement
• Elucidate risk factors for the development of an infectious disease including contacts, travel, animal contact and sexual history
• Recognise when specialist Microbiology or Infectious Diseases opinions are indicated
• Recognise when a patient is critically ill with sepsis, promptly initiate treatment and liaise with critical care and senior colleagues
• Outline spectrum of cover of common anti-microbials, recognising complications of inappropriate use
• Use local anti-microbial prescribing guidelines, including therapeutic drug monitoring when indicated
• Recognise importance of immunisation and Public Health in infection control, including reporting notifiable diseases
• Accurately describe skin lesions following assessment

Common or Important Problems

• Allergic Eye Disease
• Anterior Uveitis
• Atopic Eye Disease
• Blepharitis
• CNS infection: retinitis, meningitis, encephalitis, brain abscess
• Common cancers (presentation, diagnosis, staging, treatment principles): lung, bowel, breast, renal, carcinoid
• Common genito-urinary conditions: non-gonococcal urethritis, gonorrhoea, syphilis
• Conjunctivitis
• Dermatitis
• Dermatomyositis
• Endocarditis
• Episcleritis
• Herpes zoster and Herpes Simplex infections
• HIV and AIDS including ethical considerations of testing
• Imported fever
• Infections in immuno-compromised host
• Intermediate Uveitis
• Keratitis
• Mixed Connective Tissue Disorders
• Osteoporosis – risk factors, and primary and secondary prevention of complications of osteoporosis
• Panuveitis
• Paraneoplastic syndromes
• Polymyalgia and temporal arteritis
• Posterior Uveitis
• Rheumatoid arthritis
• Sarcoidosis
• Scleritis
• Scleroderma
• Sjogren’s syndrome
• Systemic lupus erythematosus
• Systemic Vasculitis
• Tuberculosis

Clinical Science

• Mechanisms of inflammation and immunity
• Mechanisms of allergic sensitisation: primary and secondary prophylaxis
• Natural history of allergic diseases
• Principles and limitations of allergen avoidance
• Mechanisms of organism pathogenesis
• Host response to infection
• Principles of vaccination
• Pharmacology of anti-allergic drugs, immunotherapy and anti-infective agents

Genetic Disorders Affecting Vision

Competencies

• Recognise the organisation and role of Clinical Genetics and when to seek specialist advice
• Take and interpret a complete family history
• Recognise the anxiety caused to an individual and their family when investigating genetic susceptibility to disease
• Recognise the importance of skilled counselling in the investigation of genetic susceptibility to disease
• Recognise basic patterns of inheritance
• Understand the ethical implications of molecular testing and screening: confidentiality, screening children, pre-symptomatic testing
• Estimate risk for relatives of patients with mendelian disease
• Recognise the differing attitudes and beliefs towards inheritance
Common or Important Problems

- Autosomal recessive congenital optic neuropathy
- Familial cancer syndromes
- Homocysteinuria
- Leber’s optic neuropathy
- Marfan’s syndrome
- Mitochondrial myopathies
- Myotonic dystrophy
- Neurofibromatosis
- Retinal dystrophies
- Retinitis pigmentosa

Clinical Science

- Structure and function of human cells, chromosomes, DNA, RNA and cellular proteins
- Principles of inheritance: mendelian, sex-linked, mitochondrial
- Principles of pharmacogenetics
- Principles of mutation, polymorphism, trinucleotide repeat disorders
- Principles of genetic testing including metabolite assays, clinical examination and analysis of nucleic acid (e.g. PCR)
- Pathophysiology of genetic disorders affecting vision

Neurological Disorders Affecting Vision

Competencies

- Define the likely site of a lesion within the nervous system following full assessment
- Recognise when specialist opinion is indicated
- Recognise when a patient’s presentation heralds a neurosurgical emergency and refer appropriately
- Be aware of the management and subsequent investigation of patients presenting with neurological medical emergencies such as cerebrovascular accident, accelerated hypertension, aneurysm formation, fistula or dissection

Common or Important Problems

- Acute new headache
- Central Nervous System infection: encephalitis, meningitis, brain abscess
- Concomitant squint
• Cranial nerve palsies
• Functional disorders
• Headache including migraine, migrainous neuralgia and hemicrania
• Horner’s syndrome
• Infection
• Inflammation
• Multiple sclerosis
• Myasthenia gravis
• Non-specific orbital inflammation
• Paraneoplastic disorders
• Raised intracranial pressure
• Stroke and transient ischaemic attack
• Sub-arachnoid haemorrhage
• Thyroid eye disease
• Tumour

Clinical Science

• Anatomy or cerebral blood supply
• Cerebral automaticity
• Pathophysiology of pain
• Pharmacology of major drug classes: anxiolytics, hypnotics inc. benzodiazepines, antiepileptics,
• Physiology of nerve conduction
• Principles of neurotransmitters
• Structure and function of the central, peripheral and sympathetic nervous systems
• Structure and physiology of visual, auditory, and balance systems

Public Visual Health

Competencies

• To be aware of the importance and implications of identifying asymptomatic sight-threatening eye disease in people who perceive themselves to be in good visual health
• To be aware of the importance of internal and external quality assurance
• The ability to lead a multi-professional team of health care workers across the primary care/secondary care interface
Common or Important Problems

- Organisation and delivery of effective visual health care in the community
- Organisation and delivery of systematic screening for diabetic retinopathy in people diagnosed with diabetes

Clinical Science

- Patient management and recall
- Theory and practice of systematic screening

Retina Specific Disorders Affecting Vision

Competencies

- Recognise when specialist opinion is required.
- Be aware of the management and subsequent investigation of patients presenting with retina specific emergencies particularly choroidal neovascular membrane formation

Common or Important Problems

- Disorders of the choroid, particularly neovascular membrane formation
- Disorders of the retinal pigment epithelium
- Disorders of the photoreceptors/bipolar cells/ganglion cells
- Local disorders of retinal blood vessels
- Disorders of the vitreo-retinal interface

Clinical Science

- Pathophysiology of acquired “retina specific disorders”
- Therapeutic options for acquired “retina specific disorders”

Vascular Disorders Affecting Vision

Competencies

- Recognise when specialist opinion is required
- Be aware of the management and subsequent investigation of patients presenting with vascular medical emergencies such as cerebrovascular accident, accelerated hypertension, aneurysm formation, fistula or dissection
• Outline risk factors for vascular disease
• Counsel patients on risk factors for vascular disease
• Outline methods of smoking cessation of proven efficacy

**Common or Important Problems**

• Arteriosclerosis/ Atherosclerosis
• Carotid artery dissection
• Cerebrovascular disease
• Diabetes
• Diabetic retinopathy
• Dyslipidaemia
• Endocarditis
• Hypertension, including management of accelerated hypertension
• Ocular ischaemia
• Retinal artery macroaneurysm
• Retinal artery occlusion
• Retinal vein occlusion
• Thrombophilia
• Transient ischaemia
• Valvular Heart Disease

**Clinical Science**

• Anatomy and function of cardiovascular system
• Homeostasis of the circulation
• Atherosclerosis
• Pharmacology of major drug classes: beta blockers, alpha blockers, ACE inhibitors, ARBs, anti-platelet agents, thrombolysis, inotropes, calcium channel antagonists, potassium channel activators, diuretics, anti-arrhythmics, anti-coagulants, lipid modifying drugs, nitrates, centrally acting anti-hypertensives
• Structure and function pancreas
• Outline the structure and function of insulin
• Pharmacology of major drug classes: insulin, oral antidiabetics
Visual Rehabilitation

Competencies

- Organisation and delivery of visual rehabilitation
- Elucidate in older patients co-morbidities, activities of daily living, social support, drug history and living environment
- Recognise when specialist Medicine in the Elderly opinion is indicated
- Recognise importance of multi-disciplinary assessment
- Set realistic visual rehabilitation targets
- Recognise that older patients often present with multiple problems (e.g. loss of vision, falls and confusion, immobility and incontinence)

Common or Important Problems:

- Acute confusion
- Age related pharmacology
- Central visual loss
- Cortical visual impairment
- Dementia
- Depression in the elderly
- Deterioration in mobility
- Falls
- Homonymous visual defects
- Peripheral retinal visual loss

Clinical Science

- The normal physiology of ageing

2.3: Investigation Competencies

Listed below are the investigations that the trainee is expected to be able to outline the indications for and interpret by the end of Core Medical Training. The second list states the investigations that the trainee should know the indications for, and how the investigation is carried out. A detailed interpretation is not expected, as these investigations usually require specialist interpretation (e.g. histology, radiology). However, the reports of such tests should be interpreted in the clinical context.
Outline the Indications for, and Interpret the Following Investigations:

Biochemistry

- Basic blood biochemistry: urea and electrolytes, liver function tests, bone biochemistry, glucose, magnesium
- Cardiac biomarkers and cardiac-specific troponin
- Creatine kinase
- Thyroid function tests
- Inflammatory markers: CRP / ESR
- Arterial Blood Gas analysis
- Cortisol and short Synacthen test
- HbA1C
- Lipid profile
- Amylase
- Drug levels: paracetamol, salicylate, digoxin, antibiotics, anti-convulsants

Haematology

- Full blood count
- Coagulation screen
- Haemolysis screen
- D dimer
- Blood film report
- Haematinics

Microbiology / Immunology

- Blood / Sputum / urine culture
- Fluid analysis: pleural, cerebro-spinal, ascitic
- Urinalysis and urine microscopy
- Auto-antibodies
- H. Pylori testing

Radiology

- Chest radiograph
- Abdominal radiograph
• Joint radiographs (knee, hip, hands, shoulder, elbow, dorsal spine, ankle)

Physiological

• ECG
• Peak flow tests
• Full lung function tests

Outline the Principles of the Following Investigations:

Biochemistry

• Urine catecholamines
• Sex hormones (FSH, LH, testosterone, oestrogen and progesterone)
• Prolactin
• Specialist endocrine suppression or stimulation tests (dexamethasone suppression test; insulin tolerance test; water deprivation test, glucose tolerance test and growth hormone)

Microbiology / Immunology

• Coeliac antibody screening
• Viral hepatitis serology
• Myeloma screen
• Stool testing
• HIV testing

Radiology

• Detailed imaging: Barium studies, CT, CT pulmonary angiography, high resolution CT, MRI
• Imaging in endocrinology (thyroid, pituitary, adrenal)
• Renal imaging: ultrasound, KUB, IVU, CT

Physiological

• Echocardiogram
• 24 hour ECG monitoring
• Ambulatory blood pressure monitoring
• Exercise tolerance test
- Cardiac perfusion scintigraphy
- Tilt testing
- Neurophysiological studies: EMG, nerve conduction studies, visual and auditory evoked potentials

**Medical Physics**

- Bone scan
- Bone densitometry
- Scintigraphy in endocrinology
- V/Q scanning

**Endoscopic Examinations**

-Bronchoscopy
- Upper and lower GI endoscopy
- ERCP

**Pathology**

- Liver biopsy
- Renal biopsy
- Bone marrow and lymph node biopsy
- Cytology: pleural fluid, ascitic fluid, cerebro-spinal fluid, sputum

By the end of specialist training in Medical Ophthalmology (Ophthalmic Medicine) the trainee should be able to outline the indications for and interpret the following additional investigations:

- Orthoptic assessment
- Assessment of corneal shape, structure and thickness
- Retinal and optic nerve imaging techniques
- Ocular angiography
- Ocular and neuro-electrophysiology
- Visual Fields (automated, manual)
- Tensilon Test
- Ultrasonography of the eye, anterior orbit and neck
- Neuroimaging of the brain and orbit including magnetic resonance imaging, computed tomography and cerebral angiography
- Aqueous sampling
• Vitreous biopsy

2.4: Procedural Competencies

The trainee is expected to be competent in performing the following procedures by the end of core training. The trainee must outline the indications for these interventions. For invasive procedures, the trainee must recognise the indications for the procedure, the importance of valid consent, aseptic technique, safe use of local anaesthetics and minimising patient discomfort.

• Venepuncture
• Cannula insertion, including large bore
• Arterial blood gas sampling
• Lumbar Puncture
• Pleural tap and aspiration
• Intercostal drain insertion: Seldinger technique
• Ascitic tap
• Abdominal paracentesis
• Central venous cannulation
• Initial airway protection: chin lift, guedel airway, nasal airway, laryngeal mask
• Basic and, subsequently, advanced cardiorespiratory resuscitation
• DC cardioversion
• Urethral catheterisation
• Nasogastric tube placement
• Electrocardiogram
• Knee aspiration
• Temporary cardiac pacing by internal wire or external pacemaker
• Skin Biopsy (this is not mandated for all trainees but opportunities to become competent in this technique should be available especially for trainees who subsequently wish to undertake specialist dermatology training)

By the end of specialist training in Medical Ophthalmology (Ophthalmic Medicine) the trainee should be competent at the instruction, appraisal and assessment of junior doctors in the performance of the following additional procedures:

• Recognise and assist with the special needs of people with visual impairment in the clinical environment
• Administer periocular and intraocular drugs
• Achieve appropriate local anaesthesia, and recognise the possible complications
• Assess lacrimal function
• Perform anterior chamber paracentesis
• Perform a corneal scrape
• Remove ocular surface foreign bodies
• Achieve punctal occlusion
• Fit a bandage contact lens
• Administer periocular botulinum toxin injections
• Perform ocular ultrasound
• Demonstrate lid hygiene to a patient
• Perform anterior chamber and vitreous sampling
• Carry out irrigation and debridement of ocular contaminants
• Apply appropriate laser for the management of the lens capsule
• Apply appropriate laser for the management of raised intraocular pressure
• Apply appropriate laser for the management of retinal problems
Section 3 – The Learning Process

This section describes how learning can be achieved to accomplish the outcomes of the curriculum.

3.1 – The Model of Learning

This section describes the model of learning appropriate to Medical Ophthalmology (Ophthalmic Medicine). Trainees will achieve the competencies described in the curriculum through a variety of learning methods. There will be a balance of different modes of learning from formal teaching programmes to experiential learning ‘on the job’. The proportion of time allocated to different learning methods may vary depending on the nature of the attachment within a rotation. There must be robust arrangements for quality assurance in place to ensure consistent implementation of the curriculum (see Sections 5 and 6).

Work-Based Experiential Learning - The content of work-based experiential learning is decided by the local faculty for education (defined in Section 6 of this curriculum) but includes active participation in:

For Core Medical Training and Specialist Training:

- **Medical clinics including specialties**, including rapid access clinics. After initial induction, trainees will review patients in outpatient clinics, under direct supervision. The degree of responsibility taken by the trainee will increase as competency increases. As experience and clinical competence increase trainees will assess ‘new’ and ‘review’ patients and present their findings to their clinical supervisor.

- **Personal ward rounds and provision of ongoing clinical care** on ophthalmic or specialist medical ward attachments. Every patient seen, on the ward or in out-patients, provides a learning opportunity, which will be enhanced by following the patient through the course of their illness: the experience of the evolution of patients’ problems over time is a critical part both of the diagnostic process as well as management. Patients seen should provide the basis for critical reading and reflection of clinical problems.

- **Consultant-led ward rounds**. Every time a trainee observes another doctor, consultant or fellow trainee, seeing a patient or their relatives there is an opportunity for learning. Ward rounds, including those post-take, should be led by a consultant and include feedback on clinical and decision-making skills.

- **Procedural teaching**. All trainees are encouraged to take a procedural skills course in the clinical skills lab setting. Further highly supervised procedural experience can be obtained through the use of simulators (where appropriate and available) and staged
delivery on selected patients. As competence in specific procedural skills is gained, the level of supervision will decrease until independent practice is achieved. Assessment of progress will involve workplace-based assessment (DOPS, direct observation of procedural skills). Trainees would be expected to teach and supervise procedural skills in which they themselves are competent, to Foundation, Core Medical and Specialist trainees.

- **Multi-disciplinary team meetings.** There are many situations where clinical problems are discussed with clinicians in other disciplines. These provide excellent opportunities for observation of clinical reasoning.

- **Specialist provision of clinical care.** Some learning outcomes may be best achieved in some programmes by active participation in, or attendance at, clinics in related specialties e.g. neurology, rheumatology, dermatology, and relevant surgical specialties. Each local faculty for education will define the programme of learning activities. Trainees have supervised responsibility for the care of in-patients. This includes day-to-day review of clinical conditions, note keeping, and the initial management of the patient with referral to and liaison with clinical colleagues as necessary. The degree of responsibility taken by the trainee will increase as competency increases. There should be appropriate levels of clinical supervision throughout training with increasing clinical independence and responsibility as learning outcomes are achieved (see Section 5: Feedback and Supervision).

**Formal Postgraduate Teaching** – The content of these sessions are determined by the local faculty of medical education and will be based on the curriculum. There are many opportunities throughout the year for formal teaching in the local postgraduate teaching sessions and at regional, national and international meetings. Many of these are organised by the Royal Colleges of Physicians and the Royal College of Ophthalmologists. Suggested activities include:

- A programme of formal bleep-free regular teaching sessions to cohorts of trainees
- Case presentations
- Research and audit projects
- Journal clubs
- Lectures and small group teaching
- Grand rounds
- Clinical skills demonstrations and teaching
- Critical appraisal and evidence based medicine and journal clubs
- Joint specialty meetings e.g. ophthalmology, neurology, radiology, pathology, rheumatology
• Attendance at training programmes organised on a deanery or regional basis, which are designed to cover aspects of the training programme outlined in this curriculum. This programme should run on a three-year cycle

**Independent Self-Directed Learning** - Trainees will use this time in a variety of ways depending upon their stage of learning. Suggested activities include:

- Preparation for assessment and examinations
- Reading journals
- Reading, including web-based material
- Maintenance of personal portfolio (self-assessment, reflective learning, personal development plan)
-Audit and research projects
- Achieving personal learning goals beyond the essential, core curriculum

**Formal Study Courses** - Time to be made available for formal courses is encouraged, subject to local conditions of service. Examples include recognised Medicine courses, Ophthalmology courses, practical skills courses, appropriately structured and resourced revision courses for MRCP(UK), ALS courses.

### 3.2 – Learning Experiences

This section identifies the types of situations in which a trainee will learn.

**Learning from Practice** - Trainees will spend a large proportion of work-based experiential learning involved in supervised clinical practice in hospital and community settings. Learning will involve closely supervised clinical practice until competences are achieved. The learning environment will be in, Medical Assessment Units, General and Specialist Medical wards, A/E and critical care environments and outpatient clinics. Opportunities for informal and formal feedback on performance should occur during and at the end of clinical sessions as part of a structured appraisal process defined in the accompanying portfolio (see Section

**3.3: Work based experiential learning**

**Distributed and Concentrated Practice** - Training programme directors within local faculties of education will decide upon the details of clinical attachments. Training in Medical Ophthalmology (Ophthalmic Medicine) is distributed across medical specialties and
surgical ophthalmology with emphasis on opportunities to practise in the Medical Ophthalmology setting. As the trainee acquires competence in this area of training the emphasis of training should change such that more senior trainees take a supervisory and educational role for junior medical colleagues as well as continuing to hone their own clinical skills.

**Learning with Peers** - There are many opportunities for trainees to learn with their peers. Local postgraduate teaching opportunities allow trainees of varied levels of experience to come together for small group learning. Examination preparation encourages the formation of self-help groups and learning sets.

**Learning in Formal Situations** - There are many opportunities throughout the year for formal teaching in the local postgraduate teaching sessions and at regional, national and international meetings. Many of these are organised by the Royal Colleges of Physicians and the Royal College of Ophthalmologists.

**Personal Study** - Time will be provided during training for personal study. It may be possible for longer periods of private study to be offered as part of study leave.

**Specific Teacher inputs** - Individual units within a teaching programme will identify specific teacher inputs. These will vary from programme to programme. Recommendations for good practice are identified in the learning portfolio. Examples are:

- Each trainee must have a clinical supervisor for each attachment for workbased experiential teaching
- Specialty teaching in a clinical environment from a recognised specialist
- Advanced Life support teaching from a recognised training provider
- Procedural skills teaching delivered by a skilled specialist in both workbased setting and on formal courses
Section 4 – Assessment Strategy

The domains of Good Medical Practice will be assessed using an integrated package of workplace-based assessments and examination of knowledge and clinical skills, which will sample across the domains of the curriculum (e.g. knowledge, skills and attitudes). The assessments will be supported by structured feedback for trainees within the training programme of Medical Ophthalmology (Ophthalmic Medicine). Assessment tools will be both formative and summative and will be selected on the basis of their fitness for purpose. It is likely that the workplace-based assessment tools will include mini-CEX (mini-Clinical Examination Exercise), DOPS (Direct Observation of Procedural Skills) and MSF (multi-source feedback). The Federation of the Royal Colleges of Physicians has piloted these methods and has demonstrated their validity and reliability. It is proposed that the examination and assessment of knowledge will utilise elements of the MRCP(UK) examination, relevant to the level of training. There will be a specialty-specific knowledge examination for those seeking a CCT in Medical Ophthalmology (Ophthalmic Medicine). An assessment blueprint will be developed which will map the assessment methods on to the curriculum in an integrated way. The blueprint will ensure that there is appropriate sampling across the curriculum.
Section 5 – Trainee Supervision and Feedback

This section of the curriculum describes how trainees will be supervised, and how they will receive feedback on performance. The learning portfolio for physicians in training outlines the mechanisms for supervision and appraisal in more detail.

5.1 - Supervision

All training in Medical Ophthalmology (Ophthalmic Medicine) should be conducted in institutions with appropriate standards of clinical governance and that meet the relevant Health and Safety standards for clinical areas. Training placements must also comply with the European Working Time Directive for trainee doctors. Trainees must work with a level of clinical supervision commensurate with their clinical experience and level of competence. This is the responsibility of the relevant clinical supervisor after discussion with the trainee’s Educational Supervisor and the designated clinical governance lead. In keeping with the principles of Good Medical Practice, trainees should know that they must limit their clinical practice to the level of their clinical competence and should seek help and support without hesitation. The Educational Supervisor, when meeting with the trainee, should discuss issues of clinical governance, risk management and any report of any untoward clinical incidents involving the trainee. The Educational Supervisor should be part of the clinical specialty team. Thus if the clinical directorate (clinical director) have any concerns about the performance of the trainee, or there were issues of doctor or patient safety, these would be discussed with the Educational Supervisor. These processes, which are integral to trainee development, must not detract from the statutory duty of the trust to deliver effective clinical governance through its management systems.

The Educational Supervisor is integral to the appraisal process. This is discussed in more detail in the training portfolio. A trainee appraisal with the Educational Supervisor will include feedback on performance, review of outcomes of assessments, induction to posts and career advice. The Postgraduate deaneries should recognise the active role of Educational Supervisor in training and offer appropriate support.

5.2 - Feedback

Frequent and timely feedback on performance is essential for successful workbased experiential learning. To train as a physician, a doctor must develop the ability to seek and respond to feedback on clinical practice from a range of individuals to meet the requirements of Good Medical Practice and revalidation.
The local education faculty will establish clear processes for feedback, with close liaison with designated Educational Supervisors.

Constructive feedback should be provided throughout training in both formal and informal settings. Opportunities for feedback will arise during appraisal meetings, when trainees are undergoing workplace-based assessments, in the workplace setting, and through discussions with supervisors, trainers, assessors and those within the team.

Best practice guidance for the appraisal process is provided by the Royal Colleges of Physicians in the training portfolio (in the Appraisal Section). This guidance emphasises the need for:

- An initial appraisal meeting shortly after the start of a training placement to establish learning objectives and construct a personal development plan
- An interim appraisal meeting to discuss progress against the learning objectives
- An appraisal meeting towards the end of the training placement to reflect on the learning achievements during the attachment with reference to the initial learning objectives within the personal development plan.
- Structured written feedback from clinical supervisors
- Appropriately structured written feedback from medical colleagues and departmental staff (multi-source feedback, MSF) to include nursing staff, managerial, clerical and secretarial staff and medical staff in relevant directorates e.g. radiology, anaesthesia. This is collated by the Educational Supervisor to form the basis of a discussion with the trainee.
- Feedback on performance in recent workplace-based assessments to inform future development

It is recommended the above guidance apply irrespective of the duration of that particular attachment. Evidence that feedback has been received and subject to reflection by the trainee will be recorded in the portfolio, and discussed at the regular appraisals with the trainee’s supervisor.
Section 6 – Curriculum Implementation

This section of the curriculum provides an indication of how the curriculum is managed locally and within programmes. Specialist Training in Medical Ophthalmology lasts 4 years. It follows on from the medical competencies specified in “The Physician of Tomorrow, Medical Competencies Curriculum for General Internal Medicine (Acute Medicine)”. Specialty training consists of the application of specialist medical and ophthalmology skills to medical disorders involving vision. Specialty training is expected to include continuous training in:

- Inflammatory disorders affecting vision
- Neurological disorders affecting vision
- Ophthalmic procedures, particularly laser therapy
- Retina specific disorders affecting vision
- Vascular disorders affecting vision

This will allow the curriculum to spiral throughout the four years of specialist training.

Other aspects of training may be more suitable to modular training:

- Genetic disorders affecting vision
- Public visual health

6.1 - Training Programmes

The organisation of training programmes for core training and specialist training in Medical Ophthalmology (Ophthalmic Medicine) is the responsibility of the postgraduate deaneries. The Deaneries are currently establishing appropriate programs for postgraduate medical training in their regions. These schemes will be known as Schools of Medicine in England, Wales and Northern Ireland and Transitional Board Schemes in Scotland. In this curriculum, they will be referred to as local Faculties for medical education. The role of the Faculties will be to coordinate local postgraduate medical training, with terms of reference as follows:

- Oversee recruitment and induction of trainees from Foundation to core training, and from core training into Specialty Training
- Allocate trainees into particular rotations for core training, appropriate to their training needs and wishes
- Oversee the quality of training posts provided locally
- Interface with other Deanery Specialty Training faculties (General Practice, Anaesthesia etc)
- Ensure adequate provision of appropriate educational events
• Ensure curricula implementation across training programmes
• Oversee the workplace-based assessment process within programmes
• Coordinate the RITA process for trainees
• Provide adequate and appropriate career advice
• Provide systems to identify and assist doctors with training difficulties
• Provide flexible training
• Recognise the potential of specific trainees to progress into an academic career

6.2 - Intended Use of Curriculum by Trainers and Trainees

This curriculum, the accompanying curricula (Generic Curriculum for Medical Specialties, General Internal Medicine (Acute Medicine)) and learning portfolio are web-based documents which are available from the Joint Royal Colleges of Physicians Training Board (JRCPTB) website.

Each trainee will be given copies of the curricula and portfolio upon enrolling as a Core Medical Trainee with the JRCPTB.

Each trainee will engage with the curriculum by maintaining a portfolio. The trainee will use the curriculum to develop learning objectives, self-assess accomplishment in disparate areas of the curriculum, and reflect on learning experiences.

6.3 - Ensuring Curriculum Coverage

The details of how the curriculum is covered in any individual training programme and training unit is the responsibility of the local faculty of education in consultation with the Federation of Royal Colleges of Physicians. The need to show how trainees are progressing in their attainment of competencies will be a strong driver in ensuring that all the curriculum objectives are met.

6.4 - Responsibilities of trainees

This curriculum puts the emphasis on learning rather than teaching. Trainees are responsible for their own learning and the utilisation of opportunities for learning throughout their training. The workplace-based assessment process is also trainee led.

6.5 - Curriculum management

Local management of the curriculum is the responsibility of the local faculty of education.
Coordination of the Curriculum at national and regional level is the joint responsibility of the Deaneries and the Federation of Royal Colleges of Physicians.

Deaneries are responsible for quality management, PMETB will quality assure the deaneries and educational providers are responsible for local quality control, to be managed by the deaneries. The role of the Colleges in quality management remains important and will be delivered in partnership with the deaneries. The College role is one of quality review of deanery processes and this will take place within the SACs on a regular basis.

The Organisation and Quality Assurance of PG Training

Diagram:
- National, Regional, Local levels
- Hospital Trusts, GP Practices, QC Environment of learning, QM Commissioner/Organiser of training, QA Standards Setting
- Deaneries, Specialty Training Committees/Schools, PMETB
Section 7 – Curriculum Review

7.1 Curriculum evaluation and monitoring

The Federation of Royal Colleges of Physicians Curriculum Review Committee will oversee evaluation of the Medical Ophthalmology (Ophthalmic Medicine) curriculum, the accompanying Generic Curriculum for Medical Specialties, General Internal Medicine (Acute Medicine) and the portfolio. The curricula should be regarded as living documents and the committee will ensure that it will be able to respond swiftly to new developments. The outcome of these evaluations will inform the future development of the curricula.

This Federation committee will consist of representatives from the Specialist Advisory Committee for Medical Ophthalmology (Ophthalmic Medicine), General Internal Medicine (Acute Medicine) and the sub-committee of JRCPTB responsible for Core Medical Training; the Royal College of Ophthalmologists, lay persons; and trainees.

Formal evaluation will take place during the pilot stage of curriculum implementation and during the first year of full implementation. Evaluation will continue (as indicated from the early evaluations) during the first five years of General Internal Medicine (Acute Medicine) Training. Evaluation will continue periodically thereafter, probably every 5 years. Evaluation of the curriculum will seek to ascertain:

- Learner response to the curriculum
- Modification of attitudes and perceptions
- Learner acquisition of knowledge and skills
- Learner’s behavioural change
- Change in organisational practice

Evaluation methods will include:

- Trainee questionnaire
- College representative and Programme Director questionnaire
- Focused discussions with Educational Supervisors, trainees and, Programme Directors and Postgraduate Deans

Monitoring will be the responsibility of the Programme Directors within the local faculties for education.
7.3 - Trainee involvement in Curriculum Review

Trainee involvement in curriculum review will be facilitated through:

- Involvement of trainees in local faculties of education
- Trainees involvement in the Federation of Royal Colleges of Physicians Curriculum Committee
- Informal feedback during appraisal, RITA, College meetings
Section 8 – Equality and Diversity

The Royal Colleges of Physicians will comply, and ensure compliance, with the requirements of relevant legislation, such as the:


The JRCPTB believes that equality of opportunity is fundamental to the many and varied ways in which individuals become involved with the Colleges, either as members of staff and Officers, as advisers from the medical profession, as members of the Colleges' professional bodies or as doctors in training and examination candidates. Accordingly, it warmly welcomes contributors and applicants from as diverse a population as possible, and actively seeks to recruit people to all its activities regardless of race, religion, ethnic origin, disability, age, gender or sexual orientation.

Deanery quality assurance will ensure that each training programme complies with the equality and diversity standards in postgraduate medical training as set by PMETB.

Compliance with anti-discriminatory practice will be assured through:

- Monitoring of recruitment processes
- Ensuring all College representatives and Programme Directors have attended appropriate training sessions prior to appointment or within 12 months of taking up post
- Ensuring trainees have an appropriate, confidential and supportive route to report examples of inappropriate behaviour of a discriminatory nature
- Monitoring of College examinations

Ensuring all assessments discriminate on objective and appropriate criteria and do not unfairly disadvantage trainees because of gender, ethnicity, sexual orientation or disability (other than that which would make it impossible to practise safely as a physician). All efforts shall be made to ensure the participation of people with a disability in training.
Statutory responsibilities

The Royal Colleges of Physicians will comply, and ensure compliance, with the requirements of legislation, such as the:

- Human Rights Act 1998
- Freedom of Information Act 2001
- Data Protection Acts 1984 and 1998
References


www.mmc.nhs.uk/pages/foundation/Curriculum

http://www.rcplondon.ac.uk/pubs/books/AcuteMedicine/AcuteMedicineSummary.pdf


Harden RM, Stamper N. What is a spiral curriculum? Medical Teacher 1999; 21(2):141-143

www.gmcuk.org/publications/draft_consultation.pdf