The ROYAL COLLEGE of OPHTHALMOLOGISTS

Postgraduate Medical Training

# Neuro-ophthalmology syllabus

## Patient Management domain

# Contents

# 1 Introduction

### Definition of Special Interest Area (SIA)

Neuro-ophthalmology is the area of ophthalmology and neurology that studies disturbances of vision and eye movements that have a neurological basis. Neuro-ophthalmology covers conditions that present an acute threat to vision and life.

The scope of the clinical practice of neuro-ophthalmology varies widely, in part because it blends the skills and services of its two parent disciplines: neurology and ophthalmology. Additionally, neuro-ophthalmology incorporates selected knowledge from other disciplines, including neurosurgery, radiology, otolaryngology and rheumatology.

# 2 Syllabus

| **Level 1** | |
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| **Learning Outcome** | **Descriptors** |
| ***An ophthalmologist achieving this level will:*** | |
| **Independently perform a patient assessment and investigations sufficient to identify, describe and interpret clinical findings to arrive at differential diagnoses.**<br><br>*These descriptors are replicated on all SIA syllabi (i-xi)* | ▪ Demonstrate effective consultation skills, including active listening skills.<br>▪ Take ophthalmic and relevant systemic clinical histories appropriate to the clinical problem and patient's needs, eliciting the patient's ideas, concerns and expectations.<br>▪ Take a family history, and draw a pedigree chart as appropriate.<br>▪ Establish an effective, empathetic, compassionate and respectful doctor-patient relationship.<br>▪ Demonstrate cultural and social awareness.<br>▪ Understand the risks, professional responsibilities and safeguards of remote consultations, e.g. telephone, online consultations.<br><br>▪ Measure and record visual acuity for near and distance using an appropriate method and interpret the results. Understand the pros and cons of different methods of assessment for different patient groups.<br>▪ Be able to approximate equivalent levels of vision in Snellen, logMAR or EDTRS letter scores.<br>▪ Understand and interpret an optometric examination, including the assessment of vision and binocular vision. Interpret the refraction result. |

- Assess other visual symptoms with appropriate tools e.g. Amsler chart for visual distortion, Ishihara or other appropriate test for colour vision.
- Assess and interpret normal and abnormal visual fields by confrontation, understand the reliability of this method and when to arrange more detailed visual field analysis.
- Assess the pupil for abnormalities of shape, size and reaction, including for Relative Afferent Pupillary Defect (RAPD).

- Examine the eyelids including eversion of lids.
- Perform slit lamp biomicroscopy of the eye and adjacent structures.
- Examine the cornea, ocular surface, anterior chamber, iris and lens using appropriate techniques including assessment of the red reflex and slit lamp illumination techniques.
- Employ gonioscopy for examination of angle structures.
- Measure the intraocular pressure (IOP) accurately using a variety of applanation techniques and understand the limits of each.
- Examine the vitreous, the choroid and the retina, including the macula and optic nerve, using appropriate techniques including the direct ophthalmoscope, binocular indirect ophthalmoscope, and lenses for binocular fundus examination with the slit lamp.
- Understand how retinal examination techniques differ in magnification, orientation and field of view of the retinal image.
- Describe and record the ophthalmic findings according to usual convention.
- Perform a proficient medical examination relevant to ophthalmology, including examination of the neck, skin, nose, joints and neurological system.
- Understand the associations between clinical findings in different parts of the eye.
- Understand the associations between systemic and ophthalmic diseases.

- Select investigations appropriate to the likely diagnosis.
- Understand and apply knowledge of instrument technology relevant to ophthalmic practice.

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| | ▪ Create differential diagnoses including common conditions and those that are sight or life threatening, where appropriate. |
| *These descriptors are specific to the Neuro-ophthalmology syllabus (ix)* | ▪ Understand the formal field options (static and kinetic) and know the indications, limitations and interpretation of these.<br>▪ Recognise and accurately describe nystagmus.<br>▪ Competently perform a relevant neurological assessment with particular emphasis on the cranial nerves. Assess ptosis and understand its relationship to neurological disorders. |
| **Independently formulate and initiate a management plan for low complexity cases.**<br><br>*These descriptors are replicated on all SIA syllabi (i-xi)* | ▪ Initiate a management plan, including referring to more experienced clinicians when appropriate.<br>▪ Involve other health care professionals in patient management when appropriate.<br>▪ Make appropriate referrals in a timely and efficient manner and in accordance with local protocols and guidelines.<br>▪ Recognise when a patient's clinical presentation needs priority and make appropriate arrangements to expedite their care.<br>▪ Recognise where the patient's vision may not meet the visual standards for driving and provide appropriate counselling.<br><br>▪ Explain diagnoses to patients in simple language, using visual aids, online patient resources, leaflets, 3D models of eyes and posters available in clinic.<br>▪ Deliver information in an accessible way, including identifying and making arrangements for patients with hearing, speech or sight impairment, or those with English as a second language.<br>▪ Communicate effectively and sensitively when breaking bad news and be prepared to give clear and honest information.<br>▪ Utilise translators appropriately and in accordance with local policy.<br><br>▪ Understand and apply knowledge of general medicine and surgery relevant to ophthalmic practice.<br>▪ Understand the associations between drugs and ophthalmic disease including biologics. |

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| | ▪ Recognise when a patient is seriously ill and make appropriate arrangements for the patient's care.<br><br>▪ Prescribe local and systemic medications safely.<br>▪ Be aware of the indications, contra-indications, side-effects, and possible interactions of the drugs that are prescribed.<br>▪ Be aware of the services and support available to patients and signpost appropriately.<br>▪ Initiate appropriate referral to low vision and social services, and to eye clinic liaison officer where available.<br>▪ Make accurate, legible, signed and dated records and use Electronic Patient Records (EPR) if available.<br>▪ Contribute to the preparation of patients for surgery, including review of medical therapy prior to surgery (e.g. anticoagulants) to optimise the patient's outcome.<br>▪ Understand the process of informed consent, following the principles set in law and by GMC guidance.<br>▪ Be aware of ongoing research and offer research participation opportunities to patients as appropriate.<br>▪ Contribute to the pre-operative assessment for local and general anaesthesia as part of a multidisciplinary team.<br>▪ Recognise patient conditions that render either local or general anaesthetic hazardous.<br><br>▪ Use appropriate aseptic technique when assisting with or performing surgery.<br>▪ Use the operating microscope competently, ensuring optimum operating position.<br>▪ Use suturing techniques appropriate for different ocular tissues, demonstrating understanding of different sutures and knots.<br>▪ Identify suture types, remove sutures from the eye and adnexa at the appropriate time and manage any retained material or wound problems. |
| *These descriptors are specific to the Neuro-ophthalmology syllabus (ix)* | ▪ Request appropriate neuroimaging investigations with suitable urgency. |

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| **Justify the diagnoses and plan with reference to basic and clinical science.**<br><br>*These descriptors are replicated on all SIA syllabi (i-xi)* | ▪ Understand and apply knowledge of anatomy, of the eye, adnexa, visual pathways and associated aspects of head, neck, and neuroanatomy.<br>▪ Understand and apply knowledge of the physiology of the eye, adnexa and nervous system.<br>▪ Understand and apply knowledge of related general physiology.<br>▪ Understand and apply knowledge of biochemistry and cell biology, in particular those aspects relevant to common eye diseases.<br>▪ Understand and apply knowledge of pathology, particularly the eye, adnexa and visual system. This includes histopathology, microbiology and immunology and other branches of pathology. This includes macroscopic and microscopic appearances and laboratory techniques, including staining techniques, used.<br>▪ Understand and apply knowledge of growth, development and senescence, and the anatomical, physiological and developmental changes that occur during embryogenesis, childhood and ageing relevant to ophthalmic practice.<br>▪ Understand the development of normal and abnormal acuity, binocular vision and the control of eye movements.<br>▪ Understand and apply knowledge of optics and medical physics, regarding ultrasound, laser, electromagnetic wavelengths, and radiological investigations relevant to ophthalmic practice.<br>▪ Understand and apply the fundamental principles of Genomics and apply knowledge of clinical genetics relevant to ophthalmic practice. This will include demonstrating an understanding of the genetic basis of disease (including different single nucleotide variations and copy number variations) and the genetic contribution to common complex disease (e.g. AMD).<br>▪ Understand and apply knowledge of clinical therapeutics relevant to ophthalmic practice, including methods of action and pharmacokinetics of drugs used.<br>▪ Understand and apply knowledge of statistics relevant to ophthalmic practice, for example in the interpretation and publication of research. |

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| **Work effectively with patients and the multi-professional team.**<br><br>*These descriptors are replicated on all SIA syllabi (i-xi)* | ▪ Display the professional values and behaviours set out in the GMC's Good Medical Practice.<br>▪ Use professional judgement and expertise to apply the principles of the guidance to the various situations faced in practice.<br>▪ Recognise the limits of own knowledge and competence and work within them.<br>▪ Recognise the level of supervision commensurate with own training.<br>▪ Show respect, courtesy, honesty, compassion and empathy for others, including patients, their carers and colleagues.<br>▪ Recognise and respect diversity and ensure equality for patients, their carers, colleagues and all those involved in patient care.<br>▪ Reflect on personal behaviour and its impact on other people and the working environment. Include reflection in the professional portfolio.<br>▪ Respect patient dignity.<br>▪ Take responsibility for own health and well-being.<br>▪ Take appropriate steps to protect patients when own health is affected by illness or disability.<br>▪ Make appropriate reasonable adjustments for patients.<br>▪ Respect patient confidentiality and be aware of the implications of sharing information and the appropriate circumstances for disclosure of patient information in protecting the individual and society.<br>▪ Work within appropriate health and safety legislation.<br>▪ Work within appropriate equality and diversity legislation.<br>▪ Understand and apply legislation for safeguarding.<br>▪ Apply the principles of clinical governance and ensure patient safety is paramount in all they do.<br>▪ Apply the professional duty of candour, demonstrating openness and honesty with patients and employers.<br>▪ Deliver an honest apology if necessary and offer a clear explanation.<br>▪ Use reporting tools for clinical incidents including serious incident and never events. |

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| | ▪ Participate fully in the follow-up of any critical incidents in which they have been involved and learn from them.<br>▪ Demonstrate safe and effective handover.<br>▪ Communicate effectively with colleagues in the same and other specialties, and check that information has been understood and actioned.<br>▪ Understand the impact of human factors in communication, and how to mitigate them.<br>▪ Write clear letters with diagnosis, treatment and management to patients and other health professionals.<br>▪ Communicate in a timely manner with colleagues and managers in regard to leave and return to work plans, following local protocols, including immediate communication about sickness absences.<br>▪ Proactively arrange meeting with supervisors, and attend these meetings.<br>▪ Be aware of potential and actual conflicts of interest and declare them appropriately.<br>▪ Obtain feedback from colleagues, including multi-source feedback and use the information obtained to develop clinical practice. |

| **Level 2** | |
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| **Learning Outcome** | **Descriptors** |
| ***An ophthalmologist achieving this level will, in addition:*** | |
| **Independently manage patients at an appropriate work-rate, employing the most appropriate clinical examination equipment and investigation modalities.**<br><br>*These descriptors are replicated on all SIA syllabi (i-xi)* | ▪ Manage patients, with non-complex conditions suitable for management by the generalist, with indirect supervision.<br>▪ Manage patients, suitable for management by a generalist, at an accepted rate.<br>▪ Manage time and resources effectively.<br>▪ Demonstrate effective consultation skills, including effective verbal and non-verbal interpersonal skills.<br>▪ Identify and manage barriers to communication, including language barriers, sensory and cognitive impairment.<br><br>▪ Use the exophthalmometer and interpret the findings with relevance to the specific patient.<br>▪ Use appropriate tools to assess the cornea e.g. pachymeter and know when to use specular microscopy. |

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| | ▪ Understand when to use, and competently employ a variety of lenses for binocular fundus and gonioscopy examination with the slit lamp.<br>▪ Use a portable slit lamp competently.<br>▪ Use a binocular indirect ophthalmoscope with a variety of lenses, selected to the situation and appropriate indentation.<br>▪ Perform refraction and understand the relevance and importance of the refraction.<br>▪ Assess a patient's spectacles using neutralisation techniques and focimetry.<br>▪ Assess a patient's binocular co-operation and assess whether optical correction for this is necessary.<br><br>▪ Select investigations appropriate to the likely diagnosis. Know when they need to be ordered urgently and how to interpret the results. Know their contra-indications, limitations and implications (including cost).<br>▪ Employ and interpret new methods of assessment and investigation when they are introduced into clinical practice.<br><br>▪ Assess the progress of a patient's condition and respond accordingly. This includes observation of the natural history of a disease and clinical improvement or deterioration in response to interventions.<br><br>▪ Understand and apply knowledge of lasers. Apply this knowledge when recommending laser treatment.<br>▪ Employ safe practice, including complying with local laser safety procedures.<br>▪ Have knowledge of the common Low Vision Aids and the conditions for which they may provide benefit. |
| *These descriptors are specific to the Neuro-ophthalmology syllabus (ix)* | ▪ Accurately interpret findings from pupil assessment.<br>▪ Assess anisocoria, including how to perform and interpret appropriate pharmacological tests for specific pupil abnormalities. |
| **Refine the differential diagnoses and management plan by** | ▪ Create prioritised differential diagnoses and reach a potential diagnosis. |

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| **application of clinical knowledge.**<br><br>*These descriptors are replicated on all SIA syllabi (i-xi)* | ▪ Formulate a management plan based upon clinical assessment and, where appropriate, the results of relevant investigations.<br>▪ Demonstrate that decisions are made by applying appropriate and clear clinical reasoning.<br>▪ Recognise when a patient's ocular problem is a manifestation of a systemic disorder and when an ophthalmic diagnosis may indicate an increased risk of a systemic illness.<br><br>▪ Know the likely infective organisms in cases of infection, how they are best isolated and identified.<br>▪ Understand the indications and use of systemic and topical antimicrobials.<br>▪ Recognise when the management plan involves a level of expertise that is beyond own competence.<br>▪ Make appropriate referrals to other specialties, in a timely manner, using local pathways.<br>▪ Understand the rationale behind, and perform or organise the ophthalmic examinations required by protocols in other specialties.<br>▪ Know when patients should be jointly managed between specialties, and contribute to this management.<br><br>▪ Demonstrate the ability to reflect and learn from professional practice and clinical outcomes. |
| *These descriptors are specific to the Neuro-ophthalmology syllabus (ix)* | ▪ Recognise when neurological problems are present that require the opinion of a neurologist or neurosurgeon.<br>▪ Recognise and accurately describe findings consistent with heritable optic neuropathies. |

| **Level 3** | |
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| **Learning Outcome** | **Descriptors** |
| ***An ophthalmologist achieving this level will, in addition:*** | |
| **Independently assess and manage moderate complexity patients, demonstrating an understanding of neuro-ophthalmology** | ▪ Understand and apply knowledge of medicine and surgery relevant to neuro-ophthalmology practice, to make diagnoses and recommend a management plan.<br>▪ Be informed by the patient's unique medical, psychological and social circumstances. |

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| **procedures selecting the most appropriate treatment according to current accepted practice.** | ▪ Understand the tests and imaging techniques that might be helpful in deciding about and guiding treatment, including the indications and limitations of the tests and the interpretation of the results.<br>▪ Recognise all urgent neuro-ophthalmology conditions and carry out initial investigation and management.<br>▪ Know when to refer to neuro-ophthalmology/ neurology/ medical colleagues for further opinion/ management.<br>▪ Use with accuracy and efficiency instruments and tests available to assess the patient, including colour vision testing suitable for the cause of colour vision loss.<br>▪ Be familiar with imaging protocols e.g. for acute Horner's syndrome.<br><br>▪ Implement a detailed management plan to include care from triage to discharge from care.<br>▪ Acknowledge and follow relevant guidelines or protocols.<br>▪ Practise in line with the latest evidence.<br>▪ Understand the indications, risks and limitations of medical and surgical treatments and identify patients for whom these treatments would be appropriate.<br>▪ Involve the patient, and where appropriate, their carer, partner or relatives, in the choices about their care and enable them to express their informed consent.<br>▪ Share decision-making by providing patients with appropriate and comprehensible information, prioritising the patient's wishes and respecting the patient's beliefs, concerns and expectations.<br>▪ Communicate the uncertainty of options in a manner that patients will understand.<br>▪ Manage difficult or challenging conversations.<br>▪ Develop situational awareness and an understanding of the impact of cultural and social issues.<br>▪ Enable patient self-management where possible.<br>▪ Understand and apply knowledge of clinical genetics relevant to neuro-ophthalmology conditions. |

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| | ▪ Advise patients about patterns of inheritance and recognise when it is appropriate to refer a patient for genetic counselling.<br>▪ Recognise when it is important to offer a consultation with family members.<br>▪ Recognise when a patient has had or is developing a complication or side effect from treatment and be able to manage this in an appropriate and timely manner.<br>▪ Maintain an understanding of new developments in relevant technologies.<br>▪ Choose appropriate visual field perimeters, strategies and algorithms for neurological assessment. |
| **Risk assess and prioritise patients appropriately, recognising the need for special interest input.** | ▪ Manage patient referrals efficiently, according appropriate priority to referrals based on clinical need and in accordance with local and national guidelines.<br>▪ Refer to more experienced clinicians when appropriate.<br>▪ Manage acute presentations following local guidance.<br>▪ Know the conditions that warrant an urgent onward referral to other healthcare professionals, and be aware of the local policies and systems for making such referrals.<br>▪ Manage surgical waiting lists and other access to clinical services appropriately, intervening when clinical care for a patient is put at risk by inappropriate waiting list management. |
| **Independently perform low complexity neuro-ophthalmology procedures.** | ▪ Perform botulinum toxin therapy. Be familiar with the neuro-ophthalmic indications, including the principles and side effects of treatment and know the doses used for different indications.<br>▪ Develop new skills in a supervised simulated environment. |

| **Level 4** | |
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| **Learning Outcome** | **Descriptors** |
| ***An ophthalmologist achieving this level will, in addition:*** | |
| **Demonstrate advanced clinical management and surgical skills.** | ▪ Demonstrate competency in diagnosis, investigation and management of neuro-ophthalmic conditions, including, but not exclusively:<br>- optic nerve disorders<br>- chiasmal syndromes |

- post-chiasmal visual field loss
- disorders of the ocular motor pathways (including ocular motor nerve palsies, nystagmus and supranuclear disorders of gaze)
- abnormalities of the pupils
- disorders of higher visual function
- trigeminal, facial nerve, pain/headache and vascular disorders related to neuro-ophthalmology

- Manage eye and vision problems relating to brain damage (such as stroke, trauma, compressive lesions and multiple sclerosis).
- Employ a neutral density filter to enhance the interpretation of a swinging light test.
- Perform and reliably interpret examination of motility (including saccades, supranuclear, vestibular and OKN), nystagmus, pupil, ptosis, fields to confrontation, colour vision, tests of higher visual function.
- Demonstrate competency in investigating complex neuro-ophthalmology cases.
- Have an advanced understanding of neuro-imaging, electrodiagnostic tests and other investigations employed in neuro-ophthalmology.
- Perform temporal artery biopsy and understand the indications, limitations, technique and risks of the procedure.
- Use ultrasonography techniques to locate the temporal artery prior to its biopsy.
- Know how to handle tissue samples to increase the diagnostic yield and liaise with laboratory staff so that the specimens are correctly identified, presented and transported.
- Interpret the result of a temporal artery biopsy and make appropriate and reliable arrangements for the result to be acted upon in a timely fashion.
- Understand the role, indications and limitations of temporal artery duplex scanning in the diagnosis of giant cell arteritis.
- Have a sound understanding of the indications for, use of, and limitations of pharmacological, radiological, and surgical therapies used in the management of patients with neuro-ophthalmological disorders.
- Maintain a record of activities, using the RCOphth electronic logbook.

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| **Manage the complexity and uncertainty of neuro-ophthalmology cases.** | ▪ Understand and apply advanced knowledge of neuro-ophthalmic disease and practice.<br>▪ Diagnose and manage complex neuro-ophthalmology cases including, but not limited to:<br>- optic neuropathy related to inherited and acquired causes and compressive lesions<br>- papilloedema<br>- oculomotility disturbance (including myopathies, infra-/inter- and supranuclear disorders and vestibular disorders)<br>- visual field anomalies such as:<br>o functional disorders<br>o neoplastic/paraneoplastic disorders<br>o higher cortical visual dysfunction<br>o infective, inflammatory, auto-immune, vascular/ischaemic disorders<br>o neuro-ophthalmology presentations of systemic disorders<br>▪ Independently manage emergency neuro-ophthalmology cases.<br>▪ Manage neuro-ophthalmology clinics independently.<br>▪ Understand and utilise available instrument technology relevant to neuro-ophthalmology.<br>▪ Evaluate published developments in neuro-ophthalmology and modify own practice appropriately. Understand where controversies and alternative managements exist.<br>▪ Give specialist advice to non neuro-ophthalmology specialists.<br>▪ Liaise and support colleagues from other subspecialties to optimise patient care, when co-management is required.<br>▪ Recognise and refer patients who will benefit from more specialist input. |
| **Apply management and team working skills appropriately, including in complex, dynamic situations.** | ▪ Use highly developed consultation skills efficiently to manage busy clinics whilst managing patient expectations.<br>▪ Ability to review and set up new methods of service delivery for efficient use of resources including virtual clinics where appropriate.<br>▪ Assist with decision-making where there are cognitive impairment barriers, employing Independent Mental Capacity Advocate (IMCA) services or equivalent if necessary.<br>▪ Understand how culture or religious beliefs can affect patients' decision-making and needs, and communicate these effectively to the team. |

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| | ▪ Be sensitive to social situations and the impact these may be having on the patient, their carers and their disease.<br>▪ Understand when information must be shared more widely with schools, carers, police, etc. and understand the responsibilities and implications of sharing information.<br>▪ Receive and respond to communications in complex or challenging situations.<br>▪ Give specialist advice to non neuro-ophthalmologist specialists.<br>▪ Establish close relationships with neurology, neurosurgery, neuroradiology, endocrinology, rheumatology colleagues. Attend local multidisciplinary teams and work with other ophthalmic specialties to agree pathways of care.<br>▪ Liaise and support colleagues from other special interest areas, particularly medical retina, emergency ophthalmology and medical ophthalmology, to optimise patient care, when co-management is required.<br>▪ Promote professional values within the team.<br>▪ Work as a collaborative member of a team, respecting differences of opinion.<br>▪ Accept constructive and appropriately framed criticism.<br>▪ Support colleagues.<br>▪ Be an advocate for patients.<br>▪ Manage significant events and complaints, including writing formal reports.<br>▪ Understand and follow local policies in response to complaints. |
| **Be an effective supervisor, teacher and trainer of neuro-ophthalmology cases.** | ▪ Participate in education/training of medical students/junior trainees, and allied health professionals in neuro-ophthalmology.<br>▪ Supervise and accredit/sign off trainees to Level 3 in neuro-ophthalmology. |

# 3 Level 4: Indicative Time

The indicative time for training at this level is **12-18 months** of full-time equivalent.