"This prospectus is made under the provisions of the Universities Act, the Postgraduate Institute of Medicine Ordinance, and the General By-Laws No. 1 of 2016 and By-Laws No. 2 of 2016 for Degree of Doctor of Medicine(MD) and Board Certification as a Specialist"

POSTGRADUATE INSTITUTE OF MEDICINE
UNIVERSITY OF COLOMBO

PROSPECTUS

SUBSPECIALTY TRAINING

AND

BOARD CERTIFICATION

IN

PAEDIATRIC OPHTHALMOLOGY

2011

BOARD OF STUDY IN OPHTHALMOLOGY

Contents

Prospectus - Post MD (ophthalmology) Subspecialty Training in "Paediatric Ophthalmology" Leading to Board Certification

(1) BACKGROUND

Paediatric ophthalmology is the subspecialty of ophthalmology which concerns about the well being of ocular health of newborns, infants, toddlers and children less than 12 years of age. Prevention, early diagnosis, application of standard treatment and rehabilitation of ocular diseases is critical in this population of any society.

In newborns and early infancy, structural abnormalities such as congenital cataract, retinopathy of prematurity, congenital glaucoma, and retinoblastoma (a vision- and life-threatening malignancy), are the most severe vision-threatening eye problems. Other childhood ocular problems include strabismus, amblyopia, and refractive problems.
Strabismus is any ocular misalignment. The most common types of strabismus are esotropia (inwardly deviating eyes, or crossed eyes) and exotropia (outwardly deviating eyes, or wall-eyes).
Amblyopia refers to an abnormality of visual development characterized by decreased best-corrected visual acuity not fully attributable to a structural abnormality of the eye. Amblyopia may be unilateral or bilateral and is best treated in early childhood. However, recent data show that amblyopia may be treated even in the teenage years. The prevalence of amblyopia varies by race/ethnicity. Approximately half of amblyopia is secondary to strabismus (mainly esotropia) and the other half is from other causes such as high refractive errors, anisometropia (asymmetric refractive errors), or structural ocular problems. Amblyopia is unusual in children with intermittent exotropia. The prevalence of amblyopia in children with developmental delay is six fold greater than in children who were healthy, full-term infants.

Visually important refractive errors include high hyperopia, moderate astigmatism, moderate to high myopia, and asymmetric refractive errors. An estimated 5% to 7% of preschool children have visually important refractive errors. Twenty-five percent of children between the ages of 6 and 18 years would benefit from corrective lenses for refractive error or other reasons. During the school years, visual difficulties such as those caused by uncorrected refractive errors may interfere with school performance.

Premature birth is a major risk factor for severe visual impairment and blindness in childhood. The most common ocular problem in preterm infants is retinopathy of prematurity (ROP). The frequency and severity of ROP is inversely related to gestational age. Preterm infants also have higher rates of amblyopia, strabismus, refractive error, optic atrophy, and cortical visual impairment. Years later, these children may develop glaucoma and retinal detachments. The visual impairment is often accompanied by cerebral palsy, epilepsy, and other motor and mental handicaps.

(2) JUSTIFICATION

Child with good vision is a blessing to a society. Vision is critical in intellectual development of a child. Therefore, managing good ocular health in children is critical in a nation which is looking forward for an accelerated development in the future.

There are no statistics on childhood blindness or eye diseases in paediatric age group in Sri Lanka. Abovementioned conditions cause significant morbidity during childhood and the effects will persist throughout the life of the person. This causes severe burden to the family as well as the economy of the country.

This brings the requirement of comprehensively trained and fully dedicated Ophthalmologists to look after the ocular health in children.

(3) OBJECTIVES

D.1 To develop a training module that ensures the Board Certification as Paediatric Ophthalmologist who have the necessary commitment and expertise in achieving superior clinical outcomes in a responsive and patient focused manner in any part of Sri Lanka

(4) ELIGIBILITY REQUIREMENT

The candidate who enters the above subspecialty training program should have qualified the M.D. (Ophthalmology)

(5) ADMISSION PROCESS

Admission will be done by the board of study in Ophthalmology for the allocated training slots in the subspecialty based on the trainees' order of merit at the MD Module IV Examination.

(6) TRAINING DURATION

A total 3 years (36 months) of which;
Two years is at approved centres in Sri Lanka. Twelve months of this will be in General Ophthalmology at a main training centre approved by the board of study.
A further twelve months will be at a specialized Paediatric Ophthalmology centre approved by the board of study.
The third year will be at a Board approved centre of repute outside Sri Lanka.

(7) CURRICULUM

The curriculum of paediatric ophthalmology is divided into seventeen sections. Each section is described under several objectives and learning end points.

7.1 Paediatric Eye Examination
7.2 Strabismus
7.3 Amblyopia
7.4 Apparently Blind Infant
7.5 Visual Electro Physiology
7.6 Learning Disabilities
7.7 Retinopathy Of Prematurity
7.8 Paediatric Glaucoma
7.9 Lens Abnormalities
7.10 Uveitis
7.11 Retinoblastoma
7.12 Paediatric Retinal Diseases
7.13 Paediatric Neuro-ophthalmology
7.14 Accidental and Non-Accidental Eye Injuries
7.15 Paediatric Systemic Diseases with Ocular Involvement
7.16 Child with Low Vision
7.17 Less common Syndromes with Ocular Manifestations

7.1 Paediatric Eye Examination

This section covers the processes for observing, prompting and recording an adequate medical history as the preliminary preparation for diagnosis and treatment of paediatric eye conditions. The practitioner is to perform this work with a high degree of autonomy and responsibility for accuracy and completeness.

Objective 1: to obtain a general and ocular history from parents

Learning End Points:
Demonstrate capacity to build rapport with parents and the child
During history taking provide prompts or questioning to elicit:
• What problem prompted the referral?

• Do the parents feel there is a problem with the child's vision?
• Is the child otherwise healthy?
• Were there pre or peri-natal problems?
• What has the child's general developmental history been?
• Have the various visual development milestones been achieved?

Objective 2: to assess visual acuity

Learning End Points:

Undertake tests appropriate for the child's age and condition

Infants/preverbal children:
• Optokinetic Nystagmus
• Quality of fixation with large and small objects
• Preferential looking
• Smiling
• Involuntary movement
• Vestibular ocular reflex

Toddlers:
• 100's and 1000's and smarties
• Lea symbols
• Fixation
• 6 prism dioptre base down test or 20 dioptre base out

Preschool:
• Sheridan-Gardner test
• Stereopsis
• Kay pictures

Primary School
• Stycar letters
• Snellen visual acuity chart

Objective 3: to assess visual fields

Learning End Points:
Undertake confrontational testing for visual fields using behavioural techniques
Identify field defects and infer anatomical location of the defect

Objective 4: to assess colour vision

Learning End Points:
Test for colour vision using aids appropriate to age:
• Ishihara pseudoisochromatic plates (winding lines and numbers)

Objective 5: to undertake ocular examination

Learning End Points:
Examine the ocular adnexia to detect:
• Pseudostrabismus
• Ptosis
• Pseudoptosis

Objective 6: to perform Pupil examination

Learning End Points:
Detect abnormalities on pupil examination
including:
• Pupil shape
• Iris colour
• Direct and consensual light reflexes
• Paradoxical pupil reaction
• Anisocoria

Objective 7: to assess intraocular pressure

Use suitable testing techniques (including EUA) to measure IOP and determine whether normal or abnormal:

- Tonopen
- Perkins tonometer (< 12 months)
- Keeler pulse air tonometer (<5 years)
- Goldmann tonometer (> 5 years)

Objective 8: to perform ocular examination

Learning End points:

Perform slit lamp examination to detect:

- Anterior segment defects
- Iris transillumination
- Cataract type/position

Use indirect ophthalmoscope and suitable illumination to detect abnormalities in the retina optic nerve, e.g. Hypoplasia)

7.2 Strabismus

This section covers the process of examination for ocular motility, diagnosis of congenital and acquired ocular motility problems in the paediatric patients. The practitioner is to perform this work with a high degree of autonomy and responsibility for accuracy and completeness.

Objective 1: to assess ocular motility

Learning End Points:

Observe motility and detect abnormal responses using tests suitable for the age of the child:

• Cover tests: including cover-uncover, alternate, prism-alternate, simultaneous prism
• Krimsky test
• Supra nuclear reflexes (doll's head)
• Bruckner reflex test
• Hirschberg test
• 4 dioptre base out test
• Ductions and versions in 9 positions of gaze
• Eye alignment in right and left forced head tilt.

Objective 2: to assess binocular vision

Learning End Points:
Test binocular vision by undertaking tests appropriate for the child's age and condition:
• Lang and Firsby (< 5 years)
• Titmus fly, Randot stereopsis (5 to 8 years)
• Worth 4 dot, Bagolini glasses and synoptophore
(> 8 years)
• Fusional amplitudes

Objective 3: to assess basic, advanced and complex cases of ocular motility

Learning End Points:
Esotropias

- Congenital comitant and incomitant
- Accommodative and non-accommodative
- Decompensated
- Sensory
- Neurogenic
- Myogenic
- Restrictive
- Monofixation syndrome

- Consecutive

Exotropias

- Congenital comitant and incomitant
- Decompensated
- Sensory
- Neurogenic
- Myogenic
- Restrictive
- Divergence excess
- Convergence insufficiency

A & V patterns

Vertical strabismus

- Neurogenic
- Myogenic
- Oblique overaction
- Oblique underaction
- Dissociated vertical deviation

Motility Syndromes

- Duane's syndrome
- Brown Syndrome
- Moebious Syndrome

Objective 4: to plan management

Learning End Points:
Counselling of parents/guardian
Detect and treat amblyopia
Knowledge of surgical and non-surgical treatment for squints
Indication and timing for surgery

Objective 5: to perform basic extra ocular muscle surgery

Learning End Points:
Horizontal muscles

- Recession
- Resection

Oblique muscles

- Recession
- Tenotomy
- Tucking procedures

Adjustable sutures

Objective 6: to perform complex muscle surgeries and to manage complications

Learning End Points:
Reoperations
Overcorrection
Under correction
Slipped muscle
Globe perforation

7.3 Amblyopia

This section covers the processes for identifying and managing amblyopia using refractive, non-surgical and surgical treatments. The practitioner is to perform this work with a high degree of autonomy and responsibility for accuracy and completeness.

Objective 1: to assess the aetiology of amblyopia

Learning End Points:
Identify unilateral and bilateral amblyopia
Embryology of visual cortex and retina

Objective 2: to diagnose amblyopia

Learning End Points:
Test visual acuity and interpret result
Conduct and interpret binocular fixation test (infants)

Objective 3: to manage amblyopia

Learning End Points
Follow standard protocols to obtain informed consent from the parent/guardian.
Select appropriate treatments that may include:
• Removal of obstacles to vision e.g. cataracts
• Implementation of an occlusion program appropriate to the causative condition and circumstances of patient
• Correction of refractive errors
• Use and risks of atropine in management
• Patching protocols

7.4 Apparently Blind Infant

This section covers the processes for evaluating and managing the apparently blind infant. The practitioner is to perform this work with a high degree of autonomy and responsibility for accuracy and completeness. A demonstration of appropriate interpersonal skills in interacting with the patient and family is required.

Objective 1: to evaluate the apparently blind child

Learning End Points:
Obtain history including:
• Perinatal
• Maternal
• Family

Conduct examinations for:
• Fixation behaviour and nystagmus
• Cerebral visual impairment
• Delayed visual maturation

Objective 2: to undertake relevant investigations for the causes of poor vision in children

Learning End Points:
Conduct relevant examinations including:
• Characteristics nystagmus
• Paradoxical pupil reaction
• Iris transillumination
• Cataract
• Refractive error
• Fundus examination (esp. look for Optic nerve hypoplasia, peripheral pigmentary retinopathy, albinotic fundus, macular abnormality)
• Visual electro-physiology
• Select appropriate neuro imaging
• Genetic testing
• Biochemical testing

Objective 3: to implement appropriate management

Learning End Points:
Counselling and support. Appropriate glasses both distant and bifocals, with tinted lenses if necessary
Refer to paediatrician for examination to exclude cerebral palsy, developmental delay, autism
Refer to appropriate support agencies

7.5 Visual Electro Physiology

This section covers the processes for identifying the application of visual electro-physiology in diagnosis and interpreting the output of electrophysiological tests.

Objective 1: to understand electrophysiological tests and their use/limitations for testing retinal and visual pathway function

Learning End Points:
Outline physiology of visual response and the application of ERG, pattern ERG, multifocal ERG, EOG and VEP

Objective 2: to have the knowledge of clinical indications for requesting electrophysiological tests

Learning End Points:
Retinal function testing in suspected functional vision loss

Diagnosis of retinal dystrophies
Apparently blind infant with nystagmus
Diagnosis of optic nerve disorders
Assessing function of visual pathways
Objective measurement of vision

Objective 3: to understand electrophysiological testing procedures

Learning End Points:
Discuss the process involved in conducting tests:
- ERG, multi focal ERG
- Electro-oculogram
- VEP
- Multi focal VEP

Objective 4: to interpret abnormal test results

Learning End Points:
ERG
• A Wave
• B Wave
• Photopic and Scotopic wave forms
• Oscillatory potentials
EOG – Arden index – significance
VEP
• Amplitude
• Latency
• Waveform P 100 wave

7.6 Learning Disabilities

This section covers the processes for identifying and managing learning disabilities in children. The practitioner is to perform this work with a high degree of autonomy and responsibility for accuracy and completeness.

Objective 1: to know the aetiology of learning disabilities (in absence of neurological disorder)

Learning End Points:
Identify factors that may be associated with learning disabilities:
• Environment
• Culture
• Physical disabilities
• IQ
• Attention deficit disorder

Lack of evidence of ocular disease causing learning disabilities

Objective 2: to plan the management of learning disabilities

Learning End Points:
Perform complete eye examination to exclude eye disorders as cause of learning problems including testing accommodation, convergence, eye movements, refractive errors.

Counsel parents on issues

Refer to appropriate assessment agencies/support groups
Discuss irrelevance of minor ocular abnormalities to disabilities

7.7 Retinopathy of Prematurity (ROP)

This section covers the processes for identifying and managing Retinopathy of Prematurity according to the most current evidence based guidelines.
The practitioner is to perform this work with a high degree of autonomy and responsibility for accuracy and completeness. A demonstration of appropriate interpersonal skills in interacting with the patient and guardians is required.

Objective 1: to screen for ROP

Learning End Points:
Examine infants at risk of developing ROP with indirect ophthalmoscope
Ability to examine sick infants at neonatal ICU

Objective 2: to manage ROP

Learning End Points:

Counselling of parents
Get a detailed consent from parents
Application of Laser, Cryo and other treatment modalities
Referral to vitreoretinal surgeon when indicated

7.8 Paediatric Glaucoma

This section covers the processes for identifying, diagnosing and managing paediatric glaucoma using either surgical or non-surgical treatment. The practitioner is to perform this work with a high degree of autonomy and responsibility for accuracy and completeness. A demonstration of appropriate interpersonal skills in interacting with the patient and guardians is required.

Objective 1: to identify clinical signs of paediatric glaucoma

Learning End Points:
Diagnose signs of congenital glaucoma:
Infants:
- Buphthalmos
- Enlargement/clouding/opacity/oedema of the cornea
- Photophobia
- Epiphora
- Blepharospasm
- Syndromes:
  - Sturge Weber syndrome
  - Aniridia
  - Neurofibromatosis

Diagnose indicators of juvenile glaucoma:
Older Children:
• Visual failure
• Syndromes:
  Sturge Weber syndrome
  Aniridia
  Neurofibromatosis

Objective 2: to consider differential diagnosis for congenital glaucoma

Learning End Points:
Differentiate childhood glaucoma from:
• Congenital nasolacrimal duct obstruction
• Corneal epithelial defect/abrasion
• Ocular inflammation (uveitis, trauma)
• Corneal dystrophy especially congenital hereditary endothelial dystrophy
• Birth trauma with Descemet's tears
• Storage disease (Mucopolysaccharidosis)
• Cystinosis
• Congenital anomalies
• Sclerocornea
• Peter's anomaly
• Maternal rubella
• Herpetic keratitis
• Axial myopia
• Megalocornea
• Physiologic optic nerve cupping
• Optic nerve coloboma
• Optic atrophy
• Optic nerve hypoplasia

Objective 3: to undertake relevant investigations for glaucoma

Learning End Points:
Perform eye examinations, interpret the results and identify their relevance to the diagnosis of glaucoma

Obtain and interpret the results of IOP results taken under anaesthetic

Objective 4: to develop and implement a management plan

Learning End Points:
Identify the indications and contra-indications of treatment options including:

Medical:
• Beta blockers
• Carbonic anhydrase inhibitors
• Prostaglandin analogues

Surgical:
• Goniotomy
• Trabeculotomy
• Trabeculectomy
• Implant surgery
• Cycloablation

Consult as appropriate with other paediatric specialists and geneticist

Determine a management plan appropriate for the age and condition of patient

Explain proposed management plan to patient/parents

Follow standard protocols to obtain informed consent from the parent/guardian

Implement plan observing the following:
Non surgical:
• Monitor patient to identify changes in condition or detect side effects of medications and adjust plan as appropriate
Surgical:
• Choose appropriate procedures
• Observe the correct steps throughout the operation
• Anticipate and deal with peri-operative problems
• Conduct operation to successful conclusion

Undertake post-operative care and check for the potential of short-term or long-term complications

Manage visual rehabilitation

Provide counselling for parents

Provide on-going follow up

7.9 Lens Abnormalities

This section covers the processes for identifying, diagnosing and managing childhood cataracts and subluxation of the lens using surgical and nonsurgical treatments. The practitioner is to perform this work with a high degree of autonomy and responsibility for accuracy and completeness. A demonstration of appropriate interpersonal skills in interacting with the patient and family is required.

Objective 1: to assess aetiology of cataract

Learning End Points:
Identify possible aetiology of paediatric cataracts from patient history, ocular examination findings and laboratory studies:

Bilateral cataracts
• Idiopathic
• Hereditary without systemic disease
Autosomal dominant
Autosomal recessive
X-linked
• Genetic, metabolic and systemic disease and syndromes
Hallermann–Streiff syndrome
Lowe oculocerebrorenal syndrome
Smith-Lemli-Opitz syndrome
Galactosaemia
Hypoglycaemia
Down syndrome
Edward syndrome
Patau syndrome
Alport syndrome
Myotonic dystrophy
Fabry disease
Hypoparathyroidism
Marfan syndrome
Pseudo hypoparathyroidism
Conradi syndrome
Diabetes mellitus
Peroxisomal disorders
Wilson's disease

Maternal infection
- Rubella
- Cytomegalovirus
- Varicella
- Toxoplasmosis
- Herpes simplex

Ocular abnormalities
Aniridia
Anterior segment dysgenesis
Microphthalmia
PHPV
Posterior lenticonus

Unilateral cataracts
• Idiopathic
• Ocular abnormalities
Posterior lenticonus
Persistent hyperplastic primary vitreous
Anterior segment dysgenesis
Posterior pole tumours
• Traumatic
• Intrauterine infection (rubella)

Objective 2: to classify and describe paediatric cataracts

Learning End Points:
Correctly document the location and morphologic characteristics of cataracts to establish a specific diagnosis and identify types of cataracts that may progress including:
• Posterior lenticonus
• Persistent hyper plastic primary vitreous
• Lamellar
• Anterior and posterior sub capsular

Objective 3: to undertake relevant systemic investigations for paediatric cataracts

Learning End Points:
Select, initiate and assess the results from the appropriate investigations:

• Ocular physical examination
• Paediatric physical examination
• Pathology tests (if indicated):
TORCH titre
Syphilis serology
Urine (reducing substances and amino acids)
Red Cell galactokinase and GIP uridyl transferase
Calcium and phosphorus

Objective 4: to implement appropriate management of paediatric cataract

Learning End Points:
Follow standard protocols to obtain informed consent form the parent/guardian
Assess the risk of amblyopia associated with delaying surgery
Consult as appropriate with other paediatric specialists and geneticist
Evaluate and select appropriate treatment and precautions
Awareness of age in relation to implantation of IOL's into children

Non-surgical treatments:
• Patching
• Pupil Dilatation
Surgery:
• Lensectomy
• Vitrectomy
• Intra-ocular lens implantation
Choose appropriate procedures
Observe the correct steps throughout the operation
Anticipate and deal with peri-operative problems
Conduct operation to successful conclusion
Undertake post-operative care and check for the potential for short-term or long-term complications
Monitor refractive changes in pseudophakic eyes

Manage visual rehabilitation including contact lens fitting and management of contact lens related problems

Provide counselling for parents
Understand need for life long surveillance for glaucoma after infantile cataract surgery

Objective 5: to assess aetiology of lens subluxation

Learning End Points:
Identify aetiology of subluxation from patient history, ocular examination findings and laboratory studies:

Ocular causes:

- Autosomal dominant
- Trauma
- Aniridia
- Ectopia lentis et pupillae
- Idiopathic
- Coloboma

Systemic syndromes:

- Marfan syndrome
- Homocystinuria
- Weill-Marchesani syndrome
- Sulfite oxidase deficiency
- Hyperlysinemia

Objective 6: to undertake relevant systemic investigations for lens subluxation

Learning End Points:
Select, initiate and assess the results including evaluation of significance of subluxation from the appropriate investigations:

Ocular physical examination:

- Visual acuity
- External ocular examination
- Anterior segment including measurement of anterior chamber depth and iridocorneal angle
- Retinoscopy/refraction
- Ultrasound
- Keratometry
- Posterior segment

Paediatric physical examination

- Referral to cardiologist when appropriate

Pathology tests:

- Urine (amino acids)
- X-ray measurement of hands (brachydactyly)

Objective 7: to implement appropriate management of lens subluxation

Learning End Points:
Follow hospital policies and procedures to obtain informed consent from the parent/guardian
Assess the risk of amblyopia associated with delaying surgery
Consult as appropriate other paediatric specialists including geneticist and/or cardiologist
Evaluate and select appropriate treatment and precautions including:

Non-surgical treatments

- Phakic correction
- Contact lenses

Laser treatment
Surgery

Lensectomy/vitrectomy
Intra-ocular lens implantation
Choose appropriate procedures
Observe the correct steps throughout the operation
• Anticipate and deal with peri-operative problems
• Conduct operation to successful conclusion
• Undertake post operative care and check for the potential of short-term or long-term complications

Manage visual rehabilitation
Provide counselling for parents including understanding contact lens fitting and management of contact lens related problems
Provide long term follow up

7.10 Uveitis

This section covers the processes for identifying and managing uveitis of the anterior, intermediate and posterior segments. The practitioner is to perform this work with a high degree of autonomy and responsibility for accuracy and completeness.
A demonstration of appropriate interpersonal skills in interacting with the patient and family is required

Objective 1: to assess factors associated with onset of anterior uveitis.

Learning End Points:
Identify risk factors from patient history:
• Juvenile rheumatoid arthritis
• Family history
• Positive anti nuclear antibodies (ANA) test (esp. in females)
• Negative rheumatoid factor
• Trauma

• Sarcoidosis
• Herpes
• Kawasaki disease
• Systemic disease
• Extra-ocular manifestations of immune disease

Objective 2: to identify clinical signs/complications of anterior uveitis

Learning End Points:
Correctly diagnose indicators of uveitis:
• Anterior chamber cells and flare
• Keratic precipitates
• Posterior synechiae
• Band keratopathy
• Cataract
• Hypotony
• Glaucoma

Objective 3: to monitor at risk children

Learning End Points:
Know recommended follow up intervals
Identify evidence of improvement or deterioration in the patient and revise management plan accordingly

Objective 4: to assess factors associated with presentation of intermediate uveitis

Learning End Points:
Identify risk factors from patient history:
• Family history
• Multiple sclerosis
• Sarcoidosis

• Inflammatory bowel disease
• Lyme disease
• Toxocariasis
• Intraocular lymphoma
• Whipple's disease
• Amyloidosis

Objective 5: to identify clinical signs of intermediate uveitis

Learning End Points:
Identify indicators of intermediate uveitis:
• Pars planitis
• Cells in vitreous
• Snowbanking
• Cystoid macular oedema
• Posterior sub-capsular cataract
• Glaucoma
• Optic nerve swelling

Objective 6: to assess factors associated with presentation of posterior uveitis

Learning End Points:
Identify source of posterior uveitis:
• Toxoplasmosis:
• Congenital or acquired toxocariasis
Posterior pole granuloma
Other parasitic infections (e.g. POHS)
• VKH (Vogt Koyanagi-Harada Syndrome)

Objective 7: to Identify clinical signs of posterior uveitis

Learning End Points:
Optic neuritis:
• Macular oedema

• Vitreous opacities
Differentiate:
• Toxoplasmosis,Toxocariasis, VKH

Objective 8: to Undertake relevant investigations for uveitis

Learning End Points:
Select, initiate and assess the results from the appropriate investigations for uveitis:
• Anti-nuclear factor
• Full blood count
• ESR
• ACE
• Calcium
• C-reactive protein
• HLA status
• Toxocara antibodies
• Toxoplasmosis antibodies
• HIV screening
• Syphilis screening
• Mantoux test
• Diagnostic imaging
• Eosinophil count
• Mantoux test
• HIV serology

Objective 9: to implement appropriate management

Learning End Points:
Follow standard protocols to obtain informed consent from the parent/guardian
Evaluate and select appropriate treatment including:
• Topical steroids
• Topical or periocular steroids
• Mydriatics

• Treatment for band keratopathy
• Treatment for cataracts
• Non-steroidal anti-inflammatory drugs
• Systemic treatment including:
Steroids
immunosuppressants
cryotherapy referral to immunologist
Monitor patient for side effects of treatment including glaucoma

Objective 10: to counsel parents and child

Learning End Points:
Provide prognosis for vision
Follow up for patient and other family members where appropriate

7.11 Retinoblastoma

This section covers the processes for recognizing, treating and counselling paediatric patients with retinoblastoma. The practitioner is to perform this work with a high degree of autonomy and responsibility for accuracy and completeness. A demonstration of appropriate interpersonal skills in interacting with the patient and family is required.

Objective 1: to recognise potential cases of retinoblastoma
Learning End Points:
Identify common presentations of retinoblastoma including the significance of leukocoria

Differentiate retinoblastoma from the following:
• Persistent hyperplastic primary vitreous (PHPV)
• Cataract
• Retinopathy of prematurity

• Toxocariasis
• Retinochoroidal coloboma
• Uveitis
• Coats disease
• Vitreous haemorrhage
• Retinal dysplasia
• Tumours other than retinoblastoma
• Retinal detachment
• Myelinated nerve fibres

Demonstrate capacity to identify each entity that might be present and choose the correct management techniques for that entity

Objective 2: to undertake investigation of potential retinoblastoma

Learning End Points:
Conduct or order examinations under anaesthesia
including:
• CT scan
• MRI
• Lumber puncture
• Bone marrow aspiration
• B Scan Ultra sound

Conduct examination of other family members
Recognise histopathological features of retinoblastoma

Objective 3: to apply appropriate treatment

Learning End Points:
Follow hospital policies and procedures to obtain informed consent from the parent/guardian

Evaluate and select appropriate treatment including:
• Chemotherapy
• Laser surgery
• Cryotherapy
• Radiation
  plaques
  external beam
• Enucleation

Objective 4: to counsel parents

Learning End Points:
Provide prognosis including:
• Mortality
• Secondary tumour potential
• Morbidity due to treatment

Provide preliminary genetic counselling to family
Refer family to an expert e.g. clinical geneticist

Follow up for patient and other family members

7.12 Paediatric Retinal Diseases

This section covers the processes for identifying and managing retinal diseases using non-surgical treatments, laser and surgery. The practitioner is to perform this work with a high degree of autonomy and responsibility for accuracy and completeness. A demonstration of appropriate interpersonal skills in interacting with the patient and family is required.

Objective 1: to assess aetiology of paediatric retinal disease

Learning End Points:
Identify aetiology from patient history, ocular examination findings and laboratory studies:
• Coats' disease
• Retinal haemorrhages
• Stargardt disease
• Best disease
• Retinitis pigmentosa
• Leber congenital amaurosis
• Choroideremia
• Gyrate atrophy
• Cone disorders (including rod monochromatism)
• Congenital stationary night blindness
• Vitreoretinal dystrophies

Objective 2: to undertake relevant investigations for retinal diseases

Learning End Points:
Select, initiate and assess the results from the appropriate investigations including observing appropriate precautions with dilation:
• Ocular physical examination
• ERG/EOG
• Fluorescein angiogram
• Genetic testing
• Testing for metabolic disease

Objective 3: to implement appropriate management

Learning End Points:
Follow standard protocols to obtain informed consent from the parent/guardian

Consult as appropriate with other paediatric specialists including geneticist

Evaluate and select appropriate treatment and precautions including:
• Non-surgical treatments
• Laser treatment
• Cryotherapy
• Retina/vitreous surgery
Follow visual development

Review advances in treatment

Counselling and support services

Provide counselling for parents
Understand need for support of parents and child by low vision support agencies

7.13 Paediatric Neuro-ophthalmology

This section covers the processes for identifying and managing optic neuropathies and nystagmus. The practitioner is to perform this work with a high degree of autonomy and responsibility for accuracy and completeness. A demonstration of appropriate interpersonal skills in interacting with the patient and family is required.

Objective 1: to assess aetiology of neuro-ophthalmic disease

Learning End Points:
Identify optic nerve disease from patient history, ocular examination findings and laboratory studies:

• Optic nerve abnormalities:
  Optic nerve hypoplasia
  Morning glory disc anomaly
  Optic disc coloboma
  Optic pit
  Aicardi syndrome
  Hereditary optic neuropathies including Behr optic atrophy and Leber hereditary optic neuropathy (LHON)
  Optic neuritis
  Optic atrophy (including list of causes)
  Papilloedema and
  Pseudopapilloedema

• Nystagmus:
  Congenital idiopathic nystagmus
  Spasmus nutans
  Retinal dystrophies
  Vertical
  Upbeat
  Downbeat
  Ocular dysmetria
  Ocular flutter
  Others

Objective 2: to undertake relevant systemic investigations for neuro-ophthalmic disorders

Learning End Points:
Select, initiate and assess the results including diagnosis and evaluation of significance of disorders from the appropriate investigations:

• Ocular physical examination
• Paediatric physical examination
• Genetic testing
• Neuro-imaging
• ERG
• VER

Objective 3: to implement appropriate management

Learning End Points:
Follow hospital policies and procedures to obtain informed consent from the parent/guardian.

Consult as appropriate with other paediatric specialists including a geneticist

Evaluate and select appropriate treatment and precautions

Manage visual rehabilitation or low vision support

In event of genetic aetiology provide counselling for parents

Provide follow up for patient and other family members where appropriate

7.14 Accidental and Non-Accidental Eye Injuries

This section covers the processes for assessment and investigations of eye injuries. The standard includes the record requirements and reporting of non-accidental injuries (NAI). The practitioner is to perform this work with a high degree of autonomy and responsibility for accuracy and completeness. A demonstration of appropriate interpersonal skills in interacting with the patient and family is required

Objective 1: to perform an assessment of eye injuries

Learning End Points:
Natural history of birth-related retinal haemorrhage

Understand urgency of clearing blood from visual pathway before deprivation amblyopia develops

Examination under anaesthetic and removal of foreign bodies

Index of suspicion of non-accidental injuries e.g. Direct impact – bruising, haemorrhage and laceration, retinal detachment, subluxated lenses;
Indirect – shaking, retinal haemorrhage, optic atrophy

Understand diagnostic significance of traumatic retinoschisis

Understand eye injuries as manifestation of
'Munchausen syndrome by proxy'

Objective 2: to perform Investigations for eye injuries

Learning End Points:
Understand differential diagnosis of retinal haemorrhages in infants:
• Terson syndrome
• Birth trauma
• Systemic diseases including leukaemia and bleeding disorders
• Traumatic
• Retinoschisis

Physical assessment including skeletal scan
Neurological assessment

Electrophysiology

Documentation–photographs, diagnosis and classification

Record negative findings as well as positive findings

Objective 3: to plan management of eye injuries – nonaccidental

Learning End Points:
Know appropriate regional/national laws relating to mandatory reporting.

Consultation with appropriate local paediatric unit dealing with child abuse

Follow up appointments and visual prognosis

Management of permanent ocular damage

Objective 4: to plan management of eye injuries – accidental

Learning End Points:
Preservation of vision

Undertake counselling under supervision including:
• Providing core knowledge of injury

- Orbital haemorrhages
- Corneal laceration
- Corneo-scleral lacerations
- Intraocular haemorrhages
- Retained intraocular foreign body
- Non-penetrating trauma
- Traumatic optic neuropathy

• Precise diagnosis
• Maintain hope for what's available

Discuss steps in grieving – reactions

Apply personal coping strategies by interacting with:
• Peers
• Families
• Other health professionals

7.15 Paediatric Systemic Diseases with Ocular Involvement

This section covers the processes for identifying ocular and non-ocular manifestations of systemic diseases with ocular involvement. The practitioner is to perform this work with a high degree of autonomy and responsibility for accuracy and completeness. A demonstration of appropriate interpersonal skills in interacting with the patient and family is required.

Objective 1: to identify the ocular and non-ocular manifestations of the phakomatoses

Learning End Points:
Ability to diagnose:
• Neurofibromatosis I and II
• Sturge-Weber syndrome
• Tuberous sclerosis
• Von Hippel-Lindau disease
• Ataxia telangiectasia
• Racemose haemangioma

Objective 2: to identify the ocular and non-ocular manifestations of neuro-metabolic disorders

Learning End Points:
Ability to suspect diagnosis:
• Mucopolysaccharidosis 1 H
• Mucopolysaccharidosis 1 S
• Mucopolysaccharidosis 11
• GM 2 Type 1 Gangliosidosis
• Fabry Disease
• Wilson Disease
• Cystinosis

Objective 3: to identify the ocular and non-ocular manifestations of chromosomal anomalies

Learning End Points:
Apply diagnostic criteria for:
• Trisomy 13
• Trisomy 21

Objective 4: to identify the ocular and non-ocular manifestations of connective tissue disorders

Learning End Points:
Ability to diagnose:
• Marfan syndrome
• Pseudoxanthoma Elasticum
• Juvenile Xanthogranuloma

Objective 5: to Identify the ocular and non-ocular manifestations of albinism

Learning End Points:
Ability to diagnose:

• Oculocutaneous albinism
• Ocular albinism

Objective 6: to identify the ocular and non-ocular manifestations of leukaemia

Learning End Points:
Ability to identify the various ocular manifestations of leukaemia

Objective 7: to identify the ocular and non-ocular manifestations of congenital infections

Learning End Points:
Ability to identify disease pattern of congenital:
• Syphilis
• Toxoplasmosis
• CMV
• Herpes simplex

Objective 8: to identify the ocular and non-ocular manifestations of foetal alcohol syndrome

Learning End Points:
Optic nerve hypoplasia, ptosis, telecanthus, narrow palpebral fissures, epicanthus, strabismus high refractive errors and poor acuity.
Flat philtrum, thin upper lip

7.16 Child with Low Vision

This section covers the processes of identifying a child with low vision and to guide the child and family to build up the future.

A demonstration of appropriate interpersonal skills in interacting with the patient and family is required

Objective 1: to identify child with low vision

Learning End Points:
Updated definition of low vision
Exclude treatable causes

Objective 2: to support to the child and family

Learning End Points:
Screening of other family members
Counselling of parents/guardians
Establishment of a low vision clinic reserved for children
Communicate with Education Department
Communicate with family health workers
Advice on career development early in life

7.17 Syndromes with Ocular Manifestations

Objective 1: to identify ocular and systemic features of common and uncommon Syndromes.
For a complete list of syndromes – reference 4

Learning End Points:
To identify ocular features of the syndromes
Be able to give visual prognosis
Counsel parents
Referral to Paediatrician for screening of systemic complications

(8) EVALUATION OF THE TRAINEE

8.1 Portfolio – Surgical Log Entry, Case Records, Reflective writing, Preferably 1 Publication and 1 Presentation(Annexure 1)

8.2 Dissertation on Research project and viva (Annexure 2)

8.3 Feedback from trainers and Trainees

Systematic and regular feedback (at least once in six months) should be obtained from the Trainees and trainers.

Trainees also should be given the opportunity to write a report on their own on the programme

(9). ASSESSMENT PROCEDURE

9.1 Portfolio - Case Records 5 patients (Annexure 1), Reflective writing, Preferably 1 Publication and 1 Presentation

9.2 Dissertation (Annexure 2)

9.3 Pre Board Certification Assessment(PBCA)

9.3.1 SEQ Paper – 2 hours – 4 Questions
9.3.2 Clinical Examination (3 short cases) – two examiners
9.3.3 Viva Portfolio and Dissertation
9.3.4 Presentation to the BOS indicating the training received and future vision

Marking Scheme

9.3.1, 9.3.2 and 9.3.3 shall be marked with a numeric mark and converted in to a closed mark using the scale given below (the numeric mark does not range from 0-100)

Closed Mark		Numeric Mark
9+	-	55 – 59
9	-	50 – 54
8+	-	45 – 49
8	-	40 – 44

(10). REQUIREMENTS FOR BOARD CERTIFICATION

10.1 Completion of post MD Training Period acceptable to the Board of Study

AND

10.2 A closed mark of 9 or above for 9.3.1, 9.3.2 and 9.3.3 of the PBCA

AND

10.3 Completion of 9.3.4 and acceptance by the Board of Study

Board certification shall be deferred if above requirements are not completed. Such candidates following a counselling session/s should complete the failed component/s (10.1/10.2/10.3) again within a minimum period of 3-6 months. On successful completion at the first attempt after counselling the date of Board certification shall be backdated. If unsuccessful, the date of Board certification will be the date of

passing the subsequent assessment following further training for a minimum period of six months in a unit allocated by the BOS.

(11) RECOMMENDED READING MATERIAL

11.1 Core Reading

The most recent edition of the following reference texts are prescribed:

Wilson EM, Buckley EG, et al. *Paediatric Ophthalmology and Strabismus*. St Louis: Mosby

American Academy of Ophthalmology, *Basic and Clinical Science Course: Section 6 – Paediatric Ophthalmology and Strabismus,* San Francisco, American Academy of Ophthalmology

Taylor D, editor. *Paediatric Ophthalmology.* Oxford: Blackwell Science

11.2 Additional Reading

More A M, Lightman S. *Fundamentals of Clinical Ophthalmology: Paediatric Ophthalmology.* BMJ Books: London

Tasman W, ed. *Duane's Clinical Ophthalmology.* Philadelphia: JB Lippincott Wright KW, ed. *Paediatric Ophthalmology and Strabismus.* St Louis: Mosby Inc

REFERENCES

1. Paediatric Standards. The Royal Australian and New Zealand College of Ophthalmologists
2. American Academy of Ophthalmology, *Basic and Clinical Science Course: Section 6 – Paediatric Ophthalmology and*

Strabismus, San Francisco, American Academy of Ophthalmology
3. Preferred Practice Pattern. Paediatric Eye Evaluation. American Academy of Ophthalmology
4. Patterns of human malformations and syndromes. Smith et al
5. CURRICULUM OF HIGHER SPECIALIST TRAINING IN OPHTHALMOLOGY-THE ROYAL COLLEGE OF OPHTHALMOLOGISTS THE ROYAL COLLEGE OF SURGEONS OF EDINBURGH
6. international Council of Ophthalmology – Curriculum 2006

ANNEX 1

Submission of the Portfolio

The portfolio should include the management of ten selected cases under the supervision of the Consultant Ophthalmologist should be submitted three months before applying for Board Certification. The ten case reports must preferably include cases in which some new treatment methods have being carried out. The treatment method should be finished.

The requirement for the portfolio are;

(1) Recommend use of A4 size paper
The book should be with a hard cover:

(2) Record should include a full diagnosis and treatment plan of the cases

(3) The aim and objectives of treatment should be clearly stated together with the reason for adapting the method used

(4) The records presented should fully explain the reasons for adapting the procedure and results. Also discuss the alternative methods available

(5) Problems encountered during the treatment must be discussed

(6) Cases should be adequately illustrated by either black and white or colour prints

(7) Record book should be accompanied by a signed statement from the supervising consultant confirming the trainees involvement of the selected cases.

ANNEX 2

Guidelines for the preparation of the Dissertation

The objective of this exercise is to expose the trainee to the procedure of identification of a problem, conducting a literature search, planning an "experimental" protocol, conducting the study, management of data (collection, analysis and presentation) and presenting rational conclusions with discussion. The Dissertation would consist of either Paediatric Eye disorder presentation limited to 8000 words and should include a minimum of 20 relevant recent references from the literature. The following guidelines should he used in planning and preparation of the dissertation.

(1) The book should be submitted in ring bound or plastic edge bound form. This facilitates correction, which may be recommended by the assessors. The final form of the book may be in the sewn and bound form with a hard cover and this final bound book should be handed over to the PGIM seven days before commencement of the examination.

(2) The book should be prepared in the English Language. Trainees are strongly advised to ensure that correct grammar is used and to check the text in the book and correct spelling mistakes, typographic errors, etc.

(3) The book should be prepared on white A4 paper and typed on one side of the paper only, with minimum margins of 40 mm on the left-hand side (binding edge) and 20 mm on the other three sides (free edges). Use double spacing throughout the book. Any standard type of lettering is accepted but the same style and size should be used consistently throughout the book except when bold type for headings and italics for emphasis are used. Trainees are strongly advised to use a Word Processor for the typing of the book.

(4) Pages, subsections, tables and figures should be numbered using Arabic numerals.

(5) Pages should be numbered consecutively.

(6) Subsections should be numbered as indicated in this section. (1, 2, 3. and 4 are subsections of section 1)

(7) Tables and figures should be numbered sequentially and arranged in the appropriate place in the text.

(8) The only exception to using Arabic numerals is when quoting from other sources where Roman numerals may be used.

(9)The contents and arrangement of pages:
The contents should be given under the following headings:
Title and Authors name
Declaration by candidate
Dedication - Optional
Abstract
Table of contents
List of Symbols, abbreviations (if any) Introduction
General and specific objectives Review of literature Materials and methods Results Discussion
Limitations of the study Recommendations Acknowledgments References

9.1 Title: a brief and specific statement.

9.2 Abstract: Brief summary of the whole paper and not merely the conclusions in 500 words. Structured abstracts are preferred.

9.3 Introduction: state the information and facts known on the topic/problem selected for study. This would include a literature survey and a critical comment on the various aspects of these studies. From the information available the justification for the study can be stated. The objectives of the study should then be presented.

9.4 Material and Methods: Describe exactly what was done in specific terms and in sufficient details so that the study could even be repeated by another investigator.

The sections to be included are:
Study design
Setting
Subjects
Materials and equipment Procedures and protocols Types of measurements of observations Methods of data analysis.

9.5 Results and inferences: Summarize the data with a figure, table or by graph when
necessary

9.6 Discussion: Interpret the results so as to provide answers to the study question(s). Comment on the relevance of these answers to the present knowledge of the subject. Consider alternate interpretations. Comment on interesting or unexpected observations and about the method. Always comment on further follow-up research available on the subject.

9.7 Conclusion: List the main points in the discussion section as conclusion.

9.8 Acknowledgements: Thank people for funding, facilities, equipment, materials or assistance.. .This statement should be brief.

9.9 References: List all references that are cited in the text. The Vancouver system of listing references should be used.

Reference Style:

Type the references in double spacing in the Vancouver style (using superscript numbers and listing full references at the end of the paper in the order in which they appear in the text). Online citations should include date of access. Use Index Medicus for journal names. If necessary, cite personal communications in the text but do not include in the reference list. Unpublished work will not be accepted. References should be listed in the following style:

Journal
Seitzman GD, Gottsch JD, Stark WJ.Caract surgery in patients with Fuch's corneal dystrophy:Expanding recommendations for cataract surgery without simultaneous keratoplasty. Ophthalmology 2005; 112:441-446

Book
Sadler TW. *hangman's Medical Embryology* (5th edn). Williams & Wilkins: Baltimore, 1985; 224-226.

Book chapter
Desmet VJ, Caller F. Cholestatic syndromes of infancy and childhood. In *Hepatology: a Text Book of Liver Disease*, Zakim D, Boyer TD (eds), vol 2. W.B. Saunders: Philadelphia, 1990; 1355-1395.

Website
The Oncology Website, http://www.mit.com/oncology/
[24 April 1999].

Trainees are advised to consult the "uniform requirements for manuscripts submitted to biomedical journals" published in the New England Journal of Medicine 1997; **336:** 309-315, for further information.

9.10 Dedication of the dissertation to a person(s) is optional.

9.11 Acknowledgments should be limited to those who have significantly contributed to the training of the Postgraduate and the preparation of the dissertation.

9.12 Table of contents: All sections of' the book should be listed using Arabic numerals. The starting and end page numbers should be listed along the right margin.

9.13 List of symbols and abbreviations:
Trainees are strongly advised to use only symbols and abbreviations, which are accepted for use in scientific and medical literature. In the event of an uncommon symbol or abbreviation, which needs to be used, a brief explanatory note should be included in the list. All symbols and abbreviations with the complete terms or wording should be given in the respective lists in alphabetical order.
(Note: Units of measurements- Measurements of length, weight, and volume should be reported in metric units (meter, kilogram, litre) or their decimal multiples, Temperature should he given in degrees Celsius, Blood Pressure should be given in mm of mercury.
It is preferable if haematological and clinical chemistry measurements arc reported in the metric system in terms of the International System of Units (SI). It is recommended that uniformity be maintained throughout the book. The candidate is advised to use conversion tables.
A panel nominated by the board of study will assess the candidate's dissertation and its acceptance will determine the successful completion of the training programme.
In the event of dissertation not being accepted the candidate will be notified whether a completely new dissertation is to be prepared or whether modification of the existing one will suffice for re-submission.
A copy of the Dissertation submitted should be retained by the candidate as a safeguard in case of loss or damage to the original.