POSTGRADUATE INSTITUTE OF MEDICINE
UNIVERSITY OF COLOMBO

PROSPECTUS

SUBSPECIALTY TRAINING
AND
BOARD CERTIFICATION
IN
CORNEA AND REFLECTIVE SURGERY

2011

BOARD OF STUDY IN OPHTHALMOLOGY
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Prospectus - Post MD (ophthalmology) Subspecialty Training in “Cornea and Reflective Surgery” Leading to Board Certification

1. Justification:

The specialty of Cornea and Refractive Surgery is broadly defined as the science of the cornea. Cornea is anterior the transparent part of the eye that covers the iris, pupil, and the anterior chamber. Together with the lens, the cornea refracts light, accounting for approximately two-thirds of the eye's total optical power. The corneal subspecialty encompasses the diagnosis and management of disorders related to structure and function of the cornea, and associated structures such as the conjunctiva and the tear film as well as the optics of the cornea, refractive errors and their correction.

Diseases affecting the cornea are a major cause of blindness worldwide, second only to cataract in overall importance. The epidemiology of corneal blindness is complicated and encompasses a wide variety of infections, inflammatory, and non-inflammatory eye diseases such as Keratoconus with a very high incidence in Sri Lanka. Corneal stromal disorders as well as trauma that cause corneal scarring and loss of transparency, which ultimately leads to functional blindness is also high. Diseases and dysfunction of related structures such as the conjunctiva and tear apparatus also can cause corneal morbidity. In 2009 and 2010, 286 and 300 corneal grafts were done in Colombo eye hospital alone. Diseases of the cornea account for a substantial part of Ophthalmic practice. Chronic keratitis following epidemics of viral conjunctivitis has become huge problem. Number of eyes are removed (evisceration) every year due to corneal ulcers. In 2009 fifty six eye and in 2010 forty six eyes were removed.

Recent improvements in science and technology have enabled the surgical correction for refractive errors which itself is a highly specialized field.

The high incidence of corneal disease in Sri Lanka warrants the urgent need to improve human resources to the existing Ophthalmic health care delivery system to strengthen the delivery of specialized services, to the sizeable number of our population being afflicted with corneal disorders. This can only be delivered with equity and quality through an organized system of training of specialists who will contribute to the cornea services as a Sub-specialty in Ophthalmology. Cornea is an accepted subspecialty in U.K,
USA, India etc. There are special ‘CORNEA’ days at international Ophthalmology congresses.

Furthermore, a cohort of dedicated and trained Cornea and Refractive Surgeons will contribute to further research and development in this field in the region of South Asia.

The projected cadre for State Sector Hospitals of Board Certified Cornea and Refractive Surgeons by Ministry of Health is 1 by the year 2015. At present there are none. The Ministry of Health has created cadre positions in the Department of Health Services for which treasury approval has been obtained. (I requested a letter from the ministry confirming the cadre.)

2. Objectives/Training Outcomes at the End of the Programme:

   To develop a training module that ensures the Board Certification as Cornea and Refractive Surgeons who have the necessary commitment and expertise in consistently achieving superior clinical outcomes in a responsive and patient-focused manner. In addition to create expertise to perform research into corneal diseases and develop strategies to prevent blindness and visual impairment from corneal diseases. The Specialists will provide services to patients in Government as well as Private Hospitals in Sri Lanka.

3. Admission Criteria/Method of Selection/ Eligibility Requirement:

   The candidate who enters the above subspecialty training program should have qualified the M.D. (Ophthalmology) Examination conducted by PGIM, and completed 1 year of post MD training in Sri Lanka.

   Admission will be done by the Board of Study in Ophthalmology for the allocated training slots in the subspecialty at the end of 1 year post MD training based on the merit position at the MD Examination.
4. **Program Duration**

The Total duration will be 3 years of which

4.1 Two years will be in Sri Lanka
   a) Year one of this will be in General Ophthalmology at a training center approved by the Board of study.
   b) Year two will be at a specialized corneal center (once established) or any training center approved by the Board of Study.

4.2 Year three will be in a center of repute overseas approved by the Board of Study

5. **Training Content/Curriculum/Programme Details**

**Part I underlying concepts of refractive Surgery**

5.1 **The science of refractive surgery**
- Contribution of the corneal layers and shape to the optics of the eye
- Computerized corneal topography
  - Axial power and curvature
  - Instantaneous power and curvature
  - Corneal shape
  - Other features
- Indications for corneal topography in refractive surgery
- Corneal topography and irregular astigmatism
- Limitations of corneal topography
- Clinical situations illustrating the role of corneal topography in refractive surgery
- Wavefront analysis
  - Wavefront analysis and irregular astigmatism
  - Measurement of Wavefront aberrations and graphical representations
  - Lower order aberrations
  - Higher – order aberrations
- Biomechanics of the cornea
  - Effects of keratorefractive surgery
- Corneal wound healing
- Laser biophysics
Laser – tissue interactions
Types of photoablating lasers
Wavefront – optimized and wavefront – guided laser ablations

5.2 Patient evaluation

Patient history
- Patient expectations
- Social history
- Medical history
- Pertinent ocular history
- Patient age, presbyopia, and monovision

Examination
- Uncorrected visual acuity and manifest and cycloplegic refractive acuity
- Papillary examination
- Ocular motility, confrontation fields, and ocular anatomy
- Intraocular pressure
- Slit – Lamp examination
- Dilated fundus examination

Ancillary tests
- Corneal topography
- Pachymetry
- Wavefront analysis
- Calculation of residual stromal bed thickness after LASIK

Part II Specific procedures in refractive surgery

5.3 Incisional corneal surgery

Incisional correction of myopia
- Radial keratotomy in the United States
- Patient selection
- Surgical technique
- Outcomes
- Complications
- Ocular surgery after radial keratotomy
Incisional correction of astigmatism
   Coupling
   Arcuate keratotomy and limbal relaxing incisions
Instrumentation
Surgical techniques
Outcomes
Complications
Ocular surgery after arcuate keratotomy and limbal relaxing incisions

5.4 Onlays and inlays
Keratophakia
   Homoplastic corneal inlays
   Alloplastic corneal inlays
Epikeratoplasty
   Background
   Technique
   Outcomes
   Complications
   Alloplastic corneal onlays
Intrastromal corneal ring segments
   Background
   Patient selection for myopia
   Instrumentation
   Technique
   Outcomes
   Intacs and keratoconus
   Complications
   Uses for intrastromal corneal ring segments after LASIK
Orthokeratology

5.5 Photoablation
Background
Surface ablation: Photorefractive keratectomy, Laser subepithelial keratomileusis, and epithelial laser in situ keratomileusis
   Patient selection
   Surgical technique
   Laser treatment
   Outcomes
   Complications
Conclusions
Laser in situ keratomileusis
  Background
  Instrumentation
  Patient selection
  Surgical technique
  Outcomes
  Complications
  Conclusions
Wavefront – guided surface ablation and LASIK
  Background
  Instrumentation
  Preoperative preparation

5.6 Collagen shrinkage procedures
  History
  Laser thermokeratoplasty
  Conductive keratoplasty
    Patient selection and results
    Safety
    Other applications
  Collagen cross linking

Part III  Refractive surgery in the setting of other conditions

5.7 Refractive surgery in ocular and systemic disease
  Introduction
  Ocular conditions
    Dry eye
    Herpesvirus
    Keratoconus
    Post – penetrating keratoplasty
    Ocular hypertensive and glaucoma
    Retinal disease
    Amblyopia and strabismus in the adult and child
  Systemic conditions
    Human immunodeficiency virus
    Diabetes mellitus
    Connective tissue and autoimmune diseases
5.8 Considerations after refractive surgery
- Corneal transplantation after refractive surgery
- Contact lens use after refractive surgery
  - Indications
  - General principles
  - Contact lenses after radial keratotomy
  - Contact lenses after surface ablation
  - Contact lenses after LASIK
  - Contact lenses – assisted, pharmacologically induced keratosteepeening

5.9 International perspectives in refractive surgery
- Introduction
- Global estimates of refractive surgery
- Variation in global prevalence of refractive errors
- International trends in refractive surgery
- International regulation of refractive surgery practices and devices
- Summery

Part I Basic and Clinical Concepts of Corneal AND External Eye Disease

5.10 Structure and Function of the External Eye and Cornea
- The Outer Eye and Cornea in Health and Disease
- Development of the Anterior Segment
- Anatomy
- Eyelids
- Conjunctiva
- Cornea
- Sclera

5.11 Examination Techniques for the External Eye and Cornea
- Vision
- External Examination
- Slit-Lamp Biomicroscopy
  - Direct Illumination Methods
  - Indirect Illumination Methods
- Clinical Use
Stains
  Fluorescein
  Rose Bengal and Lissamine Green
Clinical Evaluation of Ocular Inflammation
  Eyelid Signs of Inflammation
  Conjunctival Signs of Inflammation
  Scleral Signs of Inflammation
Corneal Pachymetry
  Corneal Edema
Esthesiometry
Anterior Segment Photography
  External and Slit-lamp Photography
  Specular Photomicroscopy
  Anterior Segment Fluorescein Angiography
  Anterior Segment Echography
  Confocal Microscopy
Measurement of Corneal Topography
  Zones of the Cornea
  Shape, Curvature, and Power
  Keratoscopy
  Computerized Corneal Topography
  Retinoscopy
  Wavefront Analysis
Prevention Practices in Ophthalmology
  Universal precautions
  Public Health Ophthalmology

Part III Ocular Surface Disorders

5.12. Normal Physiology of the ocular Surface
  Eyelids
  Tear Film
  Lipid Secretion
  Aqueous Secretion
  Mucin Tear Secretion
  The Ocular Surface
  Epithelium
  Blood Supply
  Mechanical Functions
5.13. Diagnostic Approach to Ocular Surface Disease
Tear- Film Evaluation
Inspection
Tests of Tear Production
Tear Composition Assays
Ocular Cytology
Specimen Collection
Interpretation of Ocular Cytology

5.14. Dry Eye Syndrome
Aqueous Tear deficiency
   Sjogren syndrome
   Non-sjogren syndrome
Evaporative tear dysfunction
   Meibomian gland dysfunction
   Rosacea
   Seborrheic blepharitis
   Chalazion
   Hordeolum
   Sarcoidosis
   Desquamating skin conditions
   Ectodermal dysplasia
   Xerodermia pigmentosum
Noninflammatory vascular anomalies of the conjunctiva
   Hereditary hemorrhage telangiectasia
   Lymphangiectasia
Nutritional and physiologic disorders
   Vitamin A deficiency
   Vitamin C deficiency
Structural and exogenous disorders
   Exposure keratopathy
   Floppy eyelid syndrome
   Superior limbic keratoconjunctivitis
   Recurrent corneal erosion
   Persistent corneal epithelial defect
   Trichiasis and distichiasis
   Factitious ocular surface disorders
   Dellen
   Ocular surface problems secondary to contact lens wear
   Limbal stem cell deficiency
PART III Infectious diseases of the external eye and cornea

5.15. Infectious diseases of the external eye:
- Basic concepts
- Defense mechanisms of the external eye
- Normal ocular flora
- Pathogenesis of ocular infections
  - Virulence
  - Inoculum
  - Host defense
- Ocular microbiology
  - Virology
  - Bacteriology
  - Mycology
  - Parasitology
  - Prions
- Diagnostic laboratory techniques
  - Specimen collection and culturing
  - Staining methods

5.16. Infectious diseases of the external eye:
- Clinical aspects
- Viral infections
  - Herpesvirus
  - Adenovirus
  - Poxvirus
  - Other virus – associated neoplasms of the eyelid and conjunctiva
  - Other viral infections of the ocular surface
- Microbial and parasitic infections of the eyelid margin and conjunctiva
  - Staphylococcal blepharitis
  - Fungal and parasitic infections of the eyelid margin
  - Bacterial conjunctivitis in children and adults
  - Bacterial conjunctivitis in neonates
  - Chlamydial conjunctivitis
  - Parinaudoculaglanular syndrome
- Microbial and parasitic infection of the cornea and sclera
  - Bacterial keratitis
  - Atypical mycobacteria
  - Fungal keratitis
  - Acanthamoeba keratitis
Corneal stromal inflammation associated with systemic infections
Microsporidiosis
Loiasis
Microbial scleritis

PARI IV  Immune – mediated disorders of the external eye and cornea

5.17. Ocular immunology
Immunologic features of the cornea and ocular surface
Soluble mediators of inflammation
Hypersensitivity reaction of the conjunctiva, cornea, and sclera
  Anaphylactic or atopic reactions (Type I)
  Cytotoxic hypersensitivity (Type II)
  Immune – complex reactions (Type III)
  Delayed hypersensitivity (Type IV)
Patterns of immune – mediated ocular disease
  Conjunctiva
  Cornea
  Sclera
Diagnostic approach to immune – mediated ocular disorders

5.18. Clinical approach to immune – related disorders of the external eye
Immune – mediated diseases of the eyelid
  Contact dermatoblepharitis
  Atopic dermatitis
Immune – mediated disorders of the conjunctiva
  Hay fever conjunctivitis and perennial allergic conjunctivitis
  Vernal keratoconjunctivitis
  Atopic keratoconjunctivitis
  Ligneous conjunctivitis
  Contact lens – induced conjunctivitis
  Stevens – Johnson syndrome and toxic epidermal necrolysis
  Ocular cicatricialpemphigoid
  Graft –vs-Host disease
Other immune – mediated diseases of the skin and mucous membranes
Immune-mediated disease of the cornea
  Thygeson superficial punctuate keratitis
  Interstitial keratitis associated with infections diseases
Reiter syndrome
Cogan syndrome
Marginal corneal infiltrates associated with blepharoconjunctivitis
Peripheral ulcerative keratitis associated with systemic immune-mediated disease
Mooren ulcer
Immune-mediated disease of the episclera and sclera
Episcleritis
Scleritis

PART V  Neoplastic disorders of the eyelids, conjunctiva and cornea

5.19 Tumor cell biology and diagnostic approaches to ocular surfaceneoplasia
The eyelid skin and ocular surface
   Microanatomy
   Stem cells and cell turnover
Histopathologic processes and conditions
Overview of oncogenesis
   Tumor immunology
Diagnostic approaches
   Noninvasive investigation
   Biopsy decisions and techniques
Management

5.20 Clinical approach to neoplastic disorders of the conjunctiva and cornea
Cysts of the epithelium
   Epithelial inclusion cyst
Tumors of epithelial origin
   Benign epithelial tumors
   Preinvasive epithelial lesions
   Malignant epithelial lesions
Glandular tumors of the conjunctiva
   Oncocytoma
   Dacryoadenoma
   Sebaceous gland carcinoma
Tumors of neuroectodermal origin
   Benign pigmented lesions
Preinvasive pigmented lesions
Malignant pigmented lesions
Neurogenic and smooth muscle tumors
Vascular and mesenchymal tumors
   Benign tumors
   Malignant tumors
Lymphatic and lymphocytic tumors
   Lymphangiectasia and lymphangioma
   Lymphoid hyperplasia
   Lymphoma
Metastatic tumors
Epibulbarchoristomas
   Epidermoid and dermoid cyst
   Epibulbadermoid
   Dermolipoma
   Ectopic lacrimal gland
   Other choristomas

PART VI  Congenital anomalies of the cornea and sclera

5.21. Basic concepts of congenital anomalies of the cornea and sclera
   Causes of congenital corneal anomalies
   Diagnostic approach

5.22. Clinical aspects of congenital anomalies of the cornea and sclera
   Development anomalies of the globe and sclera
      Cryptophthalmos
      Microphthalmos
      Nanophthalmos
      Blue sclera
   Development anomalies of the anterior segment
      Anomalies of size and shape of the cornea
      Abnormalities of corneal structure and/or clarity
      Congenital corneal opacities in hereditary syndromes and
      chromosomal aberrations
   Secondary abnormalities affecting the fetal cornea
      Intrauterine keratitis; bacterial and syphilitic
      Congenital corneal keloid
Congenital corneal anesthesia
Congenital glaucoma
Birth tumor

PART VII  Corneal dystrophies and metabolic disorders involving the conjunctiva, cornea, and sclera

5.23 Molecular genetics of corneal dystrophies and metabolic disorders
The value of molecular genetics
Principles of genetics
Clinical genetics
Diagnostic approach
Pedigree analysis
Molecular biologic technique

5.24 Clinical approach to corneal dystrophies and metabolic disorders
Corneal dystrophies
    Anterior corneal dystrophies
    Stromal corneal dystrophies
    Endothelial dystrophies
Ecstatic disorders
    Keratoconus
    Pellucid marginal degeneration
    Keratoglobus

Metabolic disorders with corneal changes
    Disorders of carbohydrate metabolism
    Disorders of lipid metabolism and storage
    Disorders of amino acid metabolism
    Disorders of protein metabolism
    Disorders of immunoglobulin synthesis
    Non inflammatory disorders of connective tissue
    Disorders of nucleotide metabolism
    Disorders of mineral metabolism
    Corneal and external diseases signs of systemic neoplasia
PART VIII Degenerative disorders of the conjunctive, cornea and sclera

5.25. Degenerative and aging processes of the conjunctive, cornea and sclera
   Aging of the conjunctiva
   Aging of the cornea
   Degenerative changes in the cornea
   Aging of the sclera

5.26. Clinical approach to depositions and degenerations of the conjunctive, cornea, and sclera
   Conjunctival degenerations
   Pinguecula
   Pterygium
   Conjunctival concretions
   Conjunctivochalasis

   Corneal degenerations
   Epithelial and subepithelial degenerations
   Stromal degenerations – age related (involutional) changes
   Stromal degenerations – peripheral cornea
   Stromal degenerations – postinflammatory changes
   Endothelial degenerations

   Drug – induced deposition and pigmentation
   Corneal epithelial deposits
   Pigmentation

   Scleral degenerations: senile plaques

PART IX Toxic and traumatic injuries of the anterior segment

5.27. Wound healing of the conjunctive, cornea and sclera
   Wound healing of the conjunctiva
   Wound healing of the cornea
   Epithelial wound healing
   Stromal wound healing
   Endothelial wound healing
   Wound healing of the sclera
5.28. Clinical aspects of toxic and traumatic injuries of the anterior segment

Injuries caused by temperature and radiation
- Thermal burns
- Ultraviolet radiation
- Ionizing radiation

Chemical injuries
- Alkali burns
- Acid burns
- Management of chemical injuries

Toxic keratoconjunctivities from medications

Animal and plant substance
- Insect injuries
- Vegetation injuries

Concussive trauma
- Conjunctival hemorrhage
- Corneal changes
- Traumatic mydriasis and miosis
- Traumatic iritis
- Iridodialysis and cyclodialysis
- Traumatic htpHEMA

Nonperforating mechanical trauma
- Conjunctival laceration
- Conjunctival foreign body
- Corneal foreign body
- Corneal abrasion
- Posttraumatic recurrent corneal erosion

Perforating trauma
- Evaluation
- Management

Surgical trauma
- Corneal epithelial changes from intraocular surgery
- Descemet’s membrane changes during intraocular surgery
- Corneal endothelial changes from intraocular surgery
- Conjunctival and corneal changes from extraocular surgery
PART X  Surgery of the ocular surface

5.29 Introduction to surgery of the ocular surface
  Corneal and conjunctival epithelial wound healing
    Role of stem cells
    Conjunctival epithelium
  Maintenance of the ocular surface and its response to wound healing

5.30 Surgical procedures of the ocular surface
  Conjunctival biopsy
    Indications
    Surgical technique
    Tissue processing
  Tarsorrhaphy
    Postoperative care
    Alternatives to tarsorrhaphy
  Pterygium excision
  Conjunctival transplantation
    Conjunctival transplantation for pterygium
    Other indications for conjunctival grafting
  Limbal transplantation
  Conjunctival flap
    Indications
    Surgical technique
    Complications
    Considerations in removal of the flap
  Mucous membrane grafting
    Indications
  Superficial keratectomy and corneal biopsy
    Indications
    Surgical technique
  Management of descemetocele, corneal perforation, and corneal edema
    Bandage contact lens
    Cyanoacrylate adhesive
    Reconstructive lamellae and patch grafts
  Corneal tattoo
    Indications and options
    Surgical technique
PART XI  Corneal transplantation

5.31 Basic concepts of corneal transplantation
Transplantation immunobiology
   Histocompatibility and other antigens
   Immune privilege
Eye banking and donor selection
   Criteria contraindicating donor cornea use

5.32 Clinical approach to corneal transplantation
Penetrating keratoplasty
   Indications
   Preoperative evaluation and preparation
   Surgical technique
   Combined procedures
   Intra operative complications
   Post operative care and complications
   Control of postoperative corneal astigmatism and refractive error
   Diagnosis and management of graft rejection
Pediatric corneal transplants
Corneal autograft procedures
   Rotational autograft
   Contralateral autograft
Lamellar keratoplasty
   Indications
   Surgical technique
   Postoperative care and complications
   Current developments

6. Evaluation Procedure

6.1. Mechanism for programme evaluation
Reliable indicators to assess the training programme should be identified in the area of educational process, resources available, organization and learning environment have to be included in program evaluation, description of the program and performance of the trainees should be considered as key factors
Performance of the Trainees after the training in the real world would be a true indicator
6.2. 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.

7. Assessment Procedure

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

7.2 Dissertation (Annexure 2) based on the Research Project

7.3 Pre Board Certification Assessment (PBCA)
   7.3.1 SEQ Paper – 2 hours – 4 Questions
   7.3.2 Clinical Examination (3 short cases) – two examiners
   7.3.3 Viva Portfolio and Dissertation
   7.3.4 Presentation to the BOS indicating the training received and future vision

Marking Scheme

7.3.1, 7.3.2 and 7.3.3 shall be marked with a numeric mark and converted into a closed mark using the scale given below (the numeric mark does not range from 0-100)

<table>
<thead>
<tr>
<th>Closed Mark</th>
<th>Numeric Mark</th>
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<tbody>
<tr>
<td>9+</td>
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<td>8+</td>
<td>45 – 49</td>
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<td>40 – 44</td>
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</tbody>
</table>
8. Requirements for Board Certification

8.1 Completion of post MD Training Period acceptable to the Board of Study AND
8.2 A closed mark of 9 or above for 7.3.1, 7.3.2 and 7.3.3 of the PBCA AND
8.3 Completion of 7.3.4 and acceptance by the Board of Study

Board certification shall be deferred if above requirements are not completed. Such candidates following a counseling 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 counseling, 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.

9. Method of Delivery and Learner Support System

Clinical ward based training/discussion, tutorials, small group discussions

10. Training Setting/Units and Educational Resources

Teaching will be done by the trainers approved by the board of study of Ophthalmology and the resources such as clinics, theater and library will be used as learning methods. Regular case discussions, Journal Clubs, presentations on new surgical methods will be held regularly.

11. Details of Trainers

The current panel of Board approved trainers who are Board Certified Consultants with MD and Foreign Qualifications such as FRCS (UK) employed by the Ministry of Health. They provide an honorary service for which no payment is made by the University/PGIM
ANNEX 1

Submission of the Case Book

A case book encompassing 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 been carried out. The treatment method should be finished.

The requirement for a case record book 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 trainee's 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 a corneal or ocular surface disorder presentation limited to 8000 words and should include a minimum of 20 relevant recent references from the literature.

The following guidelines should be 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


Book


Book chapter


Website

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 be given in degrees Celsius, Blood Pressure should be given in mm of mercury.)
It is preferable if haematological and clinical chemistry measurements are 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.