Course Curriculum

Fellowship In
Cornea and Refractive Surgery

Prepared by:

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Guidelines & Affiliation:

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1) Name of the subject: Cornea and External Eye Diseases

2) Description:

a) Goals

The goal of the 12-months cornea and external disease fellowship is to provide

- Advanced training for the diagnosis and the medical and surgical management of varied anterior segment disorders affecting the lids, ocular surface, cornea
- Exposure to the state of the art refractive surgeries.
- Opportunity to treat all anterior segment problems, including cataract
- Adequate opportunities for conducting applied and clinical research.

b) Statement of the Objectives of the course

i) Knowledge

The first 6 weeks of the fellowship constitute a probation period during which the fellows will learn basic examination techniques and relevant diagnostic procedures in ophthalmology through rotation with faculty members in various subspecialities (Cornea, glaucoma, Retina, Oculoplasty, Uveitis, Pediatric Ophthalmology & Strabismus) and also in paraclinical departments) . In the next 7.5 months the fellow will work in the Glaucoma department. In the final 3 months of the program, subject to satisfactory performance, the fellow may see and treat cases independently as an adjunct faculty of the institute and work in the peripheral outreach centres of the institute.

The fellow should at a minimum be able to evaluate a patient with acute or chronic or anomalies of the anterior segment, be able to create a differential diagnosis for the typical corneal findings, for the specific anterior segment effects of various systemic and ocular medications, and for surgery of the cornea and conjunctiva, to delineate the risks and benefits for surgical procedures of the anterior segment

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ii) Skills and Attitudes:

The fellow must be able to complete a detailed examination of the eyelids, orbits, conjunctiva, cornea, anterior chamber, iris, anterior chamber angle, lens, vitreous, retina and choroid.

Should recognize the various tests that are available to aid in the diagnosis of external disease patients including measurement of the tear film, use of the microbiology laboratory, information available from genetic analysis,special ophthalmic examination techniques including ultrasound, specular microscopy, pachymetry, confocal microscopy and corneal topography.

iii) **Communication abilities**: The fellow must be able to probe the patient's history for relevant details of the onset and course of the ocular condition. Fellow will be taught about counselling and patient interaction

The fellow should be able to use all of these skills in order to diagnose and treat disorders relevant to the subspeciality.

Periodic sessions will be organised to train the fellows in the following:

- Communication skills: oral and written
- Leadership skills: through participation in community work as the working head of the camps and screening programmes
- Use of technology for teaching and communication
    - Internet to access journals, emails and websites
    - Pubmed and Medline search for bio-medical literature
    - Training sessions on PowerPoint presentations, use of Microsoft excel for statistics and projections

c) Course contents (Syllabus)

BROAD AREAS OF EXPERTISE

EXTERNAL EYE AND CORNEA

Eyelid

- General and dermatological problems and eyelid margin disease, including
- Meibomian gland dysfunction

Conjunctiva

- Infections
- Inflammatory diseases

Cornea

- Dry eye - causes, symptoms and management
- Complications of contact lens wear
- Pterygium
- Infections (clinical features, microbiological investigations and management of viral, bacterial, fungal and amoebic infection)
- Peripheral ulcerative keratitis and autoimmune corneal disease
- Deposits and degenerations
- Common dystrophies (clinical features and management)
- Corneal refractive surgery: Incisional, EXCIMER laser.
- Eye retrieval and eye banking
- Corneal transplant surgery
- Selective Endothelial Transplant surgery
- Limbal stem cell surgery

Sclera

- Scleritis

Refractive Surgery

Lasik

Treatment options for Keratoconus

INTACS

Collagen Cross Linking

i) Essential knowledge

Essential knowledge in diagnosing various corneal and external disease conditions

1. Acute and chronic blepharitis
2. Acute and chronic conjunctivitis
3. Acute and chronic infectious keratitis including bacterial, viral, fungal, and parasitic
4. Non –infectious keratitis
5. Anterior segment anomalies
6. Autoimmune and immunologic diseases of the anterior segment

7. Fundamentals of anterior segment anatomy, physiology and wound healing
8. Fundamentals of refractive surgery and its complications
9. Principles of anterior segment pharmacology
10. Skill in anterior segment surgery including eyelid, conjunctival, scleral and corneal procedures – tarsorrhaphy, reconstruction of the ocular surface, surgical management of corneal erosions and phototherapeutic keratectomy.
11. Skill in penetrating and lamellar keratoplasty, with emphasis on patient selection, surgical technique and postoperative care including recognition and management of graft rejection and endophthalmitis and advanced techniques for lamellar and penetrating keratoplasty.
12. Fundamental knowledge of contact lens physiology, design and materials, and contact lens-associated problems.
13. Skills in diagnostic techniques including biomicroscopy, specular microscopy, corneal topography, vital stains of the ocular surface, corneal biopsy techniques and interpretation and corneal pachymetry.
14. Medical and surgical management of corneal thinning and perforation, including techniques of pharmacological manipulation, application of tissue glue and therapeutic contact lenses.
15. Understanding of cornea and conjunctival pathology results and interpretation of ocular cultures.
16. Knowledge of eye banking procedures and donor selection.
17. Skill in use of reference material, including electronic searching and retrieval of relevant articles, monographs, and abstracts

The fellow will be regularly coming to the operation theatre to assist and observe the consultants. During the later months (last 3-6 months) of the fellowship the candidates will do wet lab, assisted surgeries and later independently.

The fellow will be involved in various ongoing research projects in the hospital, he /she will be encouraged to present papers and publish in peer reviewed journals.

Other desirable knowledge

- Evaluation and timely referral of patients with more advanced diseases in the following subspecialties: Cornea, Glaucoma, Retina, Oculoplasty, Uveitis, Paediatric Ophthalmology and Strabismus
- Basic practice management principles: setting up a private practice, basic financial issues, and other issues and support systems for practice
- Communication basics: communicating with other doctors, paramedical personnel, community workers etc
- Optional: based on candidate's interest, performance and availability of case load, fellows may get to do commonly performed surgical work in other subspecialties

ii) Essential Investigation and Diagnostic Procedures

To perform or interpret results of procedures

- General ophthalmology and cataract

  Syringing, A-scan biometry, Keratometry
- Cornea including eye banking

  Corneal Scraping, Orbscan, Pachymetry, Specular Microscopy

iii) Procedural and Operative Skills

Objective

To acquire demonstrable proficiency in the assessment and contemporary management of disorders of corneal and external eye diseases.

Surgical Core Curriculum and competence

- Competence to perform penetrating keratoplasty
- Management and primary repair of penetrating eye injury, including those affecting the anterior segment
- Management of emergency diseases of the cornea, particularly corneal melt.
- Pterygium excision, including conjunctival autografting and antimetabolites.
- Corneal surface surgery including amniotic membrane grafting
- Observation and assisting refractive surgeries

Medical Management- Core Curriculum:

- Clinical evaluation of the patient undergoing corneal transplantation leading to the development, after discussion with the patient, of a suitable management plan.
- Investigation and management of acute and chronic conjunctivitis, including appropriate use of laboratory investigations.
- Management of tear film insufficiency, including punctal plugs and cautery.
- Management of atopic eye disease.
- Management of contact lens related disorders.
- Management of infective keratitis, including biopsy/sampling (for cytology, histology, microbiology) and the development of an appropriate antimicrobial strategy, and in particular the management of herpetic keratitis.
- Acute management of severe chemical burns involving the anterior segment.

Desirable clinical experience

- Combined corneal transplantation, cataract extraction and lens implantation.
- Management of acute corneal perforation by transplantation or tissue glues.
- Fitting of contact lenses.
- Endothelial specular microscopy.
- Corneal topography.
- Management of the complications of severe chemical injuries to the anterior segment.
- Limbal cell transplantation and conjunctival autografting.
- Techniques and organisation of eye-banking.
- Subspecialty Journal Club meetings.

MICROBIOLOGY RELATED TO CORNEAL DISEASE

- Host defence mechanisms of the ocular surface
- Gram staining and classification of bacteria
- Antibiotics: mechanisms of action and spectrum of activity of major classes of antibiotics used in ophthalmology
    - Bacterial resistance
- Viruses: classification, structure and replication, and laboratory methods of detection
    - Antiviral agents: mechanisms of action
- Fungi: classification, host susceptibility factors, antifungal agents, mechanisms of action

- Toxoplasma
- Chlamydia
- Acanthamoeba

d) Teaching / Learning Activities

- Departmental activities (please see below section e)
- Practical clinical training of post graduates (DNB in ophthalmology): Fellows are expected to participate in the training of DNB candidates. This can involve activities such as discussion of cases in an informal way on a regular basis to formal presentations in weekly meetings.
- Training of paramedical and community health workers: Fellows may be requested by advanced notice to participate in training of paramedical personnel in the hospital or team members in community level. Hands on experience of conducting camps, communication and training of field workers is expected to provide excellent experience and learning for the fellows.
- Journal Access: Our institution has access (both hard copies and online) to peer-reviewed, reputed journals. The fellows are guided by their faculty to regularly update their knowledge by reviewing latest articles from these journals.
- Participation in state level and national level conferences, CMEs, seminars: fellows are expected to present at least one paper/ poster during their tenure in a CME meeting outside of the institution.
- Research Methodology Training: Periodically (every 3-6 months) training will be organized to cover the following topics:
    - Research paper writing : basics
    - Basics of epidemiology and biostatistics
    - Regulatory issues in human research: Indian regulations and others
    - Good clinical Practice (GCP) training

e) Participation in Departmental Activities

(1) **Journal review meetings**: Will be held once in every 2 weeks. One of the presenters will (typically a fellow or a post-graduate) presents an interesting article from a recent journal. The validity of research methods, the findings, the applicability, and clinical implications of the findings will be critically reviewed and discussed. One of the faculty members moderates the entire proceedings and will summarize the discussion at the end of the session.

(2) **Seminars**: Subject seminars will be held once a week. Topics of importance are covered. Either the fellow or a faculty will present a detailed account of a a particular topic for ex. : a diseases or drug or new therapy etc. Interaction is strongly encouraged in such presentations.

(3) **Clinico-pathological conferences**: Basic science faculty from Narayana Hrudayalaya will be invited to discuss challenging cases wherein a diagnosis was finally achieved through the laboratory help.

(4) **Interdepartmental meetings**: These will be of great importance in better understanding of diseases which have involvement of different disease processes or involve multiple structures in the eye. Also some the patients may have associated systemic conditions and having a meeting with other specialists such as physicians, neurologists, endocrinologists may be of great importance.

(5) **Community work- camps/ filed visits**: Fellows are expected to participate in community programs. We have regular weekly camps as well special camps organized from time to time.

(6) **Clinical case presentations**: Every week, interesting and important cases will be discussed. Learning by case study approach is a well established method of training and fellows will be strongly encouraged to discuss cases with the mentors on a regular basis.

(7) **Participation in conferences/ presentation of papers**: Narayana Nethralaya has a strong and growing research team. Fellow are strongly encouraged to work with faculty in producing good quality research and they are encouraged to present and publish such papers. One paper presentation or a journal article submission is required for course completion.

1. **Rotation and Posting in other departments** (duration and Learning requirements to be specified) Fellows will be rotated through other specialties in ophthalmology to allow for understanding of co-management, referral practice and academic challenges.

1.1. For the initial 6 weeks the fellows work in rotation with faculty members in the various subspecialties. 1 week each in :

- Glaucoma
- Retina including medical and surgical retina
- Orbit and oculoplasty,

- Paediatric Ophthalmology and Strabismus
- Uveitis

During this period the fellow would also visit, discuss and learn from interaction with the relevant para-clinical departments like microbiology and pathology.

Learning requirements during the subspecialty rotation

- Examination and management of simple diseases
- Assisting and Performing common procedures and surgeries
- Learning Evaluation and timely referral of patients with more advanced diseases

3. Orientation Programme

An orientation programme for a period of 1 week will be scheduled at the beginning of the fellowship program. The following components will be included in the orientation:

- General and Human resource related:
    - Hospital policies regarding patient care, employment, leave and all human resource related matters
    - Security, emergency, disaster management in the hospital
    - Employees benefits
- Patient care
    - Policies
    - Emergency management
    - Documentation
    - Surgery scheduling, OT procedures, preanesthetic evaluation
    - Policies for Referrals to other doctors and hospitals : internals, external
- Laboratory : Requests, communication, precaution for specimen handling, emergency handling of specimens
- Eye bank and Eye donation
- Library:
    - Rules regulations
    - Procedures for borrowing
    - Plan for materials not available inhouse
    - Online access , use of internet, use of pubmed and medline search
    - Access to password protected library e.x: RGUHS library (after the access becomes available to us)

- National Programmes for Prevention of blindness
    - NPCB
    - Other NGO and programmes

3. Training in teaching skills and research methodology

A half a day session will be organized every 3-6 months that will train all the post graduates and fellows in the following:

- Communication skills: oral and written
- Use of technology for teaching and communication
    - Internet to access journals, emails and websites
    - PowerPoint presentations, excel for statistics and projections
    - Pubmed and Medline search
- Research Methodology
    - Research paper writing : basics
    - Basics of epidemiology and biostatistics
    - Regulatory issues in human research: India regulations
    - Good clinical Practice (GCP) training

f. Monitoring of Teaching and Learning Activities

Monitoring of Learning

Periodic evaluation of log book (end of every month):

- Fellows are expected to document clinical and surgical work is a systematic manner in a logbook that is specifically designed for this purpose. Academic program participation should also be documented in the log book.
- Periodic Internal examinations: clinical assessment (end of every 3 months): Clinical assessment would be held at the end of every 3 months. This may include clinical case presentation, and clinical case quiz.

- Theory and Practical examination at the end of the course per RGUHS regulations. (section 10. Scheme of assessment: RGUHS notification, dated 22-09-2006, Ref: ACA/Fellowships/Rules-1/2006-07).

Monitoring of operative skills:

- Wet lab training under supervision and with video recording facility on animal or model eyes.
- Surgery performed under supervision: Fellows will perform surgeries under supervision till an appraisal is given by the faculty regarding the competence level to handle independent surgeries.
- Review video recorded surgeries with the trainees (once a month): Faculty members will review the approach, alternatives and potential ways of handling complications if any while reviewing an actual surgical procedure. Such learning experience can be supplemented by viewing additional videos of surgeries performed by the faculty.

Monitoring of teaching and communications skills:

- Grading and appraisal of post graduate teaching seminars: Faculty members will critically apprise a fellow of their performance during a seminar or case presentation that they may do for the post graduates.
- Encouraging presentation in conferences at state and national levels: Fellows will be encouraged and trained to present papers at conferences outside of the institution.

Monitoring of research:

Fellows are expected to complete at least one project work during the course duration which will result in one submission to a conference and or a journal

Appraisal of faculty:

Anonymous trainee appraisal of the faculty: Fellows will be requested to give a 360^0 evaluation of their faculty and appraise regarding them at the end of each posting. Such evaluation will be kept anonymous and confidential to avoid any conflicts or fear.

Faculty appraisal by fellowship monitoring committee: A monitoring committee from the institute will be set up to constantly monitor the progress of the programme, fellows well being and to facilitate an excellent learning and teaching environment.

1.2. Scheme of Examinations

Examination and assessment will be conducted as per directions from RGUHS (section 10. Scheme of assessment: RGUHS notification, dated 22-09-2006, Ref: ACA/Fellowships/Rules-1/2006-07).

1.3. Recommended Books and Journals:

1. The Current American Academy of Ophthalmology Basic and Clinical Science Course (12 volumes)
2. Abrams D. Duke Elder's *Practice of Refraction*. Churchill Livingstone. This text covers the basic principles of refraction.
3. Duane's Clinical Ophthalmology By William Tasman, Edward A. Jaeger, Thomas David Duane2005.
4. Principles and Practice of Ophthalmology by Daniel Myron Albert, Frederick A. Jakobiec - 2000. *Principles and Practice of Ophthalmology*. W B Saunders.
5. Ophthalmology, 2nd Edition By Myron Yanoff, MD and Jay S. Duker, MD
6. Kanski JJ. *Clinical Ophthalmology*. Butterworth/Heinemann. Fifth Edition
7. The Wills Eye Manual: Office and Emergency Room Diagnosis and Treatment of Eye Disease (Paperback).

Cornea speciality specific books:

Cornea Fundamentals - Vol 1	Krachmer
Cornea Diagnosis and Fundamentals - Vol 2	Krachmer
Cornea Surgery - Vol 3	Krachmer
Atlas of Clinical Ophthalmology	Albert and Jakobeic
Corneal Disorders - Second Edition	Leibowitz Waring
Customized Corneal Ablation	Macrae
Ocular Surface Disorders	Edwar J Holland
Advances in Ophthalmology	Ashok Garg
Clinical Ophthalmology	Jack J Kanski
The Cornea - Third Edition	Gilbert Smolin
Refractive Keratotomy	George O Waring III
Clinical decision making in optometry	Ellen Richter Ellinger
Corneal Topography	Melanie C Corbett
Wave Front Analysis & Corneal Topography	A Agarwal
Grayson's Diseases of Cornea - 4th Edition	Arffa

1.4 Availability of the material related to the speciality-Ophthalmology:

1. Text books : 300
2. Journals subscribed per year : 08
3. video Tapes : 50
4. Audio Tapes : 05
5. CD- ROMS : 05
6. Internet Facility : yes