
**CURRICULUM / STATUTES & REGULATIONS
FOR
4 YEARS DEGREE PROGRAMME
IN
OTOLARYNGOLOGY
(MS Otolaryngology)**



FATIMA JINNAH
MEDICAL UNIVERSITY, LAHORE
Government of The Punjab

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FATIMA JINNAH MEDICAL UNIVERSITY, LAHORE

STATUTES

Nomenclature Of The Proposed Course

The name of degree programme shall be MS Otolaryngology. This name is well recognized and established for the last many decades worldwide.

Course Title:

MS Otolaryngology

Training Centers

Departments of Otolaryngology (accredited by FJMU) in affiliated institutes of Fatima Jinnah Medical University Lahore.



Duration of Course

The duration of MS Otolaryngology course shall be four (4) years with structured training in a recognized department under the guidance of an approved supervisor.

After admission in M.S. Otolaryngology Programme the resident will spend first 6 Months in the relevant Department of Otolaryngology as **Induction period** during which resident will get orientation about the chosen discipline and will also undertake the **mandatory workshops** (Appendix E). The research project will be designed and the **synopsis** be prepared during this period.

On completion of the induction period the resident will start formal training in the Basic Principles of General Surgery for 06 Months. At the end of one calendar year the candidate will take up the Abridged Examination.

During 2nd, 3rd & 4th years, of the Programme there shall be two components of the Programme. The Research Synopsis must be got approved by AS&RB of the University within first two years of the Programme.

1. Clinical Training in Otolaryngology
2. Research and Thesis writing

The candidate shall undertake clinical training to achieve educational objectives of M.S. Otolaryngology (knowledge & Skills) alongwith rotations in the 3rd year year of the programme as follows:

- a) 3 months in Plastic Surgery
- b) 3 months in Neurosurgery

Research Component and thesis writing shall be completed over the four years duration of the course. Candidates will spend total time equivalent on calendar for research during the training. Research can be done as one block or it can be done in the form of regular periodic rotations over four years as long as total research time is equivalent to one calendar year.

Admission Criteria

Applications for admission to MS Training Programs of University will be invited through advertisement in print and electronic media mentioning closing date of applications and date of Entry Examination.

Eligibility: The applicant on the last date of submission of applications for admission must possess the:

- i) Basic Medical Qualification of MBBS or equivalent medical qualification recognized by Pakistan Medical & Dental Council.
- ii) Certificate of one year's House Job experience in institutions recognized by Pakistan Medical & Dental Council Is essential at the time of interview. The applicant is required to submit Hope Certificate from the concerned Medical Superintendent that the House Job shall be completed before the Interview.
- iii) Valid certificate of permanent or provisional registration with Pakistan Medical & Dental Council.



Registration and Enrollment

- As per policy of Pakistan Medical & Dental Council the number of PG Trainees/ Students per supervisor shall be maximum 05 per annum for all PG programmes including minor programmes (if any).
- Beds to trainee ratio at the approved teaching site shall be at least 5 beds per trainee.
- The University will approve supervisors for MS courses.
- Candidates selected for the courses after their enrollment at the relevant institutions shall be registered with FJMU as per prescribed Registration Regulation.

Accreditation Related Issues of The Institution

A). Faculty

Properly qualified teaching staff in accordance with the requirements of Pakistan Medical and Dental Council (PMDC)

B). Adequate Space

Including class-rooms (with audiovisual aids), demonstration rooms, computer lab and clinical pathology lab etc.

C). Library

Departmental library should have latest editions of recommended books, reference books and latest journals (National and International).



- Accreditation of Otolaryngology training program can be suspended on temporary or permanent basis by the University, if the program does not comply with requirements for residents training as laid out in this curriculum.
- Program should be presented to the University along with a plan for implementation of curriculum for training of residents.
- Programs should have documentation of residents training activities and evaluation on monthly basis.
- To ensure a uniform and standardized quality of training and availability of the training facilities, the University reserves the right to make surprise visits of the training program for monitoring purposes and may take appropriate action if deemed necessary.

AIMS AND OBJECTIVES OF THE COURSE

AIM

The aim of four years MS programme in Otolaryngology is to train residents to acquire the competency of a specialist in the field so that they can become good teachers, researchers and clinicians in their specialty after completion of their training.

GENERAL OBJECTIVES

MS Otolaryngology training should enable a student to:

1. Access and apply relevant knowledge to clinical practice:
 - Maintain currency of knowledge

- Apply scientific knowledge in practice
- Appropriate to patient need and context
- Critically evaluate new technology

2. Safely and effectively performs appropriate surgical procedures:

- Consistently demonstrate sound surgical skills
- Demonstrate procedural knowledge and technical skill at a level appropriate to the level of training
- Demonstrate manual dexterity required to carry out procedures
- Adapt their skills in the context of each patient and procedure
- Maintain and acquire new skills
- Approach and carries out procedures with due attention to safety of patient, self and others
- Critically analyze their own clinical performance for continuous improvement

3. Design and implement effective management plans:

- Recognize the clinical features, accurately diagnose and manage neurological problems
- Formulate a well-reasoned provisional diagnosis and management plan based on a thorough history and examination
- Formulate a differential diagnosis based on investigative findings

- Manage patients in ways that demonstrate sensitivity to their physical, social, cultural and psychological needs
- Recognize disorders of the nervous system and differentiate those amenable to surgical treatment



- Effectively manage the care of patients with ENT trauma including multiple system trauma
- Effectively recognize and manage complications
- Accurately identify the benefits, risks and mechanisms of action of current and evolving treatment modalities
- Indicate alternatives in the process of interpreting investigations and in decision-making
- Manage complexity and uncertainty
- Consider all issues relevant to the patient
- Identify risk
- Assess and implement a risk management plan
- Critically evaluate and integrate new technologies and techniques.

4. Organize diagnostic testing, imaging and consultation as needed:

- Select medically appropriate investigative tools and monitoring techniques in a cost-effective and useful manner
- Appraise and interpret appropriate diagnostic imaging and investigations according to patients' needs
- Critically evaluates the advantages and disadvantages of different investigative modalities

5. Communicate effectively:

- Communicate appropriate information to patients (and their family) about procedures, potentialities and risks associated with surgery in ways that encourage their participation in informed decision making
- Communicate with the patient (and their family) the treatment options including benefits and risks of each

- Communicate with and co-ordinate health management teams to achieve an optimal surgical environment
- Initiate the resolution of misunderstandings or disputes

- Modify communication to accommodate cultural and linguistic sensitivities of the patient

6. Recognize the value of knowledge and research and its application to clinical practice:

- Assume responsibility for self-directed learning
- Critically appraise new trends in Otolaryngology
- Facilitate the learning of others.

7. Appreciate ethical issues associated with Otolaryngology:

- Consistently apply ethical principles
- Identify ethical expectations that impact on medico-legal issues
- Recognize the current legal aspects of informed consent and confidentiality
- Be accountable for the management of their patients.

8. Professionalism by:

- Employing a critically reflective approach to Otolaryngology
- Adhering with current regulations concerning workplace harassment
- Regularly carrying out self and peer reviewed audit
- Acknowledging and have insight into their own limitations
- Acknowledging and learning from mistakes

9. Work in collaboration with members of an interdisciplinary team where appropriate:



- Collaborate with other professionals in the selection and use of various types of treatments assessing and weighing the indications and contraindications associated with each type
- Develop a care plan for a patient in collaboration with members of an interdisciplinary team
- Employ a consultative approach with colleagues and other professionals
- Recognize the need to refer patients to other professionals.

10. Management and Leadership

- Effective use of resources to balance patient care and system resources
- Identify and differentiate between system resources and patient needs
- Prioritize needs and demands dealing with limited system resources.
- Manage and lead clinical teams
- Recognize the importance of different types of expertise which contribute to the effective functioning of clinical team.
- Maintain clinically relevant and accurate contemporaneous records

11. Health advocacy:

- Promote health maintenance of patients
- Advocate for appropriate health resource allocation
- Promote health maintenance of colleagues and self scholar and teacher



SPECIFIC LEARNING OUTCOMES

On completion of the training programme, Otolaryngology trainees pursuing an academic pathway will be expected to have demonstrated competence in all aspects of the published syllabus. The specific training component would be targeted for establishing clearly defined standards of knowledge and skills required to practice Otolaryngology at secondary and tertiary care level with proficiency in the Basic and applied clinical sciences, Basic Otolaryngologic care, ENT intensive care, Emergency (A&E) medicine and Complementary surgical disciplines.

- 1. Cognitive knowledge:** Describe embryology, applied anatomy, physiology, pathology, clinical features, diagnostic procedures and the therapeutics including preventive methods, (medical/surgical) pertaining to Otolaryngology and Head & Neck Surgery.
- 2. Clinical Decision Making Ability & Management Expertise:** Diagnose conditions from history taking, clinical evaluation and investigations and develop expertise to manage medically as well as surgically the commonly encountered, disorders and diseases in different areas as follows:
Otology, Neurology & Skull-base Surgery: External, middle and internal ear diseases, deafness including the common complications associated with middle ear inner facial Nerve palsy, tinnitus, vertigo and other conditions such as acoustic neuroma, malignant tumours, glomus tumor and petrous apex cholesteatoma etc. and to be capable of doing early diagnosis of these conditions and also to acquire adequate knowledge about principles of therapy of these diseases.
- 3. Rhinology:** Able to diagnose and manage nasal and paranasal sinus conditions such as infection, polyps and allergy. Acquire some surgical skills to do septorhinoplasty, septoplasty, functional endoscopic sinus surgery (FESS). Develop



- capability to do oncologic diagnosis and therapy planning for proper management of such patients in collaboration with radiotherapists and medical oncologists.
4. **Laryngology:** Able to diagnose and manage benign lesions of the larynx including voice-disorders and pharyngeal and nasopharyngeal diseases, viz-adenoids and angiofibroma. Capable to do diagnosis of oncologic conditions such as laryngeal carcinoma and plan its therapy strategies.
 5. **Oral cavity/salivary glands:** Learn about Oral cavity and salivary gland diseases, their diagnosis and therapy planning with referral strategies for cancer patients to advanced cancer centers/ Hospital.
 6. **Head/Neck conditions/diseases:** Learn about head and neck diseases including Parotid gland and thyroid diseases, neurogenic tumours and neck space infections/and their management.
 7. **Broncho-esophageal region:** Learn about broncho-esophageal diseases/disorders such as congenital disorders, diagnosis of Foreign bodies in wind/food pipes with their management policies. Capable to perform panendoscopies for oncologic evaluation in the head-neck region, including oesophageal malignancy.
 8. **Plastic reconstruction following major head neck surgery & trauma:** Acquire general principles of reconstructive surgery and its referral needs.
 9. **Advanced Surgical methods:** Acquire knowledge about phonosurgery like microlaryngoscopic surgery, palatopharyngoplasty for VPI & Cleft palate, and thyroplasty for voice-disorders.
 10. **General principles of newer therapy/Surgery:** Newer knowledge about ENT diseases in general, including technological (Laser) and pharmacologic advances (medicines) and newer method of therapy for certain conditions such as Obstructive sleep apnoea syndrome and asthma.
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11. **Traumatology & Facio-maxillary Injury:** Acquire knowledge in the management of Traumatology in general and facio-maxillary injury in particular, including nasal fractures. Be capable of doing screening in the community, of the audiological & speech related disabilities, and also to do early identification of malignancies and create its awareness in the community/ society to eventually get better cooperation from people in health management.
12. **Radiology:** Acquire knowledge about radiology/imaging and to interpret different radiological procedures and imaging in Otolaryngology – Head and Neck and skull base regions. There should be collaboration with Radiology department for such activities.
13. **Audiology & Rehabilitation:** Perform different audiological and neuro-otological tests for diagnosis of audiologic/vestibular disorders/diseases and become capable to interpret these findings and to incorporate their implication in diagnosis and their treatment including the rehabilitative methods in Audiology and speech pathology including hearing aids and other assistive and implantable devices.
14. **Psychologic and social aspect:** Some elementary knowledge in clinical Psychology and social, work management is to be acquired for management of patients, especially those terminally ill and disable-persons and interacting with their relatives.
15. **Preventive Otolaryngology:** Acquire knowledge about prevention of some conditions especially in children such as middle ear and sinus infection, hereditary deafness and early diagnosis of head-neck malignancy. Hence he/she should know about the preventive Otorhinolaryngology (ENT).



16. **Identification of a special areas within the subject:** To further develop higher skills within the specialty in a specialized area such as Otolaryngology, Neurology, Rhinology, head and neck oncology, skull base surgery and Audiological medicine, Resident may identify some area of interest, during the Residency Programme in one of such areas like Otolaryngology.

17. **Research Experience:**

All residents in the categorical program are required to complete an academic outcomes-based research project during their training. This project can consist of original bench top laboratory research, clinical research or a combination of both. The research work shall be compiled in the form of a thesis which is to be submitted for evaluation by each resident before end of the training. The designated Faculty will organize and mentor the residents through the process, as well as journal clubs to teach critical appraisal of the literature.



PRACTICAL TRAINING

1. A Resident doctor, pursuing MS Degree course is expected to perform major and minor surgical procedures first through observation and then under supervision of a supervisor/faculty member till he/she is proficient to perform major and minor surgical maneuvers independently such as: (Few examples only given):
 - Tracheostomy
 - Tonsillectomy
 - Adenoidectomy/grommet insertion,
 - Nasal Polypectomy
 - Incision/drainage of quinsy/other abscesses,
 - S.M.R. & Septoplasty
 - Cortical mastoidectomy
 - Modified radical Mastoidectomy.
2. Be able to manage common emergencies like, fracture nasal bone, stridor requiring a tracheostomy, epistaxis, subperiosteal abscess, and Peritonsillar abscess.
3. He/she should be capable to do minor operations independently (Few examples only given)
 - Myringotomy and myringoplasty
 - Antral washout and nasal biopsy
 - Sub-mandibular salivary gland removal
 - Biopsy from a neck mass, such as a node
 - Direct Laryngoscopy
 - Nasopharyngoscopy
 - Flexible Bronchoscopy and Oesophagoscopy
 - Aural polypectomy
4. He/she should be able to do the following operations under supervision/guidance of senior colleagues/ faculty member (Few examples only given):



- Fibre-optic rigid endoscopy of oesophagus
- Intranasal ethmoidectomy
 - External ethmoidectomy
 - External fronto ethmoidectomy
 - Maxillectomy (Partial and Total)
 - Excision of thyroglossal cyst
 - Superficial Parotidectomy
 - Radical block dissection of the neck for metastatic nodes.
 - Total Laryngectomy for cancer.
 - Laryngofissure
 - Repair of laryngotracheal trauma.
 - Ligation external carotid artery

5. He/she should be able to do under guidance/supervision the following specialized operative procedures (Few examples only given):

- Facial nerve decompression
- Pinna-Repair (Post-traumatic)
- Surgery of choanal atresia,
- External canal atresia-surgery,
- Functional endoscopic/sinus surgery,
- Stapedectomy
- Tympanoplasty with mastoid surgery
- Rhinoplasty for cosmetic purposes.
- Fibre-optic bronchoscopy and oesophagoscopy including foreign body removal
- Cryo/Laser surgery in ENT
- Microlaryngoscopic voice-surgery for vocal nodules, polyps/ cyst etc
- Phonosurgery for cord palsy including type I thyroplasty.
- Skull base/parapharyngeal space surgery
- Thyroid surgery,
- Laryngo-tracheal stenosis – surgical correction,



- Facio-maxillary injury etc.

REGULATIONS

Scheme of the Course

A summary of four years course in MS Otolaryngology is presented as under:

Course Structure	Components	Examination
<p>At the End of 1st year of Programme</p>	<ul style="list-style-type: none"> • Principles of General Surgery • Relevant Basic Sciences (Anatomy, Physiology, Pharmacology, Pathology) 	<p><u>Abridged Examination</u> at the end of 1st Year of M.S. Otolaryngology Programme.</p> <p>Written paper MCQs Video Projected Clinical Examination</p>
<p>At the end of Final year of the Programme</p>	<p style="text-align: center;"><u>Clinical component</u></p> <ul style="list-style-type: none"> • Professional Education in Otolaryngology: <p>Clinical Component</p> <p>Training in otolaryngology during 2nd, 3rd & 4th years of the M.S. programme.</p> <p>Rotations in the related fields</p> <p><u>Research component of final Examination</u></p> <p>Research work / Thesis writing must be completed and submitted atleast 6 months before the end of training.</p>	<p><u>Final Examination</u> at the end of 4th year of M.S. Otolaryngology.</p> <p>Written: Paper 1 & 2 of Problem based MCQs & SEQs in the subject.</p> <p>Clinical, TOACS/OSCE & ORAL:</p> <p>Examination:</p> <ul style="list-style-type: none"> • Short Cases • Long Case • TOACS/OSCE & ORAL • Continuous Internal Assessment <p>Thesis Evaluation and defence at the end of 4th year M.S. Otolaryngology Programme.</p>

Examinations.

All candidates admitted in M.S. Otolaryngology Programme shall appear in Abridged Examination at the end of 1st calendar year.


Written Examination	=300 Marks
Video projected clinical/ Practical Examination	= 50 Marks
Total	= 350 marks

Eligibility Criteria

To appear in Abridged Examination, a candidate shall be required

- a) To have submitted certificate of completion of mandatory workshops.
- b) To have submitted certificate of completion of one year of training from the supervisor/supervisors of rotations.
- c) To have submitted assessment proforma from the supervisor on 03 monthly basis achieving a cumulative score of **75%**.
- d) To have submitted certificate of submission of synopsis
- e) To have submitted evidence of payment of examination fee.

Abridged Examination Schedule and Fee

- I. Abridged Examination at completion of one year of training, will be held twice a year.
 - II. There will be a minimum period of 30 days between submission of applications for the examination and the conduction of examination.
 - III. Examination fee will be determined periodically by the university.
 - IV. The examination fee once deposited cannot be refunded / carried over to the next examination under any circumstances.
 - V. The Controller of Examination will issue Roll Number Slips on receipt of prescribed application form, documents satisfying eligibility
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criteria and evidence of payment of examination fee.

Written Exam

There will be 150 Single best answer type MCQs with a total of 300 marks as follows:-

Principles of General Surgery = MCQs = 100 questions

Basic Sciences = MCQs = 50 questions

(Anatomy, Physiology, Pharmacology, Pathology)

- I. Each correct answer to MCQ will carry 2 marks. Incorrect response will result in deductions of 0.5. Duration of this exam will be 150 minutes.
- II. The candidates scoring 50% marks will pass the written examination and will then be eligible to appear in the Video-Projected Clinical Examination

Video Projected Clinical Part of Abridged Exam (VPCE)

The VPCE will consist of 25 videos/ Slides of clinical material and scenarios from Otolaryngology and General Surgery Each Video/ slide will have one question and carry 2 marks. Incorrect response will result in deduction of 0.5 marks. The Candidate securing 50% marks in VPCE will pass this part of exam

Declaration of Result

The Candidate will have to score 50% marks in written and video-projected clinical components and a cumulative score of 60% to be declared successful in the Abridged Examination.


A maximum total of four consecutive attempts (availed or unavail) will be allowed in the Abridged Examination during which the candidate will be allowed to continue his training program. If the candidate fails to pass his Abridged Examination within the above mentioned limit of four attempts, the candidate shall be removed from the training program, and the seat would fall vacant, stipend/ scholarship if any would be stopped.

Final Examination M.S. Otolaryngology

Eligibility Criteria: To appear in the Final Examination the candidate shall be required:

- i) To have submitted the result of passing Abridged Examination.
- ii) To have submitted the certificate of completion of training, issued by the Supervisor will be mandatory.
- iii) To have achieved a cumulative score of 75% in Continuous Internal assessments of all training years.
- iv) To have got the thesis accepted and will then be eligible to appear in Final Examination.
- v) To have submitted no dues certificate from all relevant departments including library, hostel, cashier etc.
- vi) To have submitted evidence of submission of examination fee.

Final Examination Schedule and Fee

- a) Final examination will be held twice a year.
 - b) The candidates have to satisfy eligibility criteria before permission is granted to take the examination.
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- c) Examination fee will be determined and varied at periodic intervals by the University.
- d) The examination fee once deposited cannot be refunded / carried over to the next examination under any circumstances.
- e) The Controller of Examinations will issue an Admittance Card with a photograph of the candidate on receipt of prescribed application form, documents satisfying eligibility criteria and evidence of payment of examination fee. This card will also show the Roll Number, date / time and venue of examination.

Components of Final Examination

Written Part of Final Examination	Total marks 500
Clinical, TOACS/OSCE & ORAL	Total marks 500
Contribution of CIS to the Final Examination	Total marks 100
Thesis Evaluation	Total marks 400
Total	1500 Marks

Written Part of Final Examination

- a) There will be two written papers which will cover the whole syllabus of the specialty of training with total marks of 500.
- b) The written examination will consist of 200 single best answer type Multiple Choice Questions (MCQs) and 10 Short Essay Questions (SEQs). Each correct answer in the Multiple Choice Question paper will carry 02 marks, but an incorrect response will result in deduction of 0.5 mark. Each Short Essay Question will carry 10 marks.



b) The Total Marks of Clinical & Oral Examination will be 500 and to be divided as follows:

Short Cases	Total Marks = 200
Long Case	Total Marks = 100
TOACS/OSCE & ORAL	Total Marks = 200
Total Marks	500

- c) A panel of four examiners will be appointed by the Vice Chancellor and of these two will be from FJMU whilst the other two will be the external examiners. Internal examiner will act as a coordinator. In case of difficulty in finding an Internal Examiner in a given subject, the Vice Chancellor would, in consultation with the concerned Deans, appoint any relevant person with appropriate qualification and experience, outside the University as an examiner.
- d) The internal examiners will not examine the candidates for whom they have acted as Supervisor and will be substituted by other internal examiner.
- e) The candidates scoring 50% marks in each component of the Clinical & Oral Examination will pass this part of the Final Examination.
- f) The candidates will have two attempts to pass the final examination with normal fee. A special administration fee of Rs.10,000 in addition to normal fee or the amount determined by the University from time to time shall be charged for further attempts.



Declaration of Result

For the declaration of result


- I. The candidate must get his/ her Thesis accepted.
- II. The candidate must have passed the final written examination with 50% marks and the clinical & oral examination securing 50% marks. The cumulative passing score from the written and clinical/ oral examination shall be 60%. Cumulative score of 60% marks to be calculated by adding up secured marks of each component of the examination i.e written and clinical/ oral and then calculating its percentage.
- III. The MS degree shall be awarded after acceptance of thesis and success in the final examination.
- IV. On completion of stipulated training period, irrespective of the result (pass or fail) the training slot of the candidate shall be declared vacant.



Submission / Evaluation of Synopsis

1. The candidates shall prepare their synopsis as per guidelines provided by the Advanced Studies & Research Board, available on university website.
2. The research topic in clinical subject should have 30% component related to basic sciences and 70% component related to applied clinical sciences. The research topic must consist of a reasonable sample size and sufficient numbers of variables to give training to the candidate to conduct research, to collect & analyze the data.
3. Synopsis of research project shall be submitted by the end of the 2nd year of MS program. The synopsis after review by an Institutional Review Committee shall be submitted to the University for consideration by the Advanced Studies & Research Board, through the Principal / Dean /Head of the institution.

Submission of Thesis

1. Thesis shall be submitted by the candidate duly recommended by the Supervisor.
 2. The minimum duration between approval of synopsis and submission of thesis shall be one year.
 3. The research thesis must be compiled and bound in accordance with the Thesis Format Guidelines approved by the University and available on website.
 4. The research thesis will be submitted along with the fee prescribed by the University.
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Thesis Examination

- a) The candidate will submit his/her thesis at least 06 months prior to completion of training.
- b) The Thesis along with a certificate of approval from the supervisory will be submitted to the Registrar's office, who would record the date / time etc. and get received from the Controller of Examinations within 05 working days of receiving.
- c) The Controller of Examinations will submit a panel of eight examiners within 07 days for selection of four examiners by the Vice Chancellor. The Vice Chancellor shall return the final panel within 05 working days to the Controller of Examinations for processing and assessment. In case of any delay the Controller of Examinations would bring the case personally to the Vice Chancellor.
- d) The Supervisor shall not act as an examiner of the candidate and will not take part in evaluation of thesis.
- e) The Controller of Examinations will make sure that the Thesis is submitted to examiners in appropriate fashion and a reminder is sent after every ten days.
- f) The thesis will be evaluated by the examiners within a period of 06 weeks.
- g) In case the examiners fail to complete the task within 06 weeks with 02 fortnightly reminders by the Controller of Examinations, the Controller of Examinations will bring it to the notice of Vice Chancellor in person.
- h) In case of difficulty in find an internal examiner for thesis evaluation, the Vice Chancellor would, in consultation with the concerned Deans, appoint any relevant person as examiner in supersession of the relevant Clause of the University Regulations.
- i) There will be two internal and two external examiners. In case of difficulty in finding examiners, the Vice Chancellor would, in consultation with the

concerned Deans, appoint minimum of three, one internal and two external examiners.

j) The total marks of thesis evaluation will be 400 and 60% marks will be required to pass the evaluation.

k) The thesis will be considered / accepted, if the cumulative score of all the examiners is 60%.

l) The clinical training will end at completion of stipulated training period but the candidate will become eligible to appear in the Final

Examination at completion of clinical training and after acceptance of thesis. In case clinical training ends earlier, the slot will fall vacant after stipulated training period.

Award of MS Otolaryngology Degree

After successful completion of the structured courses of MS Otolaryngology and qualifying Abridged and Final examinations (Written, Clinical, TOACS/OSCE & ORAL and Thesis) the degree with title MS Otolaryngology shall be awarded.



CONTENT OUTLINE

MS Otolaryngology

Basic Sciences:

Student is expected to acquire comprehensive knowledge of Anatomy, Physiology, Pathology, and Pharmacology relevant to surgical practice appropriate for Otolaryngology

1. Anatomy

- *Clinical and functional anatomy with pathological and operative relevance*
- *Surgical approaches to the ear, nose, larynx and head & neck structures*
- *Histology and embryology of ear, nose, larynx and head & neck structures*

- Cell Biology: Cytoplasm – Cytoplasmic matrix, cell membrane, cell organelles, cytoskeleton, cell inclusions, cilia and flagella.
- Nucleus – nuclear envelope, nuclear matrix, DNA and other components of chromatin, protein synthesis, nucleolus, nuclear changes indicating cell death.
- Cell cycle, mitosis, meiosis, cell renewal.
- Cellular differentiation and proliferation.
- Tissues of Body: Light and electron microscopic details and structural basis of function, regeneration and degeneration. Confocal microscopy.
- The systems/organs of body – Cellular organization, light and electron microscopic features, structure function correlations, and cellular organization.



Embryology

- General Features of Human Development
- Features of mitotic and meiotic modes of cell division. Genetic consequences of meiotic division.
- Abnormal mitotic and meiotic divisions of clinical importance.
- Gametogenesis: origin of germ cells.
- Oogenesis: prenatal and postnatal development of ova.
- Spermatogenesis: proliferation and maturation of male germ cells. Abnormal gametes, their clinical significance.
- Ovulation, fertilization and the consequences of fertilization.

Early Embryonic Development:

- Cleavage, morula and blastocyst formation and implantation.
- Formation of the three primary germ layers.
- List of the derivatives of the respective germ layers.

Period of the Growing Fetus:

- Various stages and salient features of the fetus development

Extraembryonic Membranes:

- Development, functions and anomalies of yolk sac, amnion, chorion, allantois, umbilical cord and placenta.

Development of the External Body Form:

- Shaping of the head and neck. Common developmental anomalies associated.

The Branchial Apparatus:

- Development and fate of the bronchial grooves, arches and pouches. Their derivatives and anomalies.

Teratogenesis:

- Factors known to be involved in the development of congenital anomalies especially related to the otolaryngological system.
- Concept of critical periods.



Histology:

Structural and Functional Organization of the Tissues of Body

- Classification of tissues and identification of various tissues particularly those related to the musculoskeletal system, in routine histological preparations under the light microscope.

The Epithelial Tissue

- General structure, functions and classification of epithelia
- Their location in the body
- General characters of serous and mucous membranes
- General structural features of exocrine and endocrine glands

The Connective Tissue

- Cartilage
- Structure of bone marrow. Cell lines seen in haemopoiesis.
- Factors required for bone growth.

The Muscular Tissue

- Structural and functional differences between the smooth skeletal and cardiac types of muscle.
- Fine structure of skeletal and cardiac muscle fibers, and its relationship to the mechanism of contraction.
- Specialized conducting tissue of the heart.

The Neural Tissue

- The neuron, morphology of the perikaryon and its processes.
- Coverings of the axons in the peripheral nerves and the central nervous system.
- Types of neuroglia and their functions.
- Process of myelination in the peripheral nerves and the central nervous system.
- Axon terminals and synapses. Nerve fiber degeneration and regeneration.

Surface and Imaging Anatomy

Upper respiratory system including

- Ear (sense of hearing enters via cranial nerve)
- Nose.
- Paranasal Sinuses.
- Oral Cavity
- Pharynx.
- Larynx
- Salivary Glands
- Head and neck
- Blood supply, Nerve supply and the Lymphatic drainage of the ear, nose,

- throat and trachea, larynx, and accessory sinuses
- Anatomy of the Central Nervous System with particular reference to ear, nose and throat
 - Gross Anatomy of neck and chest in relation to trachea and oesophagus
 - Comparative study of Anatomy of the ear, nose and throat in relation to lower animals

2. Physiology

- Physiology of ear, nose, throat and oesophagus
- Sound Transmission
- Functions of the nose
- Physiology of olfaction
- Physiology of hearing
- Middle ear impedance transformer mechanism
- Vestibular function in maintaining equilibrium
- Auditory pathway
- Physiology of swallowing
- Speech generation
- Endocrine glandular function, particularly thyroid, parathyroid and pituitary glands
- Shock and circulatory support
- Exocrine glands, particularly salivary glands
- Special senses, particularly hearing, balance and olfaction

3. Pharmacology

- The Evolution of Medical Drugs
- British Pharmacopia
- Introduction to Pharmacology
- Receptors
- Mechanisms of Drug Action
- Pharmacokinetics
- Pharmacokinetic Process
 - Absorption
 - Distribution



- Metabolism
- Desired Plasma Concentration
- Volume of Distribution
- Elimination
- Elimination rate constant and half life
- Creatinine Clearance
- Drug Effect
 - Beneficial Responses
 - Harmful Responses
 - Allergic Responses
- Drug Dependence, Addiction, Abuse and Tolerance
- Drug Interactions
- Dialysis
- Drug use in pregnancy and in children
- Ototoxicity and medication

4. Pathology

Pathological alterations at cellular and structural level in infection, inflammation, ischaemia, neoplasia and trauma affecting the ear, nose and upper respiratory tract

Cell Injury and adaptation

- Reversible and Irreversible Injury
- Fatty change, Pathologic calcification
- Necrosis and Gangrene
- Cellular adaptation
- Atrophy, Hypertrophy,
- Hyperplasia, Metaplasia, Aplasia

Inflammation

- Acute inflammation
- Cellular components and chemical mediators of acute inflammation
- Exudates and transudate
- Sequelae of acute inflammation
- Chronic inflammation
- Etiological factors and pathogenesis
- Distinction between acute and chronic (duration) inflammation

- Histologic hallmarks
- Types and causes of chronic inflammation, non-granulomatous & granulomatous,

Haemodynamic disorders

- Etiology, pathogenesis, classification and morphological and clinical manifestations of Edema, Haemorrhage, Thrombosis, Embolism, Infarction & Hyperaemia
- Shock; classification etiology, and pathogenesis, manifestations.
- Compensatory mechanisms involved in shock
- Pathogenesis and possible consequences of thrombosis
- Difference between arterial and venous emboli

Neoplasia

- Dysplasia and Neoplasia
- Benign and malignant neoplasms
- Etiological factors for neoplasia
- Different modes of metastasis
- Tumor staging system and tumor grade

Immunity and Hypersensitivity

- Immunity
- Immune response
- Diagnostic procedures in a clinical Immunology laboratory
- Protective immunity to microbial diseases
- Tumour immunology
- Immunological tolerance, autoimmunity and autoimmune diseases.
- Transplantation immunology
- Hypersensitivity
- Immunodeficiency disorders
- Immunoprophylaxis & Immunotherapy

Related Microbiology

- Role of microbes in various otolaryngological disorders
- Infection source
- Nosocomial infections
- Bacterial growth and death
- Pathogenic bacteria
- Vegetative organisms
- Spores
- Important viruses

- Important parasites
- Surgically important microorganisms
- Sources of infection
- Asepsis and antisepsis
- Sterilization and disinfection
- Infection prevention
- Immunization
- Personnel protection from communicable diseases
- Use of investigation and procedures in laboratory
- Basics in allergy and immunology


Special Pathology

- Foreign body in Ear, Nose & Throat
- Otitis media
- Otitis externa
- Mastoiditis
- Rupture of tympanic membrane
- Meniere's disease
- Nasal allergy
- Nasal Polyp
- Epistaxis
- Sinusitis
- Hearing Loss
- Tonsillitis and peritonsillar abscess
- Pharyngitis
- Ludwig's Angina
- Hoarseness of voice
- Laryngotracheitis
- Laryngeal obstruction
- Diphtheria
- Indication of tracheostomy
- Carcinoma of Larynx
- Wax in ear, Haematoma auris, Furunculosis
- Indications for and interpretation of results of common biochemical and haematological tests
- Macroscopic and microscopic appearances of common or important diseases found in otolaryngology

MS Otolaryngology

Principles of General Surgery for Abridged Examination

- History of surgery
- Preparing a patient for surgery
- Principles of operative surgery: asepsis, sterilization and antiseptics
- Surgical infections and antibiotics
- Basic principles of anaesthesia and pain management
- Acute life support and critical care:
 - Pathophysiology and management of shock
 - Fluids and electrolyte balance/ acid base metabolism
 - Haemostasis, blood transfusion
- Trauma: assessment of polytrauma, triage, basic and advanced trauma
- Accident and emergency surgery
- Wound healing and wound management
- Nutrition and metabolism
- Principles of burn management
- Principles of surgical oncology
- Principles of laparoscopy and endoscopy
- Organ transplantation
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