



**ALL INDIA INSTITUTE OF MEDICAL SCIENCES
NAGPUR**

Department of ENT

CURRICULUM

Masters in Surgery (MS)

OTORHINOLARYNGOLOGY

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Masters in Otorhinolaryngology is a three year postgraduate course.

1.0 Goal:

The purpose of PG education is to create specialists who would provide high quality health care and advance the cause of science through research & training. The purpose of MS Otorhinolaryngology is to standardize Otorhinolaryngology teaching at Post Graduate level throughout the country so that it will benefit in achieving uniformity in undergraduate teaching as well and resultantly creating competent ENT Surgeons with appropriate expertise.

2.0 Program Outcome:

At the end of postgraduate training the student should be able to:

1. Practice his specialty ethically keeping in mind the requirement of the patient, community and people at large.
2. Demonstrate sufficient understanding of basic sciences related to his specialty and be able to integrate such knowledge in his Clinical practice.
3. Diagnose and manage majority of conditions in his specialty (clinically and with the help of relevant investigations)
4. Plan and advice measures for the promotive, preventive, curative and rehabilitative aspects of health and diseases in the specialty of Otorhinolaryngology.
5. Should be able to demonstrate his cognitive skills in the field of Otorhinolaryngology and its ancillary branches during the formative and summative evaluation processes.
6. Play the assigned role in the implementation of National Health Programs
7. Demonstrate competence in basic concepts of research methodology and writing thesis and research papers.
8. Develop good learning, communication and teaching skills.
9. Demonstrate sufficient understanding of basic sciences and the clinical applications related to the specialty to be able to integrate this knowledge into Clinical practice. Acquire in-depth knowledge in the subject including recent advances.

10. Demonstrate that he is fully conversant with the latest diagnostics & therapeutics available.

SUBJECT SPECIFIC LEARNING OBJECTIVES

1. Theoretical Knowledge:

A student should have fair knowledge of basic sciences (Anatomy, Physiology, Biochemistry, Microbiology, Pathology and Pharmacology) as applied to Otorhinolaryngology and be able to integrate such knowledge in his clinical practice. She/he should acquire in-depth knowledge of his subject including recent advances. She/he should be fully conversant with the bedside procedures (diagnostic and therapeutic) and having knowledge of latest diagnostics and therapeutics available.

2. Clinical / Practical skills:

A student should be adept at good history taking, physical examination, providing basic life support and advanced cardiac life support, common procedures like FNAC, Biopsy, aspiration from serous cavities, lumbar puncture etc. She/he should be able to choose the required investigations to enhance the attitude, communication skills, including dealing with patient's relatives with the required empathy, adapt to changing trends in education, learning methods and evolving new diagnostic and therapeutic techniques in the subject of Otorhinolaryngology.

3. Research:

She/he should know the basic concepts of research methodology, plan a research project, plan and write a thesis and should know how to use library facilities. Basic knowledge of statistics is also required. Knowledge about use of internet resources is required.

4. Teaching:

The student should learn the basic methodology of teaching and assessment and develop competence in teaching medical/paramedical students and their assessment.

3.0 Syllabus

Course content in the syllabus will be based on the curriculum goals wherein a postgraduate student is required to acquire knowledge of basic and applied sciences including anatomy, physiology, pharmacology, pathophysiology and microbiology related to ear, nose, throat, head and neck.

3.1 Theory training program

Course contents:

1. Anatomy and Physiology of Ear, Nose and Throat, Trachea and esophagus.
2. The generation and reception of speech
3. Radiographic anatomy of the ear, nose, throat and imaging.
4. Bacteriology in relation to Otorhinolaryngology
5. Allergy and rhinitis
6. Haematology in relation to Otolaryngology
7. Anaesthesia for Otolaryngology
8. Pharmacology of drugs used in Otorhinolaryngology.
9. Electrolyte, fluid balance/shock conditions
10. Use of teaching aids
11. Routine blood, urine testing
12. Preparation of slides
13. Facial nerve stimulation test
14. Audiometric tests like pure tone Audiometry, Impedance Audiometry, Free field Audiometry, Specialized tests of hearing including SISI, Tone decay, ABLB, Speech discrimination score etc.
15. Vestibular tests like caloric testing (Water and Air) stopping test, Fukuda's test,
16. Evoked response audiometry.

Ear:

1. The physical and functional examination of the ear
2. The functional and physical examination of the vestibular system.
3. Tinnitus
4. Affections of external ear
5. Repair of deformities of the external ear.
6. Congenital conditions of the middle ear cleft
7. Traumatic conductive deafness
8. Acute inflammation of the middle ear cleft
9. Non-suppurative otitis media
10. Chronic suppurative otitis media
11. Management of chronic suppurative otitis media
12. Complications of infections of middle ear.
13. Tumors of the middle ear cleft and temporal bone
14. Diseases of the otic capsule-otosclerosis
15. Diseases of the otic capsule-other diseases

16. The deaf child
17. Acoustic neuroma
18. Ototoxicity
19. Presbycusis
20. Diagnosis and management of sudden and fluctuant sensorineural hearing loss
21. Meniere's disease
22. Neurologic aspects of vertigo
23. Facial paralysis
24. Rehabilitation of adults with acquired Hearing loss-Hearing aids
25. The cochlear Implants
26. Nystagmus
27. Otoacoustic emissions

Nose:

1. Examination of the nose
2. Conditions of the external nose
3. Injuries of the facial skeleton
4. Congenital diseases of the nose
5. The nasal septum
6. Foreign bodies in the nose, rhinolith
7. Epistaxis
8. Acute chronic inflammations of the nasal cavities
9. Vasomotor rhinitis-allergic and non-allergic
10. Nasal polyposis
11. Abnormalities of smell
12. Acute sinusitis
13. Chronic sinusitis
14. Nasal Allergy/Fungal allergic sinusitis
15. Complications of acute and chronic sinusitis
16. Tumors of nose and sinuses
17. Facial pains
18. Trans-ethmoidal hypophysectomy
19. Functional endoscopic sinus surgery (FESS)

Throat:

1. Methods of examination of the mouth and pharynx
2. Diseases of the mouth

3. Diseases of the salivary glands
4. Pharyngeal lesions associated with general diseases
5. Diseases of the tonsils and adenoids (excluding neoplasms)
6. Tumors of the pharynx
7. Hypopharyngeal diverticulum (Pharyngeal Pouch)
8. Methods of examining and larynx and tracheobronchial tree
9. Congenital diseases of the larynx
10. Laryngeal disorders in singers and other voice users
11. Neurological affections of larynx and pharynx
12. Intubation of the larynx, laryngotomy and tracheostomy
13. Cervical node dissection
14. Skin grafts in Otolaryngology and reconstructive methods including regional and distant flaps for repair of defects after excision of tumors or trauma.
15. Micro laryngeal surgery/thyroplasty

Miscellaneous and head and neck:

1. Cranial nerves
2. Raised intracranial tension-causes, diagnosis, management with particular reference to otitis hydrocephalus
3. Head injuries and I.C. Haemorrhage
4. Pituitary gland, anatomy, physiology hypo - and hyper - pituitarism, new growths.
5. Intracranial venous sinuses and their affections
5. Osteology: skull, mandible cervical and thoracic vertebral sternum
6. Cervical fascia, facial spaces in neck, retro-pharyngeal and parapharyngeal Abscesses
7. Anatomy and physiology of thyroid gland, goitre, diseases of the thyroid and carcinoma of thyroid
8. Large blood vessels in neck, thoracic duct development of major cervical and thoracic blood vessels.
9. Head and neck reconstructive surgery

Drugs used in Otorhinolaryngology:

1. Antibiotics
2. Antihistaminics
3. Nasal vasoconstrictors
4. Local anaesthetics
5. Corticosteroids
6. Cyto-toxic agents
7. Antibiotics

8. Radioactive isotopes
9. Antifungal agents
10. Vasopressive and other agents used in shock like states.

General:

1. Physiology of circulation, regulation of blood pressure, reactions of body to haemorrhage, pathophysiology of shock, fluid balance, blood transfusion and its hazards, fluid replacement therapy, burns
2. Agents used in shock like states

Desirable

1. The ears and nasal sinuses in the aerospace environment
2. Physiological consideration of pressure effects on the ear and sinuses in deep water diving
3. The principles of cancer immunology with particular reference to head and neck cancer
4. Principles of chemotherapy in head and neck cancer
5. Recording of nystagmus by ENG and its interpretation

Ear:

1. Traumatic lesions of the inner ear
2. Inflammatory lesions of the vestibular and auditory nerve
3. Vascular lesions of the inner ear
4. Electronystagmography
5. Skull base/Neurologic surgery

Nose:

1. Cosmetic surgery of the nose
2. Non-healing granuloma of the nose
3. Surgery of the pterygopalatine fossa
4. LASER Surgery

Throat:

1. Oesophageal conditions in the practice of ear, nose and throat surgery
2. Disorders of speech
3. Lower respiratory conditions in Otolaryngology

Miscellaneous and head and neck:

1. Functional Anatomy of cerebellum and brainstem
2. Anatomy of mediastinum
3. Pleura, plural cavity, broncho-pulmonary segments and their clinical importance
4. Facial plastic surgery

3.2 Practical Training Program

Acquisition of practical competencies being the keystone of postgraduate medical education, postgraduate training will be skills-oriented. The practical training program will be in a phased manner, learning from basics to advanced skills.

A. Cognitive Domain

At the end of training, the student should be able to demonstrate ability to practically apply knowledge gained during training period. This would include the following:

Basic Sciences related to Otolaryngology

- Physiology- Mechanism of perception of smell and taste, mechanism of breathing and voice production, lacrimation, deglutition and salivation. Functional tests of the nose and paranasal sinuses, mechanism of cough and sneezing.
- Physics of sound, theories of hearing, mechanism of perception of sound and speech production, physiology of equilibrium and cerebral function. Physiology of brain in connection with hearing, speech, smell and phonation. Audiologic tests like audiometry, impedance, evoked potentials, OAE, Speech audiometry.
- Physiology of larynx, tracheobronchial tree and oesophagus - Histology of mucous membranes, internal ear and other associated organs and structures, nose, PNS NPx, Larynx, Tracheo-Bronchial tree, Lymphoepithelial system.
- Mechanism of immune system/immunology and genetics.
- Anatomy-Embryogenesis of ear, nose and throat including palate and the larynx, Oesophagus, trachea and lungs, tongue, salivary gland Head and Neck and skull base etc.
- Parapharyngeal spaces in the neck including connective tissue barriers of larynx.
- Applied anatomy of the skull bones, accessory sinuses, external, middle and inner ears, nose, PNS, nasopharynx, meninges, brain, pharynx, larynx, trachea and bronchi, lungs, pleurae, oesophagus and the mediastinum.
- Anatomy of all cranial nerves with their functions.

Principles and Practices of Otolaryngology, Audiology and Speech Pathology

- Clinical Methodology as applied to ORL HN diseases in adult and children and the accessory sinuses, diagnosis and surgical treatment of diseases of nose, throat and ear in adult and children. Prevention and treatment, infectious diseases of Otolaryngology and Head Neck region. Circulatory and nervous disturbances of the nose, throat and ear and their effects on other organs of the body.
- Deformities, injuries sinus infections, polyps and the tumors of the nose, and paranasal sinuses.

- Examination of the ear, deafness and allied diseases, complications of diseases of the ear. Injuries, tumors, nervous and circulatory neurological disturbances of the ear. Diagnosis and treatment of tinnitus and vertigo. Diagnosis and rehabilitation of the Hearing handicapped including, dispensing of hearing aid other vibrotactile aids.
- Surgical pathology of Otolaryngology and Head Neck region.
- Basic knowledge of anaesthesia as related to Otorhinolaryngology.
- Examination of diseases of children (Paediatric ORL) in connection with throat and larynx. Neurological and vascular disturbances.
- Congenital and neonatal stridor.
- Pathology of various diseases of the larynx and throat, tracheobronchial tree and their causative organisms.
- Indications and various techniques of direct laryngoscopy, nasal endoscopy. Bronchoscopy and oesophagoscopy, including microlaryngoscopic procedures.
- Reading of radiograms, scans, audiograms, nystagmograms and tympanograms in connection with ENT diseases/disorders.
- Special apparatus for the diagnosis and treatment of the diseases of ear, nose and throat including audiometer, BERA, Speech analyser etc.

Recent advances in Otolaryngology and Head Neck surgery

- Recent developments in the diagnosis, pathogenesis and treatment of the ENT diseases
- The knowledge of the frontiers of the oto-laryngology and lateral skull base surgery
- Rhinoplasty, endoscopic sinus surgery, and anterior cranial fossa surgery
- Knowledge of LASERS and fibre optics
- Other methods of managing Hearing loss
- Implantable hearing aids cochlear implants
- Phonosurgery
- Etiology and Managements of sleep apnoea/snoring
- Hypophysectomy and optic nerve decompressions
- Immunotherapy and modalities of the gene therapy
- Newer techniques for Radiotherapy including, use of gamma knife for treatment of Intracranial tumors and other malignancy
- Chemotherapy of cancer

General Surgical Principles and Head-Neck Surgery

- General Surgery, Head and Neck oncology, and Medicine as applicable to the ENT disorders/ diseases. Surgery of congenital deformities of nose, ear (Pinna) and trachea/oesophagus etc.

- Radiology, Imaging – computed tomography and magnetic resonance imaging, (MRI) and intervention radiology and angiography as related to ENT
- General Pathologic aspects such as wound healing and also pathology and Pathogenesis of ENT diseases, Pharmacology, molecular biology, genetics, cytology, haematology, and immunology as applicable to otolaryngology
- General Principles of faciomaxillary traumatology and neck injury
- Plastic Surgery as applicable to Otolaryngology

B. Affective Domain

1. The student will show integrity, accountability, respect, compassion and dedicated patient care. The student will demonstrate a commitment to excellence and continuous professional development.
2. The student should demonstrate a commitment to ethical principles relating to providing patient care, confidentiality of patient information and informed consent.
3. The student should show sensitivity and responsiveness to patients' culture, age, gender and disabilities.
4. The student should be able to choose the required investigations to enhance the attitude, communicative skills, including dealing with patient's relatives with the required empathy, adapt to changing trends in education, learning methods and evolving new diagnostic and therapeutic techniques in the subject of ENT.

C. Psychomotor Domain

By the end of the training, a student should be able to demonstrate his skills in:

- Taking a good history and demonstrating good examination techniques.
- arrive at a logical working diagnosis, differential diagnosis after clinical examination and order appropriate investigations keeping in mind their relevance (need based) and thereby provide appropriate care that is ethical, compassionate, responsive and cost effective and in conformation with statutory rules.
- Should be able to perform and demonstrate the practical skills in the field of Otorhinolaryngology including the following:
 - Examination of the ear, nose and throat oral cavity examination
 - Clinico-physiological examination and evaluation of the audio-vestibulo neurological system
 - Examination of the larynx and the throat including flexible endoscopy, stroboscopy, voice analysis and the clinico-physiological examination of the speech

- Examination of the otological and audiological system including Tuning fork testing, audiological evaluation, micro and otoendoscopy
- Clinical and physiological evaluation of the nose and paranasal sinuses including nasal endoscopy and olfactory evaluation
- Examination of the neck and its structures
- Should demonstrate and perform various therapeutic skills related to the speciality such as :
 - Tracheostomy
 - Anterior/ posterior nasal packing
 - Ear Packing and Syringing
 - Foreign body removal from air nose and throat
 - Airway management including basic life support skills, Cardiopulmonary resuscitation, intubation, homeostasis maintenance, IV alimentation and fluid, electrolyte maintenance and principles of blood transfusion alimentation including Nasogastric feeding, gastrostomy
 - Wound suturing, dressings and care of the wounds
 - Basic principles of rehabilitation
 - Common procedures like FNAC, biopsy, aspiration from serous cavities, lumbar puncture etc.
- Should understand principles of and interpret X-rays/CT/MRI, audiograms, ENG, BERA, OAE, ultrasonographic abnormalities and other diagnostic procedures in relation to the speciality
- Should have observed/performed under supervision the various surgical procedures in relation to the speciality

4.0 Training Program:

4.1 Schedule of posting:

The postgraduate resident will undergo a graded training with postings schedule as follows:

First Year	Unit Posting	6 months	
	Unit Posting	6 months	
Second Year	Inter-departmental Rotation	2 months	Surgical Oncology: 1 month Radio diagnosis: 15 days Radiotherapy: 15 days
	Unit Posting	4 months	
	Unit Posting	6 months	
	Unit Posting	6 months	
Third Year	Unit Posting	6 months	
	Unit Posting	6 months	

4.2. Academic Activities:

Learning in postgraduate program is essentially self-directed and from clinical and academic work.

The formal sessions are meant to supplement this core effort.

1. Bed side Teaching rounds _____ Daily
2. Clinical case discussions _____ Once a week
3. Seminars / Journal Club/ Statistical meetings _____ Once a week
4. Dissertation Review: Total 5, At submission of synopsis(1), Interim result(3) and at final submission(1)
5. Mortality meetings: _____ Once in 3 months
6. Inter-departmental Meetings / Integrated Seminars _____ Bimonthly
7. Guest Lectures / CME/workshops/seminars _____ Once in three months
8. Workshops on : Biostatistics, Research Methodology, Teaching Methodology, Health Economics, Medical Ethics and legal issues _____ Once during the program.
9. Speciality Clinics: 4 speciality clinics will be held namely Otology, Rhinology, Tumour and Vertigo clinics will be held once a week.
10. Cadaveric temporal bone, Nose & Paranasal Sinuses and head & neck dissections to be arranged during 2nd & 3rd year of Residency.
11. Log book: Each student will be asked to present a specified number of cases for clinical discussion, perform procedures/tests/operations/present seminars/review articles from various journals in inter-unit/interdepartmental teaching sessions. They should be entered in a Log Book. The Log books shall be checked and assessed periodically by the faculty members imparting the training.

5.0 Dissertation

- Topic of dissertation should be decided by the student in consultation with the guide who is a recognized postgraduate teacher.
- The candidates shall report the progress of the dissertation work to the concerned guide periodically and obtain clearance for the continuation of the dissertation work.
- Dissertation should be completed and submitted by the stipulated date.
- Acceptance of the dissertation will be a prerequisite to appear in the final examination.

Timeline for dissertation:

Synopsis submission and approval: Process to be completed within six months of admission to MS program

SN	Activity	July admission	January admission
1	Selection of topic in consultation with PG Guide	September / October	March / April
2	Approval by Department PG Committee		
3	Institute Scientific Committee approval	November / December	May / June
4	Institute Ethics Committee approval		
5	Final approval letter by Academics Section	31 st December	30 th June

Submission of Dissertation:

The Dissertation will be submitted to Academic Section at least six months prior to the scheduled examination, i.e. by 31st December for June examination and by 30th June for December examination.

Timing of six monthly progress report submission to Academic Section:

Report	July Session		January session	
	Period	To be submitted	Period	To be submitted
First	July to December	7 th January	January to June	7 th July
Second	January to June	7 th July	July to December	7 th January
Third	July to December	7 th January	January to June	7 th July
Fourth	January to June	7 th July	July to December	7 th January
Fifth	July to December	7 th January	January to June	7 th July
Sixth	January to June	10 th June	July to December	10 th December

Note: The first five reports will be taken into consideration to decide the eligibility of the student to appear for the Professional Examination.

6.0 Documentation:

The work done during the three years based on the above areas will be documented in a Log Book . The performance of the Postgraduate student during the training period will be monitored throughout the course and duly recorded in the log books as evidence of the ability and daily work of the student.

6.1 Clinical Skills:

1. Out-patient procedures
2. Endoscopic procedures
3. Minor OT procedures
4. Audiological procedures
5. Otological Surgeries
6. Nose Surgeries
7. Throat Surgeries
8. Head and neck Surgeries
9. Functional Endoscopic Sinus Surgeries
10. Oesophagoscopy
11. Bronchoscopy
12. Allied subjects skills: Surgical oncology
13. Allied subjects skills: Radio-diagnosis and Radiotherapy

6.2 Academic performance:

1. Academic Activity: Case presentation
2. Academic Activity: Seminars
3. Academic Activity: Journal Club
4. Academic Activity: Dissertation review
5. Academic Activity: CME, Workshop, Conferences, Presentations, Publications

7.0 Assessment

General Principles:

- The assessment will be valid, objective, and reliable.
- It covers cognitive, psychomotor and affective domains.
- It involves formative, continuing and summative (Term and Final) assessments.
- Thesis will also be assessed separately.

- Assessment will be done every 6 monthly, five times during the program and the results documented in the log book.

7.1 Formative Assessment:

The formative assessment is continuous as well as periodical. Formative assessment will provide feedback to the candidate.

Continuous assessment will be based on the feedback from the senior residents and the consultants concerned.

Periodical assessment will held every six monthly and graded by the consultant in-charge during the particular posting and academic assignment.

1. Personal attributes

- **Behavior and Emotional Stability:** Dependable, disciplined, dedicated, stable in emergency situations, shows positive approach.
- **Motivation and Initiative:** Takes on responsibility, innovative, enterprising, does not shirk duties or leave any work pending.
- **Honesty and Integrity:** Truthful, has ethical conduct, exhibits good moral values, loyal to the institution.
- **Inter-personal Skills and Leadership Quality:** Has compassionate attitude towards patients and attendants, gets on well with colleagues and paramedical staff, is respectful to seniors, has good communication skills.

2. Clinical Work:

- **Availability:** Punctual, available continuously on duty, responds promptly on calls and takes proper permission for leave.
- **Diligence:** Dedicated, hardworking, does not shirk duties, leaves no work pending, does not sit idle, competent in clinical case work up and management.
- **Academic ability:** Intelligent, shows sound knowledge and skills, participates adequately in academic activities, and performs well in oral presentation and departmental tests.
- **Clinical Performance:** Proficient in clinical presentations and case discussion during rounds and OPD work up. Preparing Documents of the case history/examination and progress notes in the file (daily notes, round discussion, investigations and management), skill of performing bed side procedures and handling emergencies.

Assessment will be done by grading the performance for the personal and clinical attributes as

follows:

***Grade A ($\geq 80\%$) , B (65-79%) , C (50-64%), D ($<50\%$)**

3.Internal Assessment:

End of term examination will be conducted as per the following schedule:

SN	Timing	Theory Marks	Practical Marks
1	End of 1 st Year	100	100
2.	End of 2 nd Year	100	100
3.	2yr & 9month (Pre-Prof)	400	400
	Total	600	600

The Internal assessment will be presented to the Board of examiners for due consideration at the time of Final Examinations.

7.2 Final Summative Assessment:

General Principles:

1. Eligibility for Final Summative:

1. Attendance: $\geq 80\%$ in each 6 monthly term
2. Overall Grade for performance : Based on 6 monthly assessments, a satisfactory remark for 4 out of 5
3. Dissertation: Acceptance
4. Presentation of Scientific Poster (1) and Paper (1) at National Meeting.
5. Publication : Original research in indexed Journal: Sent/accepted/published
6. Minimum 50% in research methodology exam.
7. Minimum 50% marks in formative assessment, separately in theory and practicals.

2. Pattern of exam and marks distribution

A. Theory examination (Total = 400marks)

Paper	Title	Marks	Marks Distribution
Paper 1:	Basic Sciences related Otolaryngology	100	Long Answer questions: 10 X 10 =100
Paper 2:	Principles and Practices of Otolaryngology	100	
Paper 3:	General Surgical Principles and Head-Neck Surgery	100	
Paper 4:	Recent advances in Otolaryngology and Head Neck surgery	100	
Total		400	

B. Practical & Viva voce examination (Total = 200marks)

S N	Subject	Type	Marks Distribution
1	Long Case	1 long case of 150 marks	150
2	Short Cases	2 short cases of 75 marks each	150
3	Viva voce (1. Identification of Surgical Pathology, excised specimens & discussion, 2. Reading X-Rays & CT Scan/MRI/ 3. Identification of Instruments & discussion, 4. Interpretation of audiovestibular investigations such as audiogram, ABR, ENG etc. 5. Simulated surgical situation/ steps of operative procedures, required instruments/ discussion.) 6. Due weightage will be given to Log Book	Viva voce	100

	Records and day to-day observation during the training.		
	Total		400

3. Candidate will have to pass theory and practical examinations separately.
4. The pass percentage for practical exams will be 50%.
5. The pass percentage for theory will be 50% ,with at least 40% score in each paper independently.

6. Syllabus for Individual Papers

Paper –I (Basic Sciences related Otolaryngology)

1. Physiology- Mechanism of perception of smell and taste, mechanism of breathing and voice production, lacrimation, deglutition and salivation. Functional tests of the nose and para nasal sinuses, Mechanism of cough and sneezing.
2. Physics of sound, theories of hearing, mechanism of perception of sound and speech Production, Physiology of equilibrium & Cerebral function . Physiology of brain in connection with hearing, speech, smell and phonation. Audiologic tests like audiometry, impedance, evoked potentials, OAE, Speech audiometry
3. Physiology of larynx, tracheobronchial tree & oesophagus.
4. Histology of mucous membranes, internal ear and other associated organs and structures, nose, PNS Nasopharynx, Larynx, TB tree, Lymphoepithelial system. Mechanism of immune system/immunology and genetics.
5. Anatomy- Embryogenesis of ear, nose and throat including palate and the larynx, Oesophagus, trachea and lungs, tongue, salivary gland Head & Neck & skull base etc.
6. Parapharyngeal spaces in the neck including connective tissue barriers of larynx.
7. Applied anatomy of the skull bones, accessory sinuses, external, middle and inner ears, nose, PNS, nasopharynx, meninges, brain, pharynx, larynx, trachea and bronchi, lungs, pleurae oesophagus and the mediastinum.
8. Anatomy of all cranial nerves with their functions.

Paper-II (Principles and Practices of Otolaryngology)

1. Clinical methodology as applied to ORL HN disease in adult & children and the accessory sinuses, diagnosis and surgical treatment of diseases of nose, throat and ear in adult and children.
2. Prevention and treatment of infectious diseases of Otolaryngology and Head Neck region.

3. Circulatory and nervous disturbances of the nose, throat and ear and their effects on other organs of the body.
4. Deformities, injuries sinus infections, polyps and the tumours of the nose, and paranasal sinuses.
5. Examination of the ear, deafness and allied diseases, complications of diseases of the ear. Injuries, tumours.
6. Diagnosis and treatment of tinnitus and vertigo.
7. Diagnosis and rehabilitation of the Hearing handicapped including, dispensing of hearing aid other vibrotactile aids.
8. Surgical pathology of Otolaryngology and Head Neck region.
9. Basic knowledge of the anaesthesia as related to Otorhinolaryngology.
10. Examination of diseases of children (Pediatric ORL) in connection with throat and larynx. Neurological and vascular disturbances. Congenital and neonatal stridor.
11. Pathology of various diseases of the larynx and throat, tracheo bronchial tree and their causative organisms.
12. Indications and various techniques of direct laryngoscopy, nasal endoscopy, bronchoscopy and oesophagoscopy, including microlaryngoscopic procedures.
13. Reading of radiograms, scans, audiograms, nystagmograms and tympanograms in connection with ENT diseases/ disorders.
14. Special apparatus for the diagnosis and treatment of the diseases of ear, nose and throat including audiometer, BERA, ENG, Speech analyzer etc.

Paper- III (General Surgical Principles and Head-Neck Surgery)

1. General surgery, Head & Neck oncology, and & Medicine as applicable to the ENT disorders/diseases.
2. Surgery of congenital deformities of nose, ear (Pinna) & trachea/oesophagus etc.
3. Radiology, Imaging – computed tomography and magnetic resonance imaging, (MRI) and interventional radiology and angiography as related to E.N.T.
4. General principles of faciomaxillary traumatology and also neck injury, Plastic surgery as applicable to Otolaryngology.
5. Basic computers, computer averaging of the biological signals and its applications in Otolaryngology & Otolaryngologic equipments.
6. Audiologic and speech disorders and their management strategies.

7. Principles of Jurisprudence and ethical issues and applicable to ENT surgeons.

Paper –IV (Recent advances in Otolaryngology and Head Neck surgery)

1. The recent developments in the diagnosis pathogenesis treatments of the Otorhinolaryngology diseases.
2. The knowledge of the frontiers of the otolaryngology and lateral skull base surgery.
3. Rhinoplasties, endoscopic sinus surgery, and anterior cranial fossa surgery.
4. Knowledge of LASERS and fibre optics.
5. Other methods of managing Hearing loss.
6. Implantable hearing aids. Cochlear implants.
7. Phonosurgery
8. Etiology and Managements of sleep apnoea/snoring,
9. Hypophysectomies and optic nerve decompressions.
10. Immunotherapy and modalities of the gene therapy
11. Newer techniques for Radiotherapy including, use of gamma knife for treatment of intracranial tumours and other malignancy.
12. Chemotherapy of cancer.

8.0 Recommended Textbook, Reference Books, Journals

8.1 Textbooks

01. Scott-Brown's Otolaryngology and Head & Neck surgery.
02. Cumming's Otolaryngology and Head & Neck surgery.
03. Stell & Maran's Head & neck surgery.
04. Shambaugh's Surgery of the ear.
05. Stamberger's Functional Endoscopic Sinus Surgery.
06. Clinical Audiovestibulometry by Anirban Biswas.

8.2 Reference Books:

01. Paparella's Otolaryngology and Head & neck surgery.
02. The Sinuses by Paul J. Donald.
03. Surgery of the skull base by Paul J. Donald.
04. Brackman's Otologic surgery.
05. Montgomery's Surgeries of upper respiratory system.
06. Ballanger's Diseases of nose, throat and ear.
07. Rob & Smith's Clinical surgery of ear, nose and throat.
08. Jackson's Bronchoesophagology.
09. Bluestone's Pediatric otolaryngology.
10. Kleinsasser's Microlaryngoscopy and Endolaryngeal microsurgery.
11. Ludman's Diseases of ear.
12. Harnsberger's Head & neck imaging.
13. Jatin P Shah's Head & neck surgery.
14. Bailey and Biller's Surgery of Larynx.
15. Nasal and Sinus Surgery by Steven C. Marks.

8.3 Journals

1. Otolaryngology and Head & Neck Surgery.
2. Journal of Laryngology and Otology
3. Laryngoscope
4. Archives of Otolaryngology Head & Neck Surgery.
5. Indian Journal of Otorhinolaryngology and Head & Neck Surgery.
6. Otolaryngologic Clinics of North America.
7. Annals of Otology, Rhinology and Laryngology.
8. Journal of Facio-maxillary surgery.
9. Asian Journal of Ear, Nose and Throat.
10. Ear, Nose and Throat journal.
11. Current opinion in Otolaryngology
12. Otology and Neuro-otology