

# **Program**

# **MS ENT**

**(Revised with effect from 2019-2020 onwards)**

# Courses

## **Paper - I Basic Medical Sciences Pertaining to ENT and Principles of General Surgery (Course U15MSEN01)**

CO1: Knowledge of the anatomy of Ear, Nose and Throat.

CO2: Knowledge of the physiology of Ear, Nose and Throat.

CO3: Knowledge about the Microbiology and Pharmacology relevant to ENT.

CO4: Knowledge of general surgical principles relevant to ENT.

### BASIC SCIENCES

#### **Anatomy:**

Embryogenesis of ear, nose and throat including palate larynx, Esophagus, trachea, lungs, tongue, salivary gland, Head, Neck & Skull base etc. Parapharyngeal spaces in the neck including connective tissue barriers of larynx. **Applied anatomy of the skull bones, accessory sinus, external, middle and inner ears, nose, PNS, nasopharynx,** meninges, brain, pharynx, larynx, trachea and bronchi, lungs, pleurae, esophagus, and the mediastinum. **Anatomy of all cranial nerves with their functions.**

#### **Physiology:**

Mechanism of perception of smell and taste, mechanism of breathing and voice production, deglutition and salivation. **Functions of the nose and Para sinuses, Mechanism of cough and sneezing. Physics of sound, theories of hearing, mechanism of perception of sound, speech Production, Physiology of equilibrium.** Physiology of brain in connection with hearing, speech smell and phonation. Audiologic tests like Audiometry, impedance, evoked potentials, Oto Acoustic Emissions, Speech audiometry Physiology of larynx, tracheobronchial tree & oesophagus. Histology of mucous membranes, internal ear and other associated organs and structures, nose Para Nasal Sinuses, Nasopharynx, Tracheo Bronchial tree, Lymphoepithelial system. Mechanism of immune system/immunology and genetics.

#### **Clinical**

- Clinical methodology as applied to Otorhinolaryngology and Head & Neck disease in adult & 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 body. Deformities, injuries, sinus infections, polyps and the tumors of the nose, and paranasal sinuses. Examination of ear, deafness and allied diseases & complications of diseases of the ear. Injuries, tumors, circulatory & neuro-otological disturbances of the ear. Diagnosis & 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 anesthesia as related to ENT.
- Examination of diseases in children (Pediatrics ORL) in connection with throat and larynx. Neurological & vascular disturbances. Congenital & neonatal stridor.
- Pathology of various diseases of larynx and throat, tracheo-bronchial tree and their causative organisms.
- Indications & 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.
- General surgery, Head & Neck oncology, and Medicine as applicable to the ENT disorders/diseases. Surgery of congenital deformities of nose, ear (Pinna) & Trachea/oesophagus etc.
- Radiology, Imaging, computed tomography and magnetic resonance imaging, (MRI) and interventional radiology and angiography as related to E.N.T.
- General pathologic aspects as wound healing, Pathology and Pathogenesis of ENT diseases, Pharmacology, molecular biology, genetics, cytology, hematology, and immunology as applicable to otolaryngology.
- General principles of faciomaxillary traumatology and also neck injury, plastic surgery as applicable to Otolaryngology.
- Basic computers, computer averaging of the biological signals and its applications in Otolaryngology & Otolaryngologic equipments.

**Paper - II Diseases of EAR, Audiology & Speech Therapy (Course U1MSEN02)**

CO1: Detailed knowledge of common diseases affecting the ear.

CO2: Knowledge and skill in use of otoscope and tuning fork tests.

CO3: Ability to diagnose and manage (including surgical management) common ear conditions.

CO4: Knowledge of instruments used for audiometry.

CO5: Competency in performing basic audiometric test.

CO6: Competency in managing cases of foreign body.

AUDIOLOGIC AND SPEECH DISODERS-MANAGEMENT STRATEGIES.

- Sound wave and their characteristics, Sound measurement
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- AUDIOLOGICAL TESTS: Brief description about audiometers and its accessories, Pure Tone Audiometry;** Principle, Procedure and interpretation of audiograms using audiometric symbols, Masking; Principle and procedure, Audiometric configurations for different pathologies, Speech Audiometry, Special test to differentially diagnose RCP and CP
- PTA in pediatric age group
- AUDIOLOGICAL TEST FOR PAEDIATRIC POPULATION: BOA, VRA**
- IMPEDANCE AUDIOMETRY AND REFLEXOMETRY:** Principle, procedure and classification of tympanograms, tympanograms in various pathologies
  - OTO ACOUSTIC EMISSIONS: Principle, Types and its interpretation
- BRAINSTEM EVOKED RESPONSE AUDIOMETRY:** Differential diagnosis of pathologies using BERA
- Cortical Evoked Response Audiometry (CERA)
- EVALUATION OF A DEAF CHILD:** A test Battery Approach
- AUDIOLOGICAL REHABILITATION:** Hearing Aids- Of deaf child and elderly population, Cochlear implants, Bone anchored hearing aids
- Trans sphenoidal approach in neurosurgery
- AN OVERVIEW OF THERAPUTIC INTERVENTION FOR SPEECH AND LANGUAGE DISORDERS.**

**Paper - III Diseases of Throat and Head and Neck (Course U19MSEN03)**

CO1: Detailed knowledge of common diseases affecting the throat, head and neck.

CO2: Competency in the medical and surgical management of tonsillitis.

CO3: Ability to diagnose and manage (including surgical management) common throat, head & neck conditions.

CO4: Knowledge of the evaluation of hoarseness

CO5: Competency in managing cases of foreign body.

- 1) **Proper history taking, clinical examination pertaining to ENT.**
- 2) **Diagnostic nasal endoscopy.**
- 3) **Flexible nasopharyngoscopy.**
- 4) Otomicroscopy.
- 5) Indirect laryngoscopy.
- 6) Direct laryngoscopy
- 7) Audiological evaluation incl. PTA, Impedance audiometry, BERA, caloric test.
- 8) **Radiological interpretation – Xray, CT, MRI.**



## **Paper - IV Recent Advances in Otorhinolaryngology, Medicine and Surgery as Applied to ENT and Diseases of Nose (Course U19MSEN04)**

CO1: Knowledge of diagnosis and management of all nasal conditions.

CO2: Competency in managing cases of foreign body.

CO3: Updated knowledge of technologies and instrumentations used in ENT.

CO4: Knowledge about the recent published research papers in ENT.

The recent developments in the diagnosis, pathogenesis and treatments of the ENT diseases.

- The knowledge of frontiers of the oto-laryngology and lateral skull base surgery.
- Recent advances in the treatment of acute onset deafness
- Rhinoplasties, endoscopic sinus surgery, and anterior cranial fossa surgery.
- Liaising with Oral and Maxillofacial surgery colleagues in required cases
- Knowledge of LASERS and fibre optics.**
- Knowledge of recent advances in MicroLaryngeal Surgeries
- Phonosurgery
- Hypophysectomies and optic nerve decompressions.
- Immunotherapy and modalities of the gene therapy.**
- Newer technique for Radiotherapy including, use of gamma knife for treatment of intracranial tumours and other malignancy & Chemotherapy of Head & Neck cancer.**

### **Soft Skills (Elective Course)**

CO1: Competency to conduct a clinical research.

CO2: Acquisition of pedagogical skills for students (MBBS, BSc Audiology)

CO3: Ability to work as a member of a healthcare team.

CO4: Communication skills with patients, caregivers and colleagues including non medical staff.

CO5: Attitude to be a lifelong learner.

## **Scheme of examination**

### **Theory**

Theory examination constitute 4 papers, each paper is of 100 marks.

Paper I            Basic Sciences

Paper II           Otolaryngology and Audiology

Paper III          Laryngology, Voice, Speech and swallowing and Head and Neck

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Diseases  
Paper IV Rhinology & Recent advances

**Division of Questions**

Each question to be of a total of 10 marks, of structured nature. Subdivision and respective marks to be indicated clearly. 20 marks based on clinical scenarios. This can be a single question/scenario or two separate scenarios. Accordingly the total number of questions would be 9 or 10. The prepared question papers are intended as a model for the examiners. Individual variations within the guidelines set above can be made.

**Practical examination**

Only long case of importance to be given for history taking, approach to the patient, clinical examination, diagnosis and management.

Three short cases: One from each system not covered by the long cases. Here importance is given for the clinical examination, findings, diagnosis and management of each case. Total marks 200.

**Viva Voce:**

X- rays, CT scan, MRI

Surgical instruments

Surgical specimens

Microscopic slides covering microbiology and pathology

Osteology

Audiology and Speech pathology

Operative surgery

Marks are to be distributed according to the content of the particular portion.

Total marks 100.

**Log Book**

The day today work, attendance, participation in seminar, case discussion, joined clubs, surgeries performed, assisted, observed,

Attendance of clinical workshop, CME programmes, conferences, medical camps, CPC's, and other academic programmes are to be entered. The log book should be submitted to Assistant professors of the concerned unit and got signed every month.

The unit chief should sign the logbook once the posting in that unit is over.

**Thesis- Dissertation**

It is essential to know how to collect data, compile it, and publish it. Hence thesis – dissertation in a relevant topic pertaining to otorhinolaryngology and head and neck surgery to be submitted to the University at least 3 months before the theory examination. The University may send it for evaluation well in advance of final examination.

**MAXIMUM MARKS FOR UNIVERSITY EXAMINATION**

THEORY	PRACTICAL	VIVA VOCE
400	200	100



### DISTRIBUTION OF MARKS FOR THE UNIVERSITY EXAMI

THEORY-400	PRACTICAL-200		VIVA VOCE-100						
		SHORT CASES Or OSCE							
	LONG CASES		RADIOLOGY	INSTRUMENTS	SPECIMENS	SLIDES (MICRO+PATHOLOGY)	AUDIOLOGY & SPEECH PATHOLGY	OPERATIVE SURGERY	LOG BOOK & THE SIS
4 X 100= 400	100	35+35+30	15	15	15	10	15	15	15

10

A candidate securing separate minimum of 50% in theory and practical are eligible to pass the examination. Those securing 70% and above are eligible to pass with distinction.

## Model Question Paper

### Paper I

#### BASIC SCIENCES

100 Marks / 3 hours

1 clinical scenario question of 20 marks

8 questions of 10 marks each, all of a structured nature.

Please answer according to the assigned marks for each sub-question.

Please draw suitable diagrams wherever necessary.

1. 34/F presented with history of vertigo. Clinical features were suggestive of benign paroxysmal positional vertigo (BPPV).  
Describe the anatomical and physiological basis of the positional tests for the different types of BPPV. (4)  
Outline the pathway of the vestibule-ocular reflex (VOR). (2)  
Describe the central connections of the vestibular nuclei(5)  
Detail the specific eye movements cause dby stimulation of each SCC. (6)  
List the three visually controlled oculomotor systems apart from VOR .(3)
2. Explain, with diagrams, the anatomical basis of the Fisch Type A approach for the excision of glomus jugulare tumour. (10)
3. Describe the structure and functions of the hair cells of the cochlea .(6+4)
4. List the functions of the nose. (3)  
Discuss the 'Nasal cycle' in detail. (4)  
Principles of Rhinomanometry. (3)
5. Classify muscles of larynx. (2)

- Describe, in detail, attachments of all the intrinsic muscles of the larynx. (4)  
 Explain the concept of 'Body – Cover' of the vocal folds.(4)
6. Describe the anatomy of nerves encountered during a total parotidectomy. (8)  
 Add a note on the Otic ganglion. (2)
  7. Local anesthesia (LA):  
 Attributes and Qualities of the ideal LA agent? (4)  
 Actions and Dosages of Lignocaine. (2)  
 Technique of laryngeal LA for an office procedure on the vocal cords. (2)  
 Diagram to show points of LA infiltration for a Myringoplasty. (2)
  8. Classify Flaps used for reconstruction. (2)  
 Discuss the use of different types of free flaps in ENT. (6)  
 Add a note on the pectoralis major myo – cutaneous flap. (2)
  9. Describe the classification of chemotherapeutic agents with 1 example each. (8)  
 List the four chemotherapy strategies in head and neck cancer. (2)

## **Paper II**

### OTOLOGY and AUDIOLOGY

100 marks / 3 hours

1 Clinical scenario question of 20 marks

8 questions of 10 marks each; all of a structured nature.

Please answer according to the assigned marks for each sub – questions.

1. A 45/ M presents in Casualty following a road traffic accident, with h/o blow to his right frontal region. ENT opinion sought for bleeding noticed from the right ear.

What are the relevant clinical features to check from an otologic aspect? (4)

After initial head injury management, patient is transferred under ENT for further care for his symptoms of watery discharge from the right ear and facial asymmetry.

Give a detailed, step-wise protocol of management (4)

Right –sided LMN facial palsy persists on the 10<sup>th</sup> day.

What is the ideal electric- physiological test at this stage? (1)

Which are the different electrical tests in cases of facial nerve palsy? (2)

Describe the House- Brackmann classification used in these cases. (3)

What are the indications for facial nerve decompression in such a case? (1)

Detail the principles of facial nerve repair, intra-operatively. (3)

Name two methods of facial re-animation, in case of unresolved facial palsy. (2)

2. Define Otosclerosis and name the four common areas of its occurrence. (1+4)  
Describe the genetic pattern of its inheritance. (2)  
What is the mechanism of Carhart's notch? (2)  
What are the contraindications for surgery in Otosclerosis (3)
3. Tinnitus: List the classification and pathology of its causes. (4)  
What are its new theories of mechanisms? (4)  
Pharmacotherapy of tinnitus : Name four groups of drugs used. (2)
4. Congenital ear anomalies:  
Define Protruding ear (1)  
Discuss two commonly used corrective procedures for the protruding ear. (4)  
Principles of surgery of Anotia (4)
5. Vestibular Schwannoma (VS): Describe the clinico - pathological stages. (3)  
What are its effects on the inner ear? (2)  
Describe the possible eye findings in a case of progressive VS. (3)  
Discuss the advantages and disadvantages of the Trans-labyrinthine approach. (2)
6. Meniere's disease (MD):  
Mention four (cochlear) pathologic features. (2)  
What are its theories causation? (2)  
Modalities of intra - tympanic Gentamicin injection in MD. (2)  
Principles and types of surgeries for MD. (4)
7. Vestibular rehabilitation:  
What is meant by Static and dynamic symptoms in vestibular dysfunction? (2)  
What are the mechanisms of vestibular compensation? (6)  
Describe the Pharmacologic actions of Betahistine? (2)
8. Hearing aids (HA):  
Classify and name types Has. (2)  
Define 'Gain' and 'Peak clipping in Has. (2)  
Principles of selection and prescription of Has. (3)  
Detail the problems faced by the HA - user .(3)
9. Describe the hearing tests for Malingering. 94)  
Principles of SISI and TDT. (4)  
Name four behavioural tests to detect central auditory deafness. (2)

### **Paper III**

#### **LARYNGOLOGY, VOICE, SPEECH and SWALLOWING, HEAD and NECK**

100 marks / 3 hours

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1 Clinical scenario question of 20 marks  
8 questions of 10 marks each; all of a structured nature.

Please answer according to the assigned marks for each sub – questions.

1. 47/F with gradually progressive neck swelling, diagnosed on USG as arising in the thyroid gland. FNAC reported as suspicious of malignancy.

WHO revised histological classification of malignant thyroid tumours? (2)

What are further relevant investigations prior to surgery? (2)

Total thyroidectomy was done for this lady.

Surgical anatomic classification of recurrent and superior laryngeal nerves?  
(2)

Post – operative pt. reports hoarseness. ILS shows right vocal cord immobile in lateral position.

Detail the voice assessment methods (4)

What are the principles of management in this case? (2)

9 months post –op- no improvement in voice and findings – decision for surgery.

What are the surgical options? (1)

Classify Isshiki's Thyroplasty with one indication for each. (4)

Indications for arytenoids adduction / rotation procedure?(2)

2. In a case of intractable aspiration, what are the relevant investigations? (2)  
Describe the surgical options with their indications. (8)

3. Obstructive sleep apnoea (OSA):

How is the severity graded? (2)

Describe the diagnostic modalities with their underlying principles. (6)

What are the indications for surgery in this condition? (2)

4. laryngeal trauma:

Discuss the biomechanics of different types of laryngeal injury. (4)

Schaefer classifications. (2)

Add a note on laryngeal stents. (4)

5. Branchial cysts:

Briefly describe their theories of origin. (4)

What are the clinical features?(2)

Management? (4)

6. Sjogren's disease:

List the salivary glands –related criteria in the revised international classification.(4)

List four exclusion criteria. (2)

What are the oral and salivary manifestations? (2)

Name four therapeutic agents. (2)

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7. Give the TNM classification of metastatic neck nodes. (2)  
 What is the investigation protocol for met. nodes with unknown primary. (2)  
 What are the management options in a pt. with met. neck nodes?(4)  
 Mention the principles of positron emission tomography (PET). (2)
8. Describe the radiological appearance of four common jaw cysts. (4)  
 Discuss Odontogenic tumours of the mandible. (6)
9. Give the 4 point gradation of chronic laryngitis. (2)  
 Discuss the clinical features and management of laryngo-pharyngeal reflux (LPR). (6)  
 What are the possible findings in laryngeal tuberculosis. (2)

## **PAPER IV**

### **RHINOLOGY and RECENT ADVANCES**

100 marks / 3 hours

1 Clinical scenario question of 20 marks

8 questions of 10 marks each; all of a structured nature.

Please answer according to the assigned marks for each sub – questions.

1. 50/M presents with h/o progressive nasal block, with past h/o polypectomy many years prior. On enquiry, he has a history of allergy. He is presently diabetic, controlled with OHAs.  
 Anterior rhinoscopic examination shows polyps in both nostrils. Diagnostic nasal endoscopy is done.  
 Describe the Lund Mackay scoring system of the endoscopic findings. (2)  
 What are the newer concepts in the pathogenesis of allergic ethmoid polyps? (4)  
 List the medical management protocol for this patient. (2)  
 What are the prognostic indicators of successful outcome of surgery? (2)
2. 11/F presents with the symptom of bilateral proptosis, of recent onset but gradually progressive. On enquiry, she is non diabetic.  
 What is the most likely diagnosis? (1)  
 Other clinical features to check in this patient? (2)  
 CT PNS was done for her. Possible findings on CT? (2)  
 What are the indications for surgical intervention in this case? (2)  
 Discuss the possible surgical modalities? (3)
3. Discuss the types of endonasal frontal sinus drainage procedures . (6)  
 Indications and procedure of Balloon Sinusoplasty. (4)
4. Epsitaxis:  
 Describe the arterial supply of the nose. (4)

- Briefly describe the surgical modalities of management. (4)  
Add a note on hereditary haemorrhagic telangiectasia (HHT). (2)
5. Rhinoplasty:  
List the types of external nasal deformities (2)  
What are the causes of a saddle – nose? (3)  
Classify and list the graft materials used. (2)  
Indications and advantages of an external approach. (3)
6. Pituitary tumour, being planned for trans-nasal approach:  
What are the relevant pre – operative investigations? (2)  
Discuss the advantages and disadvantages of the various approaches. (6)  
Add a note on navigation – guided surgery, in such cases. (2)
7. Carcinoma Nasopharynx:  
Genetic factors in its aetiology. (2)  
Diagnostic tools in biopsy – negative cases. (2)  
Principles of radiotherapy in these cases. (2)  
List the anterior surgical approaches to the nasopharynx. (2)  
Role of photo- dynamic therapy (PDT). (2)
8. Explain the concepts of ‘Allergic march’ and ‘Unified airway’. (4)  
Sub-lingual immunotherapy (SLIT) for allergy. (2)  
Discuss the surgical modalities in a case of severe allergic rhinitis. (4)
9. Sialendoscopy:  
Discuss the advantages and disadvantages (4)  
List the types of scopes(2)  
Briefly describe the basic steps of procedure (2)  
Four possible complications (2)
10. Name four syndromic craniosynostoses. (2)  
Management principles in these cases. (4)  
List two surgical options. (2)  
Add a note on Distraction Osteogenesis. (2)

## **Recommended Books**

### **Must read**

1. Scott Brown’s Diseases of Ear Nose and Throat
2. Shambaugh Surgery of Ear
3. Rob and Smith Operative Surgery
4. Otolaryngology & Head Neck Surgery – Cummings
5. Montgomery’s Surgery of the upper respiratory tract (Vol- 1&2)
6. Suen Myers Head and Neck Surgery
7. Stammberger’s Functional Endoscopic Sinus surgery

### **List of books**

#### **Must refer**

1. Stell and Maran Head and Neck Surgery
  2. Mawson’s Disease of the ear
  3. Gray’s Anatomy
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4. Mirko Tos Middle ear surgery (Vol- 1,2& 3)

**List of Journals**

**Indian**

1. Indian Journal of Otolaryngology and Head Neck Surgery
2. Asian Journal of Ear Nose and Throat
3. Indian Journal of Otology

**Foreign**

1. Journal of Laryngology and Otology
2. Otolaryngologic clinics of North America
3. Int. J. of Paediatric Otolaryngology
4. Laryngoscope
5. Otolaryngology Head Neck Surgery
6. Annals of otology, rhinology & laryngology

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