Master of Medicine (Otorhinolaryngology)

Objective:

The MMed (ENT) is awarded to candidates deemed to have satisfied the following:-

- Possess adequate basic science knowledge
- Understand the patho-physiology of common ENT conditions
- Understand the clinical presentation of common ENT conditions
- Adequate clinical examination skills
- Understand the indications for common ENT investigations and ability to interpret them
- Ability to manage ENT emergencies

Syllabus

General ENT

Management of acute surgical diseases
Intensive care: shock management & fluid resuscitation
Different types of anaesthesia and pain control
Fundamental of surgical techniques
Principle of wound closure

A. Basic Science

Anatomy of the ear
Physiology of hearing and balance
Embryology of the ear

Anatomy of oral cavity, pharynx, larynx and esophagus
Anatomy of the neck
Anatomy of upper airway
Physiology of swallowing, voice production
Embryology of oral cavity, pharynx, larynx and neck

Anatomy of the nose and paranasal sinuses (including external nose)
Physiology of the nose and smell
Development of the nose and paranasal sinuses

Otology & Neuro-Otology

KEY COMPETENCIES

The candidates will be able to:-

- Understand the anatomy and physiology of the ear and lateral skull base
- Understand the pathophysiology of common ear diseases
- Perform proficient ear and vestibular examination
- Assess and manage common ear diseases
- Interpret audiological, vestibular and radiological tests for common ear diseases
- Proficient in common ear procedures

1. Basic Science

1) Describe in detail the anatomy (including embryology) of the outer, middle, inner ear, the lateral skull base and facial nerve

2) Explain in detail the physiology of hearing
   i) Role of pinna and external ear canal in hearing
   ii) Middle ear and its mechanism
   iii) Cochlear mechanics in hearing, including central control of hearing

3) Explain in detail the physiology of balance
   i) Semicircular canal
   ii) Utricle and saccule
   iii) Central processes
   iv) Nystagmus

4) Interpret common investigations in ear disorders
   i) Pure tone Audiogram
   ii) Speech audiometry
   iii) Impedance audiometry
   iv) Evoked potentials (including ECoG, ABR, AABR, SSEP, CEP)
   v) Oto-acoustic emissions
   vi) Electronystagmography
   vii) Vestibulospinal function tests
   viii) Imaging of the ear: CT and MRI
   ix) Facial nerve testing

5) Recognise and describe the aetiology, pathology, clinical presentation and treatment of :
   i) External ear malformation
   ii) Temporal Bone trauma iii) Infective ear conditions:
      a. Otitis externa
      b. Otitis media

c. Cholesteatoma
d. Labyrinthitis
e. Malignant otitis externa

iv) Complications of infective ear conditions

v) Conductive hearing loss
a. Otosclerosis
b. Tympanosclerosis
c. Ossicular chain disruption

vi) Sensorineural hearing loss
a. Sudden hearing loss
b. Presbycusis
c. Noise induced hearing loss
d. Congenital hearing loss
e. Ototoxicity
f. Fluctuating hearing loss

vii) Various causes of vertigo
a. BPPV
b. Vestibular neuronitis
c. Meniere's disease / syndrome
d. Labyrinthitis
e. Central causes
f. Others

viii) Cerebral pontine angle pathology
a. Acoustic neuroma
b. Meningioma
c. Other ptereous apex diseases

ix) Facial nerve disorders
a. Bell's palsy
b. Facial nerve injury
c. Facial nerve tumors

2. Clinical Knowledge, Skills and Judgments

1) Able to perform otological examination
2) Able to manage common otological disorders
3) Able to order and interpret tests accurately
4) Understand in detail how to perform the following:
   i) Aural toilet
   ii) Ear foreign body removal
   iii) Myringotomy and ventilation tube insertion
   iv) Myringoplasty
   v) Cortical mastoidectomy

5) Understand the principles of:
   i) Various mastoidectomies and its controversies
   ii) Complications of common ear surgeries and their management
   iii) Ossicular reconstruction and stapes surgery
   vi) Various approaches to lateral skull base
   vii) Middle ear and cochlear implants

Audiology

KEY COMPETENCIES

The candidate will be able to demonstrate:

- Understanding of the physiology of the hearing and balance
- Understand the pathophysiology of common hearing loss and balance disorders
- Understand basic audiological investigations including how it is performed
- Interpret audiological and vestibular investigations
- Understand the principle of hearing and vestibular tests
- Understand the principles and management of patients using hearing aids
- Understanding the principles and management of patients with vestibular disturbance

1. Basic Sciences

Explain in detail the audiological science:

a. Physics of sound
b. Measurement of sound
c. Anatomy of the auditory system
d. Physiological and psychological basis for hearing
e. Measurement of human hearing from birth to adult including:
    Voice perception tests
    Tuning forks tests
    Audiometry
    Evoked potentials (including ECoG, ABR, AABR, SSEP,CEP)
    Oto-acoustic emissions
    Impedance audiometry
    Neonatal, infant and childhood assessment

Explain in detail the vestibular science:

a. the anatomy of the vestibular system
b. the physiological basis for balance
c. measurement of human balance including:
    Electronystagmography and caloric testing

Rotational testing
Tests of otolith function

2. Practical skills

Audiological

Perform and interpret:

a. Voice perception testing
b. Tuning fork testing
c. Pure tone audiometry:
    Air conduction
    Bone conduction

d. Masking techniques
e. Impedance audiometry
f. Speech audiometry

Vestibular

Perform and interpret clinical assessment of vestibular function including:

a. Eye movements
b. Vestibulo-occular reflexes (static and dynamic)
c. Vestibulo-spinal reflexes (static and dynamic)
d. Clinical tests for labyrinthine fistula

3. Clinical knowledge, skills and judgement

Audiological Science

Define, diagnose and manage all types of diseases related to hearing loss as detailed in Otology and Neurotology module

Vestibular Science

Define, diagnose and manage all types of diseases related to dysequilibrium as detailed in Otology and Neurotology module

4. Rehabilitation Skills

Audiological Science

Review the process of some audiological rehabilitation including:

a. Tinnitus management including tinnitus retraining
b. Application of hearing aids including:
    Behind the ear (BTE)
    In the ear (ITE)
    In the canal (ITC)
    Completely in the canal(CIC)

c. Bone conduction hearing aids
d. Contralateral routing of signal
e. Bilateral contralateral routing of signal
f. Assistive listening devices
g. Bone anchored hearing aids
h. Implantable hearing aids
i. Cochlear implants
j. Auditory brainstem implants
k. Tinnitus masking devices

Vestibular Science

Discuss in detail:

a. Particle-repositioning manoeuvres (including Semont, Epley, Brandt-Daroff)
b. Graded vestibular exercises (including Cooksey Cawthorne)

Rhinology

KEY COMPETENCIES

The candidate will be able to:

- Understand of the anatomy and physiology of the nose and paranasal sinuses
- Understand the pathophysiology, clinical presentation and management of common sino-nasal diseases
- Interpret diagnostic tests associated with these conditions
- Able to counsel and manage patients with these conditions
- Communicate realistic outcomes of surgery and complications thereof
- Understand the management of complications of rhinological procedures

1. Basic Sciences and Applied Knowledge

1) Explain in detail the anatomy of the nasal septum, lateral nasal wall and para-nasal sinuses including innervation, blood supply and embryology.
2) Describe the anatomy of the frontal recess
3) Describe the osteology of the maxilla, ethmoid, inferior concha, septum, sphenoid, nasal bones and palatine bones
4) Review the physiology of the:
    a) Nasal air flow including tests of nasal function – rhinomanometry
    b) Nasal cycle
    c) Olfaction
    d) Nasal mucosa and mucociliary flow
5) Recognise and describe the aetiology, pathology and treatment:
    a) Nasal valve collapse
    b) Septal perforation
    c) Nasal septal deviation
    d) Epistaxis
    e) Allergic rhinitis
    f) Non-allergic rhinosinusitis
        i) Infective
        ii) Medicamentosa
        iii) Atrophic
        iv) Vasomotor
    g) Fungal sinus disease in all its various forms
    h) Complications of sinusitis
    i) Nasal polyposis including associated conditions (e.g. Samster's triad)
    j) Primary ciliary dyskinesia
    k) Cystic fibrosis
    l) Specific immunoglobulin (Ig) deficiencies
    m) Anosmia/hyposmia

n) Facial pain syndromes
o) CSF rhinorrhea
p) Granulomatous conditions
q) Pyogenic granuloma
r) Nasal fractures
s) Fibrous dysplasia
t) HHT --- Osler Rendu Weber Syndrome
u) Inverting papilloma
v) Juvenile angiofibroma
w) Sino-nasal malignancy
x) Mucocoeles
y) Odontogenic disease as related to nose and sinuses
z) Systemic diseases

6) Understand different diagnostic tests including:
   a) CT, & MRI imaging
   b) Histopathology
   c) Assessment of smell
   d) Understanding and interpretation of RAST
   e) Understanding the interpretation of various clinical tests of allergies, including how it is done (inhalant and non-inhalant)
   f) Measurements of nasal airflow
   g) Tests of lacrimal function
   h) Tests of mucociliary function

7) Understand the principles, indications and complications of:
   a) Functional Endoscopic Sinus Surgery (FESS)
   b) External approach to the sinuses

2. Clinical knowledge, skills and judgement

1) Evaluate a patient with rhinological problem
2) Order and accurately interpret diagnostic tests
3) Describe the dangers that can be recognised on a CT/MRI prior to surger.
4) Provide test information to patients in ways that lead to informed decision making
5) Demonstrate detailed understanding of how to safely perform the following surgical procedures:
   a) Medical management of sinonasal disease
   b) septoplasty / SMR
   c) turbinate surgery
   d) FESS
      i) Proper handling of FESS instruments
      ii) Uncinectomy and MMA
   e) Antral Washout
   f) Various procedures to arrest epistaxis
   g) Calwell Luc approach
   h) Frontal trephine
   i) Nasal foreign body removal

j) Nasal fracture reduction
k) Nasal haematoma / abscess drainage

6) Understand the following procedures:
   a) Orbital decompression/canthotomy and cantholysis
   b) External approach to sinuses
7) Manage any complications of the above procedures, in particular FESS

Head & Neck

KEY COMPETENCIES

The candidate will be able to:

- Understand of the anatomy and physiology of the head & neck region, including deglutition and phonation
- Understand of the management of all common head and neck conditions
- Assess a patient with a head and neck malignancy and perform pre-operative assessment, postoperative and rehabilitation management
- Collaborate with other professionals in the selection and use of various types of treatments

1. Basic Sciences and Applied Knowledge

1) Describe in detail the anatomy (including embryology) of oral cavity, lips, jaws and tongue, oro-pharynx, naso-pharynx, hypo-pharynx, tracheo-bronchial tree, larynx, cervical oesophagus, soft tissues of the neck, thyroid, para-thyroid gland, salivary glands
2) Explain the physiology of swallowing, voice production, taste, salivation, upper airway breathing, thyroid and para-thyroid gland
3) Discuss nutrition in head and neck disease
4) Recognise and describe pathology, clinical presentation and management of the head and neck including:
   a) Tumours --- benign and malignant
      i) Mucosal
      ii) Skin
      iii) Salivary glands
      iv) Thyroid
      v) Neurogenic
      vi) Vascular
      vii) Other soft tissues
      viii) Bone and teeth
   b) Infections
      i) Neck spaces
      ii) Skin and soft tissue
      iii) Salivary glands including sialolithiasis
      iv) Thyroid
      v) Bone and teeth
      vi) Laryngopharynx
      vii) Oropharynx including tonsils and peritonsillar space
   c) Trauma – blunt and penetrating
      i) Facial fractures
      ii) Blunt and penetrating neck injuries
         (1) Visceral

(2) Vascular
(3) Neural

iii) Intubation injuries and their sequelae

d) Head and neck manifestations of systemic diseases
e) Foreign bodies of aerodigestive tract
f) Gastro-oesophageal/laryngopharyngeal reflux

5) Describe, interpret and evaluate diagnostic imaging of the head and neck including:
   a) Plain x-rays
   b) CT scan
   c) MRI
   d) PET
   e) Contrast/interventional studies
   f) Nuclear
   g) Ultrasound
   h) Video stroboscopy
6) Interpretation of pathology results:
   a) Haematology
   b) Cytology
   c) Anatomical pathology
7) Understanding the principles of the following as related to head and neck:
   a) molecular biology
   b) immunology
   c) genetics
   d) epidemiology
   e) statistics
   f) carcinogenesis
   g) the benefits and deficiencies of staging systems
   h) laser physics and safety
   i) radiation physics
   j) antibiotics
   k) chemo-therapeutic agents

2. Clinical knowledge, skills and judgment

1) Assess and manage all common benign head and neck conditions
2) Evaluate and stage a patient with head and neck cancer
3) Discuss the treatment options of various head & neck cancers
4) Order and accurately interpret diagnostic tests
5) Demonstrate detailed understanding in performing the following surgical procedures:
   a) Endoscopic
      i) Oesophagoscopy & foreign body removal
      ii) Bronchoscopy & foreign body removal
      iii) Laryngoscopy direct +/- biopsy
      iv) Oesophagoscopy +/- biopsy
      v) Panendscopy/tumour evaluation +/- biopsy
      vi) Biopsy of solid tumour

vii) Fine needle aspiration biopsy

b) Non endoscopic
   i) Tonsillectomy
   ii) Adenoidectomy
   iii) Tonsillar/Adenoid haemorrhage control
   iv) Submandibular Gland excision
   v) Neck abscess drainage --- large and small
   vi) Tracheostomy
   vii) Oral laceration repair
   viii) Nasopharynx biopsy
   ix) Lymph Node biopsy
   x) Skin graft

c) Understand the principles of the following procedures:
   i) Endoscopic
      (1) Laryngectomy partial resection – Laser
      (2) Arytenoidectomy resection – Laser
   ii) Open surgery
      (1) Thyroidectomy
      (2) Various neck dissections
      (3) Parotidectomy
      (4) Laryngectomy: supracricoid, hemi-, vertical and supraglottic
      (5) Glossectomy and mandibulectomy
      (6) Defect reconstruction using free flaps, pedicled and local flaps
      (7) Cranio-facial resection
      (8) Manage any complications of the above procedures
      (9) Plan, implement and manage pre and post-operative care of the head and neck surgical patient
      (10) Recognize the role of adjuvant therapy in the management of head and neck cancer

Sleep Disorder

KEY COMPETENCIES

The candidate will be able to:

- Assess patients with snoring and sleep apnoea
- Interpret relevant diagnostic tests related to the condition
- Consider all relevant options both surgical and non-surgical
- Communicate realistic outcomes of surgery and their complications
- Manage complications

1. Basic sciences and Applied Knowledge

Define:

1. Obstructive sleep apnoea
2. Apnoea
3. Hypopnoea
4. Upper Airway Resistance Syndrome
5. Respiratory disturbance index

Physiology of sleep

Explain the physiology of:

1. Non- REM (four stages) sleep
2. REM sleep
3. Relative proportions and changes with age

Physiology of airway collapse

Describe the:

1. Role of nasal airway
2. Craniofacial skeleton
3. Soft tissues and musculature
4. Fujita classification
5. Pathophysiologic consequences including those of CPAP
6. Blood gas changes (O2, CO2)
7. Pulmonary/systemic vasoconstriction

8. Vagal bradycardia/ectopic cardiac beats
9. Sleep arousals
10. Cerebral dysfunction

Clinical consequences of obstructive sleep apnoea

1. Recognise and describe the pathology and clinical presentation of obstructive sleep apnoea
2. Review the consequences of obstructive sleep apnoea

2. Clinical knowledge, skills and judgement

1. Elicit an appropriate clinical history
2. Carry out a focused examination
3. Dynamic manoeuvres
4. Appropriate investigations

Investigations

1. Polysomnogram
2. Provide test information to patients in ways that lead to informed decision making

Management

Non-surgical

1. Review the non surgical treatment options for patients suffering from snoring and/or sleep apnoea
2. Explain the non surgical treatment options to patients in ways that ensure that they are safely and effective carried out
3. Continuous positive airway pressure
4. Mandibular advancement splint
5. Variable PAP
6. Nasal Splinting
7. Orthodontic Expansion

Surgical

Accurately identify indications for surgical intervention
Riley and Powell phase 1 &2 surgery (including results)

Phase 1

Uvulopharyngopalatoplasty/uvulopalato flap
Palatal Advancement
Hyoid Suspension
Genial tubercle advancement
Tongue base reduction/advancement

Phase 2
Maxillary/Mandibular advancement
Airway Bypass
Tracheostomy

Bariatric surgery
Effectively manage any complications of the above procedures and the underlying disease process

Plan, implement and manage pre and post-operative care of the sleep apnoea patient

Be able to describe in detailed, including complications of:

- UPPP
- Tracheostomy

LARYNGOLOGY

KEY COMPETENCIES

The candidate will be able to understand and discuss:

1. The anatomy and physiology of the larynx and upper aero-digestive tract in relation to voice production and swallowing.

2. The principles and techniques used in evaluation and treatment of voice and swallowing disorders.

3. The importance of an interdisciplinary approach in the management of voice and swallowing disorders.

1. Basic Sciences and Applied Knowledge

1. Describe the anatomy and physiology of the larynx and upper aero-digestive tract in relation to voice production and swallowing. This includes but is not confined to:
    a. Phylogeny of the larynx in relation to sphincter function.
    b. Embryology in relation to recurrent laryngeal nerve anatomy.
    c. Vocal fold histology and body cover theory.
    d. Muscles and motor innervation.
    e. Sensory innervation of the larynx and pharynx.
    f. Phases of swallowing.
    g. Effect of aging on the larynx.

2. Clinical knowledge, skills and judgement

1. Discuss the principles and techniques used in evaluation of voice and swallowing disorders.
    a. History taking in relation to voice disorders.
    b. Subjective and objective voice measurement.
    c. Importance of drugs and endocrine function on voice production.
    d. Methods of examining the larynx. Principles of videostroboscopy.
    e. Assessment of neurological disorders of the larynx through physiologic testing.
    f. Diagnosis of gastroesophageal reflux.
    g. Bed-side evaluation of swallowing.
    h. Fiber-optic endoscopic evaluation of swallowing.
    i. Radiologic assessment of swallowing.
    j. Transnasal esophagoscopy.

2. Discuss the non-surgical treatment of voice disorders.
    a. Multi-factorial model for pathogenesis of voice disorders.
    b. Muscle misuse dysphonia.

c. Laryngopharyngeal reflux.
d. Role of the speech therapist.

3. Discuss the principles and techniques of operative laryngoscopy.
    a. Anesthetic considerations in microlaryngeal surgery
    b. Microlaryngeal surgery for benign and malignant lesions. Micro-flap technique.
    c. Differences in management of nodules, polyps, cysts, respiratory papillomas, and contact ulcers.
    d. Principles of laser surgery. Safety requirements when operating with the laser.
    e. Management of glottic atypia and carcinoma-in-situ.
    f. Vocal outcomes following trans-oral laser microsurgery for laryngeal cancer. Malignant laryngeal conditions are covered in the head and neck section.
    g. Vocal fold scarring.

4. Discuss the causes and treatment principles of laryngeal and tracheal stenosis.

5. Discuss the diagnosis and management of neurological conditions such as spasmodic dysphonia, episodic laryngospasm and adductor breathing dystonia. Understand how systemic neurologic conditions such as Parkinson's disease can affect the larynx.

6. Discuss the evaluation and management of the immobile vocal cord.
    a. Differential diagnosis and evaluation of unilateral vocal cord paralysis.
    b. Injection laryngoplasty.
    c. Laryngeal framework surgery.
    d. Bilateral vocal cord immobility and treatment.

7. Discuss techniques of voice restoration following laryngeal cancer surgery including electrolarynx, esophageal speech, tracheo-esophageal puncture.

8. Discuss the principles of management of blunt and penetrating trauma to the larynx, and inhalation and caustic injury.

9. Understand the management principles of chronic dysphagia and aspiration.
    a. Postural techniques and swallowing maneuvers such as head rotation and Medelsohn's maneuver.
    b. Role of surgical management including tracheostomy, vocal fold medialisation, cricopharyngeal myotomy, epiglottoplasty, laryngeal closure, laryngectomy.
    c. The role of enteral feeding.