American Board of Otolaryngology

Otolaryngology—Head and Neck Surgery
Comprehensive Core Curriculum

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Contents

Introduction

The Otolaryngology—Head and Neck Surgery Comprehensive Core Curriculum outlined below is a compendium of topics, diseases and disorders that is included in the scope of knowledge for Otolaryngology—Head and Neck Surgery. The Curriculum outlines and provides an operational structure for the body of knowledge that is available in Otolaryngology—Head and Neck Surgery Residency training programs. This Curriculum is the foundation for the written and oral certification examinations developed by the American Board of Otolaryngology.

This document was developed by the Education Council, a committee established by the American Board of Otolaryngology, which is composed of representatives from the American Board of Otolaryngology, the ACGME Otolaryngology-Residency Review Committee, Society of University Otolaryngologists-Head and Neck Surgeons, and the Association of Academic Departments of Otolaryngology-Head and Neck Surgery.

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GENERAL OTOLARYNGOLOGY CURRICULUM

I. Fundamental Knowledge

A. General Head and Neck Anatomy

1. Unit Objective

a. At the completion of this unit, the resident understands the basic anatomy of the head and neck, including surface and internal anatomy

2. Learner Objectives

a. Upon completion of this unit, the resident:

i. Understands the anatomy of the head and neck, including interrelationships between neural structures, aerodigestive tract, ear, facial skeleton, skull, etc.

ii. Knows the surgical anatomy of the head and neck

iii. Understands radiologic imaging of the head and neck

3. Contents

a. Ear
b. Face
c. Nose
d Paranasal sinuses
e. Facial skeleton
f. Skull
g. Teeth
h. Neck
i. Aerodigestive tract
j. Cranial nerves
k. Vascular anatomy
l. Radiologic evaluation and anatomy

B. General Head and Neck Embryology

1. Unit Objective

a. At the completion of this unit, the resident understands the basic concepts and importance of embryology of the head and neck, including the ear and temporal bone, pharynx, endocrine structures, nerves and vasculature

2. Learner Objectives

a. Upon completion of this unit, the resident understands:

i. Embryology of all structures of the head and neck, including interrelationships between adjacent and related structures

ii. Surgical implications of embryology (i.e., location of parathyroid glands, tracts for congenital fistulas and sinuses)

3. Contents

a. Found in subspecialty curricula (i.e., *Otology, Pediatric Otolaryngology, Head and Neck, Laryngology*, etc.)

C. Physiology in General Otolaryngology

1. Unit Objective

a. At the completion of this unit, the resident understands the physiology of olfaction and taste, and the aerodigestive tract (humidification, respiration, phonation, and swallowing)

2. Learner Objectives

a. Upon completion of this unit, the resident understands the functions of smell and taste, and the multiple related functions of the aerodigestive tract

3. Contents

a. Olfaction (found in *Rhinology* section)
b. Taste
c. Nasal physiology (found in *Rhinology* section)
d. Respiration & phonation in the larynx (found in *Laryngology* section)
e. Swallowing
    i. Dysphagia
    ii. Aspiration
    iii. Odynophagia
f. Laryngopharyngeal reflux

D. Physical Examination in General Otolaryngology

1. Unit Objective

a. At the completion of this unit, the resident understands how to perform a physical examination of the head and neck, including internal and external structures

2. Learner Objectives

a. Upon completion of this unit, the resident understands:

    i. Evaluation of anatomy of the head and neck

    ii. Techniques for physical examination

3. Contents

a. Inspection
b. Palpation
c. Otoscopy
d. Tuning fork testing
e. Rhinoscopy
f. Indirect (mirror) laryngoscopy and pharyngoscopy
g. Fiberoptic endoscopy
h. Neurologic examination
i. Dental occlusion
j. Anatomic zones of the neck

4. Clinical Skills

a. During the training period, the resident:

i. Recognizes the normal and abnormal anatomy of the head and neck

ii. Utilizes instruments and techniques to perform a complete physical examination of the head and neck

II. Diseases and Disorders in General Otolaryngology

Most diseases are found within subspecialty curricula (i.e., *Otology, Rhinology*, etc.)

A. Unit Objective

1. At the completion of this unit, the resident can recognize, assess, diagnose, and manage diseases and disorders within general otolaryngology

B. Learner Objectives

1. Upon completion of this unit, the resident:

a. Recognizes the signs, symptoms and physical findings of diseases and disorders within general otolaryngology

b. Uses appropriate diagnostic tests

c. Performs a physical examination of the head and neck

d. Understands medical and surgical management of diseases and disorders with general otolaryngology

C. Contents

1. Ear disease (see *Otology* section)
2. Nasal disease (see *Rhinology* section)
3. Sinus disease (see *Rhinology* section)
4. Allergy (see *Allergy* section)
5. Oral cavity
   a. Cheilitis
   b. Stomatitis
      i. Bacterial
      ii. Fungal
      iii. Viral
      iv. Ulceration
   c. Pharyngitis/tonsillitis
   d. Peritonsillar abscess
   e. Sialadenitis/sialolithiasis
   f. Neurologic
      i. Palate weakness
      ii. Tongue weakness/paralysis
      iii. Dysarthria
6. Larynx and voice (see *Laryngology* section)
7. Swallowing (see *Laryngology* section)

8. Head and neck mass
    a. Congenital (see *Pediatric* section)
    b. Neoplasm (see *Head & Neck* section)
    c. Inflammatory
        i. Lymphadenitis
        ii. Nontuberculous mycobacteria
        iii. Scrofula
        iv. Sarcoid
    d. Rare diseases (sinus histiocytosis with massive lymphadopathy, etc.)
9. Trauma
    a. Soft tissue injury
    b. Soft tissue loss
    c. Facial fracture
        i. Frontal sinus
        ii. Maxilla and midface
        iii. Orbital fractures
        iv. Mandible
        v. Surgical approaches
        vi. Closed reduction vs. open reduction
    d. Penetrating trauma
        i. Airway management
        ii. Neck zones
        iii. Imaging and evaluation
        iv. Vascular injuries
        v. Surgical management
    e. Larynx trauma
        i. Airway management
        ii. Endoscopic evaluation
        iii. Radiologic evaluation
        iv Repair
10. Sleep-disordered breathing (see *Sleep Disorders* section)
    a. Snoring
    b. Sleep apnea
    c. Other sleep disorders
11. Systemic diseases with head and neck manifestations
    a. Wegener's granulomatosis
    b. Sarcoidosis
    c. Behçet's disease
    d. Pemphigus
    e. Rheumatoid arthritis
    f. Other
12. Syndromes
    a. Osler-Weber-Rendu
    b. Basal cell nevoid syndrome
    c. Other

D. Clinical Skills

1. At the completion of this unit, the resident can:

    a. Perform a comprehensive history and physical examination, order appropriate laboratory and diagnostic testing, develop a differential diagnosis, and arrive at a diagnosis of diseases and disorders in general otolaryngology

    b. Discuss the nonsurgical and surgical management of diseases and disorders in general otolaryngology

    c. Integrate the embryology, genetics, anatomy and physiology in the understanding of diseases and disorders of general otolaryngology

RHINOLOGY CURRICULUM

I. Fundamental Knowledge

A. Anatomy and Physiology of the Nose and Paranasal Sinuses

1. Unit Objective

a. At the completion of this unit, the resident understands the anatomy of the nose and paranasal sinuses, along with pertinent neural structures of the anterior skull base, vascular supply, and adjacent anatomic areas

2. Learner Objectives

a. Upon completion of this unit, the resident:

i. Understands the bony and soft tissue anatomy of the nose and paranasal sinuses and their relationship to related vascular, neural, orbital, and intracranial structures of the anterior and lateral skull base

ii. Knows the surgical anatomy, neural, vascular, and osseous components of the nose and paranasal sinuses

iii. Understands the surgical relationship of the neural, vascular, and osseous components of the nose and paranasal sinuses to the anterior and lateral skull base

iv. Knows operative approaches to the nose and paranasal sinuses

3. Contents

a. Structural surface anatomy
   i. External nasal anatomy
   ii. Septum
      a) Quadrangular cartilage
      b) Perpendicular plate of the ethmoid
      c) Vomer
      d) Sphenoid rostrum
      e) Maxillary crest
   iii. Lateral nasal wall structures
   iv. Choana
   v. Olfactory cleft
b. Bony anatomy
   i. Maxillary bone
      a) Anatomic subunits
      b) Relationship to pertinent anatomy
         i) Infraorbital nerve
         ii) Orbit
         iii) Alveolus
         iv) Pterygomaxillary space

ii. Ethmoid bone
    a) Anatomic subunits
        i) Uncinate process
        ii) Ethmoidal bulla
        iii) Basal lamella
        iv) Lamina papyracea
        v) Cribriform
            (a) Lateral lamella
            (b) Lamina cribrosa
            (c) Middle turbinate
        vi) Perpendicular plate
        vii) Crista galli
    b) Extramural ethmoid cells
        i) Agger nasi
        ii) Other
iii. Sphenoid bone
    a) Anatomic subunits
        i) Rostrum
        ii) Greater wing
        iii) Lesser wing
        iv) Planum sphenoidale
        v) Clivus
        vi) Pterygoid plates
    b) Intra-sphenoid surface topography
    c) Relationship to surrounding structures
        i) Optic nerve
        ii) Carotid artery
        iii) Cavernous sinus
        iv) Other
iv. Palatine bone
    a) Anatomic subunits
    b) Relationship to surrounding structures
        i) Pterygopalatine fissure
        ii) Foramina

c. Functional anatomy
    i. Nasal valve
d. Vascular relationships
    i. External carotid
        a) Superior labial artery
        b) Internal maxillary artery
    ii. Internal carotid
        a) Anterior ethmoidal artery
        b) Posterior ethmoidal artery
e. Neural relationships
    i. Olfactory nerve
    ii. Trigeminal nerve
        a) Ophthalmic division
            i) Nasociliary nerve
                (a) Anterior ethmoidal nerve
                (b) Posterior ethmoidal nerve
        b) Maxillary division
            i) Infraorbital nerve
            ii) Nasopalatine nerve
    iii. Parasympathetic innervation
        a) Sphenopalatine ganglion
        b) Vidian nerve
    iv. Optic nerve

f. Diagnostic skills
    i. Radiology
        a) CT
        b) MR
        c) Cisternogram
    ii. Endoscopy

4. Clinical Skills

a. During the training period, the resident:

i. Recognizes the normal and abnormal anatomy of the nose and the paranasal sinuses

ii. Interprets tests to diagnose anatomic abnormalities of the nose and paranasal sinuses

iii. Performs surgical procedures that utilize anatomic knowledge of the nose and paranasal sinuses

B. Embryology of the Nose

1. Unit Objective

a. At the completion of this unit, the resident understands the embryology of the nose and paranasal sinuses

2. Learner Objectives

a. Upon completion of this unit, the resident:

i. Knows the normal embryological development of the nose and paranasal sinuses

ii. Understands how embryological development impacts the anatomy of the nose and paranasal sinuses

3. Content

a. Development of the nasal cavity and paranasal sinuses
    i. Nasal development
    ii. Olfactory placode
    iii. Maxillary
    iv. Ethmoid
        a) Ethmoturbinals
        b) Primary furrows – form recesses and meati
    v. Sphenoid
    vi. Frontal
b. Patterns of pneumatization
    i. Ethmoid
        a) Anterior ethmoid cells
        b) Posterior ethmoid cells
        c) Variant patterns of pneumatization
    ii. Frontal
    iii. Maxillary
    iv Sphenoid
c. Cleft palate
d. Encephalocele
e. Dermoid

4. Clinical Skills

a. During the training period, the resident:

i. Recognizes the normal embryologic development of the nose and paranasal sinuses and its impact on the fixed and variable anatomy of the paranasal sinuses

ii. Recognizes how variations in paranasal sinus pneumatization contribute to subtle variations in surgical anatomy in a predictable fashion

iii. Interprets imaging and endoscopic studies that demonstrate variations and disorders of the embryologic development of the nose and paranasal sinuses

iv. Performs surgical procedures that utilize the embryologic knowledge of the nose and paranasal sinuses

C. Physiology of the Nose and Paranasal Sinuses

1. Unit Objective

a. At the completion of this unit, the resident understands the normal physiology of the nose

2. Learner Objectives

a. Upon completion of this unit, the resident understands:

i. How normal function of the nasal mucosa contributes to the homeostasis of the nose and paranasal sinus

ii. The role of nasal airflow in the function of the nose

3. Content

a. Mucosa and mucociliary function
   i. Mucosa
      a) Respiratory epithelium
      b) Pseudostratified columnar epithelium
      c) Cilia structure
         i) Ciliary ultrastructure
   ii. Vascular dynamics
      a) Autonomic control
      b) Nasal cycle
   iii. Glandular anatomy
      a) Goblet cells
      b) Seromucinous glands
   iv. Mucus
      a) Composition
      b) Motility
      c) Immune function
   v. Mucociliary flow
      a) Function
      b) Flow pathways

b. Air flow
   i. Air flow characteristics
   ii. Nasal air processing

4. Clinical Skills

a. During the training period, the resident:

i. Uses knowledge of nasal physiology to interpret causes of nasal disease

ii. Performs surgical procedures, understanding their potential impact upon nasal and paranasal sinus physiology

D. Olfaction

1. Unit Objective

a. At the completion of this unit, the resident understands nasal contribution to olfaction

2. Learner Objectives

a. Upon completion of this unit, the resident understands:

i. The relationship between normal function of the nasal mucosa and olfactory function

ii. The role of nasal airflow contributes to olfaction

iii. Neural pathways of olfaction

3. Content

a. Neuroanatomy
   i. Olfactory neuroepithelium
      a) Histology
      b) Diffusion of odorants
         i) Role of mucus
   ii. Olfactory tract neuroanatomy
      a) Peripheral
      b) Central
b. Dynamics of olfaction
   i. Odorants
   ii. Airflow dynamics at olfactory mucosa
   iii. Odorant diffusion
   iv. Olfactory transduction and coding
   v. Central processing
c. Olfactory testing
   i. Sensorineural tests
   ii. Imaging
   iii. Lab

4. Clinical Skills

a. During the training period, the resident demonstrates:

i. Ability to evaluate and treat causes of olfactory dysfunction

ii. Understanding of the potential impact of various treatments upon olfactory function

E. Nasal and Paranasal Sinus Immunology/Inflammation

1. Unit Objectives

a. At the completion of this unit, the resident understands the role of the immune system in maintaining nasal and paranasal sinus homeostasis

2. Learner Objectives

a. Upon completion of this unit, the resident:

i. Understands the role of the immune system in maintenance of nasal and paranasal sinus homeostasis

ii. Recognizes the role of inflammation in common diseases of the nose and paranasal sinuses

3. Content

a. Immunology
   i. General aspects
   ii. Triggers of the immune response
   iii. Components
      a) Inflammatory cells
      b) Immunoglobulins
      c) Inflammatory mediators
b. Microbiology
c. Endocrinology
d. Neurology
e. Diagnostic interpretation

4. Clinical Skills

a. During the training period, the resident demonstrates ability to:

i. Recognize the role inflammation plays in chronic and acute disorders of the nose and paranasal sinuses

ii. Evaluate for underlying causes of inflammation

iii. Maximize medical evaluation as a component of the management of patients with non-emergent inflammatory paranasal sinus disease

iv. Appropriately select surgical candidates based upon knowledge of underlying inflammatory disorders

F. Physical Examination

1. Unit Objectives

a. At the completion of this unit, the resident demonstrates the components of a thorough physical examination as it relates to the nose and paranasal sinuses

2. Learner Objectives

a. Upon completion of this unit, the resident:

i. Understands the individual components of the physical examination as it relates to the nose and paranasal sinus

ii. Performs a comprehensive physical examination as it relates to the nose and paranasal sinuses

iii. Interprets physical findings accurately

3. Content

a. External nasal examination
b. Evaluation of nasal valve function
c. Anterior rhinoscopy
d. Indirect nasopharyngoscopy
e. Nasal endoscopy
   i. Rigid
   ii. Flexible
f. Olfactory testing
g. Nasopharyngeal culture
h. Sinonasal aspirate/culture
   i. Antral puncture
   ii. Endoscopic middle meatal culture
i. Evaluation for CSF fistula
j. Interpretation of findings

4. Clinical Skills

a. During the training period, the resident:

i. Develops the ability to perform a comprehensive physical examination directed to the nose and paranasal sinuses

ii. Accurately interprets results of the physical examination

iii. Uses information gathered during physical examination to develop diagnostic/treatment plans for diseases of the nose and paranasal sinuses

II. <u>Diseases, Disorders, and Conditions</u>

A. Unit Objective

1. At the completion of this unit, the resident can recognize, assess, diagnose, and manage diseases and disorders of the nose and paranasal sinuses, and anterior skull base

B. Learner Objectives

1. Upon completion of this unit, the resident:

    a. Recognizes the signs and symptoms of diseases and disorders of the nose, paranasal sinuses, and anterior skull base

    b. Uses the appropriate diagnostic tests to assess diseases and disorders of the nose, paranasal sinuses, and anterior skull base

    c. Develops a diagnosis of diseases and disorders of the nose, paranasal sinuses, and anterior skull base

    d. Understands the surgical and non-surgical management of diseases and disorders of the nose, paranasal sinuses, and anterior skull base

C. Content

1. Olfactory Disorders
    a. Neurosensory olfactory disorders
        i. Viral
        ii. Trauma
        iii. Neoplasm
        iv. Demyelinating or degenerative CNS disorder
    b. Conductive disorders
        i. Inflammatory rhinosinusitis
2. Nose
    a. Congenital malformations
    b. Genetic disorders
        i. HHT
    c. Trauma
    d. Foreign body
    e. Anatomic obstruction
        i. Nasal valve collapse
        ii. Inferior turbinate hypertrophy
        iii. Septal deviation
    f. Infections
        i. Vestibulitis
        ii. Rhinitis
    g. Inflammation
        i. Allergic rhinitis
        ii. Non-allergic rhinitis
    h. Epistaxis
    i. Neoplasms
3. Paranasal sinuses
    a. Congenital malformations
    b. Trauma/foreign body
    c. Developmental
        i. Mucocele
    d. Inflammatory
        i. Chronic inflammatory rhinosinusitis with polyposis
        ii. Chronic inflammatory rhinosinusitis without polyposis
        iii. Allergic fungal rhinosinusitis
        iv. Relationship between rhinosinusitis and asthma

e. Infectious
    i. Acute rhinosinusitis
    ii. Chronic infectious rhinosinusitis
    iii. Invasive fungal
    iv. Infectious complications of CRS or ABRS
        a) Orbital
        b) Intracranial
        c) Facial soft tissue
f. Granulomatous
g. Cystic fibrosis
h. Autoimmune
i. Complications of paranasal sinus surgery
    a) Intracranial
    b) CSF fistula
    c) Orbital
    d) Recurrence/persistence of disease
    e) Neoplasms

4. Skull base
    a. Congenital
    b. Developmental
    c. Trauma
    d. Neoplasm
5. Pathology of regions adjacent to the paranasal sinuses
    a. Orbital/Lacrimal
        i. Dacryocystitis
        ii. Grave's exophthalmia
    b. Intracranial
        i. Pituitary adenoma, etc.

D. Clinical Skills

1. Upon the completion of this unit, the resident can:

    a. Obtain a comprehensive history, perform a focused physical examination, order appropriate laboratory and diagnostic studies to develop a thorough differential diagnosis, and arrive at a definitive diagnosis of the above diseases of the nose, paranasal sinuses and adjacent structures

    b. Discuss the nonsurgical as well as surgical management of the diseases and disorders of the nose, paranasal sinuses and adjacent structures

    c. Discuss the procedures and strategies necessary to treat the diseases and disorders of the nose, paranasal sinuses, skull base, and adjacent structures

III. <u>Surgical Concepts</u>

A. Unit Objective

1. At the completion of this unit, the resident understands the treatment strategies and procedures for the surgical management of diseases of the nose, paranasal sinuses, skull base, and adjacent structures

B. Learner Objectives

1. Upon completion of this unit, the resident:

    a. Understands the surgical strategies necessary to treat diseases and disorders of the nose, paranasal sinuses, skull base, and adjacent structures

    b. Performs surgical procedures to treat diseases and disorders of the nose, paranasal sinuses, skull base, and adjacent structures

C. Content

1. General
    a. Basic principles
        i. Local anesthesia
        ii. Principles of hemostasis
    b. Open approaches to the paranasal sinuses and anterior skull base
    c. Laser principles
    d. Equipment/instruments
    e. Intra-operative image guidance
    f. Graft materials
2. Specific surgical procedures
    a. Endoscopic
        i. Nasal endoscopy
        ii. Inferior turbinoplasty
        iii. Endoscopic septoplasty
        iv. Maxillary antrostomy
        v. Ethmoidectomy
        vi. Sphenoidotomy
        vii. Frontal sinusotomy
            a) Draf I
            b) Draf II
            c) Draf III
        viii. Trans-pterygoid approach to:
            a) Pterygomaxillary fissure
            b) Sphenoid sinus
        ix. Repair of CSF fistula (access to encephalocele/meningocele)
            a) Ethmoid
            b) Sphenoid
        x. Concha bullosa
        xi. Orbital decompression
        xii. Dacryocystorhinotomy
        xiii. Medial maxillectomy
        xiv. Hypophysectomy
        xv. Laser ablation of telangiectasia (HHT)
    b. Non-endoscopic
        i. Septoplasty
        ii. Inferior turbinoplasty
        iii. Anterior antrostomy
        iv. External ethmoidectomy
        v. Frontal
            a) Trephine
            b) Osteoplastic flap
            c) Obliteration
            d) Cranialization
            e) Ablation
        vi. Transeptal sphenoid sinusotomy
        vii. Medial maxillectomy
        viii. Septal dermaplasty

D. Clinical Skills

1. At the completion of this unit, the resident:

    a. Understands the surgical strategies and procedures to manage diseases and disorders of the nose, paranasal sinuses, skull base, and adjacent structures

    b. Selects the most appropriate surgical procedures to treat diseases and disorders of the nose, paranasal sinuses, skull base, and adjacent structures

ALLERGY CURRICULUM

I. Fundamental Knowledge

A. Immunology of Allergic Ear, Nose and Throat Disorders

1. Unit Objectives

a. At the completion of this unit, the resident understands the structure and function of the immune system with its related cellular and humoral functions as it relates to allergic respiratory disorders

2. Learner Objectives

a. Upon completion of this unit, the resident understands:

i. The complex structure and function of the immune system as it relates to cellular and humoral function along with the cells and related cytokines that are produced during the allergic reaction

ii. The structural anatomy of the respiratory tract and related functions of conjunctiva, middle ear, tracheal and bronchial mucosa and sinus and nasal mucosa

3. Contents

a. Definition of immunity, anaphylaxis, allergy, atopy
b. Role of innate and adaptive immunity
    i. Non-specific responses
    ii. Specific responses
        a) Specificity
        b) Memory
        c) Self-limitation
        d) Self-recognition (non-reaction to self)
        e) Amplification
        f) Feedback control
        g) Recruitment of secondary defense mechanisms
c. Components of the immune system
    i. Cells of the immune system
        a) Classes of lymphocytes including T cells, B cells, null cells
            i) TH-1 and TH-2 cells
            ii) Suppressor T-cells
        b) Mononuclear phagocytes and macrophages
            i) Role of antigen-presenting cells
        c) Mast cells and basophils
        d) Eosinophils
        e) Neutrophils and platelets
    ii. Antibodies and antigens
        a) Immunoglobulins
        b) Antibodies
        c) Antibody response to antigen challenge
    iii. Nonspecific mediators: cytokines and lymphokines
        a) Role of interferon, GM-CSF, TNF-alpha, TNF-beta, role of interleukins
    iv. Complement
        a) Classic and alternate pathway activation in the complement cascade

v. Hypersensitivity reactions: Gell and Coombs reactions
   a) Type I: immediate (anaphylactic) hypersensitivity reaction along with early and late phase reactions
   b) Type II: antibody-dependent cytotoxicity
   c) Type III: immune complex-mediated hypersensitivity reactions
   d) Type IV: cell-mediated hypersensitivity
   e) Other hypersensitivity reactions

4. Clinical Skills

a. At the completion of this unit, the resident understands the clinical impact of immunologic disorders of the head and neck

B. Inhalant Allergic Disorders

1. Unit Objectives

a. At the completion of this unit, the resident understands the nature of inhalant allergens and their impact on the patient with allergic and respiratory disorders

2. Learner Objectives

a. Upon completion of this unit, the resident understands:

i. Relevant inhalant allergens giving rise to allergic disorders and the cross reactivity of these allergens

ii. Nature of food allergy, types of food allergens and different food allergy reactions

iii. Categories of antibodies, their production stimulation and secretion

3. Contents (nature of allergic antigens)

a. Categories of inhalant allergens
   i. Pollens
      a) Tree, grass, weed pollens
      b) Thommen's postulates
   ii. Fungi
   iii. Bacteria
   iv. House dust mite
   v. Animal danders
b. Nature of food allergens and food allergy
   i. Immunologic reactions to foods
   ii. Cyclic food allergy
      a) Various stages of cyclic food sensitivity
      b) Masked sensitization and food addiction
      c) Diagnostic techniques for cyclic food allergy
         i) Oral challenge test
         ii) Skin testing techniques
            (a) Intradermal testing technique
            (b) In vitro food tests
   iii. Fixed food allergy
   iv. Signs and symptoms of food allergy
   v. Theory of action of neutralization treatment of food sensitivity
c. Development of antibodies
   i. Immunoglobulins: development of five different classes of the immunoglobulins distinguished by antigenic and structural characteristics
   ii. Production of immunoglobulins by transformation of B cells into plasma cells

4. Clinical Skills

a. At the completion of this unit, the resident understands the pathophysiology behind immunotherapy treatment of inhalant allergy

C. Hypersensitivity Disorders

1. Unit Objectives

a. At the completion of this unit, the resident understands the development of different types of hypersensitivity reactions and their impact on the patient with allergic and respiratory disorders

2. Learner Objectives

a. Upon completion of this unit, the resident understands:

i. Different types of hypersensitivity reactions that give rise to allergic disorders

ii. The nature of mechanisms of control of hypersensitivity reactions

3. Contents

a. Gell and Coombs hypersensitivity reactions
   i. Type I: immediate hypersensitivity reaction
   ii. Type II: antibody-dependent cytotoxicity
   iii. Type III: immune complex-mediated hypersensitivity
   iv. Type IV: cell-mediated hypersensitivity
b. Additional hypersensitivity reactions

4. Clinical Skills

a. At the completion of this unit, the resident understands the pathophysiology behind hypersensitivity reactions

D. Diagnosis of Allergic Ear, Nose and Throat Disorders

1. Unit Objectives

a. At the completion of this unit, the resident understands the diagnostic methods to determine the presence of an allergic disorder in the ear, nose and throat patient

2. Learner Objectives

a. Upon completion of this unit, the resident:

i. Understands the relevant history, chief complaints and medical history that demonstrate a diagnosis of upper respiratory allergy

ii. Understands the physical examination characteristics of a patient with respiratory allergy including the conjunctiva, middle ear, tracheal and bronchial mucosa and sinus and nasal mucosa

iii. Understands the rational diagnostic methodologies and physical examination of the patient with allergic disorders

iv. Can formulate a plan of management for a patient with ear, nose and throat allergic disorders

3. Contents

a. History, pertinent medical history, review of systems
b. Family history: awareness of the possibility of familial involvement of inhalant respiratory allergies
c. Specific physical examination and physical findings
    i. General
        a) Observation
    ii. Skin
        a) Urticaria, eczema
    iii. Eyes
        a) Allergic shiners
        b) Acute allergic conjunctivitis
        c) Atopic keratoconjunctivitis
    iv. Ears
        a) External ear: Id reaction
        b) Middle ear: recurrent serous otitis media and eustachian tube dysfunction
    v. Nose
        a) Chronic nasal congestion
        b) Allergic hypertrophic inferior turbinates
        c) Nasal crease
        d) Nasal polyposis
    vi. Oral cavity/oropharynx
        a) Chronic mouth breathing
        b) High arched palate
        c) Posterior oropharyngeal cobblestone formation
    vii. Larynx
        a) Edema of larynx
    viii. Chest and pulmonary tract
        a) Asthma and classic expiratory wheezes

4. Clinical Skills

a. At the completion of this unit, the resident can diagnose:

    i. Allergic disorders from history

    ii. Allergic disorders from physical examination

E. Diagnostic Testing for Allergic Ear, Nose and Throat Disorders

1. Unit Objectives

a. At the completion of this unit, the resident understands the methods of inhalant and in vitro testing techniques for the proper diagnosis of allergic respiratory disorders

2. Learner Objectives

a. Upon completion of this unit, the resident:

    i. Understands the different methods of skin testing and their results

    ii. Understands the methods of in vitro testing for respiratory and food allergens and the results

    iii. Can formulate a plan of management for a patient with ear nose and throat allergic disorders

3. Contents

a. Skin testing techniques
b. Role of scratch testing
c. Skin prick testing
    i. Single prick techniques
        a) Wheal and flare response
        b) Method of measurement
    ii. Multiple prick testing technique
        a) Different types of multiple prick testing methods
d. Intradermal testing
    i. Placement of a known quantity of antigen into the dermis
    ii. Skin endpoint titration (SET)
    iii. Screening for allergies using skin testing
e. In vitro testing techniques
f. RAST testing
g. Enzymatic in vitro techniques
h. Indications for in vitro testing
i. Allergy screening using in vitro techniques
j. Immunotherapy based on in vitro test results
k. Combining in vitro and skin testing techniques
l. Diagnostic techniques for food allergy
    i. History of food allergy reactions of patient
    ii. In vitro testing
    iii. Skin testing techniques

4. Clinical Skills

a. At the completion of this unit, the resident can diagnose allergic disorders using different diagnostic tests

II. <u>Diseases, Disorders and Conditions</u>

A. Unit Objectives

1. At the completion of this unit, the resident understands the different conditions of upper respiratory tract disorders and how allergy may relate to the disease and to symptoms

B. Learner Objectives

1. Upon completion of this unit, the resident can:

    a. Diagnose common allergy problems

    b. Formulate a plan of management for a patient with ear nose and throat allergic disorders

C. Contents

1. Allergic Rhinitis

a. Unit Objectives

i. At the completion of this unit, the resident understands the nature and etiology of common allergic rhinitis, as well as the mechanisms of management

b. Learner Objectives

i. Upon completion of this unit, the resident:

a) Understands the development of allergic rhinitis and signs and symptoms of the problem

b) Understands the nasal anatomy and physiology and its relation to allergic disease

c) Can formulate a plan of management for a patient with symptoms of allergic rhinitis

d) Understands the differential diagnosis of allergic rhinitis and other types of rhinitis

c. Contents

i. Seasonal intermittent rhinitis
ii. Springtime allergy and related pollens
iii. Fall allergy and related pollens
iv. Perennial persistent rhinitis
    a) Relative allergens causing the perennial symptoms
v. Persistent rhinitis
vi. Rhinitis medicamentosa
vii. Rhinitis of pregnancy
viii. Vasomotor rhinitis

d. Clinical Skills

i. At the completion of this unit, the resident can diagnose and treat common rhinologic problems related to allergy and inflammation

2. Allergic Ocular Disease and Conjunctivitis

a. Unit Objectives

i. At the completion of this unit, the resident understands the manifestations of ocular disorders and inhalant allergies

b. Learner Objectives

i. Upon completion of this unit, the resident:

a) Understands the signs and symptoms of allergic ocular disease

b) Can formulate a plan of management of a patient with allergic ocular disorders

c) Pathophysiology of the allergic reaction in the eye

d) Classification of ocular allergy

c. Contents

i. Seasonal/perennial allergic conjunctivitis
ii. Vernal keratoconjunctivitis
iii. Atopic keratoconjunctivitis
iv. Giant papillary conjunctivitis
v. Drug-induced allergic conjunctivitis
vi. Therapy for allergic ocular disease
    a) Topical antihistamines
    b) Topical mast cell stabilizers
    c) Nonsteroidal anti-inflammatory medications
    d) Corticosteroid therapy

d. Clinical Skills

i. At the completion of this unit, the resident can diagnose and treat common ophthalmologic disorders related to allergy and inflammation

3. Allergic Disease and Middle Ear Dysfunction

a. Unit Objectives

i. At the completion of this unit, the resident understands the different manifestations of middle ear disease as it relates to inhalant allergy

b. Learner Objectives

i. Upon completion of this unit, the resident:

    a) Understands the role of IgE reactions and development of middle ear problems in the allergic patient

    b) Can formulate a plan of management for a patient with ear, nose and throat allergic disorders

c. Contents

i. Mucous membrane and the middle ear
ii. Manifestations of serous otitis media
iii. Eustachian tube dysfunction

d. Clinical Skills

i. At the completion of this unit, the resident can diagnose and treat common middle ear disorders related to allergy and inflammation

4. Allergic Disease and Inner Ear Dysfunction

a. Unit Objectives

i. At the completion of this unit, the resident understands the different manifestations of inner ear disorders and how they relate to symptoms of patients

b. Learner Objectives

i. Upon completion of this unit, the resident:

a) Understands the rationale of the development of signs and symptoms of inner ear dysfunction with allergic symptoms

b) Can formulate a plan of management for a patient with inner ear allergic disorders

c. Contents

i. Ménière's syndrome and indications for allergy testing
ii. Vertigo induced from hypersensitivity

d. Clinical Skills

i. At the completion of this unit, the resident can diagnose and treat common inner ear disorders related to allergy and inflammation

5. Allergic Disorders and Rhinosinusitis

a. Unit Objectives

i. At the completion of this unit, the resident understands the mechanism of the development of rhinosinusitis in the patient with allergic symptomatology

b. Learner Objectives

i. Upon completion of this unit, the resident:

a) Understands the relationship of allergies to subsequent development of inflammatory and possible bacterial rhinosinusitis

b) Can formulate a plan of management for a patient with rhinosinusitis

c. Contents

i. Pathophysiology of paranasal sinus disorders
ii. Acute rhinosinusitis
iii. Recurrent acute rhinosinusitis
iv. Chronic rhinosinusitis
v. Allergic fungal rhinosinusitis (AFRS)
   a) Diagnostic criteria of allergic fungal rhinosinusitis
   b) Pathophysiology of allergic fungal rhinosinusitis
   c) Role of fungal antigens in evaluation
   d) Testing for fungal allergy
   e) Therapy for AFRS
   f) Immunotherapy in the patient with AFRS

d. Clinical Skills

i. At the completion of this unit, the resident understands the association between allergy and rhinosinusitis and can treat accordingly

6. Allergic Disease and Laryngeal Dysfunction

a. Unit Objectives

i. At the completion of this unit, the resident understands the different conditions of laryngeal and pharyngeal disorders and how they relate to symptoms of patients with allergy

b. Learner Objectives

i. Upon completion of this unit, the resident:

a) Understands the anatomy and physiology of the larynx and pharynx and the signs and symptoms of allergic laryngeal disorders

b) Can formulate a plan of management for a patient with laryngeal and pharyngeal allergic disorders

c. Contents

i. Laryngopharyngeal anatomy
ii. Acute laryngopharyngitis: anaphylaxis
iii. Allergic angioedema and laryngitis
iv. Angioedema and urticaria of the larynx
v. Role of ACE inhibitors
vi. Oral allergy syndrome
vii. LPR and GERD

d. Clinical Skills

i. At the completion of this unit, the resident understands the association between allergy and laryngeal dysfunction and can treat accordingly

7. Allergic Disease and Asthma

a. Unit Objectives

i. At the completion of this unit, the resident understands the different symptoms of asthma in allergic patients

b. Learner Objectives

i. Upon completion of this unit, the resident:

a) Understands the mechanisms of asthma and pathophysiology of this problem

b) Can formulate a plan of management for a patient with asthma and understands the pertinent medications to control symptoms

c. Content

i. Asthma diagnosis
ii. Auscultation
iii. Pulmonary function testing
    a) Role of flow-volume loop
    b) Peak flow measurements
iv. Pathophysiology of asthma
v. Asthma severity
vi. Pharmacotherapy of asthma

d. Clinical skills

i. At the completion of this unit, the resident understands the association between allergy and asthma

8. Latex Hypersensitivity

a. Unit Objectives

i. At the completion of this unit, the resident understands the nature of latex hypersensitivity

b. Learner Objectives

i. Upon completion of this unit, the resident:

a) Understands the role of latexreactions and cross-reactivity

b) Can formulate a plan of management for a patient with latex hypersensitivity

c. Content

i. Latex hypersensitivity
ii. Cross reactions and latex hypersensitivity
iii. Mechanism of management of the patient with latex hypersensitivity

d. Clinical Skills

i. At the completion of this unit, the resident understands and can treat latex hypersensitivity reactions

9. Allergic Manifestations of Chemical Sensitivity

a. Unit Objectives

i. At the completion of this unit, the resident understands the different manifestations of chemical sensitivity

b. Learner Objectives

i. Upon completion of this unit, the resident:

a) Understands the symptoms of possible chemical sensitivity in the allergic patient

b) Can formulate a plan of management for a patient with e-chemical sensitivity and other allergic disorders

c. Content

i. Nature of chemical sensitivity
ii. Mechanisms of chemical injury
   a) Acute poisoning
   b) Chronic poisoning
iii. Total allergic load
iv. Chemical hypersensitivity tests
v. Treatment of chemical sensitivity

d. Clinical Skills

i. At the completion of this unit, the resident understands and can treat chemical sensitivity disorders

10. Non-Allergic Rhinitis

a. Unit Objectives

i. At the completion of this unit, the resident understands the signs and symptoms of a patient with rhinitis not due to any allergic sensitivities

b. Learner Objectives

i. Upon completion of this unit, the resident:

a) Understands the manifestations of symptoms of non-allergic rhinitis

b) Can formulate a plan of management for a patient with symptoms of non-allergic disorders

c. Content

i. Vasomotor rhinitis
ii. Management of symptoms of non-allergic rhinitis

d. Clinical Skills

i. At the completion of this unit, the resident understands and can treat non-allergic rhinitis

III. Habilitation/Rehabilitation

A. Unit Objectives

1. At the completion of this unit, the resident understands the methods to improve a patient's symptoms of allergic rhinitis with development of avoidance techniques, environmental controls, pharmacotherapy and potential immunotherapy

B. Learner Objectives

1. Upon completion of this unit, the resident:

a. Understands the rationale for the use of environmental controls

b. Can utilize appropriate pharmacotherapy to help control symptoms of inhalant allergy

c. Can formulate a plan of management using appropriate allergen immunotherapy

d. Understands the potential reactions that may occur in the patient undergoing immunotherapy treatment

C. Content

1. Environmental controls and avoidance techniques
   a. Prevention of allergy
   b. Specific environmental controls
      i. Pollen controls
      ii. Mold controls
      iii. Dust mite control
      iv. Epidermal avoidance
      v. Other allergens and their controls
      vi. Role of use of air filters and air conditioning

2. Pharmacotherapy
    a. First and second generation antihistamines
        i. Uses of classic antihistamines
        ii. Benefits of second generation antihistamines
        iii. Combination decongestant and antihistamine therapy
    b. Decongestant therapy
    c. Mast cell stabilizers
    d. Corticosteroids
        i. Topical
            a) Different topical medications
            b) Adverse reactions to topical intranasal steroids
        ii. Systemic
    e. Anti-leukotrienes
    f. Mucolytic agents
    g. Monoclonal antibody therapy
3. Allergen immunotherapy
    a. Indications for immunotherapy
    b. Contraindications to immunotherapy
    c. Interpretation of allergy tests
    d. Mixing immunotherapy vials
    e. Immunotherapy escalation schedules
    f. Maintenance immunotherapy
        i. Symptom-relieving dose of treatment
        ii. Maximally tolerated dose treatment
        iii. Optimal-dose treatment
    g. Immunotherapy safety

D. Clinical Skills

1. At the completion of this unit, the resident understands and can:

    a. Recommend environmental controls and avoidance techniques

    b. Treat with pharmacotherapy

    c. Treat allergic disorders with immunotherapy

LARYNGOLOGY, VOICE AND SWALLOWING CURRICULUM

I. Fundamental Knowledge

A. General Larynx Anatomy

1. Unit Objective

a. At the completion of this unit, the resident understands the basic anatomy of the larynx, including surface and internal anatomy

2. Learner Objectives

a. Upon completion of this unit, the resident:

i. Understands the anatomy of the larynx, including relationships between framework, muscles, and nerves

ii. Knows the surgical anatomy of the larynx

3. Contents

a. Cartilage
   i. Thyroid
   ii. Cricoid
   iii. Arytenoid, with emphasis on cricoarytenoid motion
   iv. Cuneiform and corniculate
b. Muscles, including actions
c. Vascular supply and lymphatic drainage
d. Nerves
   i. Sensory
   ii. Motor
e. Mucosa, including layered histology
   i. Epithelium
   ii. Basement membrane
   iii. Superficial, middle and deep layers of lamina propria
      a) Vocal ligament
f. Membranes
   i. Thyrohyoid
   ii. Cricothyroid
   iii. Conus elasticus
   iv. Quadrangular membrane

4. Clinical skills

a. At the completion of this unit, the resident understands the anatomy of the larynx

B. General Larynx Embryology

1. Unit Objective

a. At the completion of this unit, the resident understands the basic concepts and importance of embryology of the larynx

2. Learner Objectives

a. Upon completion of this unit, the resident understands:

i. Embryology of the larynx, including interrelationships

ii. Surgical implications of embryology

3. Contents

a. Embryologic fusion planes
b. Branchial arches, pouches, etc.

4. Clinical Skills

a. At the completion of this unit, the resident understands embryology and its relationship to anatomy of the larynx

C. Laryngeal and Pharyngeal Physiology

1. Unit Objective

a. At the completion of this unit, the resident understands the physiology of respiration, phonation and swallowing

2. Learner Objectives

a. Upon completion of this unit, the resident understands the functions of the larynx and pharynx

3. Contents

a. Respiration
b. Phonation
   i. Cover-body theory of phonation, including meaning and significance of "mucosal wave"
   ii. Mechanism of pitch control
   iii. Anatomic and physiologic correlates of voice quality
c. Swallowing
d. Airway protection

4. Clinical skills

a. At the completion of this unit, the resident understands the:

i. Physiology of different functions of the larynx

ii. Impact of laryngeal dysfunction on different aspects of normal physiology

D. Physical Examination in Laryngology

1. Unit Objective

a. At the completion of this unit, the resident understands how to perform a physical examination of the larynx

2. Learner Objectives

a. Upon completion of this unit, the resident understands the:

i. Evaluation of the anatomy of the head and neck

ii. Techniques for physical examination

3. Contents

a. Inspection
b. Palpation
c. Indirect (mirror) examination
d. Fiberoptic examination
   i. Flexible
   ii. Hopkins rod
e. Stroboscopy
f. Direct (operative) laryngoscopy
g. Other evaluations
   i. Voice analysis (jitter, shimmer, etc.)
   ii. EMG
   iii. Perceptual analysis

4. Clinical skills

a. At the completion of this unit, the resident can perform:

i. A comprehensive physical examination and evaluation of the larynx and laryngeal function

ii. Appropriate evaluation of the larynx

II. <u>Diseases, Disorders, and Conditions in Laryngology</u>

A. Unit Objective

1. At the completion of this unit, the resident can recognize, assess, diagnose and manage diseases and disorders within laryngology

B. Learner Objectives

1. Upon completion of this unit, the resident:

a. Recognizes the signs, symptoms, and physical findings of diseases and disorders in laryngology
b. Uses appropriate diagnostic tests
c. Performs physical examinations
d. Understands medical and surgical management of diseases and disorders within general otolaryngology

C. Contents

1. Infectious
    a. Laryngitis
        i. Bacterial
        ii. Viral
        iii. Fungal
    b. Pharyngitis
        i. Bacterial
        ii. Viral
        iii. Fungal
2. Inflammatory/traumatic
    a. Laryngitis
    b. Laryngopharyngeal reflux
    c. Hemorrhage
    d. Polyp
    e. Cyst
    f. Nodule
    g. Granuloma
    h. Reinke's edema
    i. Scar
3. Neoplasm
    a. Benign
        i. Papilloma
        ii. Other
    b. Malignant
        i. Squamous cell carcinoma
        ii. Other
4. Structural
    a. Sulcus vocalis
    b. Voice changes of aging
    c. Saccular cyst
    d. Laryngocele
        i. Internal
        ii. External
        iii. Mixed
5. Neurologic
    a. Vocal fold paralysis or paresis
        i. Unilateral
        ii. Bilateral
    b. Sensory deficit
    c. Spasmodic dysphonia
6. Syndromes and diseases with laryngeal involvement
    a. Sarcoid
    b. Amyloid
    c. Wegener's
    d. Tuberculosis
    e. Other granulomatous disease

D. Clinical skills

1. At the completion of this unit, the resident can:

    a. Develop a thorough differential diagnosis and arrive at a definitive diagnosis of the above diseases and disorders of the larynx

    b. Discuss the different etiologies, manifestations, and patterns of laryngeal diseases and disorders

III. Therapeutic and Surgical Concepts

A. Unit Objective

1. At the completion of this unit, the resident understands the treatment strategies and procedures for the medical, surgical and behavioral management of diseases of the larynx and pharynx

B. Learner Objectives

1. Upon completion of this unit, the resident:

    a. Understands medical, surgical and behavioral strategies necessary to treat diseases and disorders of the larynx and pharynx

    b. Can perform surgical strategies to treat diseases and disorders of the larynx and pharynx

C. Contents

1. Behavioral management
    a. Voice rest
    b. Voice therapy
2. Medical management
    a. Steroids
    b. Reflux medication
    c. Botulinum toxin
    d. Other
3. Surgical management
    a. External surgical approaches
        i. Laryngofissure
        ii. Laryngeal framework surgery
            a) Thyroplasty types 1 to 4
            b) Arytenoid repositioning surgery
        iii. ORIF of larynx
    b. Internal/endoscopic approaches
        i. Fiberoptic flexible laryngoscopy
            a) Therapeutic
                i) Injection
                ii) Foreign body removal
                iii) Other
        ii. Direct laryngoscopy
            a) Suspension surgical laryngoscopy
            b) Micro-suspension surgical laryngoscopy
        iii. Vocal fold surgery
            a) Injection
            b) Injection augmentation
            c) Botox
            d) Incisional biopsy
            e) Excisional biopsy
            f) Stripping
            g) Marsupialization
            h) Mucosal microflap
        iv. Laser surgery
            a) CO_2
            b) Angiolytic lasers
        v. Microdebrider surgery

D. Clinical Skills

1. At the completion of this unit, the resident:

    a. Understands and can perform endoscopic and open surgical procedures on the larynx

    b. Can select the most appropriate surgical procedure in order to treat diseases and disorders of the larynx

ADULT SLEEP MEDICINE CURRICULUM

I. Fundamental Knowledge

A. Sleep Physiology

1. Unit Objective

a. At the completion of this unit, the resident understands the physiology of sleep, including sleep stages, and sleep disorders

2. Learner Objectives

a. Upon completion of this unit, the resident understands:

i. Sleep physiology

ii. Sleep disorders

iii. Sleep evaluation techniques

3. Contents

a. Sleep stages
b. Sleep latency
c. Neural centers
d. Neural connections
e. Electroencephalogram changes
f. Circadian features related to sleep
g. Sleep disorders
    i. Sleep stage dysfunction
    ii. Sleep timing disorders: delayed sleep phase, advanced sleep phase, shift work/jet lag
    iii. Inadequate sleep/sleep deprivation
    iv. Restless limb syndrome/periodic limb movement disorder/bruxism
    v. Insomnia
    vi. Narcolepsy
    vii. Sleep disordered breathing
        a) Central sleep apnea
        b) Obstructive sleep apnea/snoring/upper airway resistance syndrome
            i) Sites of obstruction
            ii) Severity staging
            iii) Associated comorbidity
                (a) Medical: hypertension, etc.
                (b) Sequelae: sleepiness, performance

4. Clinical skills

a. At the completion of this unit, the resident understands:

i. Normal and abnormal sleep physiology

ii. Anatomic mechanisms of obstructive apnea

iii. Evaluation of normal and abnormal sleep

iv. Medical and functional consequences of sleep apnea

B. Physical Examination in Sleep Disordered Breathing

1. Unit Objective

a. At the completion of this unit, the resident understands the examination of the patient with a sleep disorder

2. Learner Objectives

a. Upon completion of this unit, the resident can perform an appropriate physical examination of a patient with a sleep disorder

3. Contents

a. Nasal anatomy
b. Soft palate
c. Oropharynx and retrolingual airway
d. Tonsil and adenoid tissue
e. Tongue
    i. Oral
    ii. Tongue base
f. Craniofacial (mandible, maxilla)
g. Neck soft tissue
h. Hyoid position
i. Laryngeal anatomy
j. Body habitus
k. Body mass index

4. Clinical skill

a. At the completion of this unit, the resident can perform a comprehensive physical examination of the patient with a sleep disorder

C. Diagnostic Evaluation in Sleep Disorders (including apnea)

1. Unit Objective

a. At the completion of this unit, the resident understands the diagnostic evaluation of the patient with a sleep disorder

2. Learner Objectives

a. Upon completion of this unit, the resident can perform an appropriate diagnostic evaluation of the patient with a sleep disorder

3. Content

a. Sleep study (polysomnography, ambulatory cardiorespiratory studies, actigraphy)
   i. Data measured (apnea index, etc.)
      a) Normal ranges
   ii. Sleep architecture
   iii. Ventilation/respiration parameters
   iv. Oxygenation parameters
   v. Position, sleep stage
b. History: symptoms, comorbidities
c. Physical examination
d. Fiberoptic examination
   i. Sedated
   ii. Awake
e. Occlusion
f. Cephalometric evaluation
g. Multiplanar radiologic evaluation
   i. CT
   ii. MRI

4. Clinical skills

a. At the completion of this unit, the resident:

   i. Understands indications for further evaluation of sleep dysfunction

   ii. Can interpret an overnight polysomnogram

   iii. Can use diagnostic tools for anatomic evaluation

II. <u>Diseases and Disorders</u>

A. Unit Objective

1. At the completion of this unit, the resident understands sleep diseases and disorders

B. Learner Objective

1. Upon completion of this unit, the resident:

   a. Knows the differential diagnosis of sleep disorders

   b. Can diagnose sleep disorders including sleep-disordered breathing

C. Content

1. Sleep stage dysfunction
2. Sleep timing disorders: delayed sleep phase, advanced sleep phase, shift work/jet lag
3. Inadequate sleep/sleep deprivation
4. Restless limb syndrome/periodic limb movement disorder/bruxism
5. Insomnia
6. Narcolepsy
7. Sleep disordered breathing
    a. Central sleep apnea
    b. Obstructive sleep apnea/snoring/upper airway resistance syndrome
        i. Sites of obstruction
        ii. Severity staging
        iii. Associated comorbidity
            a) Medical: hypertension, etc.
            b) Sequelae: sleepiness, performance

D. Clinical Skills

1. At the completion of this unit, the resident understands the differential diagnosis of sleep disorders

III. <u>Surgical Concepts</u>

A. Unit Objective

1. At the completion of this unit, the resident understands the surgical treatment of some sleep disorders

B. Learner Objective

1. Upon completion of this unit, the resident:

    a. Can perform surgical correction of anatomic deformities causing sleep apnea

    b. Understands the role of surgery, realistic goals of surgery, and staging of surgical procedures

    c. Understands indications for surgical intervention and expected outcomes

    d. Understands risks and complications of surgery

C. Content

1. Roles of surgery
    a. Adjunctive (i.e., facilitate CPAP)
    b. Salvage treatment for failure of nonsurgical treatment
    c. Primary treatment
2. Surgery staging
    a. Primary level of obstruction
    b. Multi-level strategies
    c. Global airway strategies
3. Nasal surgery
    a. Septum
    b. Turbinate
        i. Partial resection
        ii. Tissue reduction (radiofrequency, cold ablation, etc.)
    c. Nasal valve
4. Tonsillectomy
5. Adenoidectomy

6. Palate surgery
    a. Uvulopalatopharyngoplasty
        i. Multiple modifications
    b. Tissue reduction (radiofrequency, etc.)
    c. Stiffening procedures
7. Tongue surgery
    a. Volume reduction
    b. Tongue suspension
        i. Suture
        ii. Genioglossus advancement
8. Mandible with or without tongue and maxilla
    a. Genioglossus advancement
    b. Sagittal split osteotomy with advancement
        i. Maxillo-mandibular advancement
9. Neck
    a. Lipectomy
    b. Hyoid suspension
10. Tracheotomy
11. Role of bariatric surgery
12. Outcomes of surgical interventions
    a. Facilitation of nonsurgical therapies
    b. Polysomnography outcomes
    c. Clinical outcomes: symptoms, quality of life, function, medical risk, mortality risk
    d. Risks and complications of procedures

D. Clinical skills

1. At the completion of this unit, the resident understands:

    a. And can perform surgical procedures for obstructive sleep apnea

    b. Staging and combination of multiple level surgeries

    c. Success and complication rates of different surgical techniques

IV. <u>Non-surgical Treatments</u>

A. Unit Objective

1. At the completion of this unit, the resident understands the nonsurgical treatment of some sleep disorders

B. Learner Objective

1. Upon completion of this unit, the resident understands:

    a. Nonsurgical treatment

    b. Indications for surgical and nonsurgical intervention

C. Content

1. Treatment of related disorders
   a. Obesity: weight loss
   b. Rhinitis: medication, allergy testing/treatment
   c. GERD: medication, lifestyle changes
2. Sleep positioning
3. Avoiding or changing medications
4. Sleep hygiene
5. Dental appliances, including tongue appliances
6. Positive airway pressure devices (CPAP, BiPAP, AutoPap)
7. Address related sleep disorders

D. Clinical skill

1. At the completion of this unit, the resident understand the nonsurgical treatment of sleep apnea, including success and compliance rates

PEDIATRIC OTOLARYNGOLOGY CURRICULUM

I. Fundamental Knowledge

A. Embryology and Anatomy

1. Unit Objective

a. At the completion of this unit, the resident understands:

i. Basic embryology of the head and neck and abnormalities of development including genetic, environmental, and spontaneous mutations

ii. Relative differences between adult and pediatric anatomy

2. Learner Objectives

a. Upon completion of this unit, the resident:

i. Understands the significance of differences between adult and pediatric anatomy as it relates to the temporal bone, nasal cavity and sinuses, pharynx and esophagus, larynx and trachea, cranial nerves, boney and soft tissues of the head and neck, including the salivary glands and endocrine structures

ii. Understands the normal and abnormal embryologic derivations of these structures

iii. Knows the various conditions and circumstances that lead to abnormal embryologic development as well as normal variances in anatomy

iv. Knows the operative corrections/approaches for these disorders

3. Content

a. External ear/auricle
b. Facial bones/cranium
c. Nose/paranasal sinuses
d. Larynx and trachea/pharynx and esophagus
e. Lips teeth tongue and pharynx
f. Salivary glands and endocrine structures

4. Clinical Skills

a. At the completion of this unit, the resident:

i. Can perform an accurate physical examination using advanced techniques and equipment, including fiberoptics, video, otomicroscopy etc. and utilizes and synthesizes laboratory and imaging data for evaluation and planning

ii. Can educate and train parents and other family members of the significance, etiology, impact, origin of the abnormalities and the options for correction, including the timing and staging of surgery

B. Child Development and Parent/Child Interaction

1. Unit Objective

a. At the completion of this unit, the resident:

i. Has comprehension of the normal and abnormal development of children's language, gross and fine motor skills, growth, psychology, etc.

ii. Understands pharmacology and fluid management and growth charts as they relate to children

iii. Comprehends normal and abnormal parenting skills and can advocate for children

iv. Can identify potential child abuse

v. Can achieve informed consent

2. Learner Objective

a. Upon completion of this unit, the resident:

i. Understands the normal and abnormal physiology and psychologic aspects of child development

ii. Accurately assesses good, poor and harmful parenting skills and can advocate for children in need

3. Contents

a. Normal growth and development
b. Pharmacology/dosing, special metabolic profiles of children versus adults
c. Fluid management
d. Parenting skills, cultural norms
e. Psychiatric stages of identity for children
f. Children's rights, ethics, informed consent
g. Team approaches to children's care

4. Clinical Skills

a. At the completion of this unit, the resident can:

i. Interview parents and children for history

ii. Apply appropriate developmental testing: motor, sensory, psychologic

iii. Appropriately prescribe drugs, fluids etc., based on weight/height or meter squared area

iv. Achieve informed consent and experimental study entry

v. Participate in interdisciplinary team care delivery for complex conditions

C. Ears: Otology, Hearing and Hearing Loss

1. Unit Objective

a. At the completion of this unit, the resident understands:

i. Etiology of sensorineural and conductive hearing loss as well as the evaluation and management of those conditions

ii. Infectious and inflammatory diseases of the ear, their significance, etiology and treatment

iii. Balance disorders in childhood

iv. Causation and staging of microtia and aural atresia

2. Learner Objective

a. Upon completion of this unit, the resident:

i. Understands congenital, acquired and genetic aspects of sensorineural and conductive hearing loss

ii. Interprets and recognizes appropriate audiologic testing for infants and children including OAEs, ABRs, VRAs, play audiometry, etc.

iii. Interprets and obtains appropriate imaging for the ear

iv. Comprehends basic microbiology and immunology as it relates to otitis, understands pathways of disease spread, complications and treatment

v. Understands the basic physiology of hearing and balance including mechanotransduction, psycho-acoustics and central

3. Contents

a. Hearing and balance physiology
b. Diagnostic testing
c. Audiology
c. Imaging
d. Genetics
e. Laboratory
f. Acute and chronic otitis media, eustachian tube function (normal and abnormal), otitis externa, cholesteatoma, aural dysplasia and atresia, pediatric disorders of the facial nerve and temporal bone
g. Congenital and acquired hearing loss (genetic and non-genetic)

4. Clinical skills

a. At the completion of this unit, the resident can:

i. Obtain a history and physical assessment of the ears, use of the otoscope, otomicroscope

ii. Evaluate balance

iii. Interpret testing, including imaging and genetics

iv. Manage complications in children

D. Nose and Paranasal Sinuses

1. Unit Objective

a. At the completion of this unit, the resident understands:

i. Specific aspects of developmental nasal disorders

ii. Infectious and inflammatory disorders of the nose and paranasal sinuses

iii. Basics of olfaction

2. Learner Objectives

a. Upon completion of this unit, the resident:

i. Understands allergy and its expression in the pediatric nasal cavity

ii. Understands microbiology and immunology of pediatric rhinologic infection including pathways of spread and complications

iii. Understands anatomy and physiology of the nose and differences between children and adults

iv. Correctly interprets testing data, imaging, cultures and smears

v. Understands basics of olfaction, airflow dynamics and turbinate function

3. Contents

a. Nose (septum, external skeleton)
b. Lateral superior and inferior nasal cavity
c. Paranasal sinuses and relationships to optic, intracranial, and pterygomaxillary spaces, nasopharynx, especially differences between pediatric and adult
d. Vascular supply, neurogenic control, anatomy and physiology
e. Imaging: CT, MRI
f. Microanatomy of respiratory epithelium, olfactory neurons
g. Microbiology of infection, pathways of spread of complications, treatment

4. Clinical skills

a. At the completion of this unit, the resident can:

i. Obtain a history and perform a physical examination of the pediatric patient including fiberoptic visualization of the nasal cavity

ii. Interpret imaging of pediatric patients

iii. Surgically correct septal deformity, treat infectious complications, congenital abnormalities, epistaxis

E. Pharynx and Esophagus

1. Unit Objective

a. At the completion of this unit, the resident understands:

i. Dynamic anatomy and contributions to speech, airway maintenance, and swallowing and feeding

ii. Infectious and inflammatory disorders, and complications in pediatrics, including gastroesophageal reflux

iii. Effects of sleep disordered breathing in children

iv. Congenital and acquired disorders of the esophagus

2. Learner Objective

a. Upon completion of this unit, the resident understands:

i. Elements of proper speech production and speech pathology

ii. Evaluation and treatment of various sleep disorders in pediatric patients

iii. Microbiology, infections and complications related to tonsils adenoids and dentition in children

iv. Surgical indications and techniques

3. Content

a. Oropharynx/pharynx and esophagus anatomy, development and function
b. Tonsils and adenoids
c. Microbiology of the oral cavity
d. Tongue, palate and other structures contributing to speech swallowing and airway maintenance
e. Atresia, caustic ingestion, stenosis, reflux, trauma, foreign body, neurovascular supply and its development
f. Imaging and other diagnostic testing (CT, MRI, polysomnography)

4. Clinical skills

a. At the completion of this unit, the resident can:

i. Take a history and perform a physical examination of the pediatric patient including fiberoptic and video exams of swallowing and speech

ii. Interpret imaging, PSN, VPI evaluation, video swallow

iii. Surgically and nonsurgically manage sleep disordered breathing, speech disorders, infections and inflammatory disorders, complications related to tonsil, adenoid and oral infections

F. Larynx, Trachea and Bronchi

1. Unit Objective

a. At the completion of this unit, the resident understands:

i. Functional aspects of the larynx and trachea as it relates to air exchange, speech production and airway protection and maintenance in the pediatric patient

ii. Traumatic, infectious and inflammatory disorders that affect the larynx and trachea and their effects on the pediatric airway

iii. Congenital abnormalities that can result in stridor in the infant and their natural history

2. Learner Objectives

a. Upon completion of this unit, the resident:

i. Knows the embryologic derivation of laryngeal functional development, neurovascular anatomy, and central control pathways

ii. Uses multiple strategies for management of airway distress

3. Content

a. Embryologic development of larynx and trachea
b. Physics of air passage through the larynx and trachea
c. Normal voice production
d. Neurovascular physiology of the larynx
e. Laryngeal closure and protection (laryngospasm)
f. Vocal fold mobility impairment
g. Origins of infectious and inflammatory disorders of the pediatric larynx and trachea
h. Papilloma, laryngotracheobronchitis, epiglottitis, bacterial tracheitis
i. Aspiration protection strategies
j. Imaging and other evaluation techniques including EMG, video endoscopy, FEESST

4. Clinical skills

a. At the completion of this unit, the resident can:

i. Take a history and perform physical examinations, including fiberoptic flexible examinations

ii. Order and obtain appropriate additional information

iii. Interpret testing, exams and prior assessments

II. Diseases, Disorders and Conditions

A. Unit Objective

1. At the completion of this unit, the resident can:

    a. Recognize, assess, diagnose, and manage diseases and disorders of the pediatric patient's ear, nose, sinus, pharynx, esophagus, larynx, trachea, face, salivary glands, endocrine glands

    b. Note deviations from normal psychologic and physiologic development and help correct these problems

B. Learner Objective

1. Upon completion of this unit, the resident can:

    a. Recognize signs and symptoms of pediatric otolaryngologic disorders

    b. Use appropriate tests and evaluation methods for pediatric otolaryngologic disorders

    c. Develop a diagnosis for pediatric otolaryngologic disorders

    d. Understand the surgical and nonsurgical management of pediatric otolaryngologic disorders

C. Content

1. External ear
    a. Congenital malformations
    b. Trauma (hematomas, foreign bodies)
    c. Infections/inflammatory disorders
2. Middle ear and mastoid
    a. Congenital malformations
    b. Trauma
    c. Infection
        i. Acute
            a) Suppurative and nonsuppurative
        ii. Chronic
            a) Suppurative and nonsuppurative
    d. Cholesteatoma
        i. Congenital
        ii. Acquired
    e. Mastoiditis
        i. Coalescent-acute
        ii. Chronic
    f. Complications
        i. Tympanic membrane perforations
        ii. Ossicular erosion, discontinuity
        iii. Abscesses
        iv. Meningitis
    g. Neoplasm
    h. Inner ear
        i. Neurosensory loss
            a) Genetic
            b) Acquired
            c) Congenital (Mondini, vestibular aqueduct, etc.)
        ii. Vertigo
            a) Migraine
            b) Inflammatory

i. Nose/paranasal sinus
    i. Congenital disorders
        a) Dermoid cyst
        b) Glioma
        c) Encephalocele
        d) Choanal atresia/stenosis
        e) Hemangioma
        f) Pyriform aperture stenosis
        g) Cystic fibrosis
        h) Nasolacrimal duct cyst
    ii. Infections
        a) Acute
        b) Chronic
            i) Bacterial
            ii) Fungal
    iii. Allergy and inflammation
    iv. Complications
        a) Abscess
            i) Orbital
            ii) Epidural
            iii) Intracranial
        b) Meningitis
    v. Neoplasms
        a) Benign
            i) Antro-choanal polyp
            ii) Angiofibroma, etc
        b) Malignant
            i) Esthesioneuroblastoma
            ii) Hemangioendothelioma, etc
j. Pharynx/esophagus
    i. Congenital
        a) Atresia, stenosis
        b) Beckwith syndrome
        c) Cleft palate
    ii. Infection/inflammation/allergy
        a) Tonsillitis
            i) Acute and chronic
        b) Adenoiditis
        c) Reflux esophagitis
        d) Eosinophilic esophagitis
        e) Angioedema
        f) Stomatitis
        g) Glossitis
    iii. Complications
        a) Peritonsillar abscess
        b) Retropharyngeal abscess
        c) Parapharyngeal abscess
    iv. Neoplasms
        a) Benign
            i) Lymphangioma
            ii) Dermoid, etc.
        b) Malignant
    v. Hypertrophy/obstruction tonsils and/or adenoids
        a) Sleep disorders
        b) Facial growth
    vi. Speech disorders
        a) Hyponasality
        b) Hypernasality (VPI)
        c) Delayed speech acquisition

k. Larynx/Trachea
    i. Congenital
        a) Subglottic stenosis
        b) Saccular cyst, laryngocele
        c) Laryngeal cleft
        d) Laryngomalacia
        e) Hemangioma
        f) Tracheal stenosis
        g) Extrinsic compression of the trachea
            i) Innominate, subclavian, aortic, pulmonary artery, cardiac
        h) Bronchial stenosis, malacia
        i) Tracheomalacia
    ii. Infections/Inflammation
        a) Croup
        b) Epiglottitis
        c) Bacterial tracheitis
    iii. Trauma
        a) Laryngeal fracture
        b) Laryngeal hematoma
        c) Laryngotracheal separation
    iv. Foreign body
        a) Larynx
        b) Trachea
    v. Neurologic
        a) Vocal cord paralysis
            i) Unilateral
            ii) Bilateral
    vi. Neoplasms
        a) Benign
            i) Papillomas
            ii) Granular cell myoblastoma, etc.
        b) Malignant
    vii. Dysmorphology
        a) Craniosynostoses
            i) Crouzon's
            ii) Sathre Chotzen
            iii) Apert's
            iv) Pfeiffer's
        b) Mandibulofacial dysostosis
        c) Robin sequence
        d) Stickler's syndrome
        e) Velo-cardio facial (VCF) syndrome
        f) Cleft lip
        g) Craniofacial microsomia
        h) CHARGE association
    viii. Head and Neck
        a) Embryologic
            i) Thyroglossal cyst/lingual thyroid
            ii) Thymic cysts
            iii) Branchial cysts, clefts fistulae
            iv) Lympho-venous malformation/cystic hygroma
            v) Vascular lesions
                (a) Hemangioma
                (b) Arterio-venous malformations
                (c) Venous malformations
            vi) Tumors
                (a) Rhabdomyosarcoma
                (b) Lymphomas
                (c) Langerhans cell histiocytoses, etc.

vii) Infections
(a) Abscess
(b) Immune deficiency
(c) Adenopathy
(d) Viral (Kawasaki)

D. Clinical skills

1. At the completion of this unit, the resident can:

a. Complete a comprehensive history and physical exam, order appropriate laboratory and diagnostic studies to develop a differential diagnosis, and arrive at a definitive diagnosis of the above noted pediatric otolaryngologic disorders

b. Discuss surgical and nonsurgical management of pediatric otolaryngologic disorders

c. Discuss the strategies and procedures necessary to treat pediatric otolaryngologic disorders

III. Surgical Concepts

A. Unit Objectives

1. At the completion of this unit, the resident understands treatment strategies and procedures for surgical management of pediatric otolaryngologic disorders

B. Learner Objectives

1. Upon completion of this unit, the resident:

a. Understands surgical strategies needed to treat pediatric otolaryngologic disorders

b. Can perform surgical procedures used to treat pediatric otolaryngologic disorders

C. Content

1. Specific surgical procedures
   a. Otologic
      i. Tympanocentesis
      ii. Tympanostomy
      iii. Tympanoplasty
      iv. Mastoidectomy
      v. Cochlear implantation
      vi. BAHA and implantable hearing aids
   b. Nose and Sinus
      i. Polypectomy
      ii. Endoscopic procedures of the lateral sinus wall
      iii. Drainage of peri-orbital abscess
   c. Pharynx
      i. Tonsillectomy
         a) Partial vs. total
         b) Cold instruments
         c) Powered instruments, etc.
      ii. Adenoidectomy
      iii. Incision and drainage of abscess
      iv. Pharyngoplasty
      v. Esophagoscopy

d. Larynx/trachea
    i. Endoscopic
        a) Diagnostic
        b) Therapeutic (i.e., foreign body removal)
        c) Stent placement
    ii. Tracheostomy
        a) Infant
        b) Pediatric
    iii. Suspension microlaryngoscopy
        a) Epiglottoplasty
        b) Removal of papilloma
            (i) Laser
            (ii) Shaver
    iv. Open surgical procedures
        a) Cartilage graft
        b) Excision, reanastomosis
    v. Intubation and airway management
e. Head and Neck
    i. Removal of branchial cysts and fistulae
    ii. Thyroglossal cyst excision (Sistrunk)
    iii. Lymph node biopsy
    iv. Sclerotherapy, intralesional injection
    v. Neck abscess, incision and drainage

IV. Habilitation/Rehabilitation

A. Hearing assistive devices

1. Non implantable hearing aids

2. Implantable

    a. Cochlear implants

    b. Bone anchored hearing aids

B. Speech rehabilitation

1. Surgical

2. Prosthetic

3. Other therapy

C. Swallowing rehabilitation

OTOLOGY/AUDIOLOGY CURRICULUM

I. Fundamental Knowledge

A. Temporal Bone and Skull Base Anatomy

1. Unit Objective

a. At the completion of this unit, the resident understands the anatomy of the temporal bone, cranial nerves, vascular and neural structures of the lateral skull base, the peripheral and central anatomy of the cochlea and vestibular systems

2. Learner Objectives

a. Upon completion of this unit, the resident:

i. Understands the bony and soft tissue anatomy of the temporal bone and its relationship to related vascular, neural, muscular, and bony structures of the lateral skull base

ii. Knows the surgical anatomy, neural, vascular, and skeletal components of the temporal bone and lateral skull base

iii. Knows the operative approaches to the temporal bone and lateral skull base

iv. Knows the microscopic anatomy of the auditory and vestibular systems

3. Contents

a. Auricle
b. External ear
c. Tympanic membrane
d. Ossicles
e. Tympanum
f. Eustachian tube
g. Attic
h. Mastoid
i. Petrous apex
j. Jugular foramen
k. Cochlear and central auditory pathways
    i. Osseous labyrinth, membranous labyrinth
    ii. Reissner's membrane, spiral ligament, stria vascularis, basilar membrane, Böttcher's cells, Claudius' cells, tectorial membrane, osseous spiral lamina
    iii. Organ of Corti (Hansen's cells, Dieters' cells, pillar cells, stereocilia, outer hair cells, inner hair cells)
    iv. Neural anatomy of cochlea, and central auditory pathways
l. Vestibular end organs and neural pathways
    i. Vestibule, semicircular canals, saccule, utricle
    ii. Crista ampullaris, macula sacculi, macula utriculi, kinocilium, stereocilia, type I hair cells, type II hair cells
    iii. Vascular supply
    iv. Peripheral and central neural anatomy (VOR, vestibulospinal tract, vestibulocerebellar tract)
m. Cranial Nerves
    i. III, IV, V, VI, VII, VIII, IX, X, XI, XII
n. Associated vascular, neural, and muscular structures of the lateral skull base
o. Diagnostic imaging: CT scanning, MRI imaging, plain film
    i. X-rays

4. Clinical Skills

a. During the training period, the resident:

i. Recognizes the normal and abnormal anatomy of the temporal bone, lateral skull base, and auditory and vestibular systems

ii. Interprets tests to diagnose anatomical abnormalities of the temporal bone, lateral skull base, and auditory and vestibular systems

iii. Performs surgical procedures that utilize anatomical knowledge of the temporal bone, lateral skull base, auditory and vestibular systems

B. Embryology of the Ear

1. Unit Objective

a. At the completion of this unit, the resident understands the embryology of the temporal bone, inner ear, and lateral skull base

2. Learner Objectives

a. Upon completion of this unit, the resident understands:

i. Normal embryological development and common embryological development disorders that affect the temporal bone, auditory and vestibular systems

ii. How embryological development disorders impact treatment of these disorders

3. Contents

a. Development of the external ear
   i. Aricular hillocks of His - 5th week gestation
      a) 1-3: 1st pharyngeal arch
      b) 3-6: 2nd pharyngeal arch
   ii. Microtia
b. Complete membranous labyrinthine dysplasia (Siebenmann-Bing)
c. Cochleosaccular dysplasia (Scheibe)
d. Complete labyrinthine dysplasia (Michel)
e. Incomplete partition (Mondini)
f. Common cavity
g. Semicircular canal dysplasia
h. Enlargement of the vestibular and/or cochlear aqueducts
i. Narrow internal auditory canal

4. Clinical Skills

a. During the training period, the resident:

i. Recognizes the normal and abnormal embryological development of the ear and how it influences management of disorders such atresia of the ear canal, and inner ear deformities related to hearing loss

ii. Interprets imaging studies and other diagnostic tests that demonstrate disorders of embryological development of the ear and temporal bone

iii. Performs surgical procedures that utilize the embryological knowledge of the temporal bone, ear, and lateral skull base

C. Physiology of the Eustachian Tube/Middle Ear/Mastoid

1. Unit Objective

a. At the completion of this unit, the resident understands:

i. The normal ventilation system of the eustachian tube, middle ear and mastoid

ii. The pathophysiology of abnormal conditions of the same structures

2. Learner Objectives

a. Upon completion of this unit, the resident understands:

i. How ventilation occurs in the middle ear and mastoid via the eustachian tube

ii. Consequences of poor ventilatory function

3. Contents

a. Anatomy and physiology of the eustachian tube/middle ear and mastoid
b. Acute otitis media
c. Chronic otitis media with effusion
d. Idiopathic hemotympanum
e. Chronic serous mastoiditis
f. Cholesteatoma pathophysiology

4. Clinical Skills

a. During the training period, the resident:

i. Uses knowledge of physiology of eustachian tube ventilation to explain the causes of the above pathologic conditions

ii. Understands the rationale for the medical and surgical approaches for treatment of the above pathophysiological conditions

D. Physiology of the Auditory System

1. Unit Objective

a. At the completion of this unit, the resident understands the normal physiology of the auditory system

2. Learner Objectives

a. Upon completion of this unit, the resident understands:

i. How sound is amplified by the middle ear, transduction in the cochlea, and routes of transmission in the brainstem to the brain

ii. How pitch and intensity of sound is coded in the cochlea

3. Contents

a. Definitions of sound
b. Middle ear mechanics
c. Cochlear mechanics
d. Hair cell transduction
e. Auditory nerve action potentials
f. Efferent auditory system
g. Pitch perception (temporal and place)
h. Intensity

4. Clinical Skills

a. During the training period, the resident uses knowledge of:

i. Middle ear mechanics to interpret causes of conductive hearing loss

ii. Cochlear mechanics and physiology of auditory system to understand sensorineural hearing loss

E. Audiology

1. Unit Objective

a. At the completion of this unit, the resident has knowledge of the testing procedures used to evaluate hearing

2. Learner Objectives

a. Upon completion of this unit, the resident understands:

i. Common audiologic testing procedures

ii. Use of masking, methods of performing audiogram and speech testing

iii. Indications for performing auditory diagnostic tests

3. Contents

a. Audiogram
b. Pure-tone air conduction
c. Pure-tone bone conduction
d. Speech testing
e. Masking
f. Acoustic impedance
g. Otoacoustic emissions
h. Electrocochleography
i. Auditory brainstem response
j. Steady state evoked potentials (ASSR)
k. Play audiometry
l. Visual response audiometry
m. Intraoperative monitoring

4. Clinical Skills

a. During the training period, the resident:

i. Performs routine audiometric testing such as air conduction and bone conduction audiogram, speech testing, acoustic impedance, otoacoustic emissions, auditory brainstem response and intraoperative auditory monitoring

ii. Interprets standard audiogram, ABR, acoustic impedance, and OAE, testing to diagnose hearing loss

F. Physiology of the Vestibular System

1. Unit Objective

a. At the completion of this unit, the resident understands the physiology of the vestibular system sufficiently to make wise diagnoses, properly interpret vestibular testing in its clinical context, and plan appropriate medical, rehabilitative, or surgical treatment

2. Learner Objectives

a. Upon completion of this unit, the resident understands:

i. The peripheral and central vestibular system and its neural projections

ii. Sensory integration essential to human equilibrium, and its implications for vestibular diagnosis and treatment

iii. Vestibular compensation and its treatment implications

3. Contents

a. Semicircular canals
b. Otolithic organs (Saccule, Utricle)
c. Vestibuloocular reflex (VOR)
d. Vestibulo-spinal reflex and output responses
e. Nystagmus and Ewald's laws
f. Rationale for vestibular rehabilitation therapy
g. Rationale for vestibular ablation procedures

4. Clinical Skills

a. During the training period, the resident can:

i. Take an organized medical history from a dizzy patient

ii. Determine appropriate testing and treatment

iii. Distinguish the surgical candidate from the non-surgical patient

G. Vestibular Testing

1. Unit Objective

a. At the completion of this unit, the resident understands the clinical measures that may be used to assess a patient with balance disorders, including simple bedside testing and the testing modalities employed in a sophisticated modern vestibular testing facility

2. Learner Objectives

a. Upon completion of this unit, the resident understands:

i. Physical exam findings that indicate a unilateral peripheral vestibular lesion or a bilateral peripheral vestibulopathy

ii. Vestibular testing environment and basic principles for interpretation of test results, including potential pitfalls and false positive results

3. Contents

a. Electro- or videonystagmography
   i Oculomotor testing: saccade latency, accuracy, velocity; smooth pursuit and optokinetic testing
   ii. Spontaneous and positional nystagmus
   iii. Caloric irrigations
b. Rotary chair
c. VEMP
d. Posturography
e. Bedside testing in vestibular disorders (See *Physical Exam*, below)

4. Clinical Skills

a. During the training period, the resident:

i. Performs a suitable bedside exam for the patient with balance disorders

ii. Can identify physiological and pathological nystagmus present in a computerized eye movement tracing, and interpret its significance

iii. Recognizes central abnormalities in oculomotor test results

iv. Performs calculations of unilateral weakness and directional preponderance from caloric results

v. Properly interprets rotary chair and posturography response results

vi. Articulates a summary evaluation of vestibular abnormalities and how they relate to clinical diagnosis and treatment

H. Facial Nerve Testing

1. Unit Objectives

a. At the completion of this unit, the resident understands the pathophysiology of nerve injury and the utility of facial nerve testing

2. Learner Objectives

a. Upon completion of this unit, the resident understands:

i. Sunderland classification of neural injury

ii. Use of nerve excitability testing, maximal stimulation testing, electroneuronography and electromyography

3. Contents

a. Pathophysiology of neural injury
b. Clinical examples of neural injuries (Bells Palsy, facial nerve trauma)
   i. Nerve excitability testing
   ii. Maximal stimulation testing
   iii. Electroneuronography
   iv. Electromyography

4. Clinical Skills

a. During the training period, the resident orders and interprets appropriate facial nerve testing for a given clinical lesion

I. Surgical Monitoring (Cranial Nerve, Auditory)

1. Unit Objective

a. At the completion of this unit, the resident understands the indications, techniques and pitfalls of intraoperative cranial nerve monitoring

2. Learner Objective

a. Upon completion of this unit, the resident understands:

i. Techniques for facial nerve and intraoperative ABR testing

ii. Technique for lower cranial nerve monitoring (IX, X, XI, XII)

iii. Clinical indications for intraoperative monitoring

3. Contents

a. Physiologic basis of ABR and electromyography
b. Intraoperative monitoring technique

4. Clinical Skills

a. During the training period, the resident:

i. Interprets the results of intraoperative monitoring

ii. Troubleshoots common sources of inaccurate cranial nerve monitoring

J. Physical Examination

1. Unit Objective

a. At the completion of this unit, the resident can perform a complete examination of the auditory and vestibular systems and cranial nerves

2. Learner Objectives

a. Upon completion of this unit, the resident recognizes normal and abnormal anatomy of the ear, signs of auditory and vestibular diseases and disorders, and signs of lateral skull base diseases and disorders

3. Contents

a. Otoscopy
b. Pneumatic otoscopy and fistula test
c. Microscopic exam and debridement of the ear
d. Tuning fork testing
e. Cranial nerve exam
f. Exam for nystagmus, including use of Frenzel glasses
g. Halmagyi head thrust testi
h. Fukuda stepping test
i. Cerebellar testing (Romberg, finger-to-nose, tandem gait)
j. Hallpike testing and particle repositioning maneuver for BPPV
k. Sensorimotor neurological testing as indicated
l. Oscillopsia test

4. Clinical Skills

a. During the training period, the resident:

i. Performs appropriate otoscopic exams with the binocular microscope and makes correct otoscopic diagnoses

ii. Cleans and debrides the ear canal or mastoid cavity safely and effectively

iii. Interprets tuning fork tests and correlates with the audiometric results

iv. Identifies unilateral and bilateral vestibular lesions and can indicate the level of compensation on clinical grounds

v. Identifies non-vestibular contributions to balance dysfunction by use of the physical exam

K. Otologic Imaging Studies

1. Unit Objective

a. At the completion of this unit, the resident can select the proper imaging study and interpret the results of that study for a given disease process

2. Learner Objectives

a. Upon completion of this unit, the resident recognizes normal and abnormal anatomy of the temporal bone, skull base, and cerebellopontine angle for the following:

i. Congenital abnormalities
ii. Acquired pathology, intratemporal
iii. Retrocochlear/CPA lesions
iv. Vascular abnormalities
v. Skull base osteomyelitis

3. Contents

a. Computerized tomography
b. MRI
c. Magnetic resonance angiogram/ venogram
d. Angiography
e. Nuclear medicine studies

4. Clinical Skills

a. At the completion of this unit, the resident can recognize:

i. Normal anatomy on the above imaging studies

ii. Pathologic lesions on the above studies

L. Anesthesia for Otologic Surgery

1. Unit Objective

a. At the completion of this unit, the resident can provide local anesthesia with sedation for otologic procedures and be aware of special considerations for general anesthesia during otologic surgery

2. Learner Objectives

a. Upon completion of this unit, the resident:

i. Can perform a local field block of the ear canal and postauricular area for preparation of an otologic procedure

ii. Understands the options for providing sedation during a local anesthesia otologic procedure as well as the management of complications of oversedation

iii. Understands the special considerations for general anesthesia and otologic surgery, such as the avoidance of neuromuscular blockade during cranial nerve monitoring, avoidance of nitrous oxide during middle ear procedures, use of hyperventilation and mannitol for intracranial procedures, and the use of hypotensive anesthesia for the control of blood loss

3. Contents

a. Local field block of external auditory canal
b. Local field block of postauricular area
c. Intravenous sedation
d. General anesthesia

4. Clinical Skills

a. During the training period, the resident:

i. Performs otologic surgery under local anesthesia with sedation

ii. Interacts with anesthesia staff in order to perform otologic surgery under optimal general anesthesia conditions

II. Diseases, Disorders, and Conditions

A. Unit Objective

1. At the completion of this unit, the resident can recognize, assess, diagnose and manage diseases and disorders of the external ear, middle ear, inner ear and lateral skull base

B. Learner Objective

1. Upon completion of this unit, the resident:

    a. Recognizes the signs and symptoms of diseases and disorders of the external ear, middle ear, inner ear and lateral skull base

    b. Uses the appropriate diagnostic tests to assess diseases and disorders of the external ear, middle ear, inner ear and lateral skull base

    c. Can develop a diagnosis of diseases and disorders of the external ear, middle ear, inner ear and lateral skull base

    d. Understands the nonsurgical and surgical management diseases and disorders of the external ear, middle ear, inner ear and lateral skull base

C. Content

1. External ear
    a. Congenital malformations
    b. Trauma/foreign bodies
    c. Infections-auricle/external canal
    d. Neoplasms-carcinoma/cholesteatoma/other
2. Middle Ear/eustachian tube/mastoid
    a. Congenital malformations
    b. Trauma/foreign bodies
    c. Infections
        i. Otitis media
            a) Acute
            b) Effusion
            c) Chronic
            d) Chronic/cholesteatoma
        ii. Mastoiditis
        iii. Petrositis
        iv. Complications of acute/chronic otitis media/mastoiditis
    d. Tympanic membrane-trauma/perforation
    e. Ossicular disorders
        i. Discontinuity
        ii. Otosclerosis
    f. Neoplasms of middle ear (glomus tumor, carcinoma, other)
3. Inner Ear
    a. Neurosensory hearing loss
        i. Hereditary (Usher syndrome, Waardenburg syndrome, etc.)
        ii. Trauma/noise/ototoxic
        iii. Autoimmune
        iv. Cogan's syndrome
        v. Age-related
        vi. Sudden deafness
        vii. Neoplasms (acoustic neuroma, glomus jugulare)
    b. Tinnitus/hyperacusis
    c. Motion sickness
    d. Vestibular neuritis
    e. Labyrinthitis-serous/suppurative/circumscribed

f. Benign paroxysmal positional vertigo
g. Ménière's disease
h. Vertigo
    i. Neurosyphilis
    ii. Migraine
    iii. Epilepsy
i. Superior canal dehiscence
j. Bilateral vestibular hypofunction
k. Cervical vertigo
l. Labyrinthine fistula
m. Pseudohypacusis

4. Facial nerve
    a. Facial paralysis
        i. Idiopathic (Viral)
        ii. Herpes zoster
        iii. Traumatic
        iv. Iatrogenic
        v. Neuroma
        vi. Hemangioma
        vii. Neoplasm, other
        viii. Congenital
5. Lateral Skull Base
    a. Neuroma cranial nerves
    b. Acoustic neuroma
    c. Neurofibromatosis II
    d. Meningioma
    e. Clivus chordoma

D. Clinical Skills

1. At the completion of this unit, the resident can:

    a. Perform a comprehensive history and focused physical examination, order appropriate laboratory and diagnostic studies to develop a thorough differential diagnosis, and arrive at a definitive diagnosis of the above diseases and disorders of the outer ear, middle ear, inner ear and lateral skull base

    b. Discuss nonsurgical as well as surgical management of the diseases and disorders of the external ear, middle ear, inner ear and lateral skull base

    c. Discuss the procedures and strategies necessary to treat the diseases and disorders of the external ear, middle ear, inner ear and lateral skull base

III. Surgical Concepts

A. Unit Objective

1. At the completion of this unit, the resident understands the treatment strategies and procedures for the surgical management of diseases and disorders of the external ear, middle ear, inner ear, and lateral skull base

B. Learner Objectives

1. Upon completion of this unit, the resident:

   a. Understands the surgical strategies necessary to treat diseases and disorders of the outer ear, middle ear, inner ear, and lateral skull base

   b. Can develop surgical strategies to treat diseases and disorders of the outer ear, middle ear, inner ear, and lateral skull base in the temporal bone laboratory prior to performing the procedures

C. Content

1. Preoperative and Postoperative Care

a. Unit Objective

i. At the completion of this unit, the resident can:

   a) Assess a prospective surgical patient for fitness for undergoing anesthesia

   b) Manage common postoperative otologic complications

b. Learner Objectives

i. Upon completion of this unit, the resident recognizes:

   a) Preoperative abnormalities that may lead to intraoperative or postoperative complications

   b) Postoperative complications and know their management

c. Contents

i. Abnormalities of hemostasis
ii. Sensitivities to anesthetic agents
iii. Systemic illnesses (cardiac, respiratory, metabolic)
iv. Need for special perioperative considerations (prophylactic antibiotics, management of chronic anticoagulants)
v. Management of postoperative complications:
   a) Hematoma
   b) CSF leak
   c) Vascular complication
   d) Facial nerve paralysis
   e) Meningitis
   f) Intravascular volume depletion

d. Clinical Skills

i. At the completion of this unit, the resident:

a) Can perform a preoperative history and physical and order appropriate laboratory studies to assess a patient's fitness for anesthesia during an otologic surgical procedure

b) Recognizes the need for consultation with other specialists when indicated

c) Recognizes and manages postoperative complications from otologic procedures

2. Specific Surgical Procedures

a. Content

i. Canaloplasty
ii. Middle ear exploration
iii. Tympanoplasty
iv. Meatoplasty
v. Stapedectomy
vi. Mastoidectomy
vii. Tympanomastoidectomy
viii. Endolymphatic sac surgery
ix. Perilymph fistula repair
x. Transtympanic drug therapy
xi. Labyrinthectomy
xii. Cochlear implantation
xiii. Implantable hearing aids
xiv. Congenital middle ear reconstruction
xv. Facial nerve surgery
xvi. Temporal bone fracture
xvii. Laser surgery in the ear
xviii. CSF leak of temporal bone
xix. Grafts (autografts, homografts, alloplasts)
xx. Incisions, flaps
xxi. Prosthetics

b. Clinical Skills

i. At the completion of this unit, the resident:

a) Has participated in and knows how to perform the surgical strategies and procedures to manage diseases and disorders of the outer ear, middle ear, inner ear, and lateral skull base

b) Can select the most appropriate surgical procedure in order to treat diseases and disorders of the outer ear, middle ear, inner ear, and lateral skull base

IV. Habilitation/Rehabilitation

A. Unit Objective

1. At the conclusion of this unit, the resident understands the utility of various prosthesis and therapies for the rehabilitation of hearing or balance deficits

B. Learner Objectives

1. Upon completion of this unit, the resident understands:

    a. Available prosthetic options for the treatment of hearing loss

    b. The role of vestibular rehabilitation in the treatment of chronic balance disorders

C. Content

1. Hearing aids
    a. Behind the ear
    b. In the ear
    c. Completely in the canal
    d. Open mold
    e. CROS hearing aid
2. Assistive listening devices
    a. FM link
    b. Devices for telephone
    c. Devices for television
    d. Devices for alarm clock and fire alarm
3. Vestibular rehabilitation rationale and implications
4. Implantable hearing devices
    a. Cochlear implant
    b. Acoustic + electric implants
    c. Implantable hearing aid
    d. Bone anchor hearing aid

D. Clinical Skills

1. At the completion of this unit, the resident:

    a. Can recommend the most appropriate hearing aid, implantable hearing device, or assistive listening device for a hearing impaired individual

    b. Has a general understanding of the fitting of these devices in clinical practice

HEAD AND NECK CURRICULUM

I. Fundamental Knowledge

A. Anatomy of the Head and Neck

1. Unit Objective

a. At the completion of this unit, the resident understands the anatomy of the upper aerodigestive tract including the nose, paranasal sinuses, ear and temporal bone, salivary glands, thyroid, parathyroids, lip, oral cavity, mandible, oropharynx, nasopharynx, hypopharynx, cervical esophagus, larynx, tracheobronchial tree and neck contents as each relates to neoplasms of the head and neck area

2. Learning Objectives

a. Upon completion of this unit, the resident:

i. Understands the anatomy of the upper aerodigestive tract

ii. Knows the surgical anatomy, neurovascular and skeletal components of the upper aerodigestive tract

iii. Knows the operative approaches to neoplasms of the upper aerodigestive tract

3. Contents

a. Skin/surface anatomy
b. Nose/paranasal sinuses
c. Ear and temporal bone
d. Salivary glands
e. Thyroid
f. Parathyroids
g. Lip and oral cavity
h. Mandible
i. Oropharynx
j. Nasopharynx
k. Hypopharynx and cervical esophagus
l. Larynx
m. Neck
n. Cranial Nerves
    i. I-XII
o. Osteology of the skull base
p. Associated vascular, neural, muscular and lymphatic structures of the head and neck
q. Diagnostic imaging: ultrasound, PET, CT, MRI and plain film x-rays

4. Clinical Skills

a. During the training period, the resident:

1. Recognizes the normal and abnormal anatomy of the head and neck region

2. Interprets tests to diagnose anatomical abnormalities of the head and neck region

3. Performs surgical procedures that utilize anatomical knowledge of the head and neck region

B. Embryology of the Head and Neck

1. Unit Objective

a. At the completion of this unit, the resident understands the embryology of the head and neck region

2. Learner Objectives

a. Upon completion of this unit, the resident:

i. Knows the normal embryological development and common embryological development disorders that affect the head and neck region

ii. Understands how embryological development disorders impact treatment of these disorders

3. Contents (excluding cleft lip and palate – see *Pediatrics* under *General*)

a. Development of the branchial arch system
b. Development of the thyroid and parathyroids

4. Clinical Skills

a. During the training period, the resident:

i. Recognizes the normal and abnormal embryological development of neck contents and how it influences management of disorders such as branchial cleft cysts, thyroglossal duct cysts, thyroid, parathyroid disorders, and cystic hygromas

ii. Interprets imaging studies, fine needle aspiration biopsies and other diagnostic tests that demonstrate disorders of embryological development of the head and neck region

iii. Performs surgical procedures that utilize the embryological knowledge of the head and neck region

C. Physiology of the Head and Neck

1. Unit Objective

a. At the completion of this unit, the resident understands the normal physiology of the upper aerodigestive tract region as it relates to neoplasms of the head and neck

2. Learner Objective

a. Upon completion of this unit, the resident understands how the upper aerodigestive tract functions during communication, mastication, respiration, swallowing and digestion

3. Contents

a. Articulation
b. Phonation
c. Mastication/salivation
d. Mechanics of swallowing

4. Clinical Skills

a. During the training period, the resident:

i. Uses knowledge of normal articulation and phonation to interpret causes of communication disorders

ii. Uses knowledge of normal mastication, salivation and swallowing to interpret causes of swallowing disorders

D. Pathology of the Head and Neck: General Considerations

1. Unit Objective

a. At the completion of this unit, the resident has knowledge of biopsy techniques (1° tumors, unguided and guided FNAB of parotid, thyroid, cervical tumors, sentinel node biopsy) and an ability to interpret surgical pathology reports (tumor size, thickness, differentiation, pattern of invasion, margins of resection, etc.) in order to make clinical decisions in the treatment of head and neck tumors

2. Learner Objectives

a. Upon completion of this unit, the resident:

i. Understands biopsy techniques and indications for each of the following biopsies:

a) Fine needle aspiration
b) Punch
c) Incisional
d) Excisional

ii. Understands the interpretation of pathology reports

iii. Knows the indications for frozen sections, immunohistochemistry, electron microscopy, flow cytometry and cytogenetics in the evaluation of pathology specimens

3. Contents

a. Biopsy techniques
b. Interpretation of pathology reports
c. Indicators for special studies

4. Clinical Skills

a. At the completion of this unit, the resident:

i. Performs routine biopsies including fine-needle aspirations

ii. Interprets pathology reports

iii. Knows indicators for special studies

E. History

1. Unit Objective

a. At the completion of this unit, the resident can obtain a clear understanding of the patients' symptoms, pertinent co-morbid conditions, general state of health, previous treatments, nutritional status, tumor status, probable management and expected outcome

2. Learner Objective

a. Upon completion of this unit, the resident recognizes the importance of the history of present illness, medical history, social history and risk factors, family history, surgical history, current medications, significant family members support and other treating physicians

3. Contents

a. History of present illness
b. Medical history
c. Social history
d. Risk factors
e. Family history
f. Surgical/radiation/chemotherapy history
g. Medications
h. Supportive resources/health care providers

4. Clinical Skills

a. At the completion of this unit, the resident:

i. Demonstrates ability to obtain a comprehensive history

ii. Understands indications for preoperative medical consultations for preoperative anesthesia clearance

iii. Demonstrates appropriate correspondence with referring physicians

F. Physical Examination

1. Unit Objective

a. At the completion of this unit, the resident can perform a complete examination of the head and neck including the ears, nose, oral cavity, pharynx, larynx, neck, face and scalp, cranial nerves II through XII, a general evaluation of appropriate additional areas (i.e., Allen's test for possible radial/ulnar forearm free flap)

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2. Learner Objective

a. Upon completion of this unit, the resident recognizes normal and abnormal anatomy of the head and neck area

3. Contents

a. General examination (weight, vital signs, Karnofsky status, etc.)
b. Ears (otoscope, otologic microscope)
c. Nose (including rigid and flexible endoscopy)
d. Oral cavity/oropharynx (including bimanual palpation FOM, BOT)
e. Pharynx/larynx (including endoscopy and mirror examinations), flexible fiberoptic laryngoscopy, transnasal esophagoscopy
f. Neck/thyroid gland
g. Face and scalp
h. CN II–XII
i. Other

4. Clinical Skills

a. At the completion of this unit, the resident demonstrates:

i. Ability to perform a comprehensive physical examination

ii. Safe and appropriate use of the otoscope, indirect laryngoscopy mirror, flexible fiberoptic laryngoscope, otologic microscope, rigid nasal and laryngeal endoscope, video stroboscope

G. Diagnostic and Therapeutic Imaging

1. Unit Objective

a. At the completion of this unit, the resident can request the appropriate imaging modality based upon the differential diagnosis developed from the history and physical examination

2. Learner Objectives

a. Upon completion of this unit, the resident:

i. Understands current diagnostic and therapeutic imaging modalities and techniques available for the head and neck area

ii. Understands appropriate indications for each imaging modality and their limitations, as well as their variations (i.e., IV contrast, fat-suppression, power Doppler)

iii. Can interpret imaging result reports and integrate that information into patient management

3. Contents

a. Plain x-rays/Panorex
b. CT Scan with/without contrast
c. Diagnostic ultrasound of the thyroid and neck
d. MRI scan with/without contrast, T1 and T2 weighted images
e. PET/CT
f. Angiography/embolization

4. Clinical Skills

a. During the training period, the resident:

i. Develops the ability to request appropriate imaging studies to assess the underlying pathology

ii. Demonstrates the ability to identify and describe normal radiographic anatomy of the head and neck

iii. Demonstrates the skill to perform real time ultrasound of the thyroid and identify nodular disease of the gland

iv. Identifies and delineates pathologic lymphadenopathy

H. Staging of Head and Neck Cancer

1. Unit Objective

a. At the completion of this unit, the resident can:

i. Accurately stage malignancies of the head and neck using the AJCC TNM staging system

ii. Understand the rationale for the AJCC staging system for malignant tumors of the head and neck and the rules that govern staging assignment

2. Learner Objectives

a. Upon completion of this unit, the resident:

i. Understands the staging criteria for squamous cell carcinoma of the upper aerodigestive tract

ii. Can acquire data from clinical and radiographic examinations to assign the appropriate stage for a squamous cell carcinoma of the upper aerodigestive tract based on the staging rules

iii. Can describe the impact of stage on prognosis and treatment options based on disease site and stage

3. Contents

a. Staging criteria for SCC of the oral cavity, oropharynx, nasopharynx, larynx and hypopharynx
b. Staging schema for metastatic SCC of the neck
c. Staging criteria for differentiated thyroid cancer
d. Staging criteria for malignant tumors of the major salivary glands

4. Clinical Skills

a. At the completion of this unit, the resident demonstrates the ability to collate physical examination with radiographic data to develop a TNM stage and overall stage assignment for patients with upper aerodigestive tract cancer

I. Anesthesia for Head and Neck Procedures

1. Unit Objective

a. At the completion of this unit, the resident:

i. Understands the medical evaluation necessary to assess comorbidity for patients undergoing general anesthesia and the appropriate specialty or subspecialty evaluations necessary to assess perioperative risk and to optimize the patient's medical condition prior to the proposed procedure

ii. Understands the various methods of airway management and indications for endotracheal intubation, laryngeal mask anesthesia, emergency tracheostomy, cricothyrotomy

iii. Understands the mode of action of commonly used local anesthetics for topical application and local infiltration, mode of action, dose ranges, untoward effects, treatment of toxic reactions, and role of vasoconstrictors

iv. Can articulate regional anesthetics blocks commonly used in the head and neck

2. Learner Objectives

a. Upon completion of this unit, the resident can:

i. Describe the schema used for assessing anesthetic risk based on comorbidity

ii. Describe the methods for safe tracheal intubation based on the patient's normal or abnormal anatomy and the options available

iii. Describe the commonly used local anesthetics, dose range for adults and children, common side effects and their management

iv. Demonstrate regional blocks for the mental nerve, lingual and inferior alveolar nerves, greater palatine nerve, cervical plexus

3. Contents

a. Review the current risk assessment schema for general anesthesia including techniques of tracheal intubation: nasotracheal, endotracheal, tracheotomy, cricothyrotomy, laryngeal mask anesthesia
b. Pharmacology of commonly used local and topical anesthetics

4. Clinical Skills

a. At the completion of this unit, the resident understands:

i. Various methods of tracheal intubation, including fiberoptic and LMA

ii. Topical application of local anesthetics for various procedures

iii. Successful local anesthetic administration and regional nerve blocks

J. Preoperative and Postoperative Care

1. Unit Objective

a. At the completion of this unit, the resident can describe:

i. Preoperative risk assessment strategies, appropriate consultation for management of comorbidity

ii. The role of prophylactic antibiotics and their indications and duration based on the type of procedure

iii. Fluid and electrolyte management in the perioperative period, strategies for acute pain management, wound catheter management, glucose regulation in the diabetic patient, wound management both complicated and uncomplicated

2. Learner Objectives

a. Upon completion of this unit, the resident:

i. Understands strategies for assessing comorbidity in patients with hypertension, diabetes, coronary artery disease, cerebrovascular disease

ii. Can discuss the various types of wounds (clean, clean-contaminated and dirty) and the role for antibiotics in each of these scenarios

iii. Understands the management of common fluid and electrolyte abnormalities, glucose regulation, blood pressure control, deep venous thrombosis prophylaxis, enteral feedings and perioperative analgesia

3. Contents

a. Review the assessment of medical co-morbidities, methods of optimization and appropriate medical consultative services
b. Anticoagulant therapy for DVT prophylaxis, insulin use to control postoperative hyperglycemia, antibiotic prophylaxis, fluid replacement, enteral feedings in patients who are tube fed

4. Clinical Skills

a. During the training period, the resident:

i. Conducts preoperative risk assessment, obtains appropriate medical consultations and writes perioperative orders

ii. Obtains proper informed consent

iii. Understands ICU monitoring equipment and appropriate use

iv. Completes accurate and legible documentation in the medical record

v. Demonstrates appropriate inter-consultant communication

vi. Demonstrates useful communication with nursing and OR staff

II. Diseases, Disorders, and Conditions

A. Unit Objective

1. At the completion of this unit, the resident can recognize, assess, diagnose and manage diseases and disorders of the head and neck

B. Learner Objectives

1. Upon completion of this unit, the resident:

    a. Recognizes the signs and symptoms of diseases and disorders of the scalp and facial skin, nose and paranasal sinuses, ear and temporal bone, salivary glands, thyroid, parathyroids, lip and oral cavity, mandible, oropharynx, nasopharynx, hypopharynx and cervical esophagus, larynx, neck as well as unusual tumors of the head and neck area

    b. Uses the appropriate diagnostic tests to assess diseases and disorders as listed above

    c. Can develop a differential diagnosis of diseases and disorders as listed above

    d. Understands the non-surgical and surgical management of diseases and disorders as listed above

C. Contents (anatomically based)

1. Scalp and facial skin
2. Nose/paranasal sinuses
3. Ear and temporal bone
4. Salivary glands
5. Thyroid
6. Parathyroids
7. Lip and oral cavity
8. Mandible
9. Oropharynx
10. Nasopharynx
11. Hypopharynx and cervical esophagus
12. Larynx
13. Neck mass
14. Unknown primary
15. Cervical metastasis/lymphoma
16. Unusual tumors of head and neck
    a. Vascular
    b. Soft tissue sarcomas
    c. Bone tumors
    d. Pediatric

III. Surgical Concepts

A. Unit Objective

1. At the completion of this unit, the resident understands treatment strategies and procedures for the surgical management of diseases and disorders of the head and neck region

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B. Learner Objectives

1. Upon completion of this unit, the resident:

   a. Understands the surgical strategies necessary to treat diseases and disorders of the head and neck region

   b. Can perform surgical strategies to treat diseases and disorders of the head and neck region

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C. Contents (Specific Surgical Procedures)

1. Salivary glands
   a. Parotidectomy
   b. Submandibular gland excision
   c. Sublingual gland excision/Ranula marsupialization
   d. Salivary gland trauma management/ductal repair
   e. Sialolith resection
2. Nose and maxilla
   a. Rhinectomy/forehead flap reconstruction
   b. Lateral rhinotomy/midfacial degloving/alotomy
   c. Maxillectomy/medial maxillectomy
   d. Craniofacial resection
   e. Nasopharyngeal tumor resection
3. Lips
   a. Vermilionectomy
   b. Wedge excision/reconstruction
   c. Upper lip resection/reconstruction
   d. Lower lip resection/reconstruction
4. Oral Cavity
   a. Partial/total glossectomy (anterior 2/3's)
   b. Partial/total glossectomy (base of tongue)
   c. Floor of mouth resection
   d. Marginal/partial/total mandibulectomy
   e. Mandibulotomy
   f. Mandible plating
   g. Dental extraction
   h. Resection hard/soft palate
   i. Intraoral reconstruction
   j. Mandibular reconstruction
5. Ear
   a. Auriculectomy/wedge resection/reconstruction
   b. Temporal bone resection
6. Neck
   a. Neck incisions
   b. Radical/modified radical neck dissection (including posterolateral and supraclavicular dissection)/selective neck dissections
   c. Cervical/scalene node biopsy
   d. Transsternal mediastinal node dissection
   e. Drainage of deep neck abscess
   f. Management of penetratory neck injuries

7. Larynx
    a. Endoscopic partial laryngectomy (supraglottic, glottic)
    b. Laryngofissure and cordectomy
    c. Vertical partial laryngectomy
    d. Supraglottic laryngectomy/supracricoid partial laryngectomy
    e. Total/near-total laryngectomy
    f. Pharyngolaryngectomy
    g. Tracheoesophageal shunt
    h. Recurrent laryngeal nerve surgery
    i. Laryngeal diversion
    j. Arytenoidectomy
8. Thyroid/Parathyroid
    a. Thyroid lobectomy/subtotal/total thyroidectomy (including paratracheal and/or superior mediastinal lymph node dissection)
    b. Parathyroidectomy (with autotransplantation)
    c. Recurrent hyperparathyroidism/cancer of the parathyroid
9. Pharynx, trachea, parapharyngeal space
    a. Tracheotomy
    b. Tracheal reconstruction
    c. Cervical esophagectomy
    d. Zenker's diverticulum surgery (open & endoscopic)
    e. Mediastinal exploration/dissection
    f. Cricopharyngeal myotomy/myectomy
    g. Revision stenotic tracheostoma
    h. Partial/total pharyngectomy
    i. Pharyngeal reconstruction
10. Endoscopy
    a. Direct laryngoscopy (fiberoptic and rigid)
    b. Nasopharyngoscopy
    c. True vocal fold injection/thyroplasty
    d. Laser/cold knife microlaryngeal surgery/arytenoidectomy
    e. Microdebrider endoscopy
    f. Esophagoscopy (diagnostic, foreign body removal, dilation)
    g. Bronchoscopy (diagnostic, foreign body removal, dilation, laser, fiberoptic)
11. Miscellaneous
    a. Incisional/excisional biopsy
    b. Needle biopsy (guided & unguided)/punch biopsy
    c. Endoscopic biopsy

D. Clinical Skills

1. At the completion of this unit, the resident:

    a. Has participated in and knows how to perform in the surgical strategies and procedures to manage diseases and disorders of the head and neck region

    b. Can select the most appropriate surgical procedure in order to treat diseases and disorders of the head and neck region

IV. Habilitation/Rehabilitation

A. Reconstruction

1. Principles
2. Local/regional flaps
3. Free tissue transfer
4. Prosthetic rehabilitation

B. Rehabilitation

1. Functional rehabilitation
2. Psychosocial rehabilitation
3. Speech pathology/therapy
4. Supportive care

C. Complications/Outcomes/Cost-effectiveness

FACIAL PLASTIC AND RECONSTRUCTIVE SURGERY CURRICULUM

I. Fundamental Knowledge

A. Facial Anatomy General and Systematic

1. Unit Objective

a. At the completion of this unit, the resident understands the general and systematic anatomy of the face and neck to include skeletal, skin, fascia, motor and sensory innervation, lymphatics and various patterns of vascular supply

2. Learner Objectives

a. Upon completion of this unit, the resident understands the bony and soft tissue anatomy of the face and neck and the relationships of hard tissue, soft tissue, vascular and neurological systems

3. Content

a. Facial Skeleton/hard tissue foundation
b. Skin and soft tissue
c. SMAS
d. Facial musculature
e. Facial nerve
f. Facial sensory innervation
g. Vascular patterns of the face
h. Lymphatics of the face

4. Clinical Skills

a. At the completion of this unit, the resident uses the anatomy to:

i. Diagnose and define problems

ii. Perform cosmetic and reconstructive procedures of the face and neck

B. Functional Facial Anatomy by Region

1. Unit Objective

a. At the completion of this unit, the resident understands the detailed surgical anatomy of each region and the relevant function and physiology

2. Learner Objectives

a. Upon completion of this unit, the resident understands the functional anatomy of each regional area and the surgical applications

3. Contents

a. Hair and scalp
b. Forehead and brow
c. Eyelids, Orbit, lacrimal system
d. Nose
    i. Nasal airflow to include rhinomanometry
e. Ears
f. Oral cavity
    i. Dental alveolar
    ii. Lips
    iii. Pharynx
    iv. Physiology of speech deglutition
g. Neck/cervical

4. Clinical Skills

a. At the completion of this unit, the resident uses:

    i. Anatomical and functional knowledge to diagnose specific clinical problems

    ii. Detailed anatomy to perform surgical procedures to correct these problems

C. Embryology

1. Unit Objective

a. At the completion of this unit, the resident understands embryology of the face and neck

2. Learner Objectives

a. Upon completion of this unit, the resident understands:

    i. Normal development

    ii. Abnormal development in common clinical syndromes

3. Content

a. General embryology of facial development
b. Detailed embryology of the ears, eyes, nose, and oral cavity to include lips

4. Clinical Skills

a. During the training period, the resident:

    i. Diagnoses and recognizes syndromes and abnormalities

    ii. Performs a functional anatomical reconstruction

D. Wound Healing

1. Unit Objective

a. At the completion of this unit, the resident understands the basic physiology of normal wound healing

2. Learner Objectives

a. Upon completion of this unit, the resident understands:

i. Normal wound healing, to include scar formation and wound mechanisms

ii. Special characteristics of nerve and bone repair

3. Contents

a. Phases and histology
b. Collagen formation
c. Biochemistry/cytokines
d. Nerve repair
e. Bone repair

4. Clinical Skills

a. During the training period, the resident:

i. Interprets abnormal wound healing

ii. Initiates pharmacologic or other interventions

E. Physical Exam/Endoscopy

1. Unit Objective

a. At the completion of this unit, the resident can perform a complete clinical examination of the face and neck

2. Learner Objectives

a. Upon completion of this unit, the resident can:

i. Perform a general physical and aesthetic evaluation of the face and neck

ii. Perform specific focused evaluations of each anatomical area

3. Contents

a. Face
   i. Proportions
   ii. Symmetry
   iii. Cranial nerve exam
b. Eyes
   i. Lid position
   ii. Levator excursion
   iii. Extraocular muscles
   iv. Schirmer's Test
   v. Anterior vector

c. Brow
    i. Position
    ii. Shape
    iii. Symmetry
d. Nose
    i. Visual examination
    ii. Palpation
    iii. Intranasal and endoscopic examination
e. Oral
    i. Occlusion
    ii. Velopharyngeal competence
f. Ear
    i. Cephalometrics measurements

4. Clinical Skills

a. During the training period, the resident uses these skills to diagnose diseases, disorders and conditions

F. Facial Analysis and Cephalometrics

1. Unit Objective

a. At the completion of this unit, the resident understands the normal facial proportions and basic methods to analyze them

2. Learner Objectives

a. Upon completion of this unit, the resident:

    i. Understands basic facial proportions

    ii. Understands basic soft and hard tissue cephalometrics

    iii. Recognizes common abnormalities

3. Contents

a. Angles classification
b. Facial proportions
c. Frankfort horizontal
d. Soft tissue cephalometrics
e. Hard tissue cephalometrics

4. Clinical Skills

a. During the training period, the resident:

    i. Diagnoses facial abnormalities and precisely plans reconstruction

    ii. Makes appropriate referrals

G. Photography

1. Unit Objective

a. At the completion of this unit, the resident understands the essentials of medical photography relevant to facial plastic and reconstructive surgery

2. Learner Objectives

a. Upon completion of this unit, the resident understands:

i. The importance of quality and consistent photography
ii. Standard facial views for specific procedures
iii. Basic aspects of equipment and technology

3. Contents

a. Standard facial views
b. Equipment
c. Imaging – Computer

4. Clinical Skills

a. During the training period, the resident uses these skills to accurately document clinical cases

H. Imaging

1. Unit Objective

a. At the completion of this unit, the resident understands the effective utilization of available imaging techniques

2. Learner Objectives

a. Upon completion of this unit, the resident understands:

i. Basic characteristics of available imaging technologies

ii. How to select the most appropriate imaging study

iii. How to interpret imaging studies for relevant clinical information

3. Contents

a. Plain Radiograph/tomography
b. Panorex
c. CT scans
d. MRI
e. Ultrasound
f. Arteriography
g. Bone scan
h. Lymphoscintigraphy

4. Clinical Skills

a. During the training period, the resident uses this knowledge to diagnose patients in a precise, thoughtful, and cost effective manner

I. Psychological and Social Assessment

1. Unit Objective

a. At the completion of this unit, the resident understands normal psychological reaction to surgery and recognizes the signs and symptoms of abnormal psychology

2. Learner Objectives

a. Upon completion of this unit, the resident:

i. Understands the psychological significance of physical deformities and normal reactions to them

ii. Recognizes abnormal psychological behavior

iii. Understands the importance of integrating social issues into the treatment plan

3. Content

a. Normal psychology of the five life cycles
b. Normal reactions to grief and loss
c. Psychopathology – neurosis, psychosis, personality disorders
d. Specific relevant disorders, such as body dysmorphic syndrome and narcissistic personality

4. Clinical Skills

a. During the training period, the resident uses knowledge to:

i. Identify patients who may need added support, either psychological or social

ii. Recognize patients with significant psychological problems who are not candidates for surgery

iii. Refer patients appropriately for social support or psychological evaluation and treatment

J. Implants and Biomaterials

1. Unit Objective

a. At the completion of this unit, the resident understands the properties and utilization of commonly available implants and biomaterials

2. Learner Objectives

a. Upon completion of this unit, the resident:

i. Understands the advantages and disadvantages of autogenous, autologous and alloplastic materials

ii. Can describe and recommend utilization of each material

3. Content

a. Homograft (Alloderm)
b. Xenograft (Surgises)
c. Alloplastic (Silastic, Gortex)

4. Clinical Skills

a. During the training period, the resident:

i. Recommends the optimal material for a given problem

ii. Provides effective informed consent to the patient

K. Laser Principles

1. Unit Objective

a. At the completion of this unit, the resident understands basic laser physics and physiology, to include laser selection for specific lesions

2. Learner Objectives

a. Upon completion of this unit, the resident understands:

i. Basic laser principles and terminology

ii. Principles of laser selection for specific clinical problems

iii. Principles of laser safety

3. Content

a. Laser biophysics
b. Laser tissue interaction to include chromophores
c. Laser characteristics (CO_2, KTP, Erbium, etc.)

4. Clinical Skills

a. During the training period, the resident:

i. Selects the appropriate laser for a specific clinical problem

ii. Performs laser procedures safely

L. Evaluation and Management of Surgical Patient

1. Unit Objective

a. At the completion of this unit, the resident understands the general concepts relevant to management of the facial plastic surgery patient

2. Learner Objectives

a. Upon the completion of this unit, the resident understands information necessary to evaluate and safely manage a facial plastic surgery patient

3. Content

a. Pre- and postoperative evaluation and care
b. Universal precautions
c. Infection control
d. Coagulation evaluation

4. Clinical Skills

a. During the training period, the resident provides appropriate and safe preoperative evaluation and postoperative care

M. Anesthesia

1. Unit Objective

a. At the completion of this unit, the resident understands the basic types of anesthesia and their potential problems

2. Learner Objectives

a. Upon completion of this unit, the resident understands:

i. Preop evaluation for anesthesia

ii. Anesthesia selection

iii. Potential complications and treatment

3. Contents

a. Classification of patients
b. Local anesthesia
    i. Regional blocks
c. General anesthesia
    i. Laryngeal mask
    ii. Endotracheal
d. Complications
    i. Malignant hyperthermia
    ii. Fire
    iii. Drug toxicity

4. Clinical Skills

a. During the training period, the resident:

i. Recommends the most appropriate anesthesia for a specific patient's needs

ii. Provides informed consent

iii. Prevents and treat complications

N. Surgical Facilities

1. Unit Objective

a. At the completion of this unit, the resident understands the types of facilities and required standards

2. Learner Objectives

a. Upon completion of this unit, the resident understands the levels of surgical facilities and their appropriate utilization

3. Content

a. Facility levels
   i. Hospital
   ii. Certified surgical centers (ASC)
   iii. Office operating suites
b. Staff training including ACLS
c. Operating and recovery room equipment
d. Certification and formal agreements

4. Clinical Skills

a. During the training period, the resident use knowledge to select the most appropriate surgical facility for a given patient

II. <u>Diseases, Disorders, and Conditions</u> (from New Classification System)

A. Unit Objective

1. At the completion of this unit, the resident can recognize, assess, diagnose and manage diseases, disorders and conditions of the face and neck to include congenital, traumatic, neoplastic, and cosmetic

B. Learner Objective

1. Upon completion of this unit, the resident:

   a. Recognizes the signs and symptoms of congenital, traumatic, neoplastic and cosmetic diseases, disorders, and conditions of the face and neck

   b. Uses appropriate diagnostic tests to assess these diseases, disorders and conditions

   c. Can develop a diagnosis of these diseases, disorders and conditions

   d. Understands the nonsurgical and surgical management of congenital, traumatic, neoplastic and cosmetic diseases, disorders and conditions of the face and neck

C. Content

1. Congenital
    a. Cleft lip and palate
    b. Microtia and auricular deformities
    c. Syndromes
2. Trauma – general and soft tissue injury
    a. Initial evaluations A, B, C's
    b. Imaging techniques
        i. CT Scans
        ii. Angiogram
        iii. MRI
3. Skeletal trauma and deformities
    a. Nasal, mandibular, frontal sinus, zygomatic, dental, maxillary (LeFort) fractures
    b. Developmental deformities (microgenia, malar hypoplasia)
4. Neoplasias and facial skin malignancies
    a. Benign and malignant lesions
    b. Histopathology
    c. Diagnostic techniques
    d. Treatment
        i. Medical
        ii. Radiotherapy
        iii. Surgery
        iv. Moh's
5. Vascular
    a. Milliken & Glowacki's classification system
    b. Classification hemangioma versus malformation
    c. Vascular malformation – slow flow, fast flow
    d. Clinical conditions
        i. Pediatric
            a) Strawberry hemangioma
            b) Pyogenic granuloma
            c) Port wine stain (vascular malformation)
            d) Angiofibroma
            e) Spider angioma
            f) Lymphatic malformation
        ii. Adults
            a) Pyogenic granuloma
            b) Spider angioma
            c) Telangiectasias
            d) Venous lake
            e) Acne rosacea
            f) Poikiloderma of Civatte
            g) Cherry angioma
            h) Kaposi's sarcoma
6. Facial Nerve
    a. Facial Paralysis
        i. Acute
            a) Traumatic
            b) Iatrogenic
            c) Infectious
        ii. Long-term
7. Hair and scalp
    a. Androgenic, traumatic, iatrogenic, alopecia
    b. Chronology and patterns of male pattern baldness – Norwood System
        i. Medical treatment of alopecia

8. Aging face
    a. Skin changes
    b. Regional changes
        i. Brow
        ii. Lids
        iii. Nose
        iv. Mouth
        v. Neck
    c. Skeletal changes
    d. Lipodystrophy
9. Nose
    a. Nasal obstruction
        i. Turbinates
        ii. Septum
        iii. Internal and external valve
    b. Nasal deformity
        i. Traumatic
        ii. Congenital cleft lip/nose
        iii. Cosmetic
10. Psychogenic
    a. Body dysmorphic syndrome
    b. Narcissistic personality
        i. Neurosis, psychosis
        ii. Personality disorder to include
            a) Body
            b) Narcissistic

III. Surgical Concepts

A. Unit Objectives

1. At the completion of this unit, the resident understands the treatment strategies and procedures for the surgical management of reconstructive and cosmetic diseases, disorders and conditions of the face and neck

B. Learner Objectives

1. Upon completion of this unit, the resident:

    a. Understands the surgical strategies necessary to treat reconstructive and cosmetic diseases, and disorders and conditions of the face and neck

    b. Can perform surgical strategies to treat reconstructive and cosmetic diseases, disorders and conditions of the face and neck in the cadaver lab prior to performing them on the patients

C. Content

1. General
    a. Atraumatic techniques, hemostasis, precise sutures
    b. Healing by secondary intention
    c. Grafts
        i. STSG
        ii. FTSG
        iii. Composite grafts
        iv. Mucosal grafts
        v. Bones grafts – calvarial/iliac/rib
        vi Cartilage grafts – auricular/rib/septal

d. Flaps
    i. Local flaps
        a) Advancement
        b) Rotation
        c) Rhomberg
        d) Bilobed
        e) Transposition/note flap
        f) Z-plasty
    ii. Regional flaps
    iii. Free flaps
        a) Fasciocutaneous
        b) Myocutaneous
        c) Osteomyocutaneous
e. Tissue expansion

2. Specific surgical procedures
    a. Cranial facial anomalies
    b. Cleft lip and palate
    c. Trauma
        i. Soft tissue
    d. Trauma
        i. Hard tissue
    e. Facial reconstruction
        i. Scalp
        ii. Forehead
        iii. Periorbital
        iv. Nose
        v. Cheek
        vi. Ear
        vii. Lips and chin
    f. Facial paralysis and reanimation
        i. Static
        ii. Dynamic
    g. Rhinoplasty
    h. Genioplasty and mandibular procedures
    i. Facial implants
    j. Scar revision
    k. Otoplasty
    l. Browplasty
    m. Blepharoplasty
    n. Liposuction
    o. Rhytidectomy
    p. Facial resurfacing
        i. Dermabrasion
        ii. Chemical peels
        iii. Laser
    q. Laser procedures
        i. Vascular
        ii. Tattoos
        iii. Hair removal
    r. Injectables
        i. Botox
        ii. Fillers
    iii. Lipostructure

D. Clinical Skills

1. At the completion of this unit, the resident:

    a. Has participated in and understands how to plan surgical strategies and perform procedures to manage reconstructive and cosmetic diseases, disorders and conditions of the face and neck

    b. Can select the most appropriate surgical procedure to reconstruct diseases, disorders and conditions of the face and neck

IV. Habilitation/Rehabilitation

A. Speech therapy

B. Osteo integrated implants

C. Prosthetic devices

CLINICAL RESEARCH CURRICULUM

I. Medical Biostatistics

A. Unit Objective

1. At the completion of this unit, the resident understands the basics of medical statistics, including fundamentals of measurement, comparing two or more groups, interpretation of results from clinical trials, correlation, and regression

B. Learner Objectives

1. Upon completion of this unit, the resident understands:

    a. Fundamentals of measurement

    b. Common statistical tests for the comparison of two or more groups

    c. Interpretation of results from clinical trials

    d. Concepts of correlation

    e. Concepts of regression and multivariable analysis

C. Contents

1. Fundamentals of measurement
    a. Four different types of variables
        i. Dichotomous
        ii. Continuous
        iii. Nominal
        iv. Ordinal
    b. Normal distribution of data
    c. Measures of central tendency (mean, median, and mode) and dispersion (range, standard deviation) and the advantages and disadvantages of each
    d. Relationship between standard deviation and standard error
    e. Calculation of confidence intervals and their use in the interpretation of results from clinical trials
    f. Concept of unit-free data
2. Comparison of two groups
    a. Mean/median
        i. Parametric (t-test)
            a) Paired
            b) Unpaired
        ii. Non-parametric test (Mann-Whitney U-test)
3. Comparison of three or more groups
    a. Mean/median
        i. Parametric (one-way ANOVA)
            a) Adjustment for multiple comparisons
                i) Bonferroni
                ii) Others
        ii. Non-parametric (Kruskal-Wallis test)
4. Comparison of proportions: ?2 test
    a. Fisher Exact Probability Test
    b. Paired (McNemar's ?2 test)
5. Measures of Agreement
    a. Percent agreement
    b. Kappa index

6. Interpretation of results from clinical trials
    a. Confidence intervals
    b. When the experimental treatment reduces the probability of a bad outcome
        i. Relative risk reduction
        ii. Absolute risk reduction
        iii. Number needed to treat
    c. When the experimental treatment increases the probability of a good outcome
        i. Relative benefit increase
        ii. Absolute benefit increase
        iii. Number needed to treat
    d. When the experimental treatment increases the probability of a bad outcome
        i. Relative risk increase
        ii. Absolute risk increase
        iii. Number needed to harm
7. Correlation – nondependent relationship
    a. Parametric Pearson's
    b. Nonparametric Spearman's Rho
8. Regression - Multivariable Analysis
    a. Linear regression
    b. Logistic regression
    c. Cox proportional hazard analysis

D. Clinical Skills

1. At the completion of this unit, the resident can apply data analysis to the review of pertinent data and literature, in the care of a patient

II. Critical Appraisal of the Medical Literature

A. Unit Objective

1. At the completion of this unit, the resident understands the methodological criteria used to assess the validity, importance, and applicability of the medical literature

B. Learner Objectives

1. Upon completion of this unit, the resident understands how to assess the validity, importance and applicability of:

    a. Diagnostic articles

    b. Prognostic articles

    c. Harm/etiology articles

    d. Therapeutic articles

    e. Systematic reviews

C. Contents

1. Reviewing the structure of an article
    a. Type of study; answering what type of question
    b. Abstract
    c. Research methods
    d. Inclusion, exclusion criteria
    e. Statistical analysis
    f. Reports reported
    g. Discussion in context with other studies
2. Diagnostic article
    a. Are the results of this diagnostic study valid?
        i. Study design
        ii. Inclusion criteria
        iii. Potential bias
        iv. Which data are reported, and how
    b. Are the valid results of this diagnostic study important?
        i. Statistical analysis
        ii. Clinical significance
        iii. Results in context of other studies
        iv. Other
    c. Can you apply this valid, important evidence about a diagnostic test in caring for your patient?
        i. Generalizability
        ii. Translation to clinic practice
3. Prognostic article
    a. Are the results of this prognostic study valid?
    b. Are the valid results of this prognostic study important?
    c. Can you apply this valid, important evidence about prognosis in caring for your patient?
4. Harm/etiology article
    a. Are the results of this harm study valid?
    b. Are the valid results of this harm study important?
    c. Should these valid, potentially important results of a critical appraisal about a harmful treatment change the treatment of your patient?
5. Therapeutic article
    a. Are the results of this single preventive or therapeutic trial valid?
    b. Are the valid results of this randomized trial important?
    c. Can you apply this valid, important evidence about a treatment in caring for your patient?
6. Systematic Review
    a. Are the results of this systematic review valid?
    b. Are the valid results of this systematic review important?
    c. Can you apply this valid, important evidence about a treatment in caring for your patient?
7. Systematic review vs. meta-analysis
    a. Difference in review and meta-analysis
    b. Interpretation of meta-analysis
        i. Homogeneity
        ii. Confidence intervals
        iii. Odds ratio, relative risk

D. Clinical Skills

1. At the completion of this unit, the resident can:

    a. Review an article, and understand and report its findings, strengths and weaknesses

    b. Apply the results of their literature appraisal to clinical care of a patient, in different scenarios

III. Evidence-Based Medicine

A. Unit Objective

1. At the completion of this unit, the resident understands the concepts of evidence-based medicine, and can integrate the results of an evidence-based review with their own experience and the patient's wishes, to provide evidence-based care

B. Learner Objectives

1. Upon completion of this unit, the resident understands:

    a. The "three-legged stool" of evidence based medicine

    b. The five levels of evidence, applied to individual studies

    c. The four grades of evidence, and applying a grade based on individual study levels

    d. Assessment of the "number needed to treat"

C. Contents

a. Background and history of evidence-based medicine
b. Three parts of evidence-based medicine (EBM)
    i. Best available evidence from the literature
    ii. Physician's clinical experience
    iii. Wishes of the patient and/or society
c. Formulating a focused clinical question
    i. Patient
    ii. Intervention
    iii. Comparison
    iv. Outcome
d. Obtaining the evidence
    i. Systematic, computerized searches
    ii. EBM databases (i.e., Cochrane, NHRQ)
    iii. Clinical research, human subjects only
e. Grading the evidence
    i. Individual studies are assigned a level
        a) Based on study methodology
        b) Based on study quality
    ii. Levels 1 through 5
    iii. Review the results of individual studies, and assign an overall grade, based on the compilation of evidence
    iv. Grades: A, B, C, D
f. Making an evidence-based recommendation
    i. Grade of evidence
    ii. Characteristics of patient and situation
g. Understanding analysis of evidence-based review
    i. Number need to treat/harm
    ii. Clinical vs. statistical significance

D. Clinical Skills

1. At the completion of this unit, the resident can:

    a. Formulate a question for an evidence-based review

    b. Retrieve, evaluate, and grade the best evidence

    c. Understand the recommendations from the best evidence

    d. Incorporate the evidence into the care of an individual patient