

## Written Examination and Continuous Certification Program Content Outline

(Approved 5-18-18)

### I. Core of Knowledge/General Plastic Surgical Principles and Techniques

#### A. Wound Repair -- Principles and Applications

1. Basic science of healing
  - a. Anatomy, physiology, biochemistry, microbiology, immunology, pharmacology of wound healing
    1. Skin and soft tissue
    2. Tendon
    3. Bone (different types)
    4. Nerve
    5. Cartilage
2. Abnormal wound healing
  - a. Delayed healing -- physiology and treatment
  - b. Excessive healing (hypertrophic scars/keloids)
    1. Physiology
  - c. Treatment of scars and keloids
    1. Surgical techniques (Z-plasty, W-plasty, etc.)
    2. Nonsurgical techniques
    3. Camouflage techniques
3. Nutrition as related to wound healing
  - a. Effects of surgery, injury, and illness on nutritional requirements
  - b. Diagnosis and treatment of deficiencies
4. Surgical incisions
  - a. Selection in relation to skin lines
  - b. Techniques for closure
  - c. Suture materials -- types and uses
5. Principles of wound management
  - a. Debridement to include mechanical, surgical, enzymatic, biologic
  - b. Use of splints, dressings, casts, topical agents
  - c. VAC (vacuum assisted closure)
    1. Physiology
    2. Indications and treatment
    3. Complications and their management
6. Preservation of skin, bone, tendon, cartilage, nerve
  - a. Principles and techniques
  - b. Biologic substitutes

#### B. Flaps and Grafts

1. Physiology of flaps
  - a. Types of flaps
  - b. Flow characteristics
  - c. "Delay" phenomenon
2. Pharmacology of flaps
3. Basic flap techniques
  - a. Flap monitoring
  - b. Treatment of ischemic flap to include all methods, eg, surgical, pharmacological
4. Physiology of grafts including skin, dermis, cartilage, bone, tendon, muscle, nerve, fat, fascia, combined tissue
5. Grafting techniques
  - a. Instruments for harvesting grafts
  - b. Graft preservation techniques
  - c. Donor site management
  - d. Recipient site management
  - e. Special technique

- f. Tissue engineered skin substrates
- C. Microsurgery
  - 1. Technical aspects of microsurgery
    - a. Microscopes -- principles, usage
    - b. Sutures -- types, indications
    - c. Suturing techniques
      - 1. Vessels
      - 2. Nerves
      - 3. Other structures including lymphatics, etc.
    - d. Couplers
  - 2. Use of microsurgery for free tissue transfer
    - a. Physiology -- including the no-reflow phenomenon
    - b. Types of flaps
      - 1. Fasciocutaneous
      - 2. Myocutaneous
      - 3. Osseous and osteocutaneous
      - 4. Complex tissue flaps
    - c. Commonly used flaps
      - 1. Indications for selection
      - 2. Donor-site/recipient-site relationships
      - 3. Anatomy
    - d. Perioperative management for free tissue transfer
      - 1. Monitoring techniques
      - 2. Treatment of the failing flap
  - 3. Use of microsurgery for replantation of amputated parts and revascularization
    - a. Physiology
    - b. Indications for and contraindications to replantation and revascularization
    - c. Techniques for replantation
      - 1. Sequence of repair
      - 2. Stabilization
    - d. Perioperative management for replantation and revascularization
      - 1. Monitoring techniques
      - 2. Salvage techniques
  - 4. Use of microsurgery in nerve repair
    - a. Physiology
    - b. Techniques
    - c. Monitoring techniques
- D. Implants and Biomaterial
  - 1. Bone
    - a. Autogenous graft repair
    - b. Cancellous versus cortical grafts
    - c. Local factors in bone graft healing
    - d. Sources of non-vascularized bone autografts, their characteristics and healing
      - 1. Rib
      - 2. Iliac
      - 3. Cranial
    - e. Sources of vascularized autografts, their characteristics and healing
      - 1. Periosteal
      - 2. Nutrient
    - f. Immunology and antigenicity of bone
    - g. Bone allografts
    - h. Clinical applications
  - 2. Cartilage
    - a. Autografts
    - b. Allografts
    - c. Immunology
    - d. Clinical application
    - e. Warping, resorption, incorporation

3. Alloplastic materials
    - a. Biomaterials
      1. Silicone
      2. Methyl methacrylate
      3. Hydroxylapatite
      4. Tricalcium phosphate
      5. Porous polyethylene
      6. Other
  4. Breast implants
    - a. Types
    - b. Biologic characteristics
    - c. Clinical choices
    - d. Breast Implant Associated-Atypical Large Cell Lymphoma
      1. Presentation
      2. Appropriate diagnosis
      3. Treatment algorithm
  5. Biologic materials
    - a. Fat
    - b. Acellular dermal matrix
      1. Human
      2. Other
    - c. Other biologic material
- E. Special techniques
1. Liposuction
    - a. Principles
    - b. Techniques and instrumentation
      1. Suction-assisted
      2. Ultrasound-assisted
      3. Other techniques (e.g., laser-assisted)
    - c. Practical applications
    - d. Complications and their treatment
  2. Tissue expansion
    - a. Principles and physiology
    - b. Devices and techniques
    - c. Practical applications
    - d. Complications and their treatment
  3. Dermabrasion and chemical peel
    - a. Principles -- physiology and pathology
    - b. Techniques
      1. Pharmacology of chemical peel
      2. Instrumentation and techniques of dermabrasion
    - c. Applications -- choices between techniques
    - d. Complications and their treatment
  4. Laser treatment
    - a. Biophysics
    - b. Instrumentation -- different types of lasers
    - c. Practical applications -- use of different lasers
    - d. Techniques, to include laser safety issues
    - e. Complications and their management
  5. Other techniques (e.g. intense pulsed light, radiofrequency, cryolipolysis, mesotherapy)
  6. Minimally invasive/Non-invasive Surgery
    - a. Endoscopic and laparoscopic
    - b. Robotic
    - c. Simulation and virtual surgery

## II. Plastic Surgical Aspects of Specific Related Disciplines

- A. Medicolegal and Psychiatric Aspects of Plastic Surgery
  1. Principles of informed consent
    - a. Consent for use of patient images (education, marketing)

2. The medical record including electronic records
  3. Evaluation of the patient for aesthetic and reconstructive surgery
  4. Psychiatric aspects of plastic surgery
  5. Management of the dissatisfied patient
  6. Regulatory and Compliance issues (HIPAA)
  7. Determination of brain death and soliciting organ donation
  8. Advanced directives, DNR, power of attorney
- B. Anesthesia and Critical Care
1. Common agents for local anesthesia (esters and amides), regional anesthesia, tumescent anesthesia, conscious sedation, and general anesthesia (intravenous agents, inhalation agents, muscle relaxants, antiemetics, liposomal bupivacaine, etc.)
    - a. Mode of action
    - b. Duration of action
    - c. Dosage and toxicity
    - d. Side effects
    - e. Antidotes
  2. Principles and techniques for administration of local anesthesia (e.g., anesthetizing the nose, use of epinephrine)
  3. Principles and techniques for regional anesthesia
    - a. Digital block
    - b. Wrist block
    - c. Brachial block
    - d. Bier block
    - e. Ankle block
    - f. Spinal and epidural
  4. Principles and techniques for conscious sedation and general anesthesia using different anesthetic techniques
    - a. Monitoring
    - b. Airway management
    - c. Preoperative medication
    - d. Intravenous agents
    - e. Inhalation agents
    - f. Muscle relaxants
    - g. Antiemetics
  5. Indications for various modes of anesthesia due to
    - a. Procedure
    - b. Patient condition
  6. Types and incidences of complications, morbidity and mortality, from various kinds of anesthesia
    - a. Local anesthesia, to include tumescent anesthesia
    - b. Regional anesthesia
    - c. Conscious sedation
    - d. General anesthesia
    - e. Hypotensive anesthesia
    - f. Malignant hyperthermia
  7. Intensive care patients
    - a. Monitoring
    - b. Respiratory management
    - c. Cardiovascular management
    - d. Fluid management
    - e. Management of shock, infection and sepsis
    - f. Management of nutrition
- C. Immunology, including transplantation
1. Basic principles of immunology
    - a. Terminology
    - b. Physiology
  2. Pharmacologic agents used in transplantation
    - a. Cyclosporine
    - b. Steroids
    - c. Imuran
    - d. Other agents (e.g. triclosan, etc.)
  3. Immunology of tumors, including:

- a. Melanoma
- b. Basal cell carcinoma
- c. Squamous cell carcinoma
- 4. Immunologic aspects of plastic surgery
  - a. "Autoimmune" diseases
  - b. Immunology of skin transplantation
  - c. Immunology of cartilage, bone, etc., for transplantation
    - 1. Complex tissue transplantation (limb, face, abdominal wall, etc.)
    - 2. Interrelationship of transplantation and microsurgery
- 5. Human immunodeficiency virus and other opportunistic infections
  - a. AIDS, Kaposi sarcoma
- D. Pharmacology and Therapeutics
  - 1. Pharmacology and clinical use of
    - a. Antibiotics
      - 1. Antimicrobial resistance
    - b. Analgesics
    - c. Anti-inflammatory agents
    - d. Steroids
    - e. Chemotherapeutic agents applicable in plastic surgery
      - 1. Complications and their management
  - 2. Diagnosis and treatment of bacterial, fungal and viral infections
    - a. Skin infections
    - b. Breast infections
    - c. Surgical site infections and prophylaxis
    - d. Hand infections
    - e. Special problems
      - 1. Animal bites, to include snake and insect bites
      - 2. Human bites
      - 3. Farm injuries

### III. Plastic Surgery of the Integument

- A. Anatomy, Physiology, and Embryology
  - 1. Normal anatomy, histology, and function of the skin
    - a. Epidermis (four layers, types of cells)
    - b. Dermis (fibroblasts, elastin, ground substance)
    - c. Appendages
      - 1. Hairs
      - 2. Eccrine glands (sweat glands)
      - 3. Apocrine glands (axilla, anal-genital region, external ear, eyelid, breast)
      - 4. Sebaceous glands
  - 2. Anatomy and function of the nail
  - 3. The reaction of the skin to
    - a. Heat
    - b. Cold
    - c. Mechanical trauma
    - d. Microbial trauma
    - e. UV light trauma
    - f. Pharmacologic agents
    - g. Smoking
  - 4. Embryologic origin of the skin
- B. Benign and Malignant Skin Lesions
  - 1. Benign epithelial and adnexal tumors (nevi, papillomas, keratinous cysts, etc.)
    - a. Pathology, biologic behavior
    - b. Treatment, surgical and nonsurgical
  - 2. Benign mesodermal tumors (hemangioma, vascular malformations, cystic hygroma, etc.)
    - a. Pathology, biologic behavior
    - b. Classification of vascular tumors
    - c. Treatment, surgical and nonsurgical
  - 3. Generalized skin disorders

- a. Pathology, biologic behavior
  - b. Treatment, surgical and nonsurgical
- 4. Malignant cutaneous tumors, epithelial and mesodermal (basal cell carcinoma, squamous cell carcinoma, malignant melanoma, Merkel cell tumor, Spindle cell cancer, dermatofibrosarcoma protuberans, neurofibromatosis, etc.)
  - a. Pathology, biologic behavior
  - b. Staging and treatment, surgical and nonsurgical
- 5. Premalignant skin tumors (Nevus sebaceous of Jadassohn, keratoacanthoma etc.)
  - a. Pathology, biologic behavior
  - b. Treatment, surgical and nonsurgical
- 6. Miscellaneous
  - a. Mohs micrographic surgery and other special techniques for tumor therapy
  - b. Complications of surgical and nonsurgical treatment and their management
- C. Burns and Trauma
  - 1. Physiology of burn injuries, including thermal, electrical, chemical, etc.
  - 2. Principles and techniques of burn resuscitation
  - 3. Burn wound management
    - a. Excisional techniques
    - b. Grafting
    - c. Other wound management (dressings, skin substitutes, etc.)
  - 4. Reconstruction of the burn patient
  - 5. Rehabilitation of the burn patient
  - 6. Radiation injury -- acute and chronic
    - a. Physiology
    - b. Treatment
  - 7. Cold injury -- physiology and treatment
  - 8. Extravasation injury
- D. Congenital and Functional Problems
  - 1. Congenital disorders of the skin (eg, giant hairy nevus, xeroderma pigmentosa, Ehlers Danlos syndrome, albinism)
    - a. Classification
    - b. General principles of medical management
    - c. Details of surgical management
  - 2. Physiology of the aging process
  - 3. Solar effects on skin
    - a. Physiology
    - b. Pharmacologic agents for prevention
      - 1. Mechanism of action
      - 2. Patient management
  - 4. Common generalized disorders of the skin (eg, scleroderma, dermatomyositis, lupus)
    - a. Basic physiology
    - b. Surgical aspects
  - 5. Alopecia and disorders of pigmentation
    - a. Evaluation and treatment
  - 6. Lipodystrophy
    - a. Physiology of fat deposition and metabolism
    - b. Localized lipodystrophy, such as Romberg's disease
      - 1. Physiology
      - 2. Surgical and ancillary techniques for treatment
  - 7. Inflammatory processes of the skin
    - a. Common bacterial skin disorders (impetigo, lymphangitis, necrotizing fasciitis, gas gangrene, gangrene)
      - 1. Diagnosis
      - 2. Surgical treatment
      - 3. Medical treatment
    - b. Hidradenitis suppurativa
      - 1. Diagnosis
      - 2. Surgical treatment
      - 3. Medical management
    - c. Common viral and fungal skin disorders
      - 1. Diagnosis

- 2. Surgical treatment
- 3. Medical treatment
- 8. Lymphedema
  - a. Physiology
  - b. Diagnosis
  - c. Treatment
    - 1. Surgical treatment
    - 2. Medical treatment

#### **IV. Plastic Surgery of the Head and Neck**

##### **A. Anatomy, Physiology, and Embryology**

- 1. Anatomy of head and neck structures, with particular focus on
  - a. Eye
  - b. External ear
  - c. Nose
  - d. Pharynx
  - e. Facial structures
  - f. Skull and facial bones
  - g. Salivary glands
  - h. Thyroid gland
- 2. Embryology of head and neck
- 3. Physiology of head and neck structures
  - a. Eye
  - b. Nose
  - c. Pharynx
  - d. Salivary glands
- 4. Dental anatomy and development
- 5. Cephalometrics and other forms of facial analysis

##### **B. Congenital Disorders**

- 1. Cleft lip and palate
  - a. Etiology and genetics
  - b. Pathologic anatomy and classification
  - c. Primary surgical treatment
  - d. Secondary surgical treatment
  - e. Nonsurgical treatment: prosthetics, orthodontics, speech therapy
- 2. Velopharyngeal incompetence
  - a. Diagnosis
  - b. Treatment
- 3. Craniofacial anomalies including, but not limited to, craniosynostosis, craniofacial microsomia, rare clefts, hypertrophy (hyperplasia, neoplasia), atrophy (hypoplasia), rare or unclassified syndromes
  - a. Etiology and genetics
  - b. Pathologic anatomy and classification
  - c. Primary surgical treatment
  - d. Secondary surgical treatment
  - e. Nonsurgical treatment: prosthetics, orthodontics, speech therapy, psychology
- 4. Auricular abnormalities: microtia, ear prominence, others
  - a. Etiology and pathogenesis
  - b. Treatment
- 5. Eyebrow/eyelid abnormalities: colobomata, ptosis
- 6. Miscellaneous conditions of head and neck including, but not limited to: congenital tumors, choanal atresia, nasal agenesis, thyroglossal duct cyst and sinus, branchial cyst and sinus, Robin Sequence, vascular malformations
  - a. Etiology and pathogenesis
  - b. Treatment

##### **C. Benign and Malignant Tumors**

- 1. Oropharyngeal tumors -- benign and malignant
  - a. Diagnostic techniques
  - b. Gross and microscopic evaluation
  - c. Biologic behavior/staging
  - d. Surgical treatment of benign and malignant tumors

1. Primary management
2. Role of neck dissection
3. Treatment of complications
- e. Long-term follow-up
- f. Adjuvant therapy
  1. Chemotherapy
  2. Radiation therapy
  3. Complications of adjuvant therapies and treatment
2. Salivary gland tumors -- benign and malignant
  - a. Diagnostic techniques
  - b. Gross and microscopic evaluation
  - c. Biologic behavior/staging
  - d. Surgical treatment
    1. Primary management
    2. Role of neck dissection
    3. Treatment of complications
  - e. Long-term follow-up
  - f. Adjuvant therapy
  - g. Inflammatory and other benign processes of the salivary glands
3. Tumors of bony and dental origin
  - a. Benign lesions
  - b. Malignant tumors
  - c. Treatment, including surgery and treatment of complications including osteoradionecrosis
4. Other head and neck tumors -- diagnosis and treatment
  - a. Rhinophyma
  - b. Tumors of
    1. Eyelid structures
    2. Lacrimal apparatus
    3. Ear
    4. Nasal cavity and paranasal sinuses
    5. Scalp and calverium
      - a. Reconstruction following radiation therapy
  - c. Tumors of vascular and lymphatic origin
5. Infections of head and neck structures
- D. Trauma
  1. Facial fractures
    - a. Diagnostic methods
    - b. Biologic and bio-mechanical aspects of injury and healing
    - c. Surgical approaches and techniques of repair
    - d. Management of specific facial fractures
      1. Maxillary and mandibular
        - a. Management of malocclusion
      2. Orbital and nasal
      3. Complex and other
        - a. Frontal with possible CSF leak diagnosis and management
        - b. Management of exposed hardware
  2. Facial nerve injury
    - a. Diagnosis
    - b. Acute management
  3. Injury to soft tissue structures
    - a. Parotid gland and duct
    - b. Lacrimal apparatus
    - c. Other
- E. Aesthetic and Functional Problems
  1. Aesthetic principles of the face
  2. Rhinoplasty
    - a. Structural considerations
    - b. Techniques



1. Incisions
2. Grafts
3. Other techniques including tip sutures
- c. Primary rhinoplasty
- d. Secondary rhinoplasty
- e. Cleft lip nose
- f. Complications – prevention and management
3. Nasal airway obstruction
  - a. Septoplasty and submucous resection
  - b. Turbinate surgery
  - c. Spreader grafts or other methods
4. The aging face
  - a. Principles and techniques
    1. Rhytidectomy
    2. Brow lift
    3. Facial liposuction
    4. Other techniques, eg, suture suspension, mid-facelift, short scar techniques
    5. Role of platysma and SMAS
  - b. Complications -- prevention and management
  - c. Ancillary/non-surgical techniques for the aging face
    1. Chemical peel
    2. Dermabrasion, microdermabrasion, micropenning
    3. Injection of filling material such as hyaluronic acid, fat, synthetic material and others
    4. Laser resurfacing, IPL, radiofrequency devices
    5. Botulinum toxin injection
    6. Other including topical/pharmacological agents (eg retinoic acids, alpha-hydroxy acids, human growth hormone, plasma-rich protein, etc.)
5. Alopecia/hair transplantation
6. Aesthetic and functional problems of the eyelid
  - a. Evaluation and diagnosis
  - b. Ptosis -- diagnosis and treatment
  - c. Dermatochalasis and other aesthetic problems
    1. Blepharoplasty techniques
    2. Complications -- prevention and management (eg, dry eye, ectropion, scleral show, lagophthalmos)
  - d. Asian eyelid and other issues
7. Deformities of the ear -- diagnosis and treatment
8. Temporomandibular joint -- diagnosis, surgical and nonsurgical treatment
9. Orthognathic surgery -- principles and techniques
10. The anophthalmic orbit
11. Other problems, including masseter hypertrophy
12. Facial nerve paralysis/palsy – established, diagnosis and treatment
  - a. Static techniques
  - b. Dynamic techniques
  - c. Nerve grafts and free tissue transfers
  - d. Medical treatment of facial nerve paralysis
13. Facial atrophy -- diagnosis and treatment
14. Facial hyperkinesia -- diagnosis and treatment
- F. Reconstruction
  1. Reconstruction of soft tissue defects
    - a. Grafts, including fat grafting and dermal-fat grafts
    - b. Flaps
    - c. Microsurgical techniques
  2. Reconstruction of structural deficits
    - a. Grafts
    - b. Flaps
    - c. Alloplastic material
    - d. Microsurgical techniques
  3. Reconstruction of specific structures

- a. Eyelid
  - b. Nose
  - c. Lacrimal apparatus
  - d. Ear
  - e. Lip and cheek
  - f. Scalp
  - g. Esophagus
  - h. Oropharynx
  - i. Skeletal reconstruction (including mandible, maxilla, skull)
4. Maxillofacial prosthetics
- a. Principles
  - b. Techniques

**V. Plastic Surgery of the Upper Extremity**

**A. Anatomy, Physiology and Embryology**

- 1. Anatomy of the upper extremity
- 2. Biomechanics of the upper extremity
- 3. Embryology of the upper extremity
- 4. Examination of the hand and upper extremity
  - a. Physical examination
  - b. Diagnostic techniques
    - 1. Electrodiagnosis
    - 2. Imaging techniques
    - 3. Other

**B. Congenital Disorders**

- 1. Diagnosis of congenital deformities of the upper extremity
  - a. Classification
- 2. Surgical treatment of specific deformities, including:
  - a. Syndactyly
  - b. Absences
  - c. Lack of differentiation
  - d. Duplication
  - e. Gigantism
  - f. Hypoplasia
  - g. Congenital bands
  - h. Other abnormalities
- 3. Nonsurgical treatment of congenital deformities

**C. Benign and Malignant Tumors**

- 1. Pathology of upper extremity tumors
  - a. Epidemiology
  - b. Etiologic factors
  - c. Clinical manifestations
  - d. Microscopic features
  - e. Result of surgical and nonsurgical treatment
  - f. Prognosis
- 2. Knowledge of the principles and techniques of management of upper extremity tumors, including reconstruction after surgical removal of the tumor
- 3. Specific tumors
  - a. Vascular tumors
  - b. Nerve tumors
  - c. Benign deep soft tissue tumors
  - d. Malignant deep soft tissue tumors
  - e. Primary bone tumors
- 4. Adjunctive modalities
  - a. Radiation therapy
  - b. Chemotherapy
  - c. Other

#### D. Trauma

1. Fractures and dislocation
  - a. Diagnostic techniques
    1. Radiograph diagnosis
    2. Other studies
  - b. Acute management of fractures and dislocations
    1. Surgical techniques
    2. Nonsurgical modalities
  - c. Principles of casting and splinting
2. Nerve injury, including brachial plexus
  - a. Anatomy, pathophysiology
  - b. Mechanisms of injury
  - c. Methods, goals of treatment
3. Major amputations and avulsions
  - a. Types and mode of injury
  - b. Acute and delayed management
  - c. Elective amputation
  - d. Wound coverage
  - e. Goals of treatment
  - f. Rehabilitation
  - g. Prostheses -- types and uses
4. Joint injury
  - a. Physiology
  - b. Mechanisms of injury
  - c. Goals and techniques of treatment
5. Tendon injury of the hand
  - a. Anatomy
    1. Extensor relationships
    2. Flexor relationships
  - b. Mechanisms of injury
  - c. Principles of immediate and delayed treatment
    1. Surgical
    2. Nonoperative
6. Muscle and tendon injury of the arm
  - a. Anatomy of the arm
  - b. Techniques of evaluation of upper extremity injuries
  - c. Treatment modalities and goals of treatment
7. Compartment syndromes and other ischemic contractures (Volkmann's)
  - a. Pathophysiology
  - b. Diagnostic methods
    1. Measurement of compartment pressures
  - c. Management
    1. Acute Management
    2. Management of late sequelae
8. Nail bed injuries
  - a. Anatomy
  - b. Pathophysiology
  - c. Treatment
9. Infections
  - a. Diagnosis and wound management
10. Fingertip and other minor injuries
  - a. Types of injury
  - b. Management and treatment modalities for fingertip injuries
  - c. Minor upper extremity injuries
11. Vascular injuries of the upper extremity

#### E. Functional Problems

1. Nerve compression and entrapment syndromes
  - a. Pathophysiology
  - b. Surgical and nonsurgical treatment of median, ulnar, and radial nerve compression neuropathies: thoracic outlet syndrome; brachial plexus neuritis, other compression
2. Rheumatoid and non-specific arthritis
  - a. Pathophysiology
  - b. Surgical and nonsurgical treatment of tenosynovitis, tendon ruptures, joint dysfunction
3. Circulatory disorders
  - a. Pathophysiology
  - b. Surgical and nonsurgical treatment of local arterial thromboses, upper extremity aneurysms, embolic disease, arteriovenous fistulae, vasospastic disease, scleroderma
  - c. Management of upper extremity lymphedema
4. Deformities of the upper extremity
  - a. Pathophysiology
  - b. Surgical and nonsurgical management of nail bed deformities
5. Non-ischemic contractures
  - a. Pathophysiology
  - b. Surgical and nonsurgical treatment of small joint contractures, Dupuytren's disease
6. Hand and upper extremity rehabilitation
  - a. Principles
  - b. Techniques: splinting, prostheses, physical therapy, sensory re-education
7. Diagnosis and management of pain syndromes, reflex sympathetic dystrophy

#### F. Reconstruction

1. Tendon reconstruction
  - a. Tendon repair
  - b. Tendon grafting
    1. Indications
    2. Sources
    3. Techniques
    4. Prostheses
2. Reconstruction for nerve and muscle deficits
  - a. Basic diagnostic principles
  - b. Tendon transfers
  - c. Nerve grafts and nerve transfers
  - d. Flaps
3. Reconstruction of missing parts
  - a. Thumb reconstruction
    1. Pollicization
    2. Flaps; free tissue transfer
  - b. Digital reconstruction
4. Reconstruction of soft tissue deficit
  - a. Grafts
  - b. Flaps
  - c. Free tissue transfer
5. Joint deformity
  - a. Pathophysiology
  - b. Repair and replacement techniques
  - c. Biomaterial
6. Reconstruction of bony deficit
7. Reconstruction following brachial plexus injury
  - a. Diagnostic methods
  - b. Early and late surgical repair

#### G. Aesthetic Surgery of the upper extremity

1. Liposuction of upper extremity
2. Brachioplasty
  - a. Aesthetic
  - b. Post-bariatric

3. Treatment of the aging hand

**VI. Plastic Surgery of the Trunk**

A. Anatomy, Physiology and Embryology

1. Embryology of the trunk and abdominal wall
2. Internal anatomy of the trunk, anterior and posterior abdominal wall
  - a. Muscles forming the abdominal wall
  - b. Deep and superficial fascia of the abdominal wall
  - c. Anatomy of trunk muscles as related to flaps for reconstructive purposes
  - d. Fat distribution
  - e. Innervation, blood supply and lymphatic drainage
3. Surface anatomy of the trunk and abdominal wall
  - a. Skin and its elastic quality
  - b. The male and female escutcheon
  - c. Innervation

B. Congenital Disorders

1. Developmental chest wall deformities
  - a. Embryology, growth and development, pathologic anatomy
  - b. Surgical and nonsurgical treatment of pectus excavatum, pectus carinatum, bifid sternum, asymmetry
2. Posterior trunk defects
  - a. Embryology, growth and development, pathologic anatomy
  - b. Surgical and nonsurgical treatment of meningocele, sacroccygeal, and spinal teratomas, dermal sinuses and post-natal pits
3. Abdominal wall defects
  - a. Embryology, growth and development, pathologic anatomy
  - b. Surgical and nonsurgical management of gastroschisis, omphalocele, urachal cysts and sinuses, prune belly syndrome, exstrophy of the bladder

C. Benign and malignant tumors of the trunk, thorax and abdominal wall

D. Trauma and Reconstruction of Trunk and Abdomen

1. Thoracic and abdominal trauma
  - a. Surgical management of chest injuries including pneumothorax and flail chest
  - b. General principles of management of abdominal visceral injuries
  - c. Assessment and management of abdominal compartment syndrome
2. Thoracic reconstruction
  - a. Skeletal
    1. Reconstruction following sternal dehiscence and/or infection
    2. Other
  - b. Soft tissue -- including flaps and grafts
  - c. Reconstruction of radiation injury to the thorax and/or trunk
3. Abdominal wall reconstruction
  - a. Fascial reconstruction of the abdomen, component separation
  - b. Principles of abdominal hernias
    1. Recurrent hernia
  - c. Abdominal wound dehiscence
4. Pressure ulcers
  - a. Etiology and staging
  - b. Pathophysiology
  - c. Prevention
  - d. Nonsurgical considerations and management
  - e. Surgical treatment
    1. Preoperative considerations
    2. Local flaps
    3. Muscle and musculocutaneous flaps
    4. Distant flaps
    5. Complications of surgery
    6. Rehabilitation
  - f. Reconstruction of acquired back defects/deformities

E. Aesthetic and Functional Problems of the Trunk and Abdomen

1. Dermatochalasis and post-obesity deformity

- a. Diagnosis
- b. Surgical treatment techniques
- c. Indications and contraindications
- d. Complications and their management
- 2. Aesthetic body contouring

## **VII. Plastic Surgery of the Lower Extremity**

### **A. Anatomy, Physiology and Embryology**

- 1. Anatomy of the lower extremity
  - a. Surface anatomy
  - b. Muscles
  - c. Nerves
  - d. Vascular supply
  - e. Bony structures
- 2. Anatomy as applied to specific lower extremity flaps
  - a. Skin flaps
  - b. Muscle and musculocutaneous flaps
  - c. Fascial and fasciocutaneous flaps
  - d. Sensate flaps
  - e. Osseous flaps
- 3. Embryology of the lower extremity
- 4. Biomechanics
  - a. Function of specific muscles and muscle groups
  - b. Gait
  - c. Functional consequences of use of specific muscles as flaps

### **B. Traumatic deformity of the lower extremity**

- 1. Mechanisms of injury
- 2. Classification
  - a. Gustilo grade
- 3. Orthopedic management
- 4. Reconstruction principles and techniques
  - a. Vascular injury
  - b. Tendon injury
  - c. Nerve injury

### **C. Reconstruction of acquired defects of the lower extremity**

- 1. Management of soft tissue defects (sarcoma, melanoma, etc.)
- 2. Management of ulcers, including the diabetic foot/leg
  - a. Pathophysiology of ulcers
  - b. Diagnosis and treatment, conservative and surgical
    - 1. Assessment for Marjolin's ulcer
  - c. Evaluation of neuropathy and injury protection
- 3. Management of defects in the vascularly compromised

### **D. Reconstruction of congenital deformities of the lower extremity**

- 1. Lymphedema
- 2. Vascular anomalies
- 3. Developmental deformities (e.g. polydactyly)

### **E. Aesthetic deformities of the buttock and lower extremity**

- 1. Classification of deformity
- 2. Management techniques
  - a. Excision methods
  - b. Liposuction
  - c. Augmentation (e.g. implants, fat transfer)

## **VIII. Plastic Surgery of the Genitourinary System**

### **A. Anatomy and Embryology**

- 1. Anatomy of the male genitourinary system
- 2. Anatomy of the female genitourinary system

### **B. Trauma, Reconstruction and Functional Disorders**

1. Developmental abnormalities of the vagina (etiology, associated syndromes, workup, reconstructive techniques)
2. Management of acquired vaginal defects (from tumor, trauma, infection, etc.)
3. Penile amputation (replantation, reconstruction)
4. Transgender patients
  - a. Evaluation with regard to WPATH guidelines
  - b. Timing and preparation for surgical reassignment
  - c. Principles and techniques of transfemale surgery
  - d. Principles and techniques of transmale surgery
  - e. Preoperative and postoperative care
5. Reconstruction of the perineum
  - a. Congenital (e.g. anorectal malformation)
  - b. Acquired (reconstruction after vulvectomy, etc.)
6. Aesthetic surgery of the genitalia
  - a. Labiaplasty
  - b. Phallus treatments

## **IX. The Practice of Plastic Surgery**

- A. General considerations of the surgical patient
  1. Patient Safety
    - a. Appropriate preoperative evaluation
    - b. Management of co-morbidities (e.g. obesity, diabetes, myasthenia gravis, steroid-dependent patient, opioid-dependent patient, psychological factors, etc.)
    - c. Surgical Time-Out
      1. Avoidance of wrong-site surgery
    - d. Lidocaine/Bupivacaine toxicity recognition and treatment
    - e. Malignant hyperthermia recognition and treatment
    - f. ACLS and airway management
    - g. Root cause analysis and near-miss reporting
    - h. Universal Precautions
      1. Infection Control
      2. Exposure management (HIV, Hepatitis, Tb, etc.)
  2. Perioperative management including preoperative, intraoperative, and postoperative
    - a. Fluid, electrolyte, and acid-base balance
    - b. Perioperative nutritional support and hydration (ERAS)
    - c. Special considerations in pediatric, geriatric populations
      1. Medication dosage adjustments
  3. Respiratory issues
    - a. COPD, emphysema, asthma management
    - b. Hypoxia
    - c. Pneumothorax
  4. Cardiovascular issues (e.g. arrhythmia, hypertension, hypotension)
  5. Wound infection and sepsis
  6. Systemic Inflammatory Response Syndrome (SIRS)
  7. Bleeding, to include hematoma/seroma
  8. Disorders of coagulation management and treatment
  9. Transfusion: indication and risks, including transfusion products
  10. DVT/PE prophylaxis and treatment
    - a. Caprini scale
    - b. Low molecular weight heparin
  11. Maintenance of normothermia
  12. Post-operative nausea/vomiting
  13. Post-operative pain management
- B. Office-based/Outpatient surgical facility
  1. Accreditation and licensing
  2. Equipment
  3. Staffing and patient monitoring
- C. ICD-10 and CPT coding
- D. Medical photography
- E. Regulatory and compliance issues (HIPAA, Quality and Data Reporting, Peer Review)

## F. Research

1. Research design
2. Legal issues (IRB approval/waiver, Declaration of Helsinki, Conflict of Interest disclosure, etc.)
3. Levels of evidence
4. Statistical analysis
5. Patient-reported outcomes

## G. Ethics and Professionalism

1. Conflicts of Interest
2. Codes of Ethics (ABPS)

## X. Plastic Surgery of the Breast

### A. Anatomy of the breasts

1. Location on the chest wall
2. Underlying structures
3. Glandular structure: lobes, lobules, alveoli/histology
4. The nipple and ductal elements
5. Variations in anatomy: polymastia, polythelia
6. Vasculature, innervation and lymphatic drainage

### B. Breast embryology

### C. Breast physiology

1. The effect of hormones and steroids on breast function
2. Breast function in adolescence, the reproductive years, pregnancy, lactation and menopause
3. Hormonal influence on breast disease

### D. Congenital Disorders

1. Developmental breast abnormalities
  - a. Growth, development, and pathologic anatomy
  - b. Surgical and nonsurgical treatment of amastia, Poland's syndrome, ectopic mammary tissue, virginal hypertrophy, gynecomastia, breast asymmetry, tuberous breasts, contour deformities, inverted nipples, nipple shape/size abnormalities

### E. Benign and Malignant Breast Abnormalities

1. Gynecomastia
  - a. Diagnosis
  - b. Treatment
2. Fibrocystic disease and other benign tumors and processes (fibroadenomas, papillomas, atypical hyperplasia etc.)
  - a. Histology/pathology
  - b. Medical treatment
  - c. Surgical therapy
3. Premalignant and malignant conditions of the breast (Ductal Carcinoma both invasive and in situ, Lobular Carcinoma both invasive and in situ, inflammatory breast cancer, Phyllodes tumor, Paget's Disease, etc.)
  - a. Pathology and biologic behavior
  - b. Diagnostic techniques
    1. Imaging: mammography, ultrasound, MRI, CT
    2. Biopsy: fine needle aspiration, wire-guided, incisional, excisional
  - c. Staging
  - d. Genetic evaluation
    1. Management of high-risk patients (BRCA, ADH, LCIS, etc.)
  - e. Chemotherapy
  - f. Radiotherapy
  - g. Surgical treatment
    1. Lumpectomy/partial mastectomy
    2. Mastectomy (nipple-sparing, total, modified radical, radical)
  - h. Management of local recurrence
  - i. Management of metastatic disease

### F. Post-Oncologic Breast Deformities/Reconstruction

1. Pathologic anatomy
2. Breast reconstruction following mastectomy
  - a. Tissue expanders
  - b. Implants
  - c. Flaps, free or pedicled



- d. Oncoplastic techniques
- e. Nipple reconstruction and tattoo
- f. Other procedures, e.g. fat transfer, use of acellular dermal matrix, etc.
- g. Management of contralateral breast
  - 1. Prophylactic mastectomy/reconstruction
  - 2. Procedures for symmetry with reconstructed breast
- G. Aesthetic and Functional Problems of the Breast
  - 1. Mammary hypertrophy
    - a. Histology, clinical features
    - b. Surgical therapy
    - c. Indications and contraindications
    - d. Complications and their management
  - 2. Mammary hypoplasia
    - a. Techniques for correction, e.g. implants, fat transfer, flaps
    - b. Indications and contraindications
    - c. Complications and their management
    - d. Capsular contracture – etiology, prevention and management
    - e. Long-term management including mammography, MRI, ultrasound
      - 1. Management of implant failure
  - 3. Mammary ptosis
    - a. Diagnosis
    - b. Surgical techniques
    - c. Indications and contraindications
    - d. Complications and their management