1. Principles of clinical surgery

Case taking- History, physical examination, Demonstration of physical signs
Clinical assessment of surgical conditions

2. Principles of Preoperative management

Investigations in surgical practice- Scientific principles, Methodology of investigation of surgical case.

Assessment of fitness for surgery and anesthesia. Tests of respiratory cardiac and renal function Patho- physiology of respiratory, cardiovascular and renal systems. Management of associated medical conditions with a knowledge of pathophysiology diabetes mellitus respiratory disease, cardiovascular disease, bleeding disorders, seizure disorders, neurological diseases, malnutrition, anemia, jaundice, steroid, anticoagulant, immune- suppressant and other drugs therapy and drug therapy and drug therapy and management of psychiatric disorders.

Pre medication and sedation
Prophylaxis prevention and risk factors of thromboembolism

3. Intra operative care

Principles of anaesthesia
Care and monitoring of anaesthesia patient
Recovery from anaesthesia, recovery room

4. Principles of post operative care

Post operative management
Post operative monitoring
High dependency unit, intensive care unit
Assessment and maintenance of fluid and electrolyte balance
Care of tubes, drains and dressings
Pathophysiology, prevention, prevention, recognition and management of postoperative complications. Respiratory infections, atelectasis and failure, deep vein thrombosis, pulmonary, embolism, myocardial infarction, cardia failure and cardiac arrest, hæmorrhage, fluid and electrolyte imbalance, shock, retention of urine renal failure, paralytic ileus, constipation, jaundice, sepsis, wound complications hematoma, infection, dehiscence, cerebral complications and psychiatric disorders.
Blood transfusion indications, hazards, complications, plasma substitutes, blood component therapy.
Techniques of venous access
Nutrition in postoperative patients
Post operative drug therapy

5. Surgical sepsis, prevention and management

Surgical infection- wound infection
Surgically important micro organisms
Principles of microbiology of body’s response to infection, SIRS, sepsis, severe, sepsis, septic shock.
Sources of surgical infection- prevention, control, investigation and treatment of surgical infections.
Principles of asepsis and antisepsis
Aseptic techniques, cross infection, sterilization, disinfection
Antibiotic prophylaxis
Principles of antibiotic, therapy, antibiotics in surgery

6. Infections and infestations of surgical importance

Bacterial- Clostridial- tetanus, gas gangrene
Salmonella
Mycobacteria- tuberculosis, leprosy
Treponema- syphilis
Actinomycosts
Anthax
Chancroid, gonorrhea, LGV, granuloma inguinale
Viral- Herpes simplex infections
Cytomegalovirus infection
Viral hepatitis- A,B,C,D,E
HIV infection- AIDS
AIDS and surgical practice
Fungal candida, Aspergillus, Mycetoma
Parasitic- Hydatid disease, filariosis, amoebiasis, malaria ascariasis

7. Principles of nutrition in surgical practice, nutrition in surgical patients and rehabilitation

Nutrition assessment in surgical practice including pre operative and post operative malnutrition.
Nutritional requirement
Indication of nutritional support
8. Metabolism in surgical patients

Metabolism of protein and carbohydrate
Protein requirements and turnover
Respiratory quotient
Energy- caloric requirements
Calorie- Nitrogen ratio, Role of fat as caloric source, Regulatory mechanism
metabolic response to trauma, surgery, sepsis and starvation.

9. Clinical immunology & Organ transplantation

Immune system- components, function
Immune response
Major histocompatibility complex (MHC)
Immune suppression, immune suppressive drugs, problems with immune suppression
Transplantation
Immunology
Organ donation, preservation
Tissue typing
Technical aspects of transplantation of kidney, heart pancreas, lung, liver, heart lung
and intestine
Ethical aspects of organ transplantation
Indian Law of Organ Transplantation

10. Surgical technique and principles of operative surgery

Skin preparation
Local anaesthesia-techniques
Incision, placement and techniques of closure
Suture & ligature materials
Suture techniques, anastomosis, tissue handling
Dressings
Tubes and drains, Catheters Cannulae
Methods of hemostasis
Principles of wound Management
Classification of surgical wounds
Pathophysiology of wound heating
Scars & Contracture, wound dehiscence
Excision of cysts and benign tumors of skin & subcutaneous tissue
Drainage of abscess
Growing, Masks, Scrubbing up, Gloves
Customs and conduct in operative theatre (Basic surgical skills training mandatory)

11. Technology in surgical practice

Diathermy principles, Usage, precautions
Lasers in surgical practice-principles, usage, precautions
Ultrasonic’s in surgical practice
Endoscopic in surgical practice
Endoscopes, thoracoscope, laparoscope scientific operation complications
Instruments for operative surgery
Operating for operative surgery
Operating microscopes
Monitors in surgical practice
Ventilators
Properties of various implant materials
Operation theatre technology
Technology of illumination (lighting) in surgical practice
Computers in surgical practice
Robots in surgical practice
Internet and surgeon
Tele surgery
Applications of principles of information technology in surgical practice

12. Trauma management

Applied basic sciences relevant to the assessment of injured patients and to the understanding of
Disorders of function caused by trauma hemorrhage and shock
Epidemiology of trauma in India
Mechanisms of trauma-blunt, sharp & Blast injury.
Metabolic response to trauma
Principles of pre-hospital care. First and ambulance service emergency management team, transport of trauma patients
Clinical assessment and management of trauma victim
Priority decisions in trauma management
Resuscitation – airway breathing & circulation management
Monitoring & repeated clinical assessment
Management of airway
Management of hemorrhage and shock
Management of traumatic wounds
13. Intensive care and management of critical illness

Intensive care-principles & practice
Intensive care unit-structure & function
Indication of admission to ICU
Clinical assessment of critically ill
Scoring systems
Monitoring in ICU
Transportation of the critically ill patients
Applied cardiovascular and respiratory physiology: Assessment
Pathophysiology of shock & management
Respiratory and cardiovascular support
Cardiopulmonary resuscitation
Acute renal failure, dialysis
Hepatic failure: Assessment and management
Selective decontamination of gut
Alimentary system management
Nutrition: Fluids & electrolyte management. In critically ill
Prevention of stress ulceration
Psychological & behavioral problems in ICU patients
Management of unconscious patient
Multiple organ dysfunction syndrome

14. Principles of diagnostic & therapeutic radiology

Imaging methods and principles of functioning-plain radiography contrast radiography ultrasound, CT scan, MR imaging scintigraphy etc.
Imaging of body systems
Interventional radiology: Importance in surgical context- binary vascular, renal etc.

15. Principles of clinical oncology

Molecular biology of cancer
Carcinogenesis
Molecular basis of carcinogenesis tumor kinetic
Genetics & cancer
Pathological classification of tumors- in general
Staging of cancers
Mechanisms of metastasis
Premalignant conditions
Epidemiology of common cancers, cancer registers
Diagnostic modalities
Cancer screening. Tumor markers
Clinical problems associated with cancer
Treatment modalities in general surgery chemotherapy, radiotherapy, hormonal
therapy immunotherapy
Terminal care of cancer patients psychological factors, pain relief

16. Principles of pathology in surgical practice

Biopsy techniques & cytological examination
Excision biopsy, incision biopsy, FNAC brush cytology, endoscopic biopsy
Basics of handling of specimen
Tissue processing, cutting & staining
Frozen section biopsy
Enzyme histochemistry
Immunohistochemistry
Electron microscopy

17. Pharmacology in surgical practice

Principles related to drug action
Half life, bioavailability , volume of distribution, clearances, drug interaction advice
drug reactions
Drug therapy in surgical practice-anticoagulants, diuretics inatropics, drugs, steroids,
analgesics
Drug therapy in of diabetes mellitus, hypertension and bronchospasm
Drug therapy in young and old age
Drug usage in pregnancy
Drug usage in diseased states-renal failure, liver disease cardiac failure

18. Principles of genetics & genetic aspects of surgical practice

Fundamentals of genetics- chromosomes, genes, genetic code. Structure of DNA
mutations,
inheritance, polymerase chain reaction gene mapping.
Applied genetics in diagnosis and management pedigree analysis, prenatal diagnoses,
common genetic diseases encumbered in surgical practice. Screening consideration
counseling.

Gene therapy

III) General Principles in Surgical Practice

Decision making in surgical practice
Principles of good surgical practice
Consent for surgical treatment informed consent unconscious patient, consent for children, mental handicap and psychiatric illness. Informed consent and surgical research – Nuremburg code.
Surgical Audit
Economic aspects in surgical practice
Principles of management in surgical care delivery
Principle of management in surgical care delivery
Principle of referral practice in surgery
Medical documentation & information systems
Quality assurance in surgical practice
Principles of research and design & analysis of clinical trials
Quality of Life assessment – part of surgical research
Critical evaluation – literature and innovations
Medicolegal aspects in surgical practice
Ethical aspects in surgical practice
Communication with patients, relative and colleagues
Decision, certification and declaration of death
Decision on brain death
Psychological effects of Surgery and bereavement
Civil responsibilities of surgeon in practice

IV) Systemwise Operative Surgery

1 Abdominal surgery
2 Haemopoietic
3 Vascular surgery
4 Head and neck surgery
5 Endocrine surgery
6 Breast
7 Thoracic surgery
8 Plastic and reconstructive surgery
9 Genito urinary surgery
10 Nero surgery
11 Orthopedics and traumatology
12 Pediatric surgery
13 Faciomaxillary surgery
14 Minimal Access Surgery
Operative Surgery of Systems in detail

1) Abdominal Surgery

Surgical anatomy of abdomen & viscera
Applied physiology of GIT
Clinical presentation, pathology and pathophysiology of disease process
Investigative modalities & indications
Management decisions
Condition affecting Stomach, duodenum Small Intestine, Hepatobiliary System
Pancreas and Large Intestine & Appendix
Abdominal wall hernia, complication, management
Conditions affecting retroperitoneum, retroperitoneal tumors
Mesentery, peritoneal cavity, mesenteric tumors, peritonitis, ascites, mesothelioma,
intrapерitoneal abscesses
Surgical management of obesity
Abdominal trauma – investigation and management with respect to organ
involvement.
Abdominal emergencies – investigation, management
Principles of operative surgery-
Decision making Pre-operative preparation
Incisions and access
Abdominal closure methods.
Laparostomy
Gastrostomy, ileostomy, colostomy and ostomy management
Gastrointestinal fistulae – management

2. Haemopoetic and lymphatic system

Anatomy & physiology of spleen, lymphnodes and lymphatics system investigative
modalities
Splenomegaly - causes, management
Spleenic trauma, splenic conservations, management of Lymphedema

3. Vascular surgery

Vascular anatomy of body
Newer concepts in vascular physiology endothelium dependent relaxation factor
Pathology of aneurysms, thrombosis, embolism, atherosclerosis Investigative
modalities in vascular surgery
Doppler, Duplex scan, angiogram, DSA, Magnetic Resonance Angiogram
Angioscopy,
Transcutaneous oxygen tension
Varicose veins
Deep vein thrombosis
Vascular malformations
Oclusive arterial diseases – evaluation, management
Arterial aneurysms – Aortic aneurysms
Vascular trauma
Angioplasty & endovascular procedures
Vascular prosthesis, vascular reconstruction Principles of operative surgery vascular bypass.
Carotid body tumor.
Mesenteric and renal vascular disease

4. Head and neck surgery

Surgical anatomy of nasopharynx, oropharynx oral cavity and neck salivary glands, nose & ear, & Principles of investigation.
Neck lumps – differential diagnosis, pathology, investigations and management
Thyroglossal cyst, fistula
Lymphangiomas
Neurogenic tumors of neck
Head and neck cancers – management
Neck dissections for malignancy – radical, modified radical, functional and selective neck injuries
Diseases of salivary glands, salivary gland tumors
Principles of operative surgery- head and neck
Reconstruction after radical surgery – head and neck

5. Endocrine Surgery

Surgical anatomy of thyroid, parathyroid and adrenal
Physiology of thyroid parathyroid and adrenal
Disorders in function
Principles of investigation of disease process
Hyperthyroidism hypothyroidism
Solitary nodule thyroid- pathology investigation
Diseases affecting thyroid gland
Tumours of thyroid papillary carcinoma, follicular carcinoma, medullary carcinoma anaplastic carcinoma investigations, management.
Surgery of thyroid gland- thyroidectomy- technique complications
Hyper parathyroidism, hypoparathyroidism
Parathyroid tumors
Surgery of parathyroid
Functional disorders of adrenal gland
Tumors of adrenal gland
Pheochromocytoma
Neuroendocrine tumors- carcinoids
Paraneoplastic syndromes

6. Breast

Surgical anatomy and applied physiology
Investigations for breast disease
Mammogram
Breast infections
Nipple discharge, breast lumps- pathology and investigations
Benign breast disease mastalgia
Carcinoma of breast- epidemiology, aetiology and risk factors, pathology, staging, investigations and treatment:
Carcinoma breast during pregnancy & lactation
Mastectomy- principles of operative surgery
Excision biopsy of breast lumps
Breast conservation in malignancy
Breast reconstruction
Aesthetic breast surgery
Gynaecomastia male breast
Male breast cancer

7. Thoracic Surgery

Surgical anatomy of chest, mediastinum, airway & lungs, diaphragm, heart & great vessels in thorax and esophagus.
Surgical physiology of chest, pulmonary system esophagus and heart
Bronchoscopy & mediastinoscopy
Trauma to chest- principles of clinical examination, investigations and management
Pneumothorax
Tube thoracostomy
Pleural effusion
Infections of lung, pulmonary tuberculosis
Emphyema
Bronchectasis
Emphysema
Pulmonary aspergillosis
Tumors of pleura and lungs; Thoracoscopy; thoracoscopic surgery
Techniques of thoracotomy & thoracic surgery
Mediastinal tumors
Deformities of chest wall
Chest wall tumors
Investigations for esophageal disease- esophagoscopy, manometry, ambulatory pH monitoring; Gastro esophageal reflux disease
Hiatus hernia
Barret’s esophagus
Esophageal trauma
Esophageal diverticula
Tumours of esophagus
Surgery of esophagus
Congenital anomalies of heart & great vessels and surgical management
Cardiopulmonary by pass- general principles
Principles of myocardial revascularization surgery, coronary artery bypass graft (CABG)
Injury to heart and great vessels
Aneurysms of thoracic aorta, aortic dissection
Complications of thoracic surgery
Diaphragmatic hernia, eventration of diaphragm, traumatic rupture of diaphragm
8. Plastic and Reconstructive surgery

Principles of plastic surgery- tissue handling excision & revision of scars and contractures, skin grafting flaps microsurgery, bone grafting nerve repair.
Reimplantation of amputated limbs, digits and organs
Care of burns and complications
Cosmetic Surgery
Reconstructive surgery reconstruction after head and neck surgery reconstruction of chest wall defects, reconstruction of abdominal wall
Hernia surgery
Craniofacial surgery

9. Genito urinary surgery

Surgical anatomy and physiology of genitor urinary system
Symptomatology and clinical examination
Investigations- GU disease
Oliguria, anuria- investigation, management
Congenital anomalies- genitourinary system
Hematuria
Infections of urinary tract
Tuberculosis of kidney and urinary tract
Renal trauma, trauma of urinary tract
Tumors of kidney and urinary tract
Urinary retention
Urinary incontinence
Urinary fistulae
Urinary diversion
Diseases of prostate and seminal vesicles
Carcinoma of prostate
Hypospadias, epispadias, phimosis
Urethral injuries
Extravasation of urine
Urethral strictures
Paraphimosis
Carcinoma of penis
Imperfect descent of testes
Torsion testes
Hydrocele, scrotal swellings- investigations, pathology, treatment
Epididymo orchitis
Testicular tumors
Fourniers gangrene
Carcinoma of scrotum
Infertility investigations, management
Impotence -Management
Prosthetics in urological surgery
Principles of operative surgery- exposure of kidney, nephroectomy, surgery for renal injuries
Genitourinary stents
Renal transplantation
10. Neurosurgery

Fundamental anatomy of skull & brain
Investigations in neurosurgical practice- CT scan, angiogram, MRI Biopsies
Congenital anomalies of central nervous system
Skull tumors
Head injury – assessment, classification, investigation, treatment
Intracranial pressure monitoring
Brain tumors- pathology, treatment
Intracranial infections- meningitis, brain abscess
Intracranial hemorrhage
Hydrocephalus
Principles of operative surgery- burr hole, craniotomy, reconstruction of skull bone defects, drainage of intracranial hematoma
Post operative management in neurosurgical patients
Stereotactic surgery

11. Orthopedics and Traumatology

Surgical anatomy of upper limb lower limb, pelvis and spine
Osteoarthritis
Ankylosing spondylitis
Osteomalacia
Osteomyelitis, Joint infections
Joint effusions
Joint and bony deformities and correction
Bone tumors, soft tissue tumors
Deformities of spine
Paraplegia, quadriplegia
Tuberculosis of bones, joints and spine
Tumors of spinal cord and vertebrae
Management of fractures
Fractures and dislocations - upper limb and lower limb
Pelvic fractures
Spinal trauma
Tendon injuries and management
Joint replacement
Peripheral nerve injuries and repair
Hand infections and injuries
Amputations

12. Pediatric surgery

Essentials of anatomy of neonate
Physiology of new born
Principles of surgery and anaesthesia in new born and children
Fluid and electrolyte management
Common congenital anomalies- cleft lip, cleft palate, tracheoesophageal fistula, gastroschisis, exomphalos, umbilical & inguinal hernia, phimosis, undescended testis.
Hypertrophic pyloric stenosis
Torsion testes, acute scrotum
Acute abdomen in neonates and children
Pediatric malignancies- neproblastoma, neuroblastoma
Jaundice biliary atresia
Malrotation of intestine
Intestinal atresia
Meconium ileus
Imperforate anus
Hirschprung’s disease
Bleeding per rectum, hematuria

13. Facio- maxillary surgery

Surgical anatomy of face and facial skeleton
Imaging anomalies
Surgical principles of correction and techniques of correction of faciomaxillary congenital anomalies
Principles of surgery of face
Surgical techniques placement of incisions
Tumors of face pathology and management
Tumors of facio- maxillary skeleton pathology investigations and management
Jaw tumors, malignant tumors of mandible maxilla
Congenital and developmental anomalies of teeth
Impacted unerupted teeth
Odontomes, odontogenic tumors
Dental caries, dental infections, alveolar abscess periodontal disease
Surgically important complications of dental disease
Osteomyelitis of jaw
Swellings of gums
Cysts of jaw
Faciomaxillary trauma principles of management- assessment, primary management maintaining airway imaging, surgical principles of treatment
Features of maxilla- Le Fort Classification
Fractures of mandible dislocation
Fracture of zygomatic bone and arch
Innovations in faciomaxillary surgery cranio orbital- Facial surgery

14. Minimal Access Surgery (MAS)

Evolution of MAS
Demerits of conventional open surgery
Nature and principles of MAS
Scope of MAS- Laparoscopic, Thoracoscopic, Endoluminal (CPI and vascular), Perivisceral endoscopic endopelvic, intra articular joint surgery, intracranial spinal combined (MAS combined with open surgery, combined MAS)
Techniques of MAS- in GI surgery, Urological surgery, Thoracic Surgery, Orthopaedics, cardiovascular surgery and Neurosurgery
Pathophysiology of pneumo peritoneum
Principles of anaesthesia relating MAS
Hazards & limitations of MAS
Innovations- in principles and technology of MAS
Standardization of training in MAS