

Passed by Academic Council (Resolution No. 355/2006) dtd. 30/05/2006, subject to Uniformity in the Examination pattern.

The Curriculum

Goals

The goals of postgraduate training course in Surgery would be to train a MBBS doctor who will Practice surgery efficiently and effectively backed by scientific knowledge and skill .

No syllabus can be comprehensive but the following topics are not intended to be prescriptive but it is a guide to the topics which need to be covered during training.

At the end of the training and evaluation,

- He will develop right attitudinal skills which will ensure effective and correct communication with patients, relatives, colleagues and superiors
- Continue to develop keen interest in continuing surgical education irrespective of whether he is in a teaching institution or is in Private practice
- Be a motivated 'teacher' - defined as a surgeon keen to share his knowledge and skills with a colleague or a junior or any learner.

Objectives of the Course

The following objectives are laid out to achieve the goals of the course. These objectives are to be achieved by the time the candidate completes the course. The objectives may be considered under the subheadings

1. **Knowledge (Cognitive domain):** Knowledge and information about the subject, Recall of and Analysis of available information to be used for the treatment of patients.
2. **Skills (Psycho motor domain):** The correct skills to be developed by working in a dry lab as well as surgeries on animals (Minimal access Surgery). He/She should develop surgical skills by assisting seniors as well as being assisted by seniors
3. **Human values:** Ethics involved in Surgical practice

At the end of the training, the candidate must be able to:

Knowledge:

- Describe etiology, pathophysiology, principles of diagnosis and management of common surgical problems including emergencies, in adults and children.
- The candidate should be conversant with Homeostatic mechanism and Fluid Electrolyte balance and replacement therapy including blood transfusion, plasma expanders and treatment of various types of shock.
- Nutrition : Assessment, Management of parenteral and enteral nutrition
- Disorders of coagulation pertaining to surgeries, DVT , Thrombophilia
- Describe common malignancies in the country and their management

- Recognize conditions that may be outside the area of his specialty / competence and appropriate referral to specialist
- Advise regarding the operative or non-operative management of the case and to carry out this management effectively.
- Update himself by self-study and by attending courses, conferences and seminars relevant to surgery.
- Teach and guide his team, colleagues and other students.
- Undertake audit, use information technology tools and carry out research, both basic and clinical, with the aim of publishing his work and presenting his work at various scientific forums.

Skills

- Take a proper clinical history, examine the patient, perform essential diagnostic procedures and order relevant tests and interpret them to come to a reasonable diagnosis about the surgical condition.
- Perform *minor* operative procedures and common general surgical operations independently and the *major* procedures with help from a senior surgeon.
- provide basic and advanced life saving support services (BLS & ALS) in emergency situations
- manage acute abdominal emergencies and poly trauma.
- Undertake thorough wound management, including burn wounds.
- Undertake complete patient monitoring including the preoperative and post operative care of the patient.
- Use of antibiotics in Surgery, Surgical infections' & use of Prophylactic antibiotics

Human values, Ethical practice and Communication abilities

- Adopt ethical principles in all aspects of his surgical practice. Professional honesty and integrity are to be fostered. Surgical care is to be delivered irrespective of the social status, caste, creed or religion of the patient.
- Develop communication skills, in particular the skill to explain various options available in management and to obtain a true informed consent from the patient.
- Provide leadership and get the best out of his team in a congenial working atmosphere.
- Apply high moral and ethical standards while carrying out human or animal research.
- Be humble and accept the limitations in his knowledge and skill and to ask for help from colleagues when needed.
- Respect patient's rights and privileges including patient's right to information and right to seek a second opinion.

Course Contents

Essential Knowledge

A list of objectives related to knowledge and higher cognitive abilities that are expected to be achieved during the course is given. The course contents have been identified and categorized as essential knowledge as under. This is to enable the student to achieve the objectives of the course. It is recognized that General surgery today mainly covers Gastrointestinal & Hepatobiliary disorders, basic urological problems, abdominal wall herniae, Breast & thyroid disorders, knowledge of some common problems in allied specialities. Further he should be familiar with complications, current controversies and recent advances in these topics.

The topics are considered under:

- Basic sciences,
- General Surgery topics and
- Specialty topics.

There will be an overlap between the General surgery and specialty categories.

Basic sciences include anatomy, physiology, biochemistry, microbiology and pathology and Radiology, as found in current text books. These standard topics are recommended to be studied as much as they are applicable to the practice of surgery.

General Surgery Topics include the following:

History of surgery

Clinical History and examination - detailed systematic history taking, clinical examination of various systems, coming to a provisional working diagnosis.

Rationale of diagnostic tests - Ordering diagnostic tests with prioritizing the needs, based on the clinical, hospital and the patient's socioeconomic condition

Informed consent / Medico legal issues - Understanding the implications of acts of omission and commission in practice. Issues regarding Consumer Protection Act. - Implications in a medico-legal case like accidents, assaults etc.

Concept of Essential Drugs and Rational use of drugs

Pharmacoeconomics

Surgical audit - Understanding the audit of process and outcome. Methods adopted for the same.

Basic statistics

Evidence based medicine - Understanding journal based literature study; the value of text book, reference book articles; value of review articles; original articles and their critical assessment. Understanding the value of retrospective, prospective, randomized controlled and blinded studies. - Understanding the principles and meanings various biostatistical tests applied in these studies.

Use of computers in surgery: Retrieval of important information, Record keeping, Powerpoint presentations for teaching, Statistical methods

Preoperative evaluation of patients with Co-morbid conditions

Principles of operative surgery like asepsis, antisepsis, sterilization. Basic surgical techniques; properties of suture materials; appropriate use of sutures, drains, prosthetic grafts. Postoperative care - concept of recovery room care; airway management; assessment of wakefulness; management of cardiovascular instability in this period. Post operative pain management as well as care of terminally ill patients especially cancer patient. Basic surgical instrumentation - Principles of surgical instrumentation; their maintenance and troubleshooting. Familiarize with minimal access surgery instruments, Diathermy & lasers.

Wound management: wound healing; factors influencing healing;

Assessment of trauma; Assessment of head, chest and abdominal trauma and triage - Assessment of a trauma victim; resuscitation; care at the site; triage; care in the accident department; criteria for immediate surgery; immediate workup and logical referral criteria. Multiple injured patient, closed abdominal and chest injuries, penetrating injuries; fractures pelvis; urological injuries; vascular injuries; trauma scores.

Surgical infections - asepsis and antisepsis; microbiological principles; rational use of antibiotics; special infections like synergistic gangrene and diabetic foot infections. Hepatitis and AIDS

Surgical nutrition - nutritional assessment; metabolic response to stress; need for nutritional support; enteral nutrition; routes of access to GI tract; parenteral nutrition; access to central veins for nutritional support.

Acute abdomen - Appendicitis / Peritonitis / Perforated viscus / Intestinal obstruction

Hernias - simple and complicated - various types of hernias; their repair; prosthetic materials

Critical care - Cardiorespiratory failure - management of shock; including monitoring; sepsis scores; pharmacological support.

Fluid and electrolyte balance / Acid - Base metabolism - The body fluid Compartments; metabolism of water and electrolytes; factors maintaining homeostasis; causes for and treatment of acidosis and alkalosis.

Pain control - acute and chronic pain; cancer and non-cancer pain; patient controlled analgesia.

Principles of oncology - cell kinetics; causation of tumours; principles of oncologic surgery, radiotherapy and chemotherapy; paraneoplastic syndromes; cancer pain management; palliative care

Principles of burn management - types of thermal injury; assessment of extent; immediate management; late management; skin cover; rehabilitation

Principles of fracture management - fracture healing; principles of immobilization; complications; principles of internal fixation.

Airway obstruction / management - anatomy of the airway; principles of keeping the airway patent; mouth to mouth resuscitation; oropharyngeal airway; endotracheal intubation; crico-thyroidotomy; tracheostomy.

Breast disease - benign and malignant disease; diagnosis; investigation; screening for cancer; genetics of breast cancer

Thyroid disease - solitary nodule; investigations; multinodular goiter; Hashimoto's disease; cancer

Specialty Topics Include

GI endoscopy and Laparoscopy:

Principles of GI endoscopy

Diagnostic and therapeutic GI endoscopy including upper GI, lower GI and pancreaticobiliary systems.

Physiology of pneumoperitoneum. Diagnostic laparoscopy & Laparoscopic therapeutic procedures

Neurosurgery :

Head and neck trauma; acute management and rehabilitation

Concept of brain death / medico-legal implications

Peripheral nerve injuries

Neoplasms of the brain and meninges

Acute and chronic infections of the brain and meninges

Hydrocephalus

Spinal injuries

Monitoring intracranial tension

Urology:

Urological injuries

Urothelial tumours / Chemotherapy

Prostatic hypertrophy

Hypospadias

Pyelonephritis / perinephric abscess

GU tuberculosis

Scrotal disease

Endourology

Peritoneal dialysis / CAPD / haemodialysis

Transplantation / harvesting kidney

Urinary diversion

Infertility / Vasectomy

Pyeloplasty / hydronephrosis

Oncology:

Breast, thyroid and GI malignancies

Chemotherapy / Adjuvant therapy

Head and neck tumours

Imaging CT/ MRI CT guided FNAB/C

Post excision reconstruction

Radiotherapy

Plastic Surgery

Burns management

Cleft lip and palate

Congenital defects of hand

Details of skin flap

Facial injuries

Hand injuries / tendon injury

Hypospadias

Nerve repair

Pressure sores

Principles of microsurgery

Principles of tissue transfer

Vascular repair

Cardio-thoracic surgery

Flail chest / thoracic trauma Bronchogenic carcinoma Lobectomies

Pneumonectomy

Endocarditis prophylaxis

Pulmonary function tests

Control of major haemorrhage

Operations on the diaphragm

Coronary artery disease

Valvular heart disease

Lobectomies and pneumonectomies

Oesophageal disease

Operations on thoracic aorta

Mediastinal tumours

Basics of congenital heart disease

Vascular Surgery

Vascular imaging

A V malformations

Exposure of major arteries and veins / vascular anastomosis

Varicose veins

Chronic venous insufficiency.

Vascular emergencies - trauma, embolism

Peripheral vascular disease - Atherosclerosis, arteritis

Details of vascular prosthesis

Paediatric Surgery

Fluid and electrolyte management

Preparation for surgery / post op care

Hernias

Spinal fusion defects Ventral defects

Operative Skills:

Emergency Room Procedures

Application of Splints for Fractures

Arterial and Venous Lines

Assessment and initial management of Poly trauma

Cardiopulmonary Resuscitation

Management of Airway Obstruction

Management of Shock and Cardiac Respiratory failure

Pre-operative Workup

Ability for adequate pre-operative preparation in special situations like Diabetes, renal failure, cardiac and Respiratory failure etc. and risk Stratification

Communication skills with special reference to obtaining Informed Consent

Proper pre-operative assessment and preparation of patients including DVT prophylaxis, Blood transfusion and Antibiotics

Post-operative Care

Airway management

Basic Physiotherapy

Management of epidural analgesia

Management of Fistulae

Management of postoperative hypo and hypertension

Postoperative pain control

Skills for Nutritional rehabilitation of patients

Skills for proper Fluid & Antibiotic management

Stoma care

Minor O. T. procedures

Circumcision under Local Anesthesia

Drainage of Abscesses

FNAC

Major dressings

Minor Anorectal Procedures (Haemorrhoids -Banding, Cryotherapy, suturing etc.

Anal dilatation and Fissures), Fistulectomy

Minor Biopsies - Lymph node, ulcer, swellings etc.,

Reduction and plaster application of simple fractures and dislocations

Removal of simple subcutaneous swellings

Sigmoidoscopy and Upper OJ. endoscopy

Suturing Techniques

Vasectomy

Wound debridement

Major Operating room techniques

Instrument arrangement and trolley layout

Skills in Sterilization techniques, O.T. Layout and Asepsis

Skin preparation - painting and draping

Technique of scrubbing and gowning

General Surgical Operative Procedures

Appendectomy

Cholecystectomy

Closure of Colostomy

Closure of peptic ulcer / under-running bleeding ulcer / vagotomy drainage

Colostomy

Cysts and sinuses of the neck

Diagnostic laparoscopy

Drainage of breast abscess / Excision of breast lump

Groin Hernia repair

Gynaecomastia

Haemorrhoidectomy / Fissurectomy / simple fistulectomy

Hemicolectomy

Herniotomy / Orchidopexy in children

Laparotomy for abdominal trauma / splenectomy

Laparotomy for intestinal obstruction / bowel resections / bowel anastomosis Management of complex wounds

Mastectomy

Opening and closing the abdomen

Opening and closing the chest

Parotidectomy

Release of bands and simple adhesive obstruction

Thyroid lobectomy

UGI endoscopy / Flexible sigmoidoscopy

Ventilation

Wide excision of breast tumours / mastectomy / microdochectomy

Gastrostomy / Feeding jejunostomy

Speciality Procedures

There will be repetition of the procedures listed under this category and those listed under General surgical procedures.

Laparoscopy And GI Endoscopy

Diagnostic and therapeutic Upper and Lower GI endoscopy

Diagnostic laparoscopy

Diagnostic Upper GI endoscopy

Laparoscopic Cholecystectomy

Neurosurgery

Craniotomy

Management of paraplegia

Peripheral nerve repair

Treatment of nerve injury specific operations

Suturing complex scalp wounds

Trephining

Urology

Carcinoma penis

Diagnostic cystoscopy

Inguinal Block Dissection

Meatotomy

Nephrectomy - partial & total

Nephrolithotomy

Orchidectomy

Orchidopexy

Retroperitoneal lymph node dissection

Supra pubic cystostomy

Total amputation of penis

TURP / Open prostatectomy

Ureterolithotomy

Urethral J Urogenital injuries

Urethral dilatation

Varicocele

Vasectomy

Oncology

All radical operations - Breast, Thyroid, GI and Facio-maxillary malignancies

Breast lumpectomy

Functional neck node dissection

Gastrectomy / Bowel resection

Metastatic workup

Plastic Surgery

Burn resuscitation

Lip surgery

Local blocks in anaesthesia

Minor hand injuries

Nerve repair

Post excision reconstruction

Reimplantation of digits

Skin flap surgery

Stitch craft

Tendon repair PA

Wound debridement

Paediatric Surgery

Anorectal anomalies

Circumcision I meatoplasty

Herniotomy

Intercostal aspiration

Laparotomy for peritonitis

Lymph node biopsy

Non operative treatment of volvulus

Orchidopexy

Ostomies

Paediatric emergencies

pyloromyotomy

Cardiothoracic Surgery (Not essential)

Canulation of artery and vein

Chest injuries PA

Empyema drainage / decortication

Endotracheal intubation

Intercostal drainage

Lobectomies and pneumonectomies

Oesophageal surgery

Opening and closing the chest

Operations on the root of the neck

Pericardiectomy

Removal of FBs

Remove pulse generator (pacing)

Rib resection PA

Tracheostomy
Undertake sternotomies
Vein and arterial harvesting
Ventilator management
Vascular Surgery

Teaching and Learning Activities

A candidate pursuing the course should work in the institution as a full time student. He should be included in Residency program No candidate should be permitted to run a clinic/laboratory/nursing home while studying postgraduate course. Each year should be taken as a unit for the purpose of calculating attendance.

Every student shall attend teaching and learning activities during each year as prescribed by the department and not remain absent himself / herself from work without valid reasons.

A list of teaching and learning activities designed to facilitate students acquire essential knowledge and skills outlined is given below. Depending on the facilities available, any or all of these methods may be employed.

1. **Lectures:** Lectures are to be kept to a minimum. They may, however, be employed for teaching certain topics. Lectures may be didactic or integrated.
 - a) Didactic Lectures: Recommended for selected common topics for post graduate students of all specialities. Few topics are suggested as examples:
 - 1) Bio-statistics
 - 2) Use of library
 - 3) Research Methods
 - 4) Medical code of Conduct and Medical Ethics
 - 5) National Health and Disease Control Programmes
 - 6) Communication Skills etc.

These topics may preferably taken up in the first few weeks of the 1st year.

- b) Integrated Lectures: These are recommended to be taken by multidisciplinary teams for selected topics, eg Jaundice, Diabetes mellitus, Thyroid Topics to be taken by Basic sciences specialist etc.
2. **Journal Club:** Recommended to be held once a fortnight All the PG students are expected to attend and actively participate in discussion and enter in the Log Book relevant details. Further, every candidate must make a presentation from the allotted journal(s) of selected articles at least two times a year and a total of 6 presentations in three years. The presentations would be evaluated using check lists and would carry weightage for internal assessment. A time table with names of the student and the moderator should be announced at the beginning of every year.

3. **Subject Seminar:** Recommended to be held once a month All the PG students are expected to attend and actively participate in discussion and enter in the Log Book relevant details. Further, every candidate must present on selected topics at least four times a year and a total of 12 seminar presentations in three years. The presentations would be evaluated using check lists and would carry weightage for internal assessment (See Checklist II of Internal Assessment). A timetable for the subject with names of the student and the moderator should be scheduled at the beginning of every year.
4. **Student Symposium:** Recommended as an optional multi disciplinary programme. The evaluation may be similar to that described for subject seminar.
5. **Ward Rounds:** Ward rounds may be service or teaching rounds.
 - a) Service Rounds: Postgraduate students and Interns should do ward rounds every day for the care of the patients. Newly admitted patients should be worked up by the PGs and presented to the seniors the following day.
 - b) Teaching Rounds: Every unit should have 'grand rounds' for teaching purpose. A diary should be maintained for day to day activities by the students.

Entries of (a) and (b) should be made in the Log book.

6. **Clinico-Pathological Conference:** Recommended once a month for all post graduate students. Presentation be done by rotation. If cases are not available due to lack of clinical postmortems, it could be supplemented by published CPCs.
7. **Inter Departmental Meetings:** Strongly recommended particularly with departments of Pathology and Radio-Diagnosis at least once a week. These meetings should be attended by post graduate students and relevant entries must be made in the Log Book.

Pathology: A dozen interesting cases may be chosen and presented by the post graduate students and discussed by them as well as the senior staff of Surgery department. The staff of Pathology department would then show the slides and present final diagnosis. In these sessions the advance immuno-histochemical techniques, the burgeoning markers other recent developments can be discussed.

Radio-diagnosis: Interesting cases and the imaging modalities should be discussed.
8. **Teaching Skills:** Post graduate students must teach under graduate students (Eg. medical, nursing) by taking demonstrations, bed side clinics, tutorials, lectures etc. Assessment is made using a checklist by surgery faculty as well students. Record of their participation be kept in Log book. Training of post graduate students in Educational Science and Technology is recommended.
9. **Continuing Medical Education Programmes (CME) :** At least 2 state level CME programmes should be attended by each student in 3years.
10. **Conferences:** Attending conferences is optional. However it should be encouraged.

11. **Dissertation** Every candidate pursuing MS degree course is required to carry out work on a selected research project under the guidance of a recognized post graduate teacher. The results of such a work shall be submitted in the form of a dissertation.

Rotation and posting in other departments

The listed knowledge and skills are to be learnt over a period of 3 years. The process is a continuous one. However the recommended period and timing of training in basic subjects, allied departments and speciality departments are given below.

In the first year, during the morning session, student should work in the parent department. It is recommended that 2 years and 4 months be spent in General Surgery and 8 months in allied and specialty departments. Depending on the time and opportunities available, some of the procedures listed for second year activity can be shifted either to the first or the third year. Students must be 'on call' on a regular basis. The total duration of postings in core and other specialities will be eight months.

Basic Sciences

Basic science should be an essential part of training. It should be done as concurrent studies during the 1st year of training. At least two hours daily may be in the first six months of the course.

In the afternoons basic science teaching relevant to surgery can be done in the respective departments.

Topics for study to include Anatomy, Physiology, Pathology, Microbiology, Pharmacology, Anaesthesia and Radiology

Pathology - Concurrent study - Recommend daily Grossing sessions, weekly Surgical pathology sessions and monthly Clinico Pathological Conferences. Radiology - Concurrent study - adequate exposure to modern imaging modalities like ultrasound sonography, CT scan, MRI and angiography.

Allied Specialty Subjects

Students should to be posted to core allied speciality subjects Viz. Anaesthesia and ICU for one month and Orthopaedics including trauma (accident and emergency) for 2 months during the second year of training. Posting to the Department of Obstetrics and Gynaecology for one month is optional. This posting may be in lieu of one of the other specialties (except the core specialties) depending on the choice of the candidate.

Other Surgical Speciality Subjects

Postings to other speciality departments will be during the second year. The departments and duration of postings are as under:

Department	Duration
• Paediatric surgery	4wks
• Plastic surgery	4wks
• Urology	4 wks
• Oncology	4 wks
• Cardiothoracic surgery	2 wks
• Neurosurgery	2 wks

Dissertation

1. The dissertation is aimed to train a post graduate student in research methods and techniques. It includes identification of a problem, formulation of a hypothesis, search and review of literature, getting acquainted with recent advances, designing of a research study, collection of data, critical analysis, comparison of results and drawing conclusions.
2. Every candidate shall submit to University in the prescribed proforma, a synopsis containing particulars of proposed dissertation work within six months from the date of commencement of the course on or before the dates notified by the University. The synopsis shall be sent through the proper channel.
3. Such synopsis will be reviewed and the dissertation topic will be registered by the University. No change in the dissertation topic or guide shall be made without prior approval of the University.
4. The dissertation should be written under the following headings:

- i Introduction
- ii Aims or Objectives of study
- iii Review of Literature
- iv Material and Methods
- v Results
- vi Discussion
- vii Conclusion
- viii Summary
- ix References
- x Tables
- xi Annexure

5. The written text of dissertation shall be not less than 50 pages and shall not exceed 150 pages excluding references, tables, questionnaires and other Checklists. It should be neatly typed in double line spacing on one side of paper (A4 size, 8.27" X 11.69") and bound properly. Spiral binding should be avoided. The dissertation shall be certified by the guide, head of the department and head of the Institution.
6. Four copies of dissertation thus prepared shall be submitted to the University, six months before final examination on or before the dates notified by the University.
7. The dissertation shall be valued by examiners appointed by the University. Approval of dissertation work is an essential precondition for a candidate to appear in the University examination.
8. **Guide:** The academic qualification and teaching experience required for recognition by this University as a guide for dissertation work be as per Medical Council of India Minimum Qualifications for Teachers in Medical Institutions Regulations, 1998. Teachers in a medical college/institution having a total of eight years teaching experience out of which at least five years teaching experience as Lecturer or Assistant Professor gained after obtaining post graduate degree shall be recognised as post graduate teachers. A **Co-guide** may be included provided the work requires substantial contribution from a sister department or from another medical institution recognised for teaching/ training by the University /Medical Council of India. The co-guide shall be a recognised post graduate teacher.
9. **Change of guide:** In the event of a registered guide leaving the college for any reason or in the event of death of guide, guide may be changed with prior permission from the university.

Practical Examination:

The Pattern of examination was earlier discussed during the meeting held in Mumbai on 5/5/06 at J.J.Hospital. All the members have agreed

Evaluation of Surgery and general topics:

Decision making in Surgery
Clinical audit

Statistics & computing in Surgery

Principles of research and design and analysis of clinical trials

Health service management and economic aspect of care

Medico legal aspect of surgical practice

Communication skills and Understanding psychological needs of the patient

Rehabilitation Screening programs their importance

Principles of surgery

Instrumentation

Video Camera

Telescopes

Diathermy

Argon beam Coagulator

CUSA/Harmonic scalpel

Lasers

Preoperative preparation and assessment of patient

Cardiopulmonary and hepatic renal function

Anticoagulant Immunosuppressant and other drug therapy

Premedication and sedation

Intra operative Care

Post op care Recognition and management of Surgical and non surgical complications.

Surgery in Hepatitis and HIV positive patients

Measures to minimize Surgical site infections

Pain control

Care of terminally ill patients