SINGHANIA UNIVERSITY

M.D. (General Medicine)
Duration- 3 Years

A. Theory examination (Total=400) Marks
- Paper 1 Basic sciences as related to Medicine- 100
- Paper 2 Principles of Medicine- 100
- Paper 3 Practice of Medicine- 100
- Paper 4 Recent Advances in Medicine- 100
Total: 400

B. Practical & Viva-Voce Examination
- 2 (Two) Long Cases- 100
- Viva-voce- 100
Total: 200

Syllabus
1.1. Theory
The theory syllabus should include the cardinal manifestations, definition, epidemiology, etiopathogenesis, clinical presentation, complications, differential diagnosis, investigations, treatment and prevention of all adult diseases. It should also cover the advances that have occurred in the science of medicine into its armamentarium of diagnosis, prevention and treatment.

Cardiovascular
- Dyspnoea and pulmonary edema, Heart murmur, Hypertension, Chest discomfort, Palpitations, Edema, Syncope.
- Atherosclerosis, Angina, Myocardial infarction, Revascularisation, Heart failure, Congenital heart diseases (cyanotic and acyanotic), Rheumatic fever and rheumatic heart disease, Infective endocarditis, Brady and Tachyarrhythmias, Diseases of myocardium (cardio-myopathy, myocarditis), Diseases of pericardium, Systemic hypertension, Diseases of the Aorta, Cor Pulmonale, Pulmonary embolism, Pulmonary hypertension, Peripheral vascular disease, Cardiac involvement in systemic disease, Echocardiography, Tread mill test, Nuclear cardiology, Cardiac catherization and angiography.

Respiratory
- Cough and Haemoptysis, Breathlessness, Hypoxia and Cyanosis.
- Infections of upper respiratory tract, tonsils and adenoids, Obstructive sleep apnea, Pneumonia, Suppurative lung disease, COPD and Emphysema, Bronchial asthma, Bronchiectasis, Pleural effusion, Pneumothorax, Mediastinal mass, Carcinoma lung, Chest imaging (X-Ray and CT scan), Bronchoscopy and Spirometry.

Gastrointestinal and liver diseases
- Acute and chronic diarrhea, Abdominal pain and distension, Ascites, Vomiting,
Constipation, Gastrointestinal bleeding, Jaundice, Dysphagia, Hepatosplenomegaly.
* Acute and Chronic pancreatitis, Diseases of the gall bladder.
* Nephrological disorders
* Hematuria, Dysuria, Azotemia, Fluid and Electrolyte disturbances.
* Acute and Chronic Glomerulonephritis, Nephrotic syndrome, Acute renal failure and Chronic renal failure, Peritoneal dialysis and Haemodialysis, Renal transplantation, TTP, Hemolytic uremic syndrome, Urinary tract infection and Pyelonephritis, Renal involvement in systemic diseases, Renal tubular disorders, Renal and bladder stones, Hydronephrosis, Cystic disease in kidney, Renal vascular hypertension.

Infections
Bacterial, Viral, Fungal and algal, Parasitic, Rickettsial, Mycoplasma, Pneumocystis carinii and protozoal infections, Tuberculosis, Spirochaetal diseases, HIV infection, Nosocomial infections, Infective endocarditis, Infection in transplant recipients, Complicated urinary tract infection, Food poisoning, Infections of the Skin, Muscles and Soft tissue, Ostomyelitis, Control of epidemics, Hospital infection control.

Emergency and critical care
Emergency care of shock, Cardio-respiratory arrest, Respiratory failure, Congestive cardiac failure, Acute renal failure, Status epilepticus, Fluid and electrolyte disturbances and its therapy, Acid-base disturbances, Drug overdose and Poisonings, Accidents, Scorpion and snake bites, GI bleed (upper and lower), Hepatic encephalopathy.

Immunology and Rheumatology
Introduction to the immune system, Primary immune deficiency diseases, Rheumatoid arthritis, SLE, Sjogren’s syndrome, Vasculitis, Scleroderma, Polymyositis, Gout, Ankylosing spondylitis, Reactive arthritis, Undifferentiated spondyloarthropathy, Sarcoidosis.

1.2. Practical
History, examination and writing of records:
* History taking should include the back ground information, presenting complaints and history of present illness, history of previous illness, family history, social and occupational history and treatment history.
* Detailed physical examination should include general examination and systemic examination (Chest, Cardio-vascular system, Abdomen, Central nervous system, locomotor system and joints).
* Skills in writing up notes, maintaining problem oriented records, progress notes, and presentation of cases during ward rounds, planning investigations and making a treatment plan should be taught.

**Bedside procedures & Investigations:**
* Therapeutic skills: Venepuncture and establishment of vascular access, Administration of fluids, blood, blood components and parenteral nutrition, Nasogastric feeding, Urethral catheterization, Administration of oxygen, Cardiopulmonary resuscitation, Endotracheal intubation, Intrathecal administration of drugs, Common dressings, Abscess drainage.
* Investigative skills: Venous blood sampling, Arterial blood sampling, Lumbar puncture, Bone marrow aspiration, Pleural, Peritoneal & Pericardial tap, Biopsy of liver and kidney.
* Bedside investigations: Hemoglobin, TLC, DLC, ESR, Peripheral smear staining and examination, Urine: routine and microscopic examination, Stool microscopy including hanging drop preparation, Examination of CSF, Pleural fluid and Peritoneal fluid, Gram staining, ZN staining, etc.

### 1.3. Clinical Teaching

#### Infectious Diseases

* Clinical

The junior resident should have knowledge and skills to assess, common infectious diseases problems:
* OPD: The junior residents should work up common OPD medical problems like acute febrile illness, acute diarrhea, urinary tract infection, lower respiratory tract infection, etc.
* WARD: During the ward posting the resident should acquire the knowledge to assess the following problems:-
  o Investigative workup of a patient with pyrexia of unknown origin.
  o Diagnosis/investigations and management of common tropical infectious diseases like Malaria, HIV, TB, Typhoid, Dengue fever, Gram +ve and Gram –ve infections, Fungal infections, Viral infections, Protozoal & Helminthic infections.
  o Management of a patient with sepsis, septicemia and septic shock.
  o Management of patients with multi systemic involvement.
  o Awareness about local notification procedures and adult vaccination.
  o Principles of infection control.

#### Toxicology and Clinical Pharmacology

**Clinical**

Residents should have knowledge and skills to assess and manage acute medical emergencies of drug overdose, illicit drug use and poisonings (accidental/suicidal). The resident should have the following skills:
* Assessment and emergency care of the unconscious patient with poisoning.
* Effects of common drugs/poisons ingested.
* Toxicology screen.
* Methods to prevent absorption and enhance elimination.
* Specific treatment of various drug overdoses and poisonings.

**Emergency Medicine**
Clinical
At the end of the casualty posting the Junior Resident should be able to diagnose and manage the following medical problems in the casualty: Acute myocardial infarction, tachyarrhythmias & bradyarrhythmias, hypertensive emergencies, pneumothorax, massive pleural effusion, pulmonary thromboembolism, perforation peritonitis, intestinal obstruction, diabetic ketoacidosis, myxedema coma, thyroid crisis, acute renal failure, metabolic acidosis, cerebrovascular accident, epilepsy, meningitis, cerebral malaria, coma, dehydration, diarrhea, septicemia, common poisonings, drowning, electrical injury etc. He should develop skills of triage and efficient emergency care.

Procedures
At the end of the casualty posting, the Junior Resident should possess theoretical knowledge of and should be able to perform the following procedures.
- External cardiac massage.
- Use of defibrillator/external cardiac pacemaker.
- Emergency IV cannula insertion and venesection.
- Emergency ryle’s tube insertion.
- Gastric lavage in case of poisonings.
- Insertion of foley’s catheter (both in males and females).
- CVP line insertion (subclavian/jugular).
- Endotracheal intubation.
- Arterial puncture for blood gas analysis.
- Thoracic and abdominal paracentesis.

Critical Care Medicine
During the training in internal medicine, residents should be posted in the intensive care unit. The unit should have modern monitoring facilities as well as facilities for providing artificial ventilatory support. The residents should be physically present in the ICU during their hours of posting, including night duties. The working in the ICU is fully supervised by seniors. During their posting in the ICU, the residents should acquire the following skills:
- Care of the seriously ill patients with haemodynamic monitoring.
- Providing assisted ventilation using correct mode and strategies using modern ventilators under senior advice.
- Insert central venous lines and arterial lines under supervision.
- Care of the unconscious patients.
- Care of patients with multiorgan failure.
- To look after the nutritional requirements of the patients.

Cardiology
Clinical
- OPD: Work up and management of common OPD cases (Rheumatic Heart disease, Ischemic heart disease, Heart failure, Hypertension etc.). He/She should be able to give advice regarding primary/secondary prevention of cardiac disease.
- WARD: Duties should include diagnostic case work up and day to day management of common cases (angina, myocardial infarction, rheumatic
heart disease, ischemic heart disease, hypertension, congestive heart failure, congenital heart disease etc.).

- Intensive coronary care unit (ICCU): A resident should acquire the expertise/knowledge to diagnose and manage acute myocardial infarction and its complications, common arrhythmias, cardiogenic shock, pericardial tamponade etc. The resident should also learn to perform the procedures and investigations (listed below) necessary to manage such patients.

Residents should be familiar with the indications/contraindications/complications of thrombolytic therapy and antithrombotic therapy. They should be fully conversant with the pharmacology and usage of anti-arrhythmic drugs, vasopressors and ionotropes and indications of pacemaker implantation.

**Procedures**
The Junior Residents should be trained to carry out the following common procedures:
- Performing and interpreting a 12-lead electrocardiogram.
- Pericardiocentesis (under cardiac monitoring).
- Cardioversion (elective/emergent).
- Defibrillation.
- Haemodynamic monitoring.

**Investigations**
The junior resident should be exposed to the theoretical and practical knowledge about the following investigations and their interpretation and applications in the various clinical situations:
- Tread Mill Test (TMT).
- Echocardiography/Doppler.
- Holter monitoring.
- Dobutamine stress test.
- Thallium scan
- Angiography & Angioplasty.
- Pacing (Permanent and temporary).

**Respiratory Medicine**

**Clinical**
- OPD: Work up and management of common OPD cases like Bronchial asthma, COPD, Acute bronchitis, Tuberculosis etc under consultant supervision.
- WARD: Diagnostic case work up and day to day management of common chest cases (asthma, COPD, pneumonia, tuberculosis including drug resistant tuberculosis, pleural effusion, lung cancer, interstitial lung disease etc.). Residents should be fully trained in assessment/management of emergencies like acute severe asthma, pneumothorax, haemoptysis and respiratory failure. They are expected to be fully conversant with the diagnosis/investigations/treatment of tuberculosis and the Revised National Tuberculosis Control Programme including DOTS (directly observed therapy short course) treatment.

**Procedures**
The Junior Resident should be trained to carry out the following common
procedures:
- Pleural fluid tapping.
- Oxygenation therapy.

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- Observation of pleural biopsy.
- Nebulisation.

Investigations
The Junior Resident should be guided and helped in acquiring theoretical and practical knowledge about the following investigations and their interpretation and applications to the various clinical situations.
- Basic chest radiology.
- CT scans chest (spiral/HRCT) - indications/patterns.
- Indications/applications of fibreoptic bronchoscopy.
- Interpretation of spirometry.

Gastroenterology
Clinical
- OPD: A Junior Resident should work up common cases and discuss with the consultant.
- WARD: A Junior Resident should gain competency in diagnostic case work up and day to day management of the following cases:
  Acute viral hepatitis and its complications, chronic hepatitis, cirrhosis of liver and its complications, management of hepatic encephalopathy, upper and lower gastrointestinal bleed (assessment/monitoring/indications for transfusion), acute abdomen (peritonitis, intestinal obstruction, pancreatitis etc), liver abscess, inflammatory bowel disease, malabsorption, intestinal tuberculosis and its complications, malignant lesions of liver, gall bladder, stomach, pancreas and intestines etc.

Procedures
The Junior Resident should have acquired practical knowledge of/and should be able to carry out the following:
- Per rectal examination and proctoscopy.
- Nasogastric intubation.
- Ascitic tap.
- Liver biopsy.
- FNAC of abdominal masses (under ultrasound guidance).
- Needle aspiration from liver abscess (under ultrasound guidance).

Investigations
The Junior Resident should have acquired the theoretical/practical knowledge about following investigations:
- Interpretation of plain X-ray of the abdomen, barium swallow, barium meal, barium enema, abdominal ultrasound and CT scan of the abdomen.
- Pattern of liver biopsy in common diseases (e.g. chronic hepatitis, cirrhosis of the liver etc.).
- Indication for upper GI Endoscopy, Sigmoidoscopy, Colonoscopy, Endoscopic Sclerotherapy and Banding, Enteroscopy.
- ERCP and MRCP- indications and interpretations.
Capsule Endoscopy - indications and interpretations.

Teaching Programme

2.1 General Principals
Acquisition of practical competencies being the keystone of postgraduate medical education, postgraduate training is skills oriented. Learning in postgraduate program is essentially self-directed and primarily emanating from clinical and academic work. The formal sessions are merely meant to supplement this core effort.

2.2 Teaching Sessions
The teaching methodology consists of bedside discussions, ward rounds, case presentations, clinical grand rounds, statistical meetings, journal club, lectures and seminars. Along with these activities, trainees should take part in inter-departmental meetings i.e clinico-pathological and clinico-radiological meetings that are organized regularly.
Trainees are expected to be fully conversant with the use of computers and be able to use databases like the Medline, Pubmed etc. They should be familiar with concept of evidence based medicine and the use of guidelines available for managing various diseases.

Assessment
All the PG residents should be assessed daily as well as periodically.

3.1 General Principles:
- The assessment should be valid, objective, and reliable.
- It should cover cognitive, psychomotor and affective domains.
- Formative and summative (final) assessment is to be conducted in theory as well as practicals/clinicals. In addition, thesis should be assessed separately.

3.2. Formative Assessment
- The formative assessment is continuous as well as end of term.
- The former is based on the feedback from the consultants concerned.
- Formative assessment will provide feedback to the candidate about his/her performance and help to improve in the areas they lack.
- Record of internal assessment should be presented to the board of examiners for consideration at the time of final examination.

3.3. Internal Assessment
The performance of the Postgraduate student during the training period should be monitored throughout the course and duly recorded in the log books as evidence of the ability and daily work of the student. Marks should be allotted out of 100 as followed.

Sr. No. Items Marks
1. Personal Attributes 20
2. Clinical Work 20
3. Academic activities 20
4. End of term theory examination 20
5. End of term practical examination 20
1. Personal attributes:
   - Behavior and Emotional Stability: Dependable, disciplined, dedicated, stable in emergency situations, shows positive approach.
   - Motivation and Initiative: Takes on responsibility, innovative, enterprising, does not shirk duties or leave any work pending.
   - Honesty and Integrity: Truthful, admits mistakes, does not cook up information, has ethical conduct, exhibits good moral values, loyal to the institution.
   - Interpersonal Skills and Leadership Quality: Has compassionate attitude towards patients and attendants, gets on well with colleagues and paramedical staff, is respectful to seniors, has good communication skills.

2. Clinical Work:
   - Availability: Punctual, available continuously on duty, responds promptly on calls and takes proper permission for leave.
   - Diligence: Dedicated, hardworking, does not shirk duties, leaves no work pending, does not sit idle, competent in clinical case work up and management.
   - Academic ability: Intelligent, shows sound knowledge and skills, participates adequately in academic activities, and performs well in oral presentation and departmental tests.
   - Clinical Performance: Proficient in clinical presentations and case discussion during rounds and OPD work up. Preparing Documents of the case history/examination and progress notes in the file (daily notes, round discussion, investigations and management) Skill of performing bed side procedures and handling emergencies.

3. Academic Activity: Performance during presentation at Journal club/ Seminar/ Case discussion/Stat meeting and other academic sessions. Proficiency in skills as mentioned in job responsibilities.

4. End of term theory examination conducted at end of 1st, 2nd year and after 2 years 9 months

5. End of term practical/oral examinations after 2 years 9 months.

Marks for personal attributes and clinical work should be given annually by all the consultants under whom the resident was posted during the year. Average of the three years should be put as the final marks out of 20.

Marks for academic activity should be given by the all consultants who have attended the session presented by the resident.

The Internal assessment should be presented to the Board of examiners for due consideration at the time of Final Examinations.

4. Job Responsibilities

The trainees in internal medicine should be designated as residents. According to year of residency he/she should be designated as First/Second/Third year resident.

- Outdoor Patient (OPD) Responsibilities
  - The working of the residents in the OPD should be fully supervised.
  - They should evaluate each patient and write the observations on the OPD card with date and signature.
  - Investigations should be ordered as and when necessary using prescribed forms.
  - Residents should discuss all the cases with the consultant and formulate a management plan.
Patient requiring admission according to resident’s assessment should be shown to the consultant on duty.

Patient requiring immediate medical attention should be sent to the casualty services with details of the clinical problem clearly written on the card.

Patient should be clearly explained as to the nature of the illness, the treatment advice and the investigations to be done.

Resident should specify the date and time when the patient has to return for follow up.

In-Patient Responsibilities
Each resident should be responsible and accountable for all the patients admitted under his care. The following are the general guidelines for the functioning of the residents in the ward:

- Detailed work up of the case and case sheet maintenance:
  He/She should record a proper history and document the various symptoms. Perform a proper patient examination using standard methodology. He should develop skills to ensure patient comfort/consent for examination. Based on the above evaluation he/she should be able to formulate a differential diagnosis and prepare a management plan. Should develop skills for recording of medical notes, investigations and be able to properly document the consultant round notes.

- To organize his/her investigations and ensure collection of reports.

- Bedside procedures for therapeutic or diagnostic purpose.

- Presentation of a precise and comprehensive overview of the patient in clinical rounds to facilitate discussion with senior residents and consultants.

- To evaluate the patient twice daily (and more frequently if necessary) and maintain a progress report in the case file.

- To establish rapport with the patient for communication regarding the nature of illness and further plan management.

- To write instructions about patient’s treatment clearly in the instruction book along with time, date and the bed number with legible signature of the resident.

- All treatment alterations should be done by the residents with the advice of the concerned consultants and senior residents of the unit.

Admission day
Following guidelines should be observed by the resident during admission day.

- Resident should work up the patient in detail and be ready with the preliminary necessary investigations reports for the evening discussion with the consultant on duty.

- After the evening round the resident should make changes in the treatment and plan out the investigations for the next day in advance.

Doctor on Duty
- Duty days for each Junior Resident should be allotted according to the duty roster.

- The resident on duty for the day should know about all sick patients in the wards and relevant problems of all other patients, so that he could face an emergency situation effectively.

- In the morning, detailed over (written and verbal) should be given to the next resident on duty. This practice should be rigidly observed.
If a patient is critically ill, discussion about management should be done with the senior resident or consultant at any time.

The doctor on duty should be available in the ward throughout the duty hours.

**Care of Sick Patients**

- Care of sick patients in the ward should have precedence over all other routine work for the doctor on duty.
- Patients in critical condition should be meticulously monitored and records maintained.
- If patient merits ICU care then it must be discussed with the senior residents and consultants for transfer to ICU.

**Resuscitation skills**

At the time of joining the residency programme, the resuscitation skills should be demonstrated to the residents and practical training provided at various work stations.

- Residents should be fully competent in providing basic and advanced cardiac life support.
- They should be fully aware of all advanced cardiac support algorithms and be aware of the use of common resuscitative drugs and equipment like defibrillators and external cardiac pacemakers.
- The resident should be able to lead a cardiac arrest management team.

**Discharge of the Patient**

- Patient should be informed about his/her discharge one day in advance and discharge cards should be prepared 1 day prior to the planned discharge.
- The discharge card should include the salient points in history and examination, complete diagnosis, important management decisions, hospital course and procedures done during hospital stay and the final advice to the patient.
- Consultants and Senior Residents should check the particulars of the discharge card and counter sign it.
- Patient should be briefed regarding the date, time and location of OPD for the follow up visit.

**In Case of Death**

- In case it is anticipated that a particular patient is in a serious condition, relatives should be informed about the critical condition of the patient beforehand.
- Residents should be expected to develop appropriate skills for breaking bad news and bereavements.
- Follow up death summary should be written in the file and face sheet notes must be filled up and the sister in charge should be requested to send the body to the mortuary with respect and dignity from where the patient’s relatives can be handed over the body.
- In case of a medico legal case, death certificate has to be prepared in triplicate and the body handed over to the mortuary and the local police authorities should be informed.
- Autopsy should be attempted for all patients who have died in the hospital especially if the patient died of an undiagnosed illness.

**Medico-Legal Responsibilities of the Residents**

- All the residents are given education regarding medico-legal responsibilities at
the time of admission in a short workshop.

- They must be aware of the formalities and steps involved in making the correct death certificates, mortuary slips, medico-legal entries, requisition for autopsy etc.
- They should be fully aware of the ethical angle of their responsibilities and should learn how to take legally valid consent for different hospital procedures & therapies.
- They should ensure confidentiality at every stage.

**Suggested Books and Journals**

5. Reference Books

- Braunwald’s Heart Disease
- Hurst’s The Heart
- Sheila Sherlock’s Diseases of the Liver and Biliary system
- Adams and Victor’s Principles of Neurology
- Crofton and Douglas Respiratory Diseases
- Brenner and Rector’s The Kidney
- William’s Text Book of Endocrinology
- Mandell’s Principles and Practice of Infectious Diseases
- Kelley’s Text Book of Rheumatology
- Devita’s Principles and Practice of Oncology
- Text Book of Critical Care Medicine
- Shamroth’s An Introduction to Electrocardiography
MODEL QUESTION PAPER
MD (General Medicine)
Paper-I
Basic Sciences as related to Medicine
Max. Marks:100 Time: 3 hrs

- Attempt ALL questions
- Answer each question & its parts in SEQUENTIAL ORDER
- ALL questions carry equal marks
- Illustrate your answer with SUITABLE DIAGRAMS

I. Describe the life cycle of malaria. What is the treatment of cerebral malaria?
II. What is antinuclear antibody (ANA)? Discuss the laboratory diagnosis of SLE.
III. Discuss haemoglobin synthesis. Write the classification of haemoglobinopathies.
IV. Write in brief about the pathogenesis of atherosclerosis.
V. Give an account of the anatomy of the mediastium.
VI. Write about the production and metabolism of bilirubin. Enumerate the hereditary defects in bilirubin conjugation.
VII. Enumerate the neurocutaneous syndromes. Describe the clinical features of Neurofibromatosis.
VIII. Discuss the pathogenesis of bone disease in chronic renal failure. What is its treatment?
IX. Discuss the pathogenesis of type 1 diabetes mellitus.
X. Write about the food sources, deficiency and treatment of thiamine.
I. Discuss the biology and evaluation of obesity.

II. Enumerate the plasma cell disorders? Describe the management of multiple myeloma.

III. Define sepsis & septic shock. Discuss the treatment strategies of Septic Shock.

IV. Describe the clinical features & management of heart failure.

V. What is pulmonary thromboembolism? Enumerate its various risk factors and diagnostic modalities.

VI. What are the causes of acute pancreatitis? Describe the systemic complications of acute pancreatitis.

VII. Enumerate the various modalities of renal replacement therapies. Describe chronic Ambulatory Peritoneal dialysis.

VIII. What is systemic sclerosis? Differentiate between its diffuse & limited variants.

IX. Discuss the diagnosis & management of osteoporosis.

X. Outline the management of acute ischemic cerebrovascular attack.
I. What is neutropenic PUO? Outline the causes and treatment of neutropenic PUO.

II. Describe the malignancies associated with AIDS.

III. Discuss the classification and investigative workup of acute myeloid leukaemia.

IV. Enumerate the causes and pathophysiology of pulsus paradoxus.

V. Discuss the metastatic complications of carcinoma lung.

VI. Classify chronic hepatitis and enumerate the causes.

VII. Enumerate the causes of acute polyradiculopathy.

VIII. Discuss the classification and treatment of lupus nephritis.

IX. Give an account of thiazolidinediones.

X. Describe empty sella syndrome?
I Describe the role of biologics in rheumatoid arthritis.
II Discuss briefly about activated protein C. What is its current status in management of severe sepsis.
III Discuss HCV treatment challenges in patients co-infected with HIV.
IV Describe the role of recombinant factor VIIa as a novel haemostatic agent.
V Discuss Incretin biology and its present status in management of Type 2 diabetes.
VI Enumerate the mechanisms of anemia in CRF and what are current recommendations for its management.
VII Discuss the present status of platelet ADP-receptor antagonists for Cardiovascular Disease.
VIII Describe current diagnostic and therapeutic strategies for pulmonary artery hypertension.
IX Discuss recent guidelines for prevention, diagnosis and treatment for ventilator associated pneumonia.
X Enumerate the newer antiepileptic drugs. Discuss the role of surgery in epilepsy.