CURRICULUM

MASTERS IN NEUROSURGERY
DEPARTMENT OF NEUROSURGERY

Peoples University of Medical & Health Sciences,
Nawabshah, Sindh

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MASTER IN NEUROSURGERY

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PEOPLES UNIVERSITY
OF MEDICAL & HEALTH SCIENCES
FOR WOMEN,
NAWABSHAH (SBA)

BOARD OF STUDIES FOR M.S NEUROSURGERY
PUM HSW, NAWABSHAH (SBA)

INTERNAL:

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CONTENTS

BACKGROUND

Just like other fields neurosurgery has undergone rapid changes in recent years. The knowledge that a competent neurosurgeon must Master has been divested. The comprehensive knowledge includes not only neurosurgical field but also of allied areas in which he must be informed if he is going to give his patients the best care that is possible.

Lay down of subject and training will be done of trainee who is beginning to assume responsibility of patient care and allied specialist who works with neurosurgical patients. Changes have been made in curriculum compared to fellowship from other universities and college of physicians and surgeons with changing practice and scope of specialty.

AIMS / GOALS

1. At the completion of training the candidate ought to be good neurosurgeon and competent to treat and operate most of the problems.

2. He should have sound Knowledge of the subject and allied fields and in emergency can be an active member of emergency squad.

3. Different techniques / procedures should be learnt by candidate & can extend and add to his knowledge with changing techniques and flexibility to adopt & command new procedures.

EDUCATIONAL OBJECTIVES (LEARNING OBJECTS)

At the end of this course the candidates are able to:

1. **Assess the patients seeking advice for need of neurosurgical procedures**
   a) Obtaining pertinent history
   b) Performing physical examination correctly
   c) Formulating a working diagnosis
   d) Deciding whether the patient requires
      - Ambulatory Care or Hospitalization
      - Referral to Other Health Professionals/Facilities
      - Emergency Care Including Life Saving Measures.
2. **Manage patients requiring neurosurgical treatment**
   a) Plan an appropriate strategy i.e. order appropriate investigations and interpret the results.
   b) To decide and implement the treatment
   c) When required perform surgical procedures independently and competently.
   d) Deal effectively and promptly with any complications which may occur during the course of disease.
   e) To manage and monitor the patient pre and post operatively.
   f) Maintain records of patients.
3. **Undertake research and publish findings.**
4. **Acquire new information, assess and make appropriate applications.**
5. **Recognize, the role of team work and function as an effective member/leader of the team.**
6. **Advise the community on promoting health and preventing diseases and training health professionals desirable.**

SCOPE

Masters in Neurosurgery has wide scope of job opportunities in both public and private sectors. It will be equivalent to fellowship from college of physicians and surgeons Pakistan. Once appointed as professional he can progress to higher grades.

ADMISSION CRITERIA

a. The admission to the degree courses shall be made by the university. The schedule of admissions shall be announced for once a year in the month of October.

b. Eligible candidates will first appear in written Entry Test. Candidates securing passing marks (40% and above) will be allowed to appear in interviews. The selection shall be made on merit, based on the cumulative scores in written test and interview.

c. The institution concerned will formulate the details of procedure, format and schedule of written test and interview.

d. The candidates shall apply for registration with the University within 03 months of their admission. The registration shall be effective from the date of admission.

FEES:

a. The cost of application form and prospectus shall be determined by the university.

b. The registration fee for all degree courses shall be prescribed by the University.

c. The Identity Card fee per year shall be Rs.50/- or as prescribed by the institute.

d. The tuition fee may be charged according to the rules framed by the university.

e. In case of foreign students, the fees shall be charged as may be prescribed by the Government of Pakistan.

f. The examination fee for degree courses shall be prescribed by the University

In centers where Neurology department does not exist, the candidate may spend this period in other institution with such facility.

SYNOPSIS

Synopsis or protocol of researched shall be submitted within six months of admission, it must be approved within one year of admission by Advanced Studies & Research Board.

THESIS

The thesis should be a piece of work embodying either a discovery of new facts or a fresh interpretation of facts or theories; in either case the work should show the candidates capacity for data analysis, critical examination, clinical evaluation & conclusive judgment.

Guidance of Research

The Supervisor for guiding the research scholar for the degree of, M.S must possess the following minimum qualification:

i. A Supervisor for guiding research scholars leading to , M.S degree shall be a Professor with major postgraduate qualification or an Associate Professor with major postgraduate qualification with 05 years of experience as Associate Professor, OR
an Assistant Professor with major postgraduate qualification with 08 years of experience as Assistant Professor.

ii. In case of collaborative research with the approved Institutes / Organizations, the Supervisor will have to be from recognized college / institute and Co-Supervisor will be taken from the collaborative Institute concerned.

iii. The Advanced Studies & Research Board shall approve the final title of the thesis within six months of the submission of the protocol of research.

WEEKLY TIME TABLE

CLINICAL MEETINGS DEVOTED TO:

NO. PER WEEK

1. JOURNAL CLUB

.....

2. MORBIDITY & MORTALITY

.....

3. CLINICAL CASE PRESENTATION

   AND/OR.....

4. DISCUSSION OF CASES OF SURGICAL

   INTEREST.....

SHOULD RECORD EACH WEEK AND THE TIME SPENT ON THEM SHOULD NOT BE LESS THAN 2 HOURS

EXPERIENCE OF TEACHING OTHERS: (TICK APPROPRIATE)
POSTGRADUATE
HOUSE SURGEONS
UNDER GRADUATES
NURSES

LEAVE RECORD

(Mention No: of Days)

CAUSAL	**30 / Year**
SICK	**on individual basis**
MATERNITY	**Two in five years**

FORM-C

EMERGENCIES ATTENDED / TREATED

EMERGENCIES HANDLED

NAME OF PATIENT WITH AGE & SEX

DIAGNOSIS

PROCEDURES PERFORMED

LEVEL OF PARTICIPATION

SIGNATURE OF SUPERVISOR

SURGICAL TRAINING POSTS HELD

S.No	WARD	SPECIALITY	DATE FROM To	CONSULTANT'S SIGNATURE

This form should only be signed by the consultant at the end of postings provided the trainee has completed the period of training satisfactorily.

LOG BOOK

Obtainable from Postgraduate office PUMHSW, should be maintained by all trainees during the training period.

INSTRUCTIONS TO TRAINEES

1. This Log Book has to be maintained by all trainees preparing for Masters in Neurosurgery.

2. Trainees are advised to make the required entries on the same day as they take place. All entries must be signed by the chairman of the unit on the day of the event.

3. The trainee is required to maintain the Log book throughout the training period.

4. The Log book will form a part of the application for appearing in Masters Final Examination.

MODALITIES OF THE TRAINING

The objectives of training will be achieved through different modes, some of which are listed below:

1. **Graded responsibility in patient care e.g:**
   a. Ward duties
   b. Emergency duties
   c. Out Patent Department (OPD) duties
   d. Operation theatre duties
   e. Specific Procedures
   f. Laboratory
   g. Library

2. **Morbidity/Mortality review meetings**
3. **Journal club**
4. **Seminars, Conferences and Lectures**
5. **Research projects**
6. **Personal Duty**
7. **Monthly Neurological Meeting**

ASSIGNMENT IN NEUROSURGICAL UNIT

(From Monday to Saturday as full time resident)

A. Early morning meeting with whole teaching staff and other doctors

B. Daily assessment of newly admitted cases as well as problems of already admitted or operated cases.

C. Teaching round for students by any /all of teaching members depending on schedule.

D. Postgraduate clinical session in OPD

E. Postoperative round with Professor/Associate and Assistant Professor/Senior Registrar

F. Teaching the undergraduate students.

G. Care of pre and postoperative patients in the ward

H. Attending Teaching sessions and operative surgical training.

I. Topic discussion in ward with any or all the teaching members:-
Topics: Neurological investigations, Backache, Spinal surgeries lamination, instrumentation, Head injury, Raised ICP, its management.

J. Assisting senior consultants in major operations.

K. Performance of surgical procedures under supervision of consultants.

L. Arranging the surgical audit with morbidity and mortality review conference after correctly collecting data.

M. Journal club meetings.

N. Case presentation by trainees on rotation basis.

O. Emergency duties for 24hurs as per schedule of department

INSTRUCTIONS FOR RECORD OF OPERATIONS

You are required to mention the record of operations / surgical procedures, major or minor performed independently, with assistance or as an assistant to your seniors as per numbering system of competency as per following.

1. **Performed as 1st Assistant**
2. **Performed with Assistance** **100 Surgical procedures**
3. **Performed without Assistance** **200 Surgical procedures (Cold elective)**

SCHEDULE OF TRAINING

TOTAL DURATION **05 Years**

Including 03years and six months years in Neurosurgical field and 1year and 6 months on rotation in following departments:

First Year Training

i). History taking
ii). Neuroanatomy
iii). Emergency duties
iv). Assist minor surgical cases
v). Routine ward duties

Second Year Training

i). Assist major surgical procedures
ii). Present cases / participate in morning meeting
iii). Seminar
iv). OPD duties

Third Year Postgraduate

i). Independent minor procedure / closure & opening of all sort of major procedures
ii). Present cases / participate
iii). Seminar
iv). OPD duties

Fourth Year Postgraduate

i). Independent major procedures under supervision
ii). Handle all emergencies independently
iii). Present cases / participate
iv). Seminar
v). OPD duties

ROTATION IN SURGICAL ALLIED FIELDS

- Ophthalmology 02 months
- Orthopedic 01 months
- ICU 01 months
- E.N.T. 02 months
- Neuromedicine 06 months
- General surgery 06 months

If Neurology department does not exist, the candidate may spend his period in other institution with this facility or in medical ward with such predominant cases.

TRAINING PROGRAMME

Trainee should have a sound knowledge & application of the following:

1. **Pre-operative preparation for various surgical procedures (listed below)**
2. **Aseptic techniques, knowledge & application**
3. **Positioning of patient on operation table for**
   - i). Cranial surgery
   - ii). Laminectomy
   - iii). Thoracotomy
   - iv). Laparotomy
   - v). Renal surgery
4. **Common surgical instruments and appliances (Including Steriotactic instruments)**

FORMAT OF SURGICAL PROCEDURES

NEUROLOGICAL SURGERY

1. Cranial Surgery	
i). Elective	100
ii). Traumatic	100
2. Spinal Surgery	**100**
3. Procedures to be Done In Ward:	
i). Lumbar puncture	50
ii). Ventricular tapping	50
iii). Wound debridement	25
iv). Incision drainage of abscess / Haematoma	25
4. Radiological Room Procedures	

NEUROLOGICAL SURGERY

A. CRANIAL SURGERY

1. **Burr hole**
2. **Shunt**
   - i). Venticuloperitoneal
   - ii). Ventriculoatrial
   - iii). Subduropleural / Cystopleural shunt
3. **Repair of Scalp wounds**
4. **Elevation of Depressed Skull Fracture**
5. **Debridement of Crush or Missile Injuries**
6. **Cranioplasty**
7. **Drainage of Intracranial Hematoma**
   - Extradural
   - Subdural acute or Chronic
   - Intracerebral
8. **Craniectomy, Craniotomy**
9. **Removal of intracranial Lesions/Tumors**
   - Supratentorial
   - Infratentorial or Posterir fossa masses
   - Abscesses and granulomas
10. **Trans-Sphenoidal pituitary approach**
11. **Removal of Retro-orbital/Orbital masses**
12. **Microvascular Decompression in Neuralgia /Hemi facial spasm**
13. **Surgeries for Aneurysm/AV Malformation**
14. **Craniosynectomy for Cranostenosis**
15. **Repair of Cranial CSF Fistulae**
16. **Neurectomies**
17. **Carotid Ligation and upper neck exposure**

B. SPINAL SURGERY

1. **Distectomy Fenestration**
2. **Laminectomy**
3. **Posterior Decocmpression ,Corporectomv and Bone Grafting**
4. **Anterior Cloward Approach**
5. **Anteriolateral/ Posteriolateral/ Web Morlev Spinal Injuries**
6. **Decompression and Wiring**

7. **Instrumentation**
   - DCP Plating
   - Harrington Instrumentation
   - Screw Fixation
8. **Peripheral Nerve Plexus Injuries Neurectomies and repair**

PROCEDURE DONE IN WARD (50 cases)

1. **Lumbar Puncture**
2. **Insertion of Epidural Drain**
3. **Cisternal Puncture**
4. **Ventricular Tapping**
5. **Tapping of Cyst Through Fontanelle**
6. **Tapping from chamber(Reservoir)**
7. **Confirmation of Shunt function on tapping**
8. **True-cut biopsy of superficial lesions**
9. **Excision of scalp cyst**
10. **Pheripheral Nerve Blocks**
11. **Alcohol block**
12. **Application of Traction Lumber ,Cervical**

RADIOLOGICAL ROOM PROCEDURES (50 cases)

1. **Myelogram**
2. **Computerized (C.T.) Scan Guided Biopsy**
3. **Ultrasound Aspiration of abdominal cyst (V.P. Shunt lower end)**
4. **Contrast confirmation of shunt function**

ADDITIONALLY THE TRAINEE SHOULD OBSERVE THE FOLLOWING PROCEDURES, KNOWING THEIR INDICATIONS AND INTERPRETATION OF RESULTS.

1. ULTRASONOGRAM OF BRAIN
2. POSITRON TOMOGRAPHIC SCAN (P.T.C).
3. COMMPUTERIZED SCAN (C.T. SCAN)
4. MAGNETIC RESONANCE IMAGING (M.R.I)
5. NUCLEAR SCINTISCAN
6. ANGIOGRAPHY
7. DOPPLER VASCULAR STUDIES

TABLE OF SPECIFICATION FOR BASIC MEDICAL SCIENCE PAPER

The candidate of M.S in Neurosurgery should have sound knowledge of basic Anatomy, Physiology, Biomechanics of skull and spine, core knowledge of Pathology, Pharmacokinctic of brain, spinal cord, peripheral nerves and neuromuscular junction.

I. ANATOMY 30%

- Scalp, skull, Investing layers, Developmental and regional anatomy of brain
- Cranial nerves, spinal cord and peripheral nerves and plexuses with applied.
- Vascular network of brain and spinal cord including circle of Will's .
- Anatomical organization of Autonomic nervous system.
- Orbit, Pituitary gland, Anatomy of nose, ear including air sinuses.
- Occipital triangle and anatomical triangles of neck.
- Cerebrospinal fluid formation and drainage.
- Abdomen, Chest cage, Urogenital system, Anatomy of limbs, hands, feet.

II. PHYSIOLOGY AND BIOCHEMISTRY(30%)

i) PHYSIOLOGY 20%

1. Cell and Nerve Muscle Physiology
2. Physiology Of Cerebrospinal Fluid Circulation
3. Functional importance of individual parts of brain spinal cord and nerves.
4. The interconnections of various parts of brain and functional organization
5. Autonomic nervous system
6. The physiology of pituitary gland, orbit and ear and nose
7. Respiratory system functions/clinical problem in respiration

ii) BIOCHEMISTRY (10%)

1. Complete analysis of body fluids
2. Effect of changes in chemical composition of Neuromuscular junction.
3. Various hormones, enzymes and their interrelation with body functions.
4. Effect of chemical changes on neonatal nervous system
5. Chemical changes and its effect on neuromuscular system in Polio
6. Role of Diabetes Mellitus in Neuropathy

III). PATHOLOGY (30%)

1. Neuron and Glial cell cytology and Genetic Diseases affecting CNS.

2. Neural cell Response to Hypoxia, Trauma, hemorrhage and General Metabolic and Hormonal disorders and Neutritional and Electrolyte imbalance.
3. Inflammatory reaction, wound healing
4. Principles of disinfection and sterlization
5. Immune system and Tissue Transplantation
6. Wound infection/ Noso-comial infection Including Carries Spine
7. Tumors related to CNS, cranium and spine including secondaries.

IV. PHARMACOLOGY (10%)

1. Antibiotics, Antifungal, Antiviral
2. Disinfectants and Antiseptics
3. Sedatives and hypnotics
4. Antiepileptic drugs
5. General and local anesthetics, muscle relaxants

The M.S candidates will be eligible to appear in Basic Science paper any time after completion of six months period after admission. The Basic Medical Science paper will be one best type and will carry 100 marks.

The candidate should clear the Basic Science Paper before the final examination.

SYSTEM OF EXAMINATION

Examination will consist of two steps as Part-I (Basic) and Part II (Clinical):

Part-I (Basic Exam)

Can be cleared from six months onward but definitely before the final examination. It will consist of MCQ type of questions and will include the questions from related Anatomy, Pathology, Pharmacology, Physiology and Biochemistry.

There will be 60 one best type questions. The distribution of marks will be as below

Anatomy 30%

Pathology..... 30%

Pharmacology..... 10%

Physiology / Biochemistry..... 30%

PAPER 2 ESSAY TYPE

PAPER 2 CONSISTS OF GENERAL NEUROSURGICAL PRINCIPLES SHORT ESSAYS

TOPICS

1. WOUND HEALING.
2. SEPSIS
3. NEUROGICAL ASSESSMENT
4. FLUID AND ELECTROLYTES
5. SHOCK
6. CSF CIRCULATION AND HYDROCEPHALUS
6. ICP MONITORING
7. CONVULSIONS
8. CNS DEVELOPMENT AND CONGENITAL ANOMALIES
9. HEAD INJURY
10. PERI-OPERATIVE MANAGENT

PART-II (CLINICAL EXAMINATION)

i. **Eligibility for Final Examination:**

Students will have to attend a minimum of 75% of Lectures, Demonstrations and Practicals, without which they will not be allowed to appear in the examination.

ii. **Approved thesis.**

iii). **The candidate must have completed prescribed training period in the concerned specialty.**

iv). **A student who though qualifying for the examination, does not appear in the examination, may be permitted to appear at any subsequent examinations as an ex-student, within a period of three years of qualifying for such an examination. Thereafter, such a student shall have to seek fresh admission in the course.**

v). **Examination for degree courses shall be held twice a year in March and September.**

THEORY EXAMINATION

PAPER-I

One best type
50% Marks
will consist of questions from Surgical Pathology, General and specific Neurosurgical aspects.

PAPER-II

Five essay type questions
One question will be of short notes
Will consist of specific neurosurgical questions
Each question will carry equal marks
All are to be attempted

PRACTICAL EXAM OF PART-II FORMAT

1). **TOACS (Task Oriented Assessment of Clinical Skills)** → **20%**

2). **LONG CASE one long case** → **30%**

Each candidate will be allotted one long case and allowed 30 minutes for history taking and clinical examination. Candidate should take a careful history from the patient / relative and after a thorough physical examination, identified the problems which the patient presents with. During this period a pair of examiners will observe the candidate. In this section the candidate will be assessed on the following areas:

i). **Interview skills**

- Introduce one self. Listens patiently and is polite with the patient.
- Is able to extract relevant information.

ii). **Clinical examination skills**

- Take informed consent
- Uses correct clinical methods systematically (including appropriate exposure and re-draping).

iii). **Case presentation / Discussion**

- Presents skillfully
- Gives correct findings
- Gives logical interpretations of findings and discusses differential diagnosis.
- Enumerates and justifies treatment plan (including rehabilitation)
- Discusses prevention and prognosis
- Has knowledge of recent advances relevant to the case
- During case discussion the candidate may ask the examiners for laboratory investigations which shall be provided, if available. Even if they are not available and are relevant, candidates will receive credit for the suggestion.

3). **SHORT CASE** **Four short cases** → **20%**

i). **Format of short cases:**

- Candidates will be examined in at least four short cases for a total of 40 minutes jointly by a pair of examiners. Candidates will be given a specific task to perform on patients, one case at a time.

  During this part of the examination, the candidate will be assessed in:

ii). **Clinical Examination Skills:**

- Takes informed consent
- Uses correct clinical methods including appropriate exposure and re-draping
- Examines systematically

iii). **Discussion**

- Gives correct findings
- Gives logical interpretations of findings
- Justifies diagnosis

As the time for this section is short, the answers given by the candidates should be precise, succinct and relevant to the patient under discussion.

4). **GRAND VIVA VOCE** → **30%**

The viva voce examination will last for 30 minutes and will be conducted by a pair of examiners. This part of the examination will assess the candidate's ability to solve problems, reaction in an emergency situation, concepts and overview of current issues relevant to specialty. The art of communicating the knowledge in the relevant field of medicine in a concise manner will also be tested. Questions will also be asked on the basis of clinical experience documented in the candidate's Log Books.