AJK Medical College, Muzaffarabad

NEUROSCIENCE MODULE
(NEU-II-0301)

4th Year

DURATION: 2 Weeks

DEPARTMENT OF MEDICAL EDUCATION

CONTENTS

MODULE TEAM

S.#	**Name**	**Designation**
1	Prof. Anwar Ul Haque	(Module Planner)
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3	Dr. Ziyad Afzal Kiyani	(DME)
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5	Dr. Shaukat Dar	(Member)
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7	Dr. Mazhar Hamdani	(Member)
8	Dr. Liaqat Awan	(Member)
9	Dr. Mateen	(Member)

PREFACE

Man is Governor on the earth. In order to perform his duties Allah Ta'lah, the Creator, the Sustainer and the ever caring has bestowed upon him the ability to acquire, retain and reproduce knowledge. (Quran Surah al-Baqrah Ayah 31-34). Angels and thus forces on earth were made obedient to him except of course Iblees or Satan, the rejected one. Satan is an open enemy to man and in order to avoid his evil designs to ruin him; the man has to follow His divine guidance. To rule the earth man is equipped with par excellence superb command and control system in him known as Nervous System! However this system is vulnerable to Satanic temptations and abduction of his all his energies, time and abilities for evil reducing man to the lowest of the low status! Are Thus most heinous crimes on earth as a matter of fact are committed by the highly educated people.

This fascinating Nervous system deserves best use of its potentials! Apart from spiritual derailment; the nervous system is victim of many diseases ranging from malformations to genetic cum metabolic disorders, infectious diseases, immunological and traumatic disorders. These disorders are by no means rare and hence good grasp on these subjects is extremely important. Regarding pathology, in 3rd year we have covered several non-neoplastic diseases. In 4th year we will mostly deal with tumors of the nervous system. These include benign & malignant tumors of brain, meninges and peripheral nervous system! Of course several important diseases of eye will be covered. Neurosurgeons, neurophysicians, pediatricians and radiologists will also *In Sha Allah* make significant contribution.

In order to understand and manage the physical disorders of this system the module has been divided into several themes and each theme is associated with distinct learning objectives. Additionally Case Scenarios and Problem Based Learning Exercises and Pathology practicals are included. Hopefully students will find these challenging and interesting! Insha Allah by acquiring adequate knowledge and training our students will find themselves among the most competent physicians of tomorrow.

INTRODUCTION

RATIONALE:
The Central and peripheral nervous systems constitute an important mean to control all voluntary and involuntary body activities. This important module comprises of 7 themes and 1 PBL. The Themes and PBL are so designed that major chunks of the subject are covered in each theme. The behavioral aspects of the nervous system are covered in a separate theme and carries significant weight. In other themes we have tried to cover important clinical aspect, of CNS disorders, Pathology and preventive medicine.

ORGANIZATION OF MODULE:
The module's themes and PBL are based on a real life situation. Each theme has clear learning object. Major emphasis will be on real Patient Examination, Discussion, Laboratory and Imaging investigation and Interpretation, Case analysis, diagnosis and management plan will be made by student under the guidance of faculty supervisors. The theme based on real life scenarios will give a fair idea to the student that how patients present in day to day clinical practices. Please refer to time table for more details regarding organization of learning objectives.

TEACHING STRATEGIES:
The content of this module will be delivered by a combination of different teaching strategies. These include small group discussions (SGD), large group interactive sessions (LGIS), history taking, patient examination, laboratory investigations and tests interpretation, Clinico-pathological conferences (CPCs), discussions and journal club. Entire curriculum will be delivered by clinical case scenarios each covering a theme. Read the cases and the objectives of the theme which you are supposed to encounter next day, understand and explain the case to yourself and study the relevant information. The students will present clinical cases based on scenarios themselves and display the relevant radiological and pathological features. Following learning/teaching strategies will be used in this module.

SMALL GROUP DISCUSSION (SGD):
Main bulk of the course content will be delivered in small group sessions. Each theme has an associated case. The case will be centered around which learning will take place. Every group will have a facilitator assigned to it. The facilitator will be there to keep you on track, giving you maximum liberty to discuss and achieve the objectives as a group. Small groups will be followed by a wrap up session to standardize learning. Rest of the information will be in the schedule/ time table.

LARGE GROUP INTERACTIVE SESSIONS (LGIS):
LGIS will be employed at times to augment small groups. By and large they will be used to pass on general concepts regarding the theme. Large group instruction will be employed at times sparingly. Attend large group sessions with the following focus:

- ✓ Identify important points.
- ✓ Ask questions on concepts not well understood in the text books.
- ✓ Measure your learning comprehension

CLINICO-PATHOLOGICAL CONFERENCES (CPCS):
The students will be required to present cases related to the themes in groups. They will collect the information about the different facets of patient's disease and present to the whole class with the help of appropriate histopathological, radiological and clinical slides. It will be followed by question, answer and discussion.

PRACTICAL SKILLS:
Selection of tests, collection of the specimen, examination and interpretation of specimens/test reports, microscopic slides, culture plates/media examination and radiological images.

SELF-DIRECTED LEARNING (SDL):
A task will be given in SDL regarding the theme to be discussed before PBL. This will help to prepare you a bit before the theme is under discussion. A few SDLs have been added in between to create an environment for you to search literature as well as to deduce and synthesize information from different sources to meet the learning objectives.

ASSESSMENT:
In this module, you will have formative and summative assessment. This will give you an idea about the format of the examination that you will go through at the end of the year. This will be followed by feedback on your performance in the exam. Marks obtained in the module examination will contribute 30% (internal assessment) towards end of year Professional University Examination. There is no re-sit exam for module written assessment and

block IPE under any circumstances. If you miss them, your internal assessment will be recorded as zero. No excuse of any kind is permissible for absence in module or IPE assessment.

TABLE SPECIFICATIONS (TOS)

SR.NO	THEME	WEIGHT%
1	Tumors	20
2	Eye	35
3	Trauma	15
4	Stroke	10
5	Seizers	10
6	Pain in the Neck & Back	05
7	Malformations	05

THEME 1: TUMORS

LEARNING OBJECTIVES:

At the end of the module the students will be able to:

Classify brain tumors and give their common locations, age groups and clinical & radiological presentations

Classify peripheral nerves tumors, give their gross and microscopic features, associated clinical syndromes and clinical & radiological presentations

Classify meningeal tumors and give their gross and microscopic features and clinical & radiological presentations

Explain how metastatic tumors present and how they may be differentiated from primary brain tumors

Explain the relationship of AIDS with primary brain lymphoma and type of lymphoma

Explain how tumors of CNS are diagnosed

THEME 2: EYE

LEARNING OBJECTIVES:

At the end of the module the students will be able to:

1. Classify diseases affecting Pupil and give their pathogenesis and prsentations
2. Explain Optic neuritis in terms of its pathogenesis, manifestations and management
3. Explain Oculomotor palsy in terms of its pathogenesis, manifestations and management
4. Classify eye tumors in terms of presentation, location, types and gross and microscopic features

THEME: 3 (TRAUMA)

LEARNING OBJECTIVES:

At the end of the module the students will be able to:

1. Perform basic assessment in the emergency situation
2. Integrate into interdisciplinary management
3. Decide appropriate investigations, interpret the results, and react appropriately
4. Define and enumerate causes of coma.
5. Enumerate and explain causes, pathogenesis and treatment of cerebral swelling and raised intracranial pressure.
6. Describe principles of cerebral function monitoring, especially intracranial pressure.
7. Explain principles of the management of head injury and Glasgow Coma Scale.
8. Fundoscopic evaluation of raised intracranial pressure (ICP)
9. Manage raised intracranial pressure (ICP)
10. Explain principles of diagnosing brain stem death
11. Explain management of cervical spine injuries
12. Explain principles of the safe transfer of injured children and adults and portable monitoring systems.
13. Explain how to prevent, identify, and manage injuries of brain and spinal cord and their complications
14. Organize rehabilitation transfer and follow-up

15. Communicate with the patient, relatives, and colleagues (Please now refer to case1)

THEME: 4 (STROKE)

LEARNING OBJECTIVES:

At the end of the module the students will be able to:

1. Investigate and examine a patient with history of weakness in terms of mode of onset of weakness , rate of progression, functional status and any associated symptoms like vertigo, headache palpitation , chest pain etc
2. Describe different causes of ischemic stroke like atrial fibrillation and hypertension etc
3. Chart out the plan of investigations in patients with focal neurological deficits
4. Highlight the importance of history of hypertension, DM, valvular heart disease or addiction, family history of same disease, family history of dyslipidemia, IHD at young age.
5. Highlight the importance of CT scan brain, ECG, Lipid Profile, Echocardiography and renal function testes in hemiplegia, monoplegia or paresis Stroke
6. Treat Ischemic stroke once diagnosed per guidelines.
7. Recognize and manage following complications of stroke:
    a. Raised intracranial pressure with brain herniation.
    b. Aspiration pneumonia
    c. UTI
    d. Bed sores
    e. Spasticity
    f. Post stroke dystonia
    g. Stress ulcer
    h. Depression
8. Perform detailed neurological examination that will help you localize the lesion as follows:.
    a. Motor system including tone power, reflexes, planters, and cerebellar signs
    b. Sensory system including pin prick and sense of position
    c. Cranial nerves function tests
9. Recognize that stroke of cortical origin may be present with fits, stroke of frontal lobe might be having personality disorder and incontinence and similarly in stroke of occipital area,visual problems dominate (Please refer Cases 2 and 3)
10. Differentiate between different signs and symptoms of ischemic stroke .
11. Explain different causes of ischemic stroke like atrial fibrillation and hypertension etc
12. Chart out the plan of investigations in patients with focal neurological deficits
13. Explain Post stroke: dystonia, Stress ulcer and Depression
14. Describe how will you localize the lesion through detailed neurological examination including checking of Motor system including tone power, reflexes,planters, and cerebellar signs Sensory system including pin prick and sense of position
15. Discuss developmental theories of personality
16. Discuss medical implementation of personality
17. Describe psychological problems and their effects on the body
18. Explain illness leading to psychological effects
19. Identify the causes and presentation of optic neuritis
20. Enumerate the relevant diagnostic tests for diagnosis of optic neuritis
21. Define and enumerate the Causes of R.A.P.D
22. Define diabetic retinopathy, its stages, presentation and treatment
23. Describe hypertensive retinopathy, retinal vascular occlusion, their risk factors, treatment and complications

THEME: 5 (SEIZURES)

LEARNING OBJECTIVES:

This section focuses upon recognition of different types of seizures, localization of seizures and treatment of epilepsy. The module also includes a case and post-module questions)

Regarding Epilepsy the students will be able to:

Differentiate between different types of seizures in a patient with history of seizures

Describe different causes of epilepsy

Chart out the plan of investigations in patients with seizures

Determine frequency of seizures , description of seizures by witness like tongue bite, up-rolling of eyes or just twitching of face or staring look
Determine any type of hallucinations, fever head injury or drug intake
Take appropriate history about incidence of similar disease , mental retardation and psychomotor manifestations
Investigate accordingly if types of seizures are recognized like focal, generalized, and explain why like neuroimaging is more important than EEG in focal seizures
Explain epilepsy once classified, treat as per type and frequency of fits
Explain complications of seizures such as the Head injury/trauma, Status epilepticus, Metabolic acidosis, Rhabdomyolysis and SUDEP
Perform the detailed neuro exam and localize the lesion particularly in secondary epilepsy in terms of motor system, sensory system and cranial nerves and cerebellar sign
Describe seizures originating from temporal lobe usually accompanied with visual hallucinations and memory problems and those of frontal region have personality problems like odd behavior. Many time, there are multiple seizures types like in patients with mental retardation.
Achieve 80% on post-module questions (Please See Cases # 4 & 5)

THEME: 6 (PAIN IN THE NECK & BACK)

LEARNING OBJECTIVES:

At the end of the module the students will be able to:
Evaluate patients with neck and back pain.
Identify spinal root innervation of upper and lower extremity reflexes.
Map myotomal innervation of major muscles in the upper and lower extremities.
Explain the importance of describing the pain in as much detail as possible when a patient comes in complaining of neck or back pain, it is important to ask them to Ask them if the pain is just located in the neck or back or does it radiate or shoot down a limb.
Make patient to point with a finger and show the line of radiation (Check here for "Dermatome map of the Body"). (This will help you localize the pain. Have them hold the arm in the anatomic position, and if the pain radiates into the thumb, then you need to think about a C6 radiculopathy.)
Take appropriate history about the characteristics of the pain (sharp, aching, shooting, electrical, burning, tingling). (This helps you differentiate the etiology of the pain.If the pain is aching or over a joint, then it is probably musculoskeletal.)If it is neuropathic in description (electrical, burning, tingling, then you need to think about a pinched nerve, etc).
Define radiculopathy, gives its causes, signs, symptoms and associated complications
Explain how will you determine if the presence of spinal stenosis from the patient of radiculopathy
Explain how will you localize the lesion through neurological examination from Myotomal distribution.(Pleases refer to cases 6 & 7 and accompanying notes)

THEME 7: Malformations

LEARNING OBJECTIVES:

At the end of the module the students will be able to:
Enumerate & describe congenital malformations of CNS under the categories of;
Hydrocephalus
Dysraphial (neuroschisis)
Developmental arrest
Phakomatosis
Define leukodystrophies and give their causes and pathogenesis
Enlist imaging modalities commonly used for evaluation of brain
Enlist imaging modalities commonly used for vertebral column and spinal cord pathologies
Give radiological features of common nervous system pathologies
Briefly describe applied anatomy and physiology of vestibulo-cochlear system
Identify common diseases causing tinnitus and vertigo
Manage common diseases causing tinnitus and vertigo
Define encephalitis and describe role of different viruses in encephalitis
Define rabies and give:
Structure and replication of Rabies Virus

Give pathogenesis and pathology of rabies
The lab diagnosis of Rabies
The epidemiology and prevention of Rabies
The pre exposure and post exposure prophylaxis
Define Hospital Management Information System
Differentiate formal & informal information system
Discuss the various process of information system
What are the various requirements of HMIS
Discuss the various uses of HMIS

CASE SCENARIOS

CASE 1

PATIENT: 19 years old
CC: Trauma, altered mental status, lower extremity injury

Patient is a young motorcyclist not wearing a helmet who spun out of control on the interstate and was brought by ambulance to a Level 3 trauma center. The medics found patient laying on the ground, combative and with an obvious deformity of his/her right proximal lower extremity which was splinted. At the scene, patient was not answering questions appropriately.

PMHx/ PSHx/ SOCIAL Hx: Unknown

MEDICATIONS	ALLERGIES
Unknown	Unknown

FAMILY Hx: Non-contributory
PHYSICAL EXAM:

HR	BP	Temperature (^oC)	O_2 Sats (RA)	RR
124	90/50	37.0^o	98%	18

GENERAL: Moderately combative, not answering questions appropriately, GCS 13
HEENT: Right parietal hematoma, PERRL 4 to 2mm, no facial tenderness, no hemotympanum, no septal hematoma, midface stable, dentition intact
NECK: C-collar in place, no midline tenderness or deformity; trachea midline
PULM: Clear to auscultation bilaterally, minor abrasions
CV: Tachycardic, reg rhythm
ABD: Soft, non-tender, road rash on right flank; FAST exam negative. Pelvis unstable.
BACK: No midline tenderness or deformity
EXT: Right open tib-fib fracture with loss of distal pulses to right lower extremity
NEURO: Moves all extremities
GU: Blood at urethral meatus, no gross blood on rectal exam with normal tone

LABS:

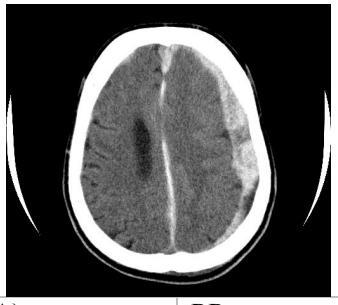
Amylase/Lipase Level		Comprehensive Metabolic Panel	
Arterial Blood Gas		Hepatic Panel	
Basic Metabolic Panel		Lactate/Cortisol Level	
Cardiac Markers		Thyroid Panel	
Coagulation Profile		Toxicology Screen	
Complete Blood Count (CBC)		Urinalysis	
CBC with differential		Urine HCG	

IMAGES:

CT Scan, without contrast	X	X-Ray	X
Ultrasound	X		

CLINICAL PROGRESSION:
History and physical, large bore IV access, and monitor. Patient has progressive hypotension.

Participants are expected to aggressively resuscitate with fluids and blood products. Upon recognition of the various injuries, student should consult trauma surgery, neurosurgery, and orthopedics, but will find that none are available and will need to stabilize patient for transfer to Level I trauma center. ***Failure to give IV fluids or blood within the first 5 minutes of the case will result in increasing tachycardia and decreased blood pressure. Similarly, after 10 minutes if the pelvis has not been wrapped, the vitals will progressively worsen*, progressing to PEA arrest.*



HR	BP	Temperature	O_2 Sat (RA)	RR
135	80/50	37.0 °C	96%	20
***After 2L IVF or PRBC transfusion, tachycardia improves.				
HR	BP	Temperature	O_2 Sat (RA)	RR
106	100/70	37.0 (^{o}C)	98%	18

***For advanced participants, mental status can progressively worsen due to head trauma requiring difficult intubation.

INSTRUCTOR NOTES:

Tips to keep scenario flowing:

If students are unsure of pathology, instructor can prompt the students to create differential diagnosis and lead them towards imaging and laboratory studies necessary to confirm diagnosis

If fluid resuscitation is not provided, nurse can verbalize need for supportive care as patient becomes increasingly hypotensive.

Scenario programming

Optimal management path:

O2/IV/monitor

History and physical examination

Appropriate lab workup: CBC, Chemistry, Tox, Coags, Type and Cross

Appropriate imaging: Portable chest and pelvis xray, FAST, leg xray, Head CT

Pelvis stabilization

Airway management

Transfer to Level 1 trauma center

Potential complications/errors path(s):

Failure to administer fluids

Failure to stabilize pelvis

Failure to transfer

CASE 2:

A 55 year-old female having history of Hypertension for last 5 years not taking medicine presents with history of sudden onset of left sided weakness of body with slurring of speech for last 12 hours.On exam her BP is 210/130 with power of 3/5 in left lower limb and 4/5 in left upper limb. Left planter is upgoing. Reflexes are normal with mild deviation of mouth to right.

Question:

If you were to examine this patient, where could be the lesion in this patient?

What investigations would you like to do in this case?

How this patient should be treated in emergency and ward there after?

CASE: 3

A 19year-old boy has history of rheumatic heart disease with mitral stenosis having history of off and palpitation. This time he presents with sudden onset of jerky movement s of the body lasting for 5-10 seconds without loss of consciousness. There no history of fever. After this event he developed weakness of lower limb. On exam, he has urinary incontinence with weakness of right lower limb. Power is 4/5 with normal reflexes and tone but right planter is up going. In the CVS there is loud S1 and mid diastolic murmur. In addition, his pulse is irregular.

Question:

What is likely cause of his symptoms and signs?
Seizure
Migraine
Stroke
Psychogenic
What do you think might be the underlying cause?
Epilepsy
Atrail fibrillation due to valvular heart disease
SOL brain
Encephalitis

CASE: 4

A 15 year-old female presents with history of nocturnal attacks of seeing some body having red dress with gun in his right hand. Immediately after seeing this, girl loses consciousness with jerky movement of the body and incontinence. This has happened three times in last 7 months.
Question:
If you were to examine this patient, what are the possibilities in your mind before you start your examination?
What investigations would you like to do in this case
How this patient should be treated and how family counseling should be done

CASE: 5

A 9 year-old boy has history of twitching of right side of face for last one months . He had several episodes in each day. Past history is unremarkable except the history of fall 3 years back having lacerated wound on top of skull. He also had loss of consciousness at that time and was admitted d in hospital for 3 days and finally discharged in good state of health.
Questions:
Which type of seizure is this?
Simple partial
Complex partial
Tonic clonic
Myoclonic
What is likely cause of this fit?
Idiopathic
Head injury in the past
Psychogenic

CASE: 6

A 55 year-old female having history of Hypertension for last 5 years not taking medicine presents with history of sudden onset of left sided weakness of body with slurring of speech for last 12 hours.On exam her BP is 210/130 with power of 3/5 in left lower limb and 4/5 in left upper limb. Left planter is upgoing. Reflexes are normal with mild deviation of mouth to right.
Question:
If you were to examine this patient, where could be the lesion in this patient?
What investigations would you like to do in this case?
How this patient should be treated in emergency and ward there after?

CASE: 7

A 19 year-old boy has history of rheumatic heart disease with mitral stenosis having history of off and palpitation. This time he presents with sudden onset of jerky movement s of the body lasting for 5-10 seconds without loss of consciousness. There no history of fever. After this event he developed weakness of lower limb. On exam, he has urinary incontinence with weakness of right lower limb. Power is 4/5 with normal reflexes and tone but right planter is up going. In the CVS there is loud S1 and mid diastolic murmur. In addition, his pulse is irregular.
Question:
What is likely cause of his symptoms and signs?
Seizure

Migraine
Stroke
Psychogenic
What do you think might be the underlying cause?
Epilepsy
Atrail fibrillation due to valvular heart disease
SOL brain
Encephalitis

PBL-1A

A 23-year-old female student consulted her GP for constant headache from several weeks which were worse in mornings. She also found that her vision had become blurred recently and she had developed diplopia two days ago. She had no past medical history of note. The patient was taking oral contraceptive pill.

On examination BP measured 125/80mmHg, BMI was 27, Her pupil were equal and reactive to light. Visual field testing revealed enlarged blinds spots bilaterally. She has diplopia on looking to right and impaired abduction of right eye. Fundoscopy revealed bilateral papilloedema. All other cranial nerves were intact, as was the examination of the cerebellar and peripheral nervous system.

INVESTIGATIONS:

ESR	8 mm/h
CT Scant of the brain without contrast	Normal
LUMBAR PUNCTURE AND CSF ANALYSIS:	
Opening Pressure	29 cm H_2O
Protein	0.4 g/l
Glucose	4.5 mmol/l
Microscopy	Lymphocytes 4/mm^3

Resource for Learning & Reference books

Robin's Pathology
University of Iowa Hospitals Handouts
Medscape.com
Google Search

AJK MEDICAL COLLEGE, MUZAFFARABAD

Schedule for Neuroscience Module
4th Year

WEEK-1

<table>
<tr><td>DATE</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>TIME</td><td>MONDAY</td><td>TUESDAY</td><td>WEDNESDAY</td><td>THURSDAY</td><td>FRIDAY</td></tr>
<tr><td>8:00am-
9:00am</td><td colspan="3" rowspan="2">Practical Professional Exam 2016</td><td>LGIS
Imaging Modalities of Nervous System
Dr. Shaukat Dar</td><td rowspan="2">SGD
Brain Tumors
Team-3
Wrap-up
Dr. Sarosh Majid</td></tr>
<tr><td>9:00am-
10:00am</td><td>LGIS
Introduction to NEU-II Module
Dr. Anwar & Module Team</td></tr>
<tr><td colspan="4"></td><td colspan="2">TEA BREAK(10:00am - 10:30am)</td></tr>
<tr><td>10:30am-
11:30am</td><td colspan="3" rowspan="2">Practical Professional Exam 2016</td><td rowspan="2">CLINICAL ROTATION</td><td>LGIS
Epilepsy
Dr. Mazhar Hamdani</td></tr>
<tr><td>11:30am-
12:30pm</td><td>LGIS
Epidemiology & Prevention of Rabies
Prof. Brig (R) Ahmed Khan/Dr. Murtaza</td></tr>
<tr><td>1:30pm-
2:00pm</td><td colspan="3"></td><td colspan="2">LUNCH BREAK</td></tr>
<tr><td>2:00pm-
3:00pm</td><td colspan="3" rowspan="2">Practical Professional Exam 2016</td><td>LGIS
Head injury & raised ICP
Dr. Liaqat</td><td rowspan="2">SDL</td></tr>
<tr><td>3:00pm-
4:00pm</td><td>SDL</td></tr>
</table>

AJK MEDICAL COLLEGE, MUZAFFARABAD

Schedule for Neuroscience Module

4th Year

WEEK-2

DATE					
TIME	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
8:00am-9:00am	LGIS Personality Developing Dr. Ayesha Mumtaz	LGIS Spinal Injury Dr. Sarmad	LGIS Laboratory Diagnosis of CNS Dr. Anwar Ul Haque/Dr. Wafa	LGIS Optic Neuritis Lt. Col Jawad	PBL-1B Pathology
9:00am-10:00am			LGIS CN-III Palsy Dr. Munir Baig	LGIS Neck & back pain Dr. Sarmad	
TEA BREAK(10:00am - 10:30am)					
10:30am-11:30am	CLINICAL ROTATION	CLINICAL ROTATION	CLINICAL ROTATION	CLINICAL ROTATION	DSL
11:30am-12:30pm					
1:30pm-2:00pm	LUNCH BREAK				
2:00pm-3:00pm	PBL-1A Pathology	PRACTICAL Tumors of Nervous System Dr. Sarosh & Team-3	LGIS Pupil Dr. Munir Baig	LGIS Tumors of Eye Dr. Anwar Ul Haque	SDL
3:00pm-4:00pm	LGIS Rabies Dr. Munir		LGIS Flaccid Paralysis & Guillain Barre Syndrome Dr. Naheem Ahmed	LGIS Vertigo & Tinnitus Dr. Farooq Kiani	

Inquires & trouble shooting

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