

Elective in Physiology

1. Basics of neurophysiology

S. No.	Name of the Elective	Neurophysiology – Nerve conduction study (NCS) and Electromyography (EMG)
1	Block	New building
2	Department/ Area	Physiology
3	Name of Mentor/ Supervisor/ In charge	Dr Shikha Gautam, Professor, Department of Physiology, HIMSR
4	Co-Supervisor	Dr Shaon Ghosh Dastidar, Assistant Professor, Department of Physiology, HIMSR
5	Number of students intake	02-05
6	Method of Selection (if applicable)	Interview to determine a candidate's understanding of neurophysiology and interest in electrophysiological techniques.
7	Objectives	1. To understand the physiological basis of peripheral nerve conduction and muscle electrical activity. 2. To learn the principles and methodology of performing NCS and EMG. 3. To identify normal vs. abnormal nerve conduction parameters. 4. To interpret EMG waveforms and understand their diagnostic relevance. 5. To develop research aptitude using electrophysiological recordings for disease modelling and functional assessment
8	Expected outcomes	By the end of the elective, students will be able to: 1. Describe the physiological principles behind NCS and EMG studies in humans 2. Perform and record motor and sensory nerve conduction studies for: I. Upper limb: 1. Median nerve — motor & sensory 2. Ulnar nerve — motor & sensory II. Lower limb: 1. Tibial nerve — motor 2. Peroneal nerve — motor & sensory 3. Sural nerve — sensory

		Perform basic EMG recordings and analyse EMG parameters such as area under curve, amplitude, duration, recruitment pattern, and interference pattern in selected muscles: I. Upper limb: Biceps, Deltoid, Abductor Pollicis Brevis II. Lower limb: Quadriceps, Tibialis Anterior, Gastrocnemius 4. Recognize deviations seen in common neuromuscular disorders (e.g., neuropathies, myopathies, motor neuron disease, radiculopathy). 5. Appreciate the application of these techniques in clinical diagnosis, rehabilitation, and neuroscience research.
9	Assessment	1. Attendance and active participation during hands-on sessions. 2. Practical competence in recording and interpreting NCS and EMG data. 3. Short presentation or mini-project report on clinical or research application (e.g., diabetic neuropathy, nerve injury recovery). 4. Maintenance of a log book with reflections and daily learning entries.
10	Log book	Regular log book entry of daily activities. See Appendix 1 for log book details.

2. Cardiac Autonomic Function Tests and Heart rate variability

S. No.	Name of the Elective	Cardiac Autonomic Function Tests and Heart rate variability
1	Block	
2	Department/ Area	Physiology
3	Name of Mentor/ Supervisor/ In charge	Dr. Iqbal Alam, Professor, Department of Physiology, HIMSR
4	Co-Supervisor	Dr Manvi Gupta, Associate Professor, Department of Physiology, HIMSR

5	Number of students intake	02-05
6	Method of Selection (if applicable)	Interview to determine a candidate's core understanding and interests in the field of Cardiac Electrophysiology.
7	Objectives	6. To help trainees acquire basic knowledge about cardiac electrophysiology. 7. To help a trainee gain competencies in cardiac autonomic function tests and heart rate variability.
8	Expected outcomes	3. To describe Cardiac electrophysiology. 4. To obtain a history relevant to cardiac autonomic function test and conduct a thorough general and cardiac examination. 5. To describe the application of cardiac autonomic function tests and heart rate variability. 6. To describe different cardiac autonomic function tests. 7. To describe heart rate variability test. 8. To be able to perform cardiac autonomic function tests. 9. To be able to perform heart rate variability test. 10. To be able to do the reporting of cardiac autonomic function tests and heart rate variability test. 11. To be able to interpret the results of cardiac autonomic function tests and heart rate variability test.
9	Assessment	5. Attendance 6. Day to day participation in learning the cardiac autonomic function tests and heart rate variability during the routine training. 7. Performance of assigned task and presentation of worked up case in the department.
10	Log book	Regular log book entry of daily activities. See Appendix 1 for log book details.

3. Basics of animal handling and Preclinical research

S. No.	Name of the Elective	Basics of animal handling and research
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1	Block	
2	Department/ Area	Physiology
3	Name of Mentor/ Supervisor/ In charge	Dr Shaon Ghosh Dastidar, Assistant Professor, Department of Physiology, HIMSR
4	Co-Supervisor	Dr Iqbal Alam, Professor, Department of Physiology, HIMSR
5	Number of students intake	02-05
6	Method of Selection (if applicable)	Interview to determine a candidate's core understanding and interests in the field of animal experimentation.
7	Objectives	8. To understand the importance of ethical aspects and importance of animal research. 9. To acquire basic knowledge about animal handling. 10. To help a trainee gain competencies in animal research.
8	Expected outcomes	12. To explain the importance of animal experimentation. 13. To know the ethical aspects of animal experimentation. 14. To follow the correct methodology for disposal of biomedical waste generation during animal experimentation. 15. To perform basic animal anthropometrical techniques independently. 16. To be able to perform recording of biological signals like Blood pressure, ECG, heart rate, respiratory rate etc. in rat model with assistance. 17. To be able to perform cannulation of rat carotid artery , independently. 18. To describe the routes of drug administration in rats and calibration of doses. 19. To describe the physiological basis of animal models of few diseases like heart failure, preeclampsia etc.
9	Assessment	8. Attendance 9. Day to day participation in animal handling and research activities during the routine training hours. 10. Performance of assigned task and presentation of results in the department.
10	Log book	Regular log book entry of daily activities. See Appendix 1 for log book details.

Annexure 1

S. No.	Name of Competency	Procedure	Date of Procedure	Trainee's feedback	Trainee's initials	Trainer's initials with date
1	To know importance of animal experimentation					
2	To know the ethical regulations and guidelines of CPCSEA in India					
3	To dispose the animal tissue according to proper guidelines.					
4	To be able to weigh the rat independently.					
5	To be able to calculate dose of drug to be administered to the rat.					
6	To be able to record Non-invasive BP, ECG, HR, RR etc. in rats.					
7	To be able to perform cannulation of rat carotid artery , independently					
8	To describe the physiological basis of animal models of few diseases like heart failure					

Reflection by student

Annexure 1

S. No.	Name of Competency	Procedure	Date of Procedure	Trainee's feedback	Trainee's initials	Trainer's initials with date
1	To describe the cardiac electrophysiology.					
2	To obtain a history relevant to cardiac autonomic function test and conduct a thorough general and cardiac examination					
3	To describe cardiac autonomic function tests and heart rate variability test.					
4	To be able to perform cardiac autonomic function tests independently.					
5	To be able to perform heart rate variability test independently.					
6	To be able to do the reporting of cardiac autonomic function tests and heart rate variability test.					
7	To be able to interpret the results of cardiac autonomic function					

	tests and heart rate variability test.					
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