Curriculum for Post-Doctoral Fellowship in Neuromuscular Disorders

Introduction:

Neuromuscular disorders include the diseases of the anterior horn cell, nerve root, plexus, peripheral nerve, neuromuscular junction, and skeletal muscle. This umbrella includes a wide variety of diseases of genetic and acquired origins. Identifying treatable diseases among them and offering supportive management for all conditions are crucial aspects of management. Evaluation and management of neuromuscular diseases require special competencies which are provided in this one-year fellowship programme.

Goals of the programme:

1. Training in the evaluation, diagnosis and management of different neuromuscular disorders including understanding the principles of motor unit physiology and the myoneural junction.
2. Working and associating with the team conducting Muscle and Nerve Clinic with a focus on follow up, counselling and physical rehabilitation methods.
3. Exposure to activities of the electroneuromyography lab and plan a focussed electromyography study, interpretation of electrophysiological abnormalities in health and neuromuscular disorders, mainly myasthenia gravis, motor neuron disease, peripheral neuropathies and myopathies.
4. Exposure to clinical genetics in relation to neuromuscular disorders and interpretation of pedigrees and molecular studies including genetic counselling.
5. Participation in the conduct and meaningful interpretation of muscle and nerve biopsies in collaboration with the Department of Neuropathology, exposure to various immunocytochemistry stains, preparing the sections for staining.
6. Training in the management of neuromuscular disorders in the neurointensive care unit focussing on the care of Guillain Barre syndrome, myasthenic crisis and critical care myoneuropathy.

Curriculum for training:

The curriculum for fellowship in Neuromuscular diseases encompasses the five core areas:

(i) Structural and functional anatomy of the central and peripheral nervous systems, neuromuscular junction and muscles

(ii) Diseases of the neuromuscular system

(iii) Electromyography and nerve conduction studies

(iv) Neuropathology, neuroimmunology, and neuroradiology of neuromuscular diseases

(v) Neurogenetics of neuromuscular diseases

(vi) Management of neuromuscular diseases

Specific skill-sets for Neuromuscular fellow

A. Clinical skills:

The fellow is expected to acquire expertise in the clinical evaluation, diagnosis, and management of the following diseases:

1. Genetic neuromuscular diseases which include muscular dystrophies and other genetic myopathies, spinal muscular atrophy, and Charcot Marie Tooth disease among other diseases.
2. Immune mediated neuromuscular diseases including inflammatory demyelinating polyradiculoneuropathies, peripheral nerve vasculitis, myasthenia gravis, and inflammatory myopathies among others.
3. Acquired degenerative diseases of neuromuscular origin, the most prominent of which is amyotrophic lateral sclerosis.
4. Other broad etiological categories include metabolic, toxic, nutritional, and infectious diseases of peripheral nervous system, neuromuscular junction and muscles.
5. Acute neuromuscular emergencies which include Guillain Barre syndrome, myasthenic crisis and critical illness myoneuropathy.

B. Electrodiagnostic skills:

Nerve conduction studies and electromyography provide essential diagnostic and prognostic information for neuromuscular diseases. The fellow is expected to acquire knowledge and skills on instrumentation, techniques of routine and uncommon nerve conduction studies, repetitive nerve conduction tests and electromyography. Planning nerve conduction studies and electromyography strategy are cardinal as are the interpretation skills. In addition, advanced skills imparted during the course will include single fibre electromyography, jitter studies with concentric needle, near nerve studies, motor unit number estimation techniques, quantitative electromyography, and needle recording and stimulation of deep nerves.

C. Paraclinical skills:

Neuropathology, neuroimmunology, neuroradiology and neurogenetics are critical components of the diagnostic pathway in neuromuscular disorders. The ability to correctly requisition and interpret the reports are vital skills and will be cultivated in tandem with the specialists in the respective departments.

D. Multidisciplinary care:

Management of neuromuscular diseases require co-ordinated multidisciplinary care and monitoring. The training will impart the knowledge on forming teams for care of the myriad disorders by anticipating the complications related to the diseases and their therapy.

Duties and responsibilities:

The fellow is expected to adhere to the following typical work schedule:

1. Weekly Muscle and Nerve Clinic on Tuesdays
2. Nerve conduction study and electromyography training for 2 – 3 days per week
3. Neuropathology and neurogenetic case discussion once a week
4. Neurorehabilitation meeting once a week
5. Two half-days a week for research
6. Journal club once every 2 weeks and 3 to 4 seminars in one year
7. Discussion of neuromuscular cases in the wards and neurointensive care unit
8. Participation in the evolution of proformas and protocols for patient management and multidisciplinary care

All the activities of the fellow will be supervised by the mentor during the entirety of the course. However, after 3 to 6 months of training, the fellow is expected to be able to methodically plan and execute activities in the clinics and electrophysiology laboratory with minimum supervision.

In addition to the regular activities, the fellow will be expected to complete at least two projects and present the research in a national or international conference. The fellow is also expected to actively contribute to the ongoing research activities of the subsection.

Assessment of output:

The following parameters will be monitored during the entirety of the course:

1. Aptitude for the subject and interest in acquiring knowledge and skills
2. Incremental acquisition of clinical skills during the course
3. Attitude towards patients and colleagues
4. Punctuality and discipline
5. Research interests and ethical conduct of research

The fellow is required to submit the following at the end of the course:

(i) Logbook of activities

The logbook should record challenging cases (anonymized) and electrodiagnostic studies, discussions in patient management and neurorehabilitation meetings, academic activities and summary of research activities.

(ii) Completion of two Institutional Ethics Committee/ Institutional Review Board approved research studies.

(iii) At least one original article submitted for publication as the first author.