Peripheral neuropathies:

I. Inflammatory or immune mediated PN:

1. **Guillain-Barre syndrome**: (mixed motor and sensory)

- Ascending paralysis characterised by paresthesia in the feet that ascends to involve legs, trunk and upper limbs associated with weakness. The symptoms progress over a month and in severe cases lead to respiratory failure (intercostal and diaphragmatic paralysis) and bulbar palsy. 1/3 of patients develop facial diplegia. Symptoms plateau over a month and recover over days to weeks. Prognosis is good. The majority of patients make full recovery. Mortality is 5% and permanent neurological deficit is 5-10%
- NCS and EMG show peripheral polyneuropathy. CSF-abnormally high protein (55-250mg /dl and normal WBC < 10 mm^3).
- This is an inflammatory polyneuropathy triggered by infection (campylobacter enteritis, hepatitis and other viral infections). Pathologically there is infiltration of the peripheral nerves and roots with lymphocytes and macrophages, demyelination and secondary axonal degeneration.
- Treatment consists of plasmapheresis or intravenous immunoglobulin. Both tests are proven to be effective in prospective randomised studies. Corticosteroids are not effective.

2. **Multifocal motor neuropathy**: characterised by asymmetrical weakness in the distribution of many peripheral nerves (atrophy, fasciculations more in the distal muscles) with sparing of sensory function. NCS show conduction block in the distribution of affected nerves. 50-80% has increased titres against ganglioside (GM1). Treatment with IV IG and immunosuppressants (cyclosporine and cyclophosphamide) is occasionally helpful. Many patients are left with permanent deficit
3. **Neuralgic amyotrophy (brachial plexopathy):** patients present with acute onset shoulder and arm pain that lasts for weeks associated with weakness of upper limb muscles. The weakness can involve any nerve in the upper limb (long thoracic nerve is most commonly involved-winging of the scapula).Sensory symptoms if present are minor. This condition is more common in males and is secondary to immune-mediated inflammatory demyelination similar to GBS. The prognosis is good with 60-80% of patients making full recovery within a year. Treatment is with short course corticosteroids or immunoglobulin analgesia and physiotherapy.
4. **Lumbosacral plexopathy:** similar to the above but involving lower limbs
5. **Monoclonal gammopathy**: idiopathic or associated with leukaemia or lymphoma. Demyelinating or axonal. Some are associated with antibodies (GM1, MAG). Prognosis is good

II. **Infectious neuropathies**:

1. **HIV neuropathy**: different types of neuropathy are associated with HIV infection .The most common is distal sensorimotor symmetrical polyneuropathy (affects 30% and involves small sensory fibres mediating pain and T sensation). Other types are GBS and mononeuritis multiplex.
2. **CMV**: can cause acute or subacute radiculopathy –gancyclovir.
3. **Herpes zoster**: recurrence of latent dorsal root ganglion varicella (chickenpox infection). Commonly followed by postherpetic neuralgia. Treatment is with

acyclovir in the early stages and medications for neuropathic pain later (Gabapetin).

4. **Others**: Hepatitis B and C, Lyme (Borrelia burgdorferi) can cause mononeuritis multiplex.

III. **Endocrine neuropathies**:

1. **Diabetic neuropathy**:

- Develops in 10% of patients in the first year and 50% at 25 years .The aetiology is not certain. Two possible mechanisms are metabolic (increased activity of aldose reductase that converts glucose to sorbitol which leads to decreased Na-K-ATPase activity) and ischemia from vascular insufficiency.
- Different types of neuropathy in DM:

A. Distal symmetrical length dependent sensory or sensorimotor polyneuropathy (gloves and stocks) sensory deficit and foot drop and foot ulcers.
B. Autonomic neuropathy: postural hypotension, distal anhidrosis, bladder atony, retrograde ejaculation, impotence, unawareness of hypoglycemia and pupillary dysfunction.
C. Proximal diabetic neuropathy: 1% of all patients characterised by weakness and atrophy of proximal muscles of pelvic girdle, thigh and shoulder.
D. Focal mononeuropathy or radiculopathy: any nerve can be involved (median, ulnar, radial, peroneal, III, IV, VI, VI). Patients present with pain , sensory and motor deficit in the distribution of the involved nerve which result from acute nerve infarction). Radiculopathy are not distinguishable from structural radiculopathy (MRI).

2. **Others**: Hypothyroidism and acromegaly (connective tissue hyperplasia) are associated with entrapment neuropathy

IV. **Toxic Neuropathies**: Alcoholic neuropathy (toxic effect of alcohol and nutritional deficiency such as thiamine deficiency), drugs (amiodarone, phenytoin chloramphenicol, isoniazid Cisplatin, vincristine and others.

V. **Nutritional**:

1. B12 (cyanocobalamin) deficiency -dementia and subacute combined degeneration.
2. Thiamine (B1)deficiency- dry beriberi-(symmetrical sensorimotor neuropathy, wet beriberi-as above + cardiac failure and Wernicke-Korsakoff syndrome (confusion, ataxia, ophthalmoplegia)
3. B6 (pyridoxine) deficiency or excess-distal sensory neuropathy.

VI. Vasculitis: PAN, RA, SLE etc…

VII. Neoplastic and Paraneoplastic: the most common is sensory ganglionopathy associated with small cell lung carcinoma (antibodies against sensory neurons).

VIII. Hereditary: Charcot-Marie-Tooth disease: autosome dominant due to mutations of PMP22 on chromosome 17. CMT disease is characterised by symmetrical length dependent demyelinating polyneuropathy leading to weakness, muscle atrophy and foot deformity (pes cavus, hammer toes). Hypertrophy of the nerves, especially ulnar and posterior auricular0. Treatment is supportive