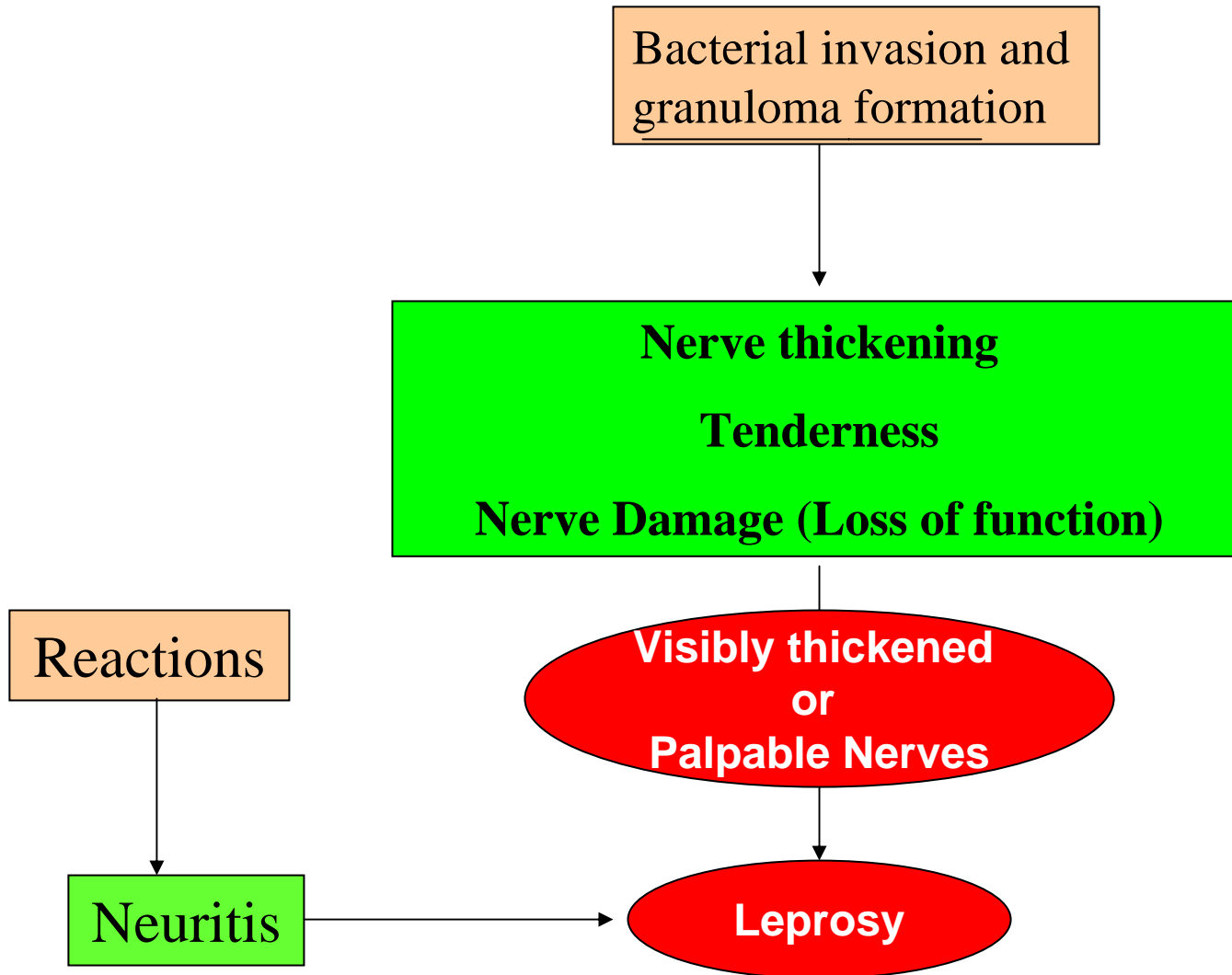


Examination of the Nerves

Assessment of nerve Function



Suspect nerve involvement

Autonomic function: Dry skin – decreased sweating, brittle skin, cracks

Sensory Function : Loss of sensation / abnormal sensation in hands and /or feet

Motor Function: Weakness in hands or feet
Weak grip / pinch etc
Movement hands / feet
Walking / running

Suspect Nerve lesion

- Numbness or tingling of hands or feet
- Lesional changes like shiny skin / loss of hair / loss of sweating in an area
- Painful and tender/ palpable nerves (especially near elbow, wrist, knee, ankle)
- Weakness of hands and/ or feet
- Painless cuts or burns on hands and feet
- Visible deformities of hands feet & eyes

Suspect Nerve lesion

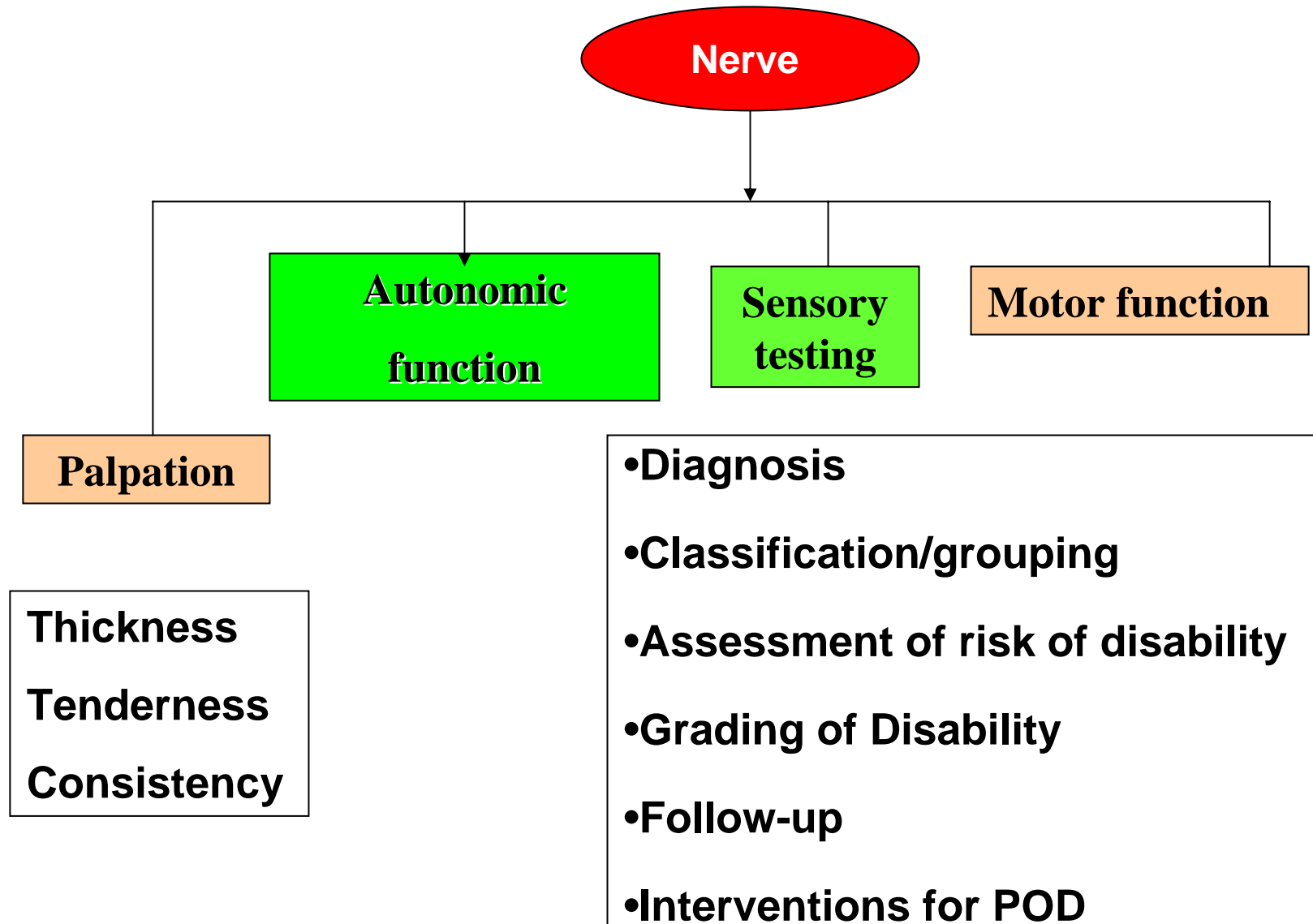
- Inability to retain chappal (foot wear without back strap)
- Ocular complaints – Lagophthalmos / reduced or absent of blinking of the eye

Presence of Disability or Deformity
Confirms involvement of the nerves

Nerves are examined to assess:

- Extent of involvement of nerve
- Extent of disability

Examination of Nerves



Involvement of Nerves

Normal:	No nerve involvement
Thickened:	With / with out any symptom /sign
Tender:	Acute neuritis
Partially damaged:	With /without tenderness gradually increasing functional deficit)
Complete N. destruction:	(Complete paralysis for more than one year)
Thin / fibrosed:	Damaged nerve healed with fibrosis

Examination of nerves

Assess for-

Thickening: Palpable/ Visibly thickened

Tenderness: Acute inflammation/ ischaemia

Autonomic function: Sweating, hairs, dry brittle skin,
Cracks – smooth shiny skin

Sensory deficit: Sensory Test (ST).

Motor Function: Power of muscles:
Strength of movement
Voluntary Muscle Tests (VMT)

Examine – Face Hands Feet

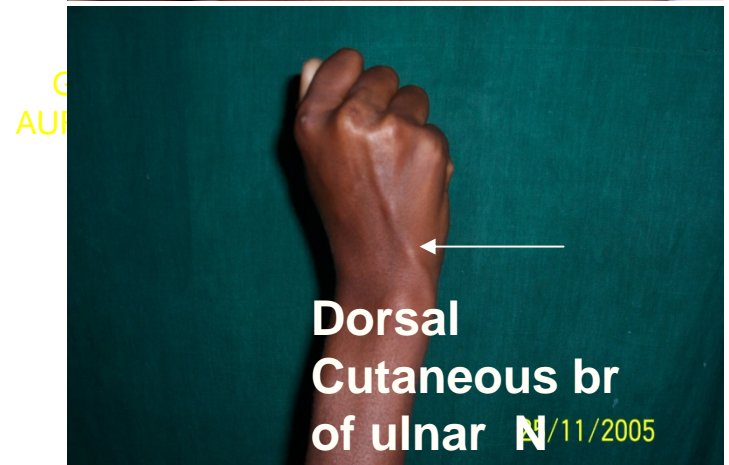
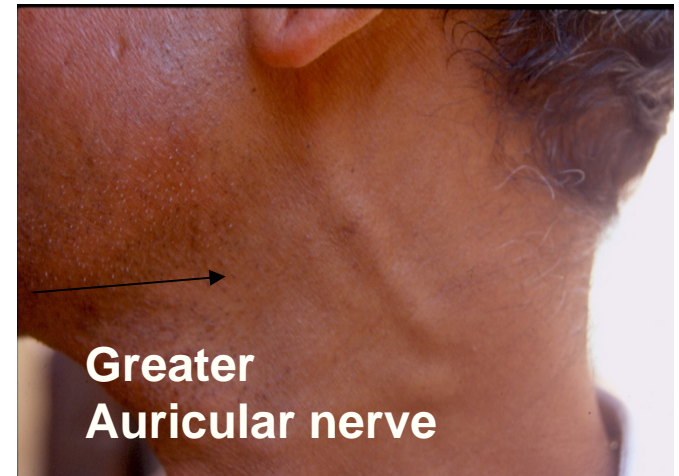
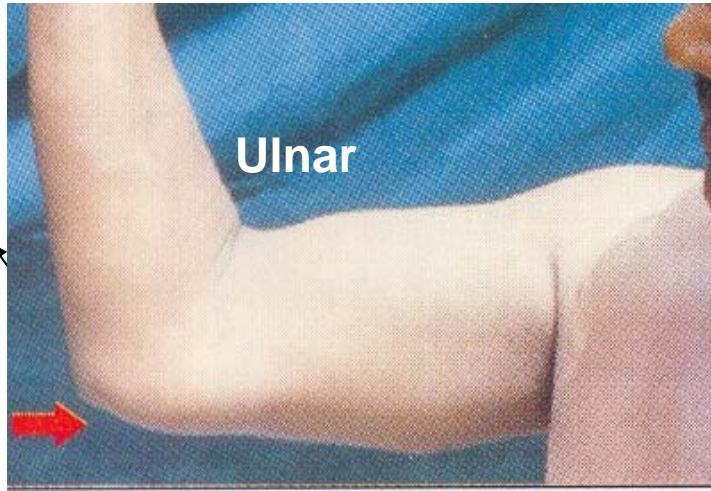


Skin condition - Hands & Feet

Blisters, dryness and wounds

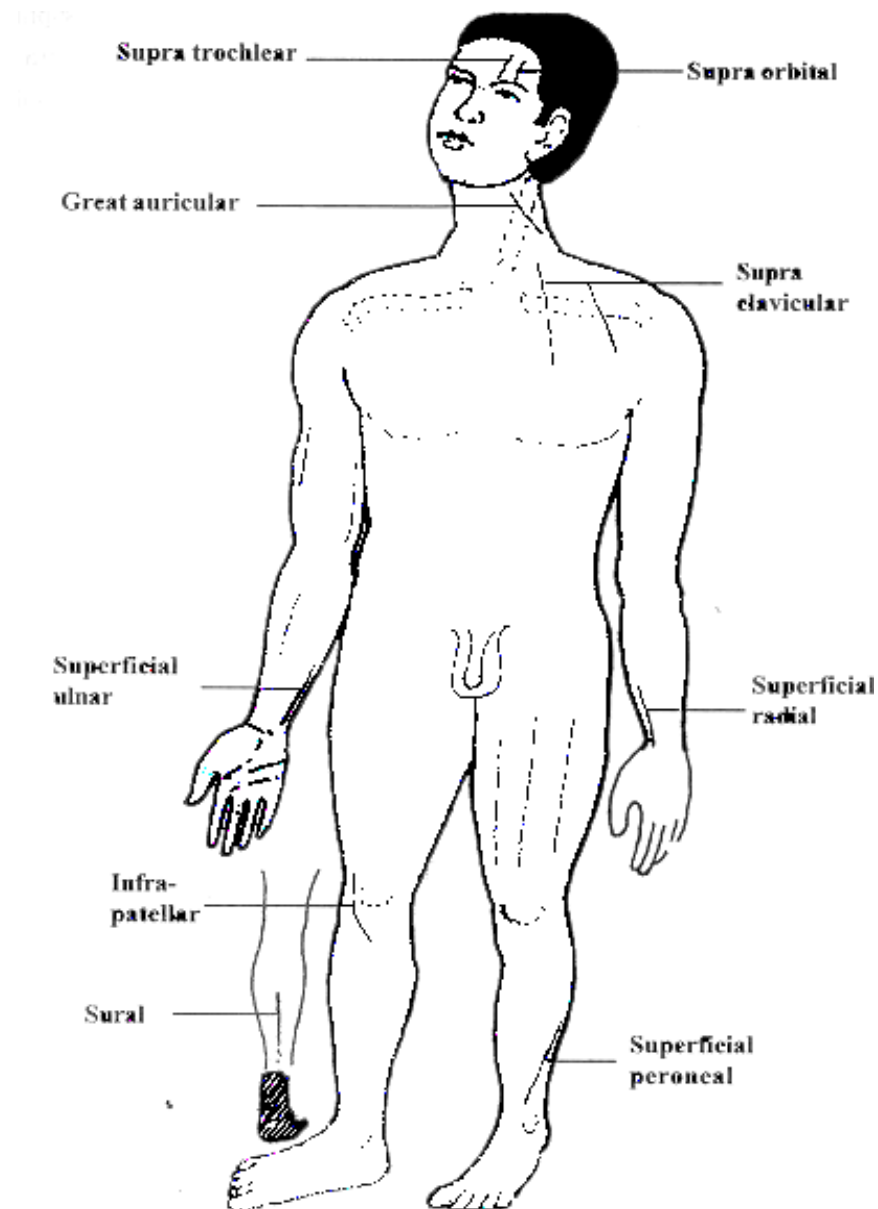


Enlarged/ tender nerves with / with out nerve function impairment

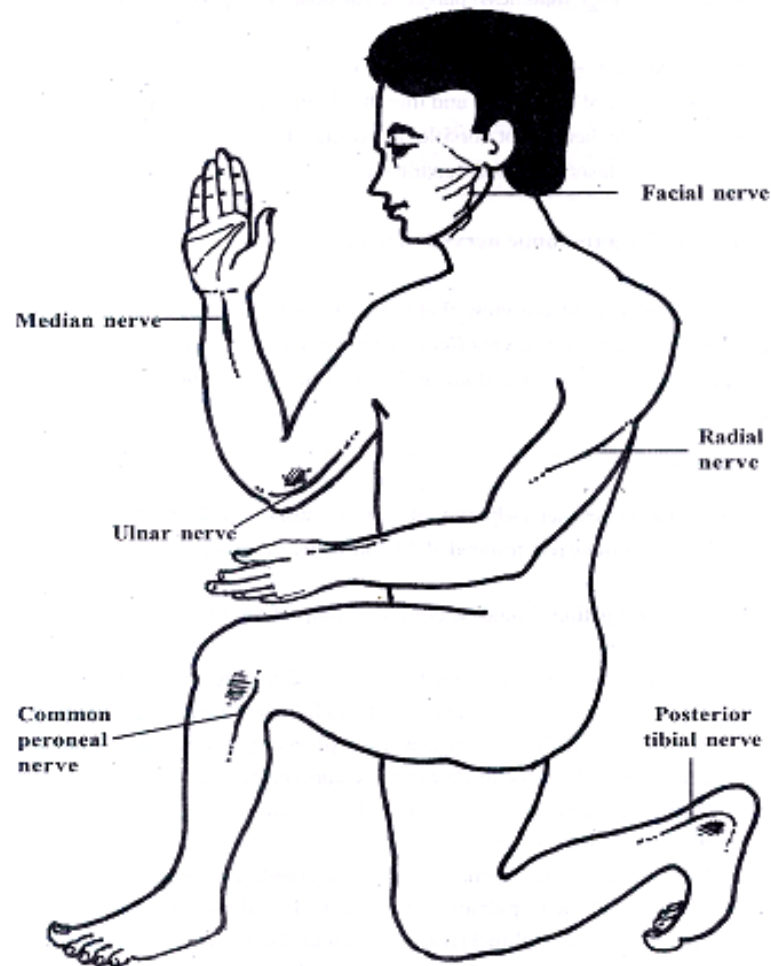


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Sensory Cutaneous nerves-



Commonly affected nerve with motor function



Facial

Ulnar

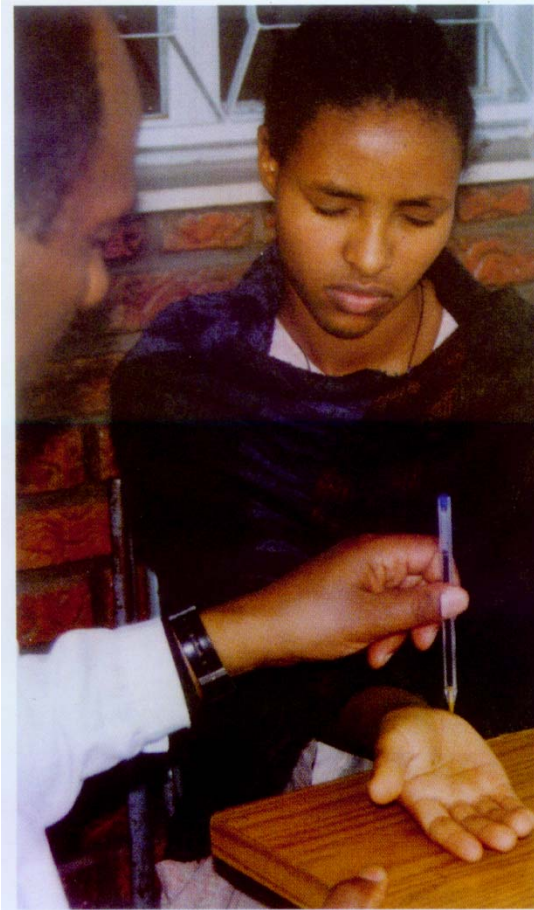
Median

Radial

Lateral popliteal

Posterior tibial

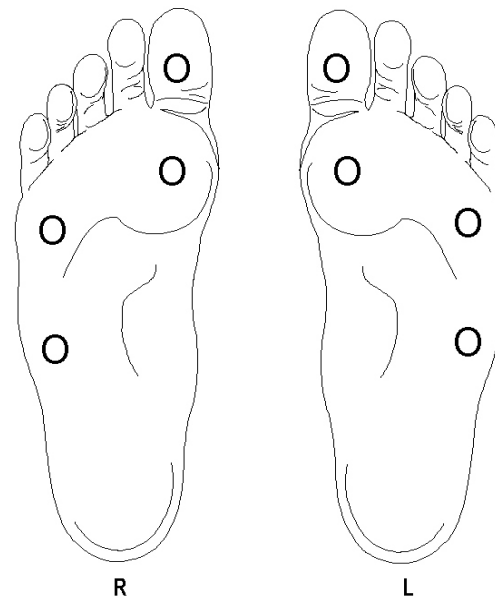
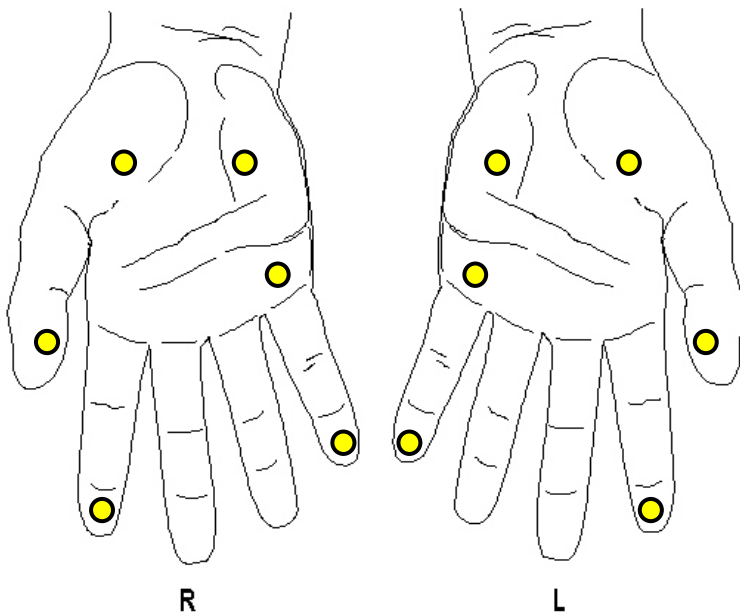
Testing For Sensory Deficit



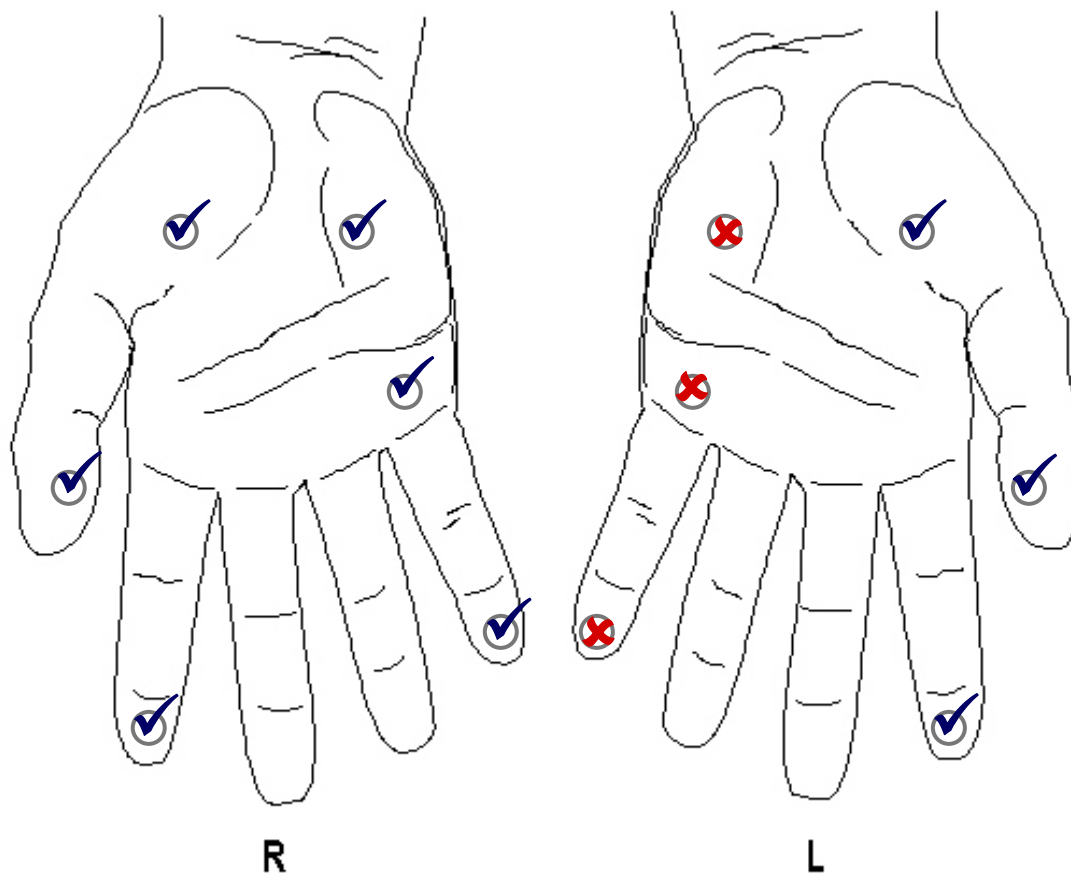
Hands / Feet



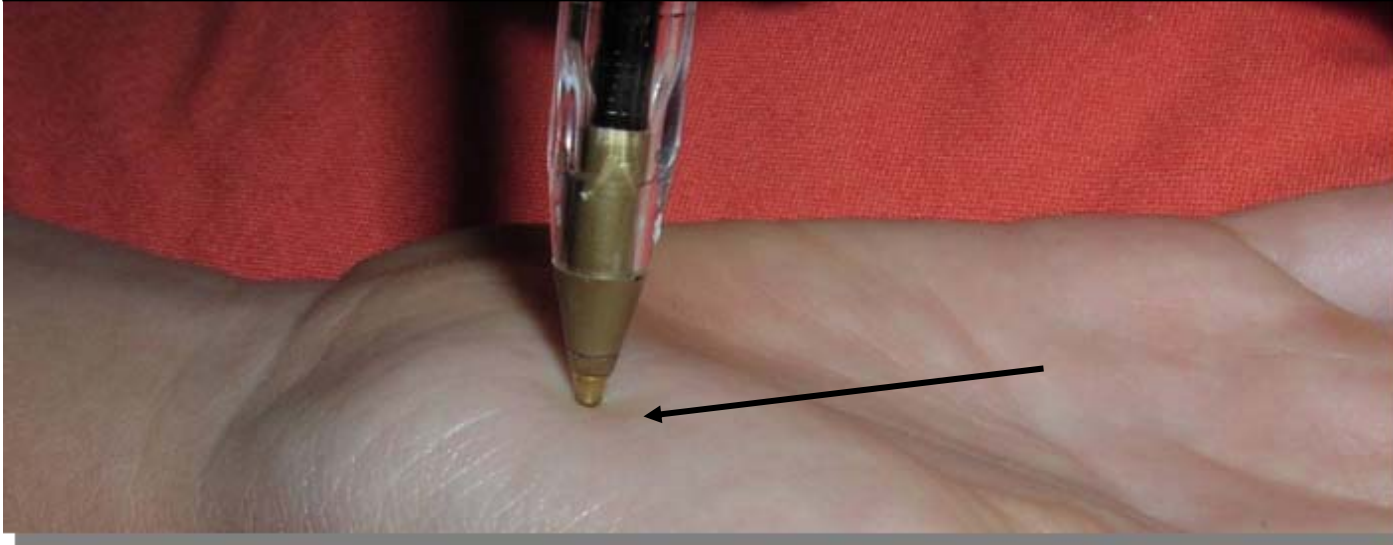
Sensory Testing – Hands & Feet



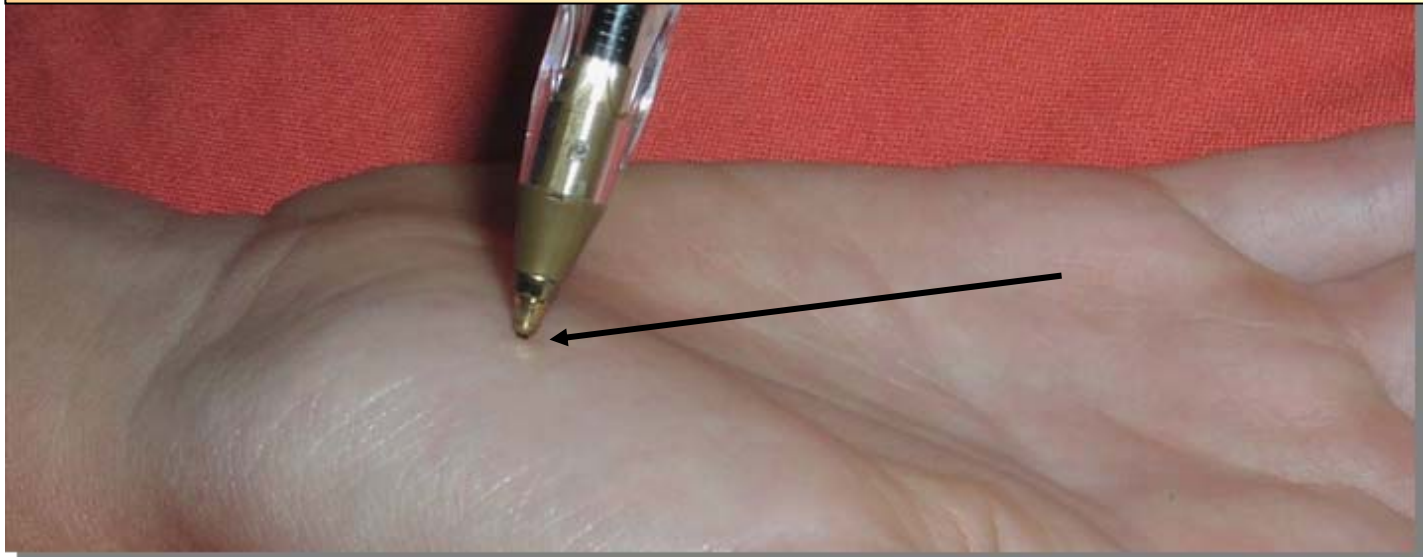
Recording results of sensory test



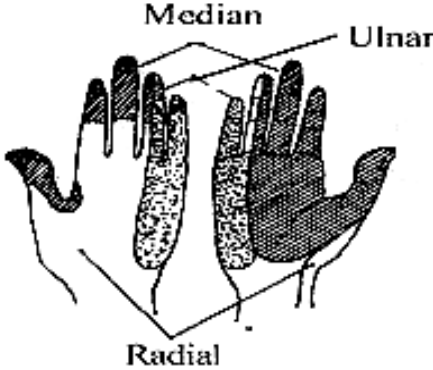

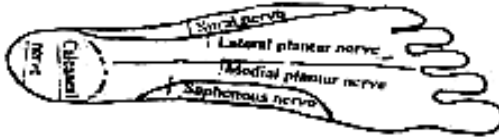

Ballpen test – wrong technique



Ballpen test – correct technique



Sensory supply of commonly affected nerves

Nerve	Area of sensory distribution	Motor supply
Ulnar nerve		Interossei and lumbricals of hand Muscles of hypo-thenar eminence
Median nerve		Adductor pollicis Muscles of the thenar eminence
Radial nerve		Muscles at the back of forearm which extend the wrist and thumb
Common peroneal (lateral popliteal) nerve		Muscles of anterior tibial compartment
Posterior tibial nerve		Interossei muscles of foot
Facial nerve (Usually the upper and lower branches)		Muscles of face

Interpretation of test for loss of sensation:

- Loss of sensation if no response
- Reduced sensation >3cm away
- Normal sensation within 3cm

Quick Muscle Test

- Face

Blinking of eyes

Lid lag or lagophthalmos

Trigeminal nerve

Facial Nerve

- Hand

Book test, fromet sign,

Card test

Oschner's clasping hand,

Pen test

wrist extension

Ulnar

Median

Radial nerve

- Foot

Stand on Toes

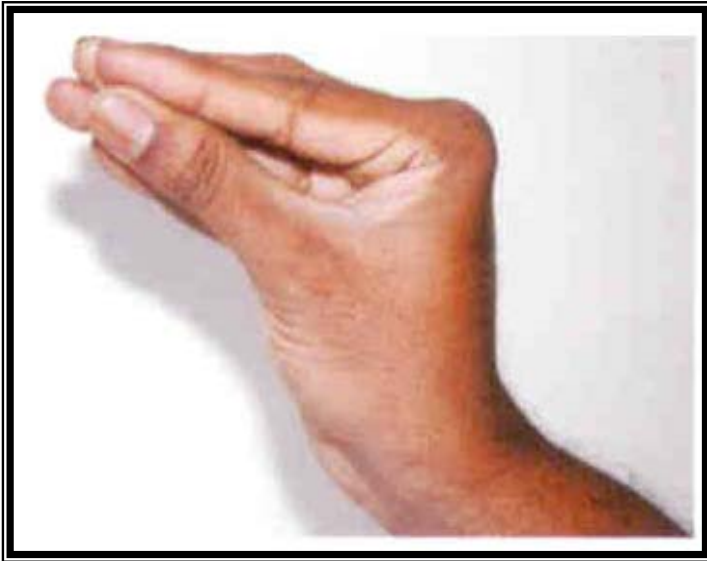
Spreading of toes

Lateral popliteal nerve

Posterior Tibial nerve



Quick Muscle Test



Standing on toes
Spreading of Toes

Posterior Tibial Nerve

Walk on heels

Common peroneal Nerve

Beak Test

- Ulnar
- Median
- Radial Nerve



Detailed Muscle Test – Muscle Strength

- Eye closure (facial nerve)
 - Blinking of eye Trigeminal nerve (sensory nerve)
 - Light closer of eyes Facial nerve
 - Tight closer of eyes Early weakness
- Little finger abduction Ulnar nerve
- Thumb up (pen test) Median nerve
- Wrist up Radial nerve
- Foot up Lateral popliteal nerve
- Spreading of toes: Postr Tibial nerve

Range of movement Active / passive / flexed proximal joints

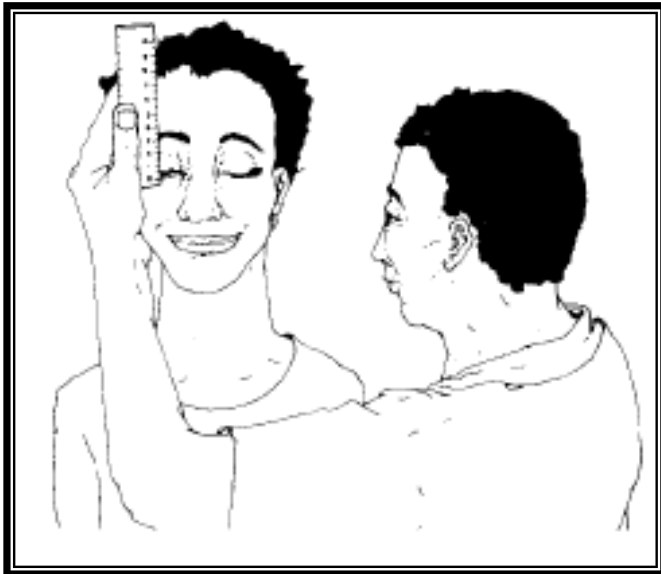
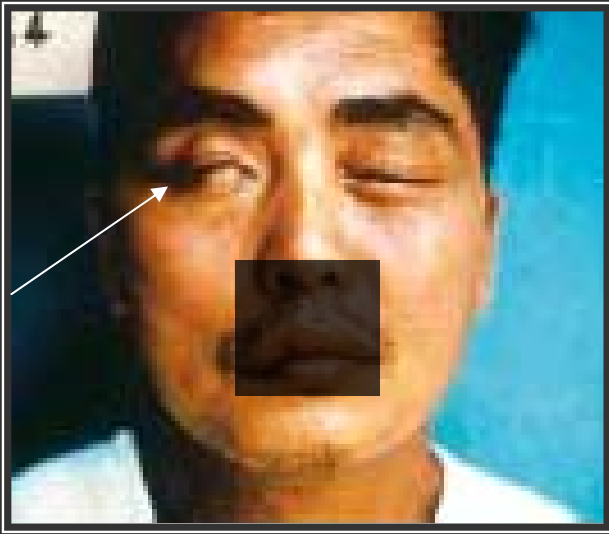
Grading of Muscle Strength

- S (Strong/ Normal) = Able to perform the movement against full resistance
- W (Weak) = Able to perform the movement but not against full resistance
- P (Paralysed) = Not able to perform the movement at all.

Lagophthalmos



Grading of Muscle Strength



- Make patient comfortable on stool
- Stand by the side of the person
- Raise chin and ask the patient to keep eyes closed lightly (sleep)
- Look for the gap between the two eyelids
- Normal: No gap or $< 1\text{mm}$

Grading of Muscle Strength



Gap > 1mm:
see whether person is able
to close the eye completely
using other facial muscles.

(Pushing cheek muscles
upwards)

To assess early **orbicularis oculi** muscle weakness:

Ask to close eye tightly and try to pull the lower lid down and
see whether the patient is able to keep his eyes closed
against resistance

Grading of Muscle Strength of eyelid

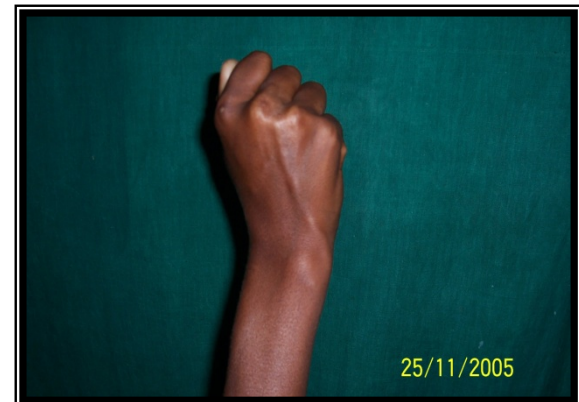
A gap visible between the upper and lower eyelids (more than 1mm)	Grade ‘P’
Able to keep his eye closed against resistance	Grade ‘S’
Not able to keep his eye closed against resistance	Grade ‘W’

Signs of facial nerve involvement

Late stages of involvement of Facial nerve:

- Flat asymmetrical face
- Loss of naso-labial fold and/ or all other creases
- Diversion of angle of mouth towards healthy side on smiling or showing teeth
- Inability to raise eye brow on the affected side
- Absence of wrinkling of the forehead on the affected side

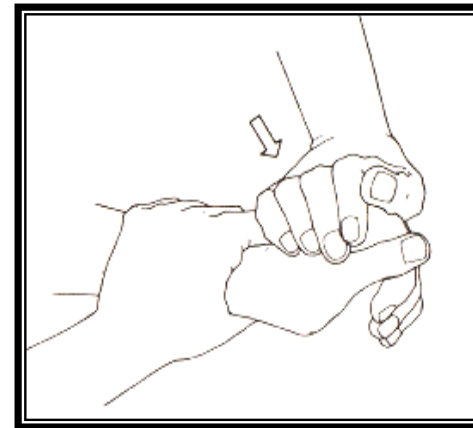
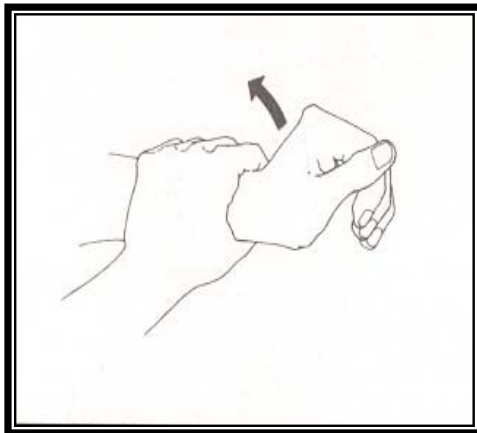
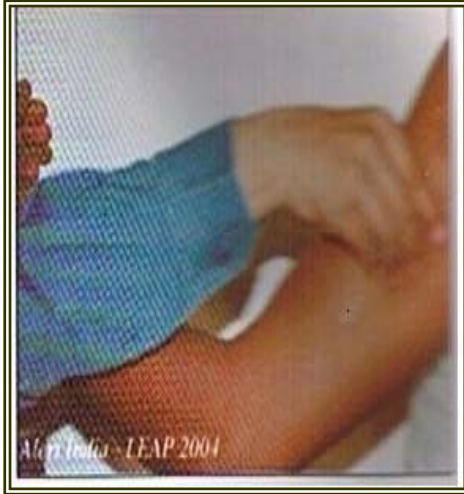
Ulnar Nerve



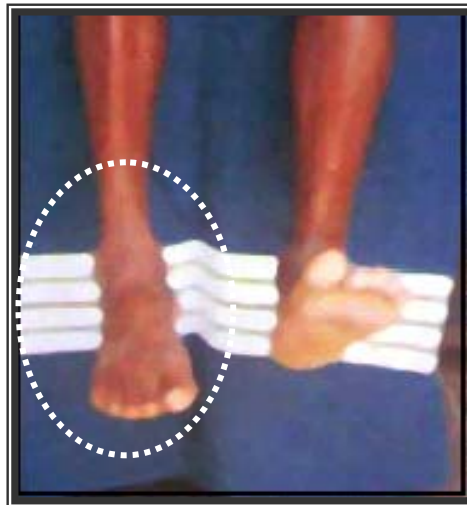
Median Nerve



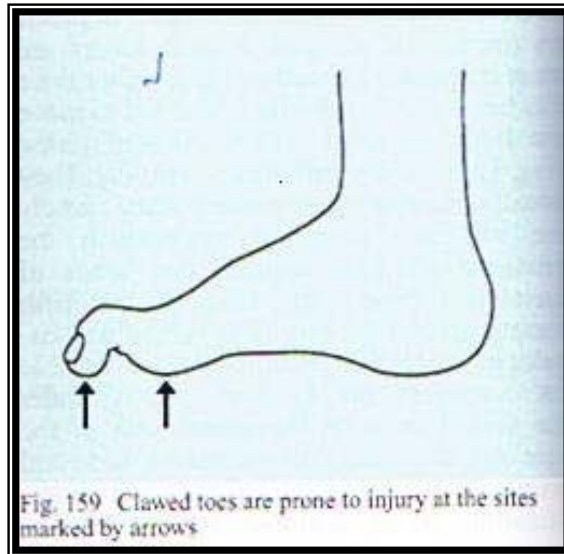
Radial nerve



Lateral Popliteal Nerve



Posterior tibial Nerve



WHO Grading of Disability

	Hands & Feet	Eye
Grade 1	Anaesthesia present but no visible deformity or damage.	Not assigned
Grade 2	Visible deformity or damage present.	<ul style="list-style-type: none">• Severe visual impairment (Vision worse than 6 / 60, inability to count fingers at 6 metres)• Lagophthalmos• Iridocyclitis• Corneal Opacities



EHF Score for grading of disability

Examination of parts	WHO Disability Grades	Sensory Testing (ST)	Voluntary Muscle Testing (VMT)	
Hands				
	0	Sensation present	Muscle power normal (S)	
	1	Sensation absent	Muscle power normal (S)	
	2	Sensation absent	Muscle power weak or paralysed (W/P)	
Feet				
	0	Sensation present	Muscle power normal (S)	
	1	Sensation absent	Muscle power normal (S)	
	2	Sensation absent	Muscle power weak or paralysed (W/P)	
Eye		Vision	Lid Gap	Blinking
	0		No lid gap	Present
	2	Can not count fingers at 6 meters	Gap present /red eye/corneal ulcer or opacity	Absent



Management of neuritis

1. Recognizing neuritis EARLY. (Acute / quite nerve paralysis)
2. Steroids
3. Splinting
4. Monitoring
5. Supportive therapy
6. SURGERY in select cases

Damage of new nerve

- New areas of sensory loss in the hands or feet (could feel before but cannot feel now).
- Loss of sweating in previously normal areas
- Previously normal muscles develop weakness/paralysis
- New nerve becomes painful or tender to the touch.
- Increase in weakness of previously weak muscle

Worsening of existing damage

- **Increase in area of loss of sweating**
- **Increase in area of loss of sensation**
- **Increase in degree of sensory loss**
- **Increase in weakness of previously weak muscle**