

# ***How to diagnose Leprosy***

- ***History taking***
- ***Clinical examination***
- ***Demonstration of sensory testing***
  - ***Nerve examination***
- ***Voluntary muscle testing with demonstration***

**Dr V. Santaram**  
Director,  
RLTRI Aska

# History taking (1)

- Name, Sex, Age, address, Occupation
- Presenting complains & their duration
- Recurrence
- Deformity (Onset & progress)
- Treatment history
- Associated illness
- Family history

## History

- **History of cutaneous lesions – hypo-pigmented, erythematous**
- **Pain / tingling sensation at elbow (Ulnar nerve), at wrist (Radial cutaneous nerve/ Median nerve) at back of Knee (Lat. Popliteal nerve) and at ankle (posterior tibial nerve)**
- **Inability to hold things / tend to fall / slip out of the hand**
- **History of unnoticed cuts/ burns**
- **Weakness in hands or feet,**
- **Lesions – dryness / shiny skin / loss of hair / loss of sweating in an area**
- **Inability to retain chappal (foot wear without back strap)**

## History- atypical signs

- **Chronic blockage of nose** - Due to Infiltration and crust formation, epiphora, epistaxis, blockage/crusting of nose
- **Ocular complaints** - Impairment of vision / red painful eye / onset or worsening of existing Lagophthalmos (Inability to close eye) / trichiasis
- **Hoarseness of voice-**
- **Nodules over ear-lobe, face etc-**
- **Shiny oily skin (face & back)-**
- **Loss of eyebrows (Madarosis)-**
- **Gynecomastia, Leonine facis etc-**

## Detailed History

### Ask for:

Presence of any deformity:

Time of onset,  
Nature of progress.

Treatment history:

Type of treatment taken,  
Name of the drugs (show BCPs)  
Duration of treatment taken  
Place from where treatment taken  
Whether registered / unregistered  
Whether treatment completed  
Reason for discontinuing treatment

Any associated illness:

Anaemia (needs treatment)  
Jaundice (start MDT after J. subsides)  
Cough (tuberculosis; continue Rifampicin)  
Swelling of the feet in recent past

## Other information

- Drug allergy
- Family History – Similar lesions/ on treatment or untreated
- H/o past illness / Major surgery
- Female patient : H/O pregnancy

# Clinical examination- 2

## Cardinal Signs

Hypo-pigmented or reddish skin lesion(s)  
with **Definite Sensory Deficit**



Involvement of the peripheral nerves

Demonstrated by definite **thickening** of the nerve with/ without loss of sensation and/or weakness of the muscles of the hands, feet or eyes supplied.

Demonstration of **M leprae** in the lesions  
- Difficult to diagnose cases

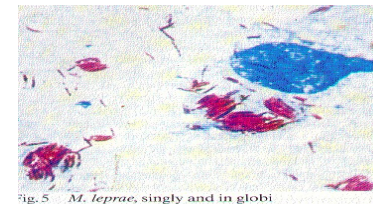


Fig. 5 *M. leprae*, singly and in globi

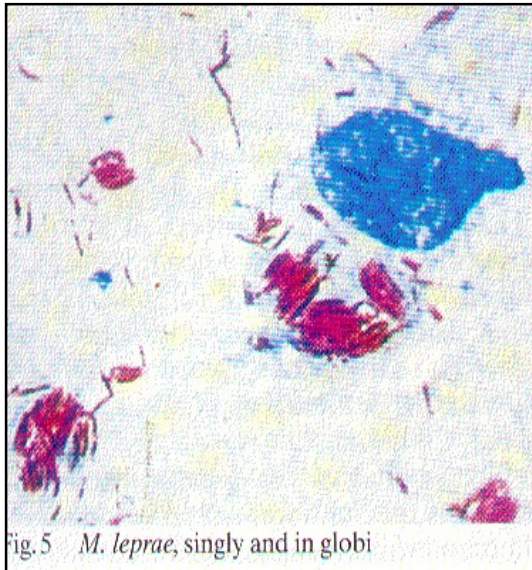
**Case of leprosy: A person with at least one cardinal sign of leprosy and yet to complete full course of MDT**

# Slit-skin-smear examination

- Some people show features like leprosy, but cardinal signs 1 & 2 are not elicited
- In such cases, slit-skin-smear examination for presence of *Mycobacterium leprae* can be helpful in diagnosis of leprosy



# Demonstration of Acid fast bacilli in skin smear



- Available at DH / specialized inst.
- Infiltrative lesions of skin without loss of sensation – especially face
- Nerve involvement without thickening of nerve / skin lesions
- First presentation nodules with fever (ENL reaction)
- Skin lesions with doubtful diagnosis & Relapse
- Positive Skin Smear in – Confirms Leprosy
- Negative Skin Smear – Leprosy can not be excluded

## Clinical examination:

- General Physical Examination –

- Detailed examination of:

Skin lesions

Reactions

Nerve function

Assess risk status

Eyes

Grade Disability

- Classify leprosy

- MDT, Counseling & Self care

# Types of presentation of Leprosy:



## Detailed examination of skin lesions

- Choose a place where good light is available
- Choose a place where there is privacy
- Always examine the whole skin from head to toe
- Number: 1-5 lesions - PB,  
Six or more lesions MB
- Colour: Hypo-pigmented (lighter than the surrounding skin)  
Erythematous (red)- disease activity/ reactional state  
Never de-pigmented.
- Sensory deficit: Cardinal sign , confirms diagnosis
- Tenderness on gentle tapping: Reactional state

## Detailed examination of skin lesions

Infiltration:	Thickened, shiny and Erythematous, diffuse infiltration
Papule / nodule	
Tenderness in Nodules:	Type 2 reactions (ENL)
Inflammation of skin lesion:	Slight erythema in active skin lesions. Swelling, redness, slight discomfort in type I reaction
Presence of atypical fetures like madarosis, shiny oily skin, Leonine facies etc	

# *Sensory testing(3)*

- Ball point pen
- Explain the procedure
- Ask to point to the spot touched with his index finger(normal skin)
- Repeat the procedure a few times
- Ask the patient to close his eyes & repeat(first on normal skin & then over affected area)
- Testing over inaccessible areas, ask to count each touch

# Remember

- No other instrument other than pen
- Touch the skin lightly
- Pen should be perpendicular to surface
- One stimulus at a time
- Vary the pace of testing

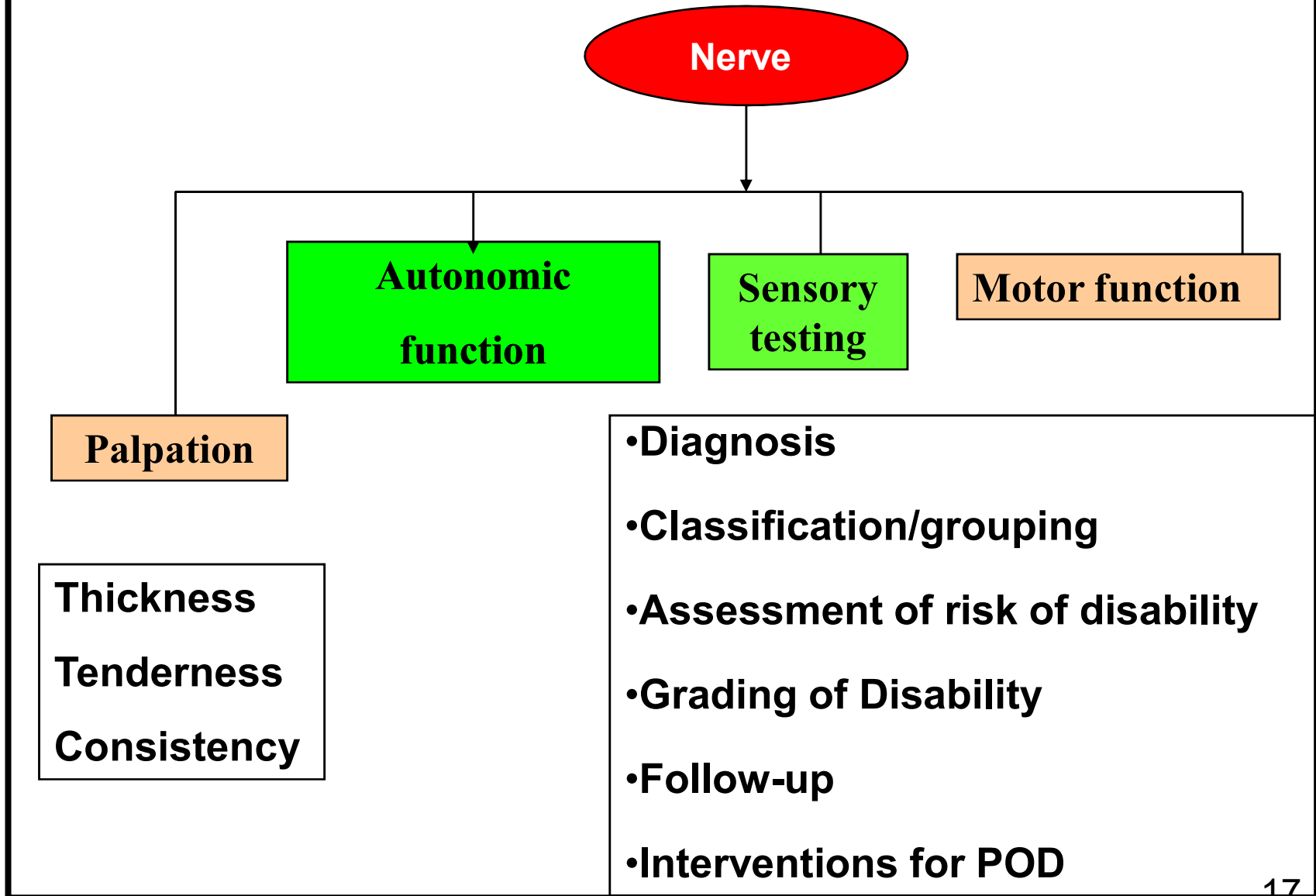


## Testing For Sensory Deficit





## Examination of Nerves (4)



## Examination of nerves

Assess for-

Thickening: Palpable/ Visibly thickened

Tenderness: Acute inflammation/ ischemia

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)

# Palpation of nerves

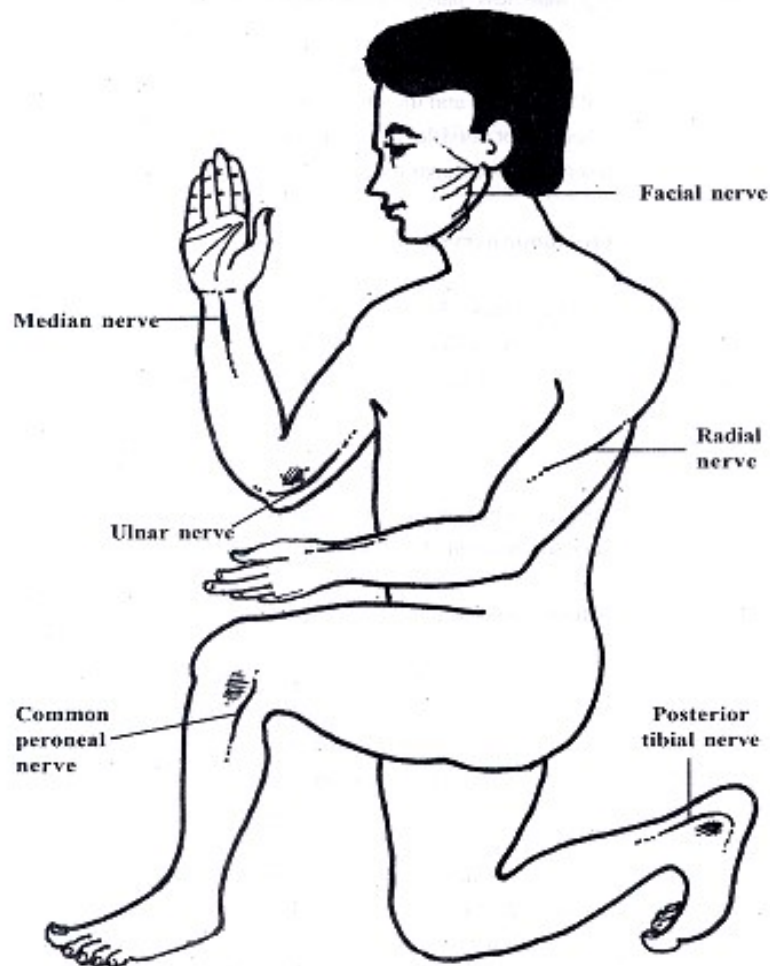
- Person to be properly positioned
- Locate the nerve correctly
- Observe person's face while palpating the nerves to elicit tenderness
- Palpate gently with the pulp of two fingers
- Palpate across the course & along in both directions

– *Detail procedure of examination of nerves will be demonstrated with the patients*

# Sites for palpation

- **Ulnar nerve-** Ulnar groove behind medial epicondyle of elbow
- **Lat.popliteal** nerve- Back of the knee behind head of fibula
- **Post.tibial** nerve- Below & behind medial malleolus of foot
- **Median nerve-** On the wrist median to palmaris longus tendon
- **Radial nerve-** Back of elbow in spiral groove at insertion of deltoid & triceps muscle
- *Few cutaneous nerves like Great-auricular,sural, supra-orbital etc are involved.*

## Commonly affected nerve



Facial

Ulnar

Median

Radial

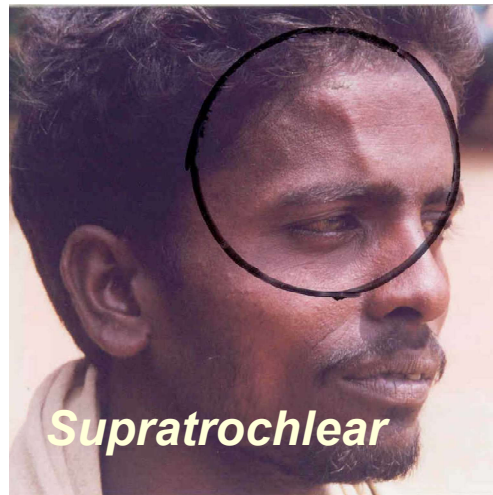
Lateral popliteal

Posterior tibial

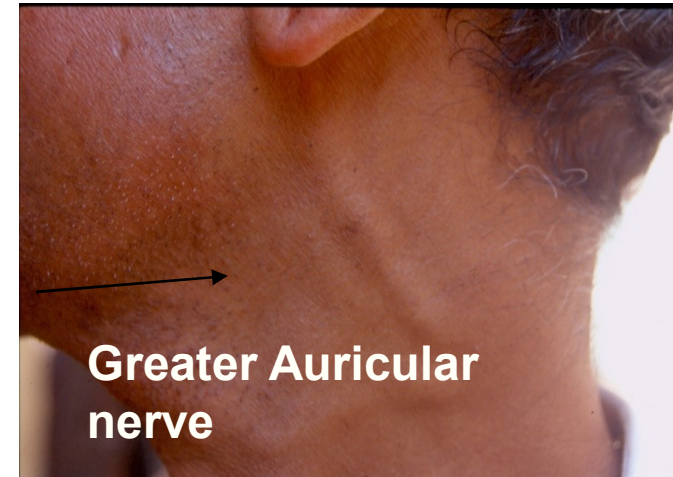
# Cutaneous nerves

Ulnar

ULNAR

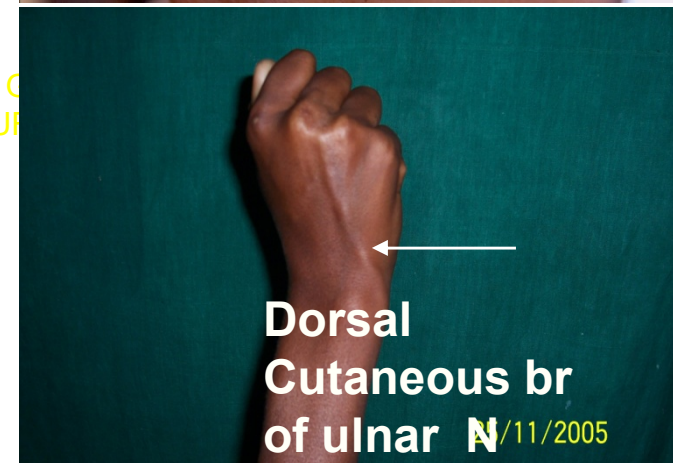


**Supratrochlear**



**Greater Auricular  
nerve**

C  
AUF



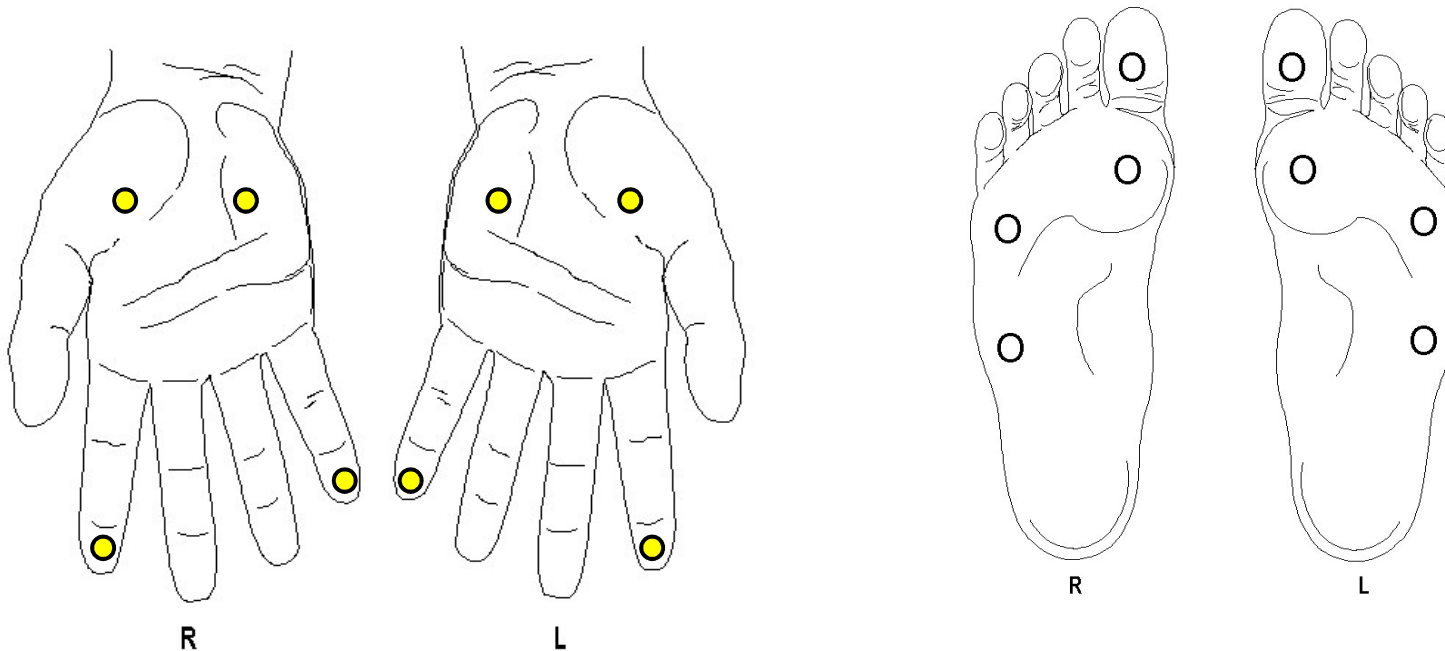
**Dorsal  
Cutaneous br  
of ulnar N**

11/11/2005

# Sensory testing

- Method of sensory test over the skin supplied by nerve is same as that for testing of patch.
  - *Will be demonstrated for palm & sole*

## Sensory Testing – Hands & Feet



### Interpretation

Loss of sensation      if no response

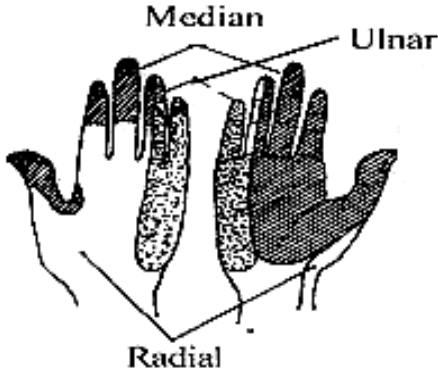

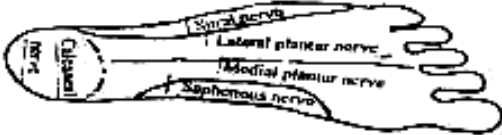

▪ Reduced sensation      >3cm away

▪ Normal sensation      within 3cm

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# 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

## Voluntary Muscle Testing (VMT)

### Grading of Muscle Strength

- S (Strong/ Normal)=Able to perform 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.
  - VMT of facial, ulnar, median, radial, lat.poplital & post. Tibial will be demonstrated

## Facial nerve



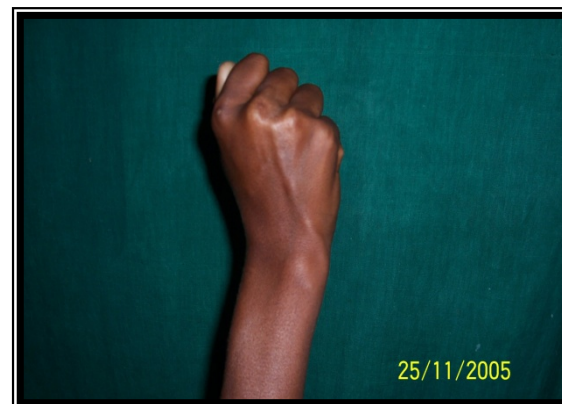
- Make patient comfortable on stool
- Stand by the side of the person
- Raise chin and ask the patient to keep eyes closed lightly (sleep)
- Look for the gap between the two eyelids
- Normal: No gap or  $< 1\text{mm}$



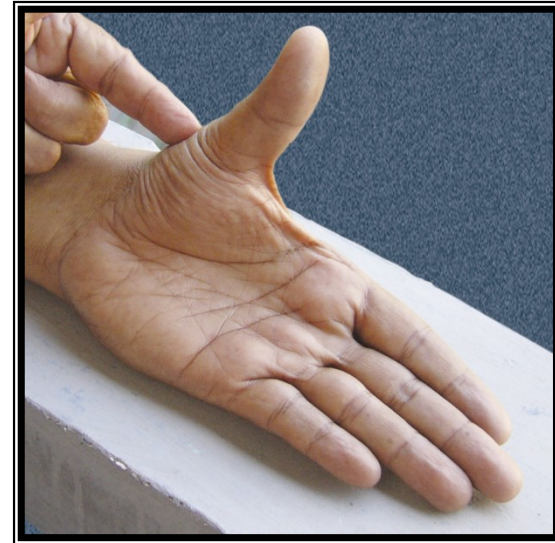
### Examinations of eyes:

- Redness, watering, cataract etc.
- Lid closure
- Vision testing (6/6)- counting fingers at a distance of 6 meters
- Blink reflex for trigeminal nerve

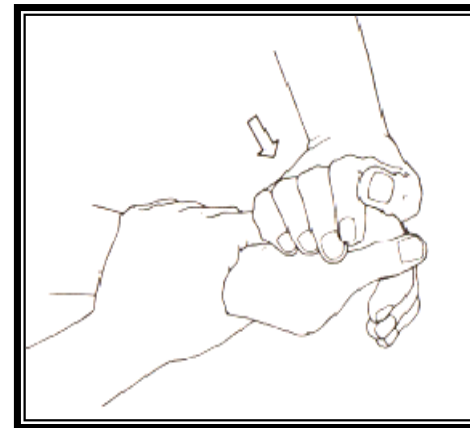
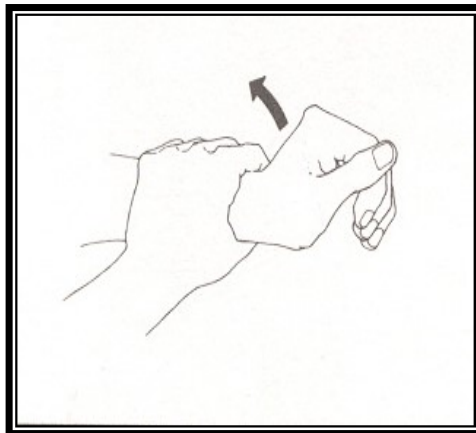
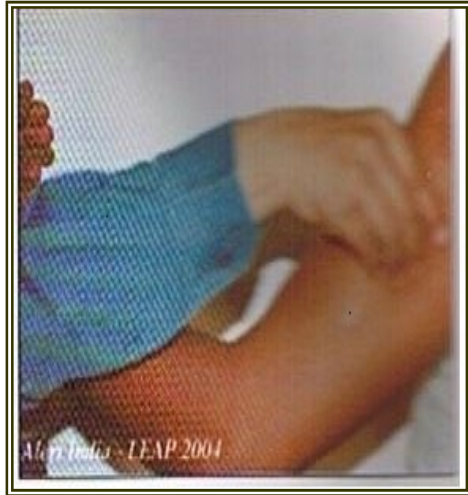
# Ulnar Nerve



# Median Nerve

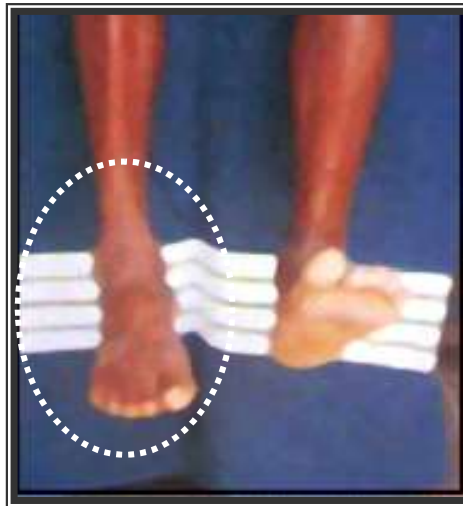


# Radial nerve

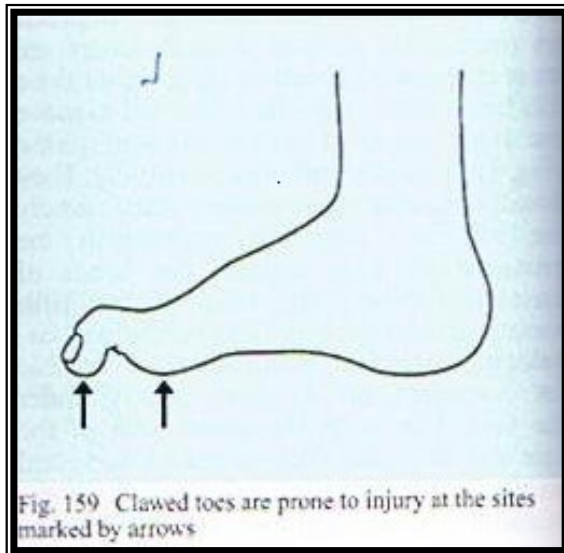




# Lateral Popliteal Nerve



## Posterior tibial Nerve





## 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

## Skin condition - Hands & Feet

### Blisters, dryness and wounds



## 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 of eyelid

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

## ***EHF Score for grading of disability***

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



## WHO Grading of Disability

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



*Disabilities in relation to damaged peripheral nerves:*

Site	Nerve	Feature
<b>HAND</b>	<b>Ulnar</b>	<b>Clawing of 4<sup>th</sup> &amp; 5<sup>th</sup> fingers. Loss of sensation and sweat over little and inner half of ring fingers.</b>
	<b>Median</b>	<b>Clawing of 1<sup>st</sup>, 2<sup>nd</sup> &amp; 3<sup>rd</sup> fingers. Inability to abduct thumb and touch tips of other fingers. Loss of sensation over thumb, index, middle, ½ ring fingers</b>
	<b>Median &amp; Ulnar</b>	<b>Clawing of all five fingers. Loss of sensation and sweat over the whole palm.</b>
	<b>Radial</b>	<b>Wrist drop. Loss of sensation and sweat over the back of the hand.</b>
<b>FOOT</b>	<b>Lateral popliteal</b>	<b>Foot drop. Loss of sensation and sweat over lower leg and dorsum of foot.</b>
	<b>Posterior tibial</b>	<b>Claw toes. Loss of sensation and sweat over the sole of the foot.</b>
<b>FACE</b>	<b>Facial</b>	<b>Inability to close the eye lids (lagophthalmos)</b>
	<b>Trigeminal</b>	<b>Loss of sensation over cornea.</b>





**THANK YOU**

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