



NLEP–RBSK-RKSK

Training module for Leprosy screening for children (0-18 years)

Leprosy in Children

Leprosy is a disease caused by a bacterium called *Mycobacterium leprae*. It affects mainly the nerves and skin. As the skin is affected, patches appear on the body. If the nerves are affected and damaged, loss of sensation on skin, weakness or paralysis of muscles or loss of sweating may occur. Damage to nerves causes permanent and progressive physical disabilities. Incubation period (duration from time of entry of the organism in the body to appearance of first clinical sign and symptom) for leprosy is variable from 6 months to even 20 years. The average incubation period for the disease is said to be 5-7 years.

Children are believed to be the most vulnerable group to infection with *Mycobacterium leprae* due to their immature or nascent immunity and exposure to interfamilial contacts. The child proportion among newly detected cases of leprosy is a strong indicator of continued transmission of the disease. Higher frequency in older children may be due to the long incubation period of leprosy (5–7 years), delay in diagnosis of early lesions and difficulty in assessing the sensory loss in younger children.

Definition of Suspect / Symptoms Guide for Suspect Case Identification

Any person with any of the following symptoms, either singly or in combination: -

S. No.	Signs and symptoms for identification of Suspect case of Leprosy	S. No.	Signs and symptoms for identification of Suspect case of Leprosy
1.	Any change in the skin color (Pale or Reddish patches on skin) with partial or complete loss of sensation	13	Weakness in hand(s) when grasping or holding objects; inability to grasp or hold objects
2.	Thickened skin on the patches	14	Ulceration in hand(s) / painless wounds or burns on palm(s)
3.	Shiny or Oily face skin	15	Numbness in hand(s) / foot/feet
4.	Nodules on skin	16	Difficulty in buttoning up shirt/jacket etc.
5.	Thickening of ear lobe(s)/nodules on earlobe(s)/nodules on face	17	Tingling in finger(s) / toe(s)
6.	Eyebrow loss	18	Tingling in hand(s) / foot/feet
7.	Inability to close eye(s)/watering of eye(s)	19	Ulceration in foot /feet; painless wounds or burns on foot/feet
8.	Nasal infiltration (saddle nose deformity)	20	Clawing / bending of finger(s) / toe(s)

9.	Thickened peripheral nerve (s)	21	Loss of sensation in sole of foot/feet
10.	Pain and /or tingling in the vicinity of the elbow, knee or ankle	22	Weakness in foot/feet/ footwear comes off while walking
11.	Inability to feel cold or hot objects	23	Foot drop / dragging the foot while walking
12.	Loss of sensation in palm (s)		

I. Skin Examination (C:7.1 at RBSK screening tool)

1. Choose a place where good light is available.
2. As far as possible, choose a place where there is privacy, especially for female case examination.
3. Always examine the whole body skin from head to toe as much as possible.

What should one look for in the skin?

The following features must be noted when examining a lesion/patch on the skin:

1. **Site of skin patch:** This is useful for follow-up. Indicates the risk for nerve damage
2. **Number of skin lesions/patches:** The number of lesions indicates the severity of the disease. This is useful for grouping and follow-up.
3. **Color of the lesion/patch:** May be hypo-pigmented (lighter in colour than the rest of the skin), or erythematous (reddish). Lesions of leprosy are never depigmented. Erythematous colour can be used to identify disease activity or a reaction state.
4. **Sensory deficit over lesion/patch:** This is useful for diagnosis when there are countable or a few numbers of patches on body. Loss of sensation is a cardinal sign of leprosy.
5. **Presence of infiltration:** This term refers to change in facial skin texture, thickened, shiny and erythematous facial skin, all three features must be present in the same area.
6. Also look for sensory loss in hand, foot, disability and deformity.



Figure 1: Classical presentation of skin patches among children due to leprosy

Sensory testing on skin lesion:

It is very important to pick up the skill of eliciting sensory loss in skin patch.

- You will need a light ball point pen (with plastic body) without cap.
- Explain to the child what you are going to do and demonstrate it.
- Touch the skin with tip of the pen lightly and ask the individual to point to the spot touched with his index finger.

{Repeat this procedure a few times until the patient is familiar and comfortable with the procedure. Now ask the patient to close his eyes and repeat the procedure (first on the normal skin then over the affected area). Touch the sites randomly not to set any pattern, give sufficient time to point out the site, keep minimum distance of 10 cm between two consecutive points touched, note time and specificity to locate and point out site touched. }

- While testing lesions over inaccessible areas (back, buttocks) the patient may be asked to count each touch.

Remember:

- When testing for sensation, touch the skin lightly with the pen. Do not stroke.
- The pen should be perpendicular to the surface of the skin.
- Do not keep asking the patient whether he feels the touch. You may get misleading results.
- Proceed from the normal skin to the patch.
- Give only one stimulus at a time.

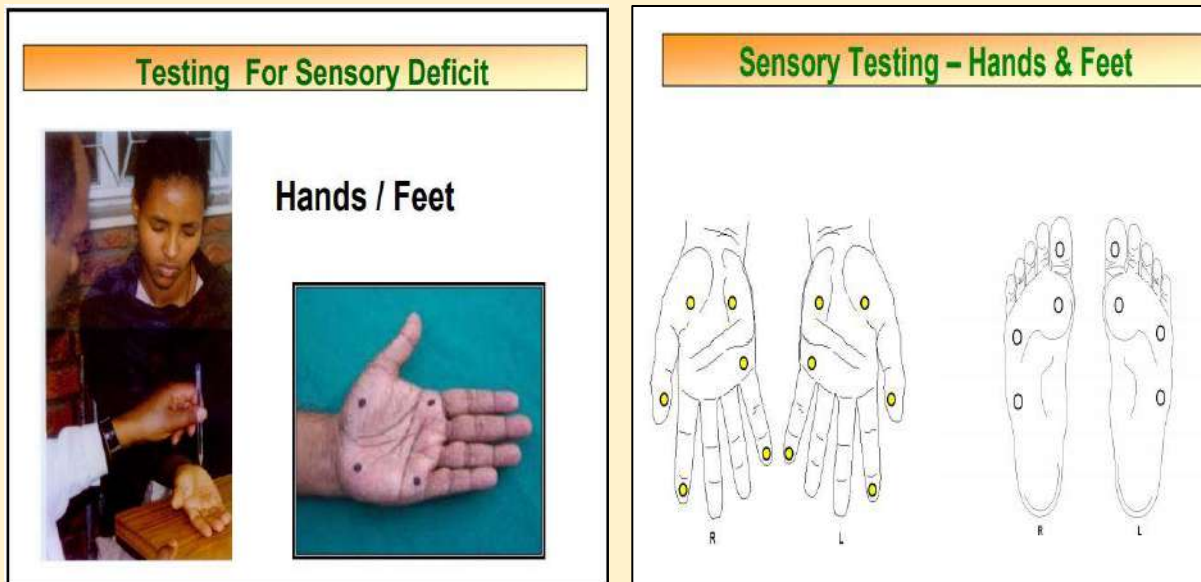


Figure 2 and 3: Common sites for sensory testing

II. Peripheral Nerve Examination and Assessment of Function (C:7.2 at RBSK screening tool (6-18 yrs))

Suspect nerve involvement if any of the functions is altered:

- **Autonomic Function:** Dry skin –decreased sweating over skin lesion/ hand and /or feet, brittle hard skin, cracks.
- **Sensory Function:** Loss of sensation / abnormal sensation in hands and /or feet
- **Motor Function:** Weakness in hands or feet muscles/visible deformities.

Suspect nerve involvement is any of these symptoms present:

1. Numbness or tingling of hands or feet
2. Skin lesion with shiny skin / loss of hair / loss of sweating / loss of sensation / non itchy
3. Painful and tender/ palpable nerves (especially near elbow, wrist, knee, ankle)
4. Weakness of small muscles of hands and/ or feet
5. Painless cuts, burns, wounds and ulcers on hands or feet
6. Visible deformities of hands, feet or eyes (images given below)
7. Inability to retain chappal, slipping of chappals from foot (i.e. foot wear without back strap)
8. Ocular complaints – lagophthalmos / reduced or absence of blinking of the eye
9. **Presence of Disability or Deformity in hands/feet/eyes, confirms involvement of the nerves**

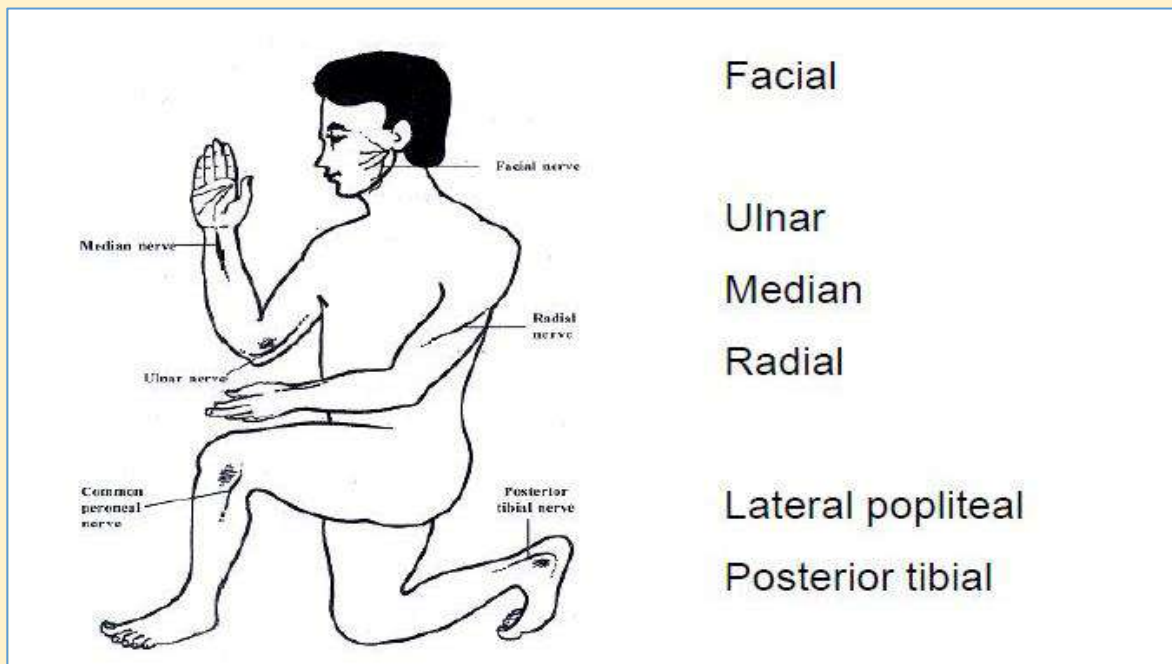


Figure 4: Commonly affected peripheral nerves of Face, Upper limb and Lower limb

Sensory supply of commonly affected nerves

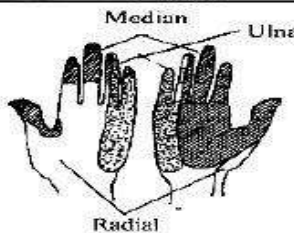

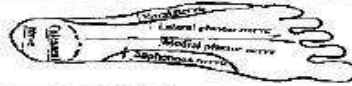

Nerve	Area of sensory distribution	Motor supply
Ulnar nerve		Interossei and lumbricals of hand
Median nerve		Muscles of hypo-thenar eminence
Radial nerve		Muscles of the thenar eminence
Common peroneal (lateral popliteal) nerve		Muscles of anterior tibial compartment
Posterior tibial nerve		Interossei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

Figure 5: Sensory supply of common peripheral nerves

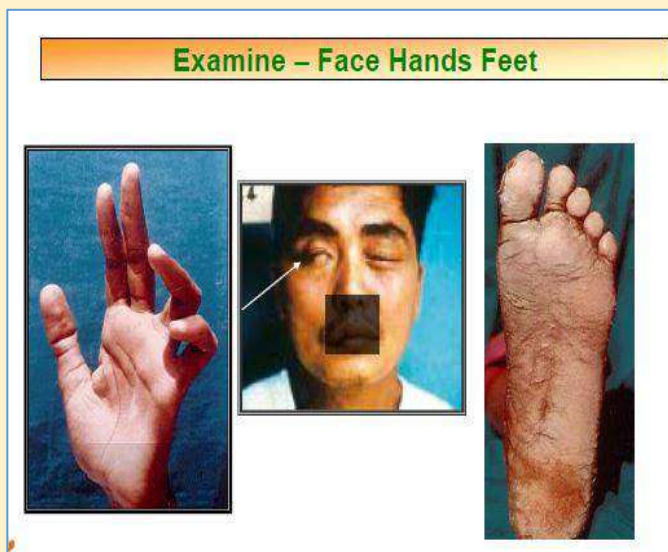


Figure 6: Claw hand, Lagophthalmos of left eye and dry, cracked foot skin

Figure 7: Blister on index figure, dry, cracked foot skin and ulcers on foot

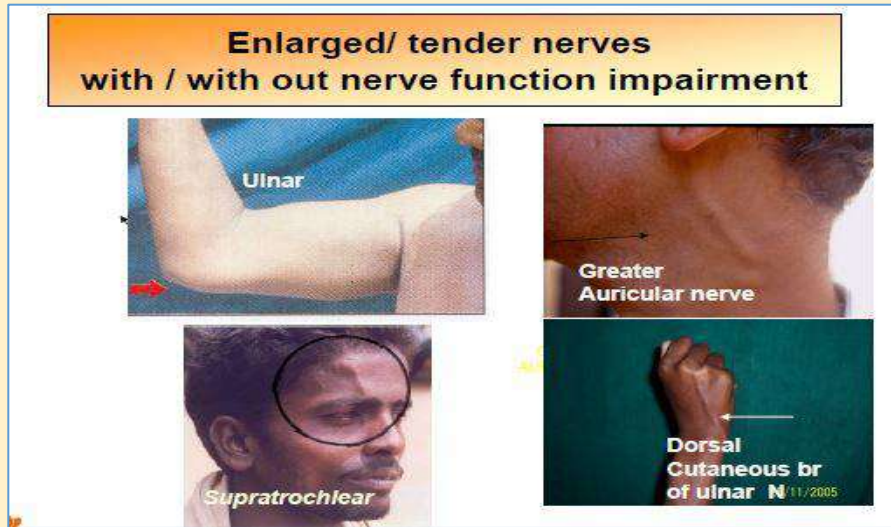


Figure 8: Nerve thickness/enlargement at 4 sites (Ulnar nerve at elbow, Greater Auricular nerve at neck, Supratrochlear nerve on forehead and Ulnar Cutaneous nerve at wrist)

III. Presentation of Contractures and Visible Deformities (C:7.3 at RBSK screening tool (6-18 yrs))

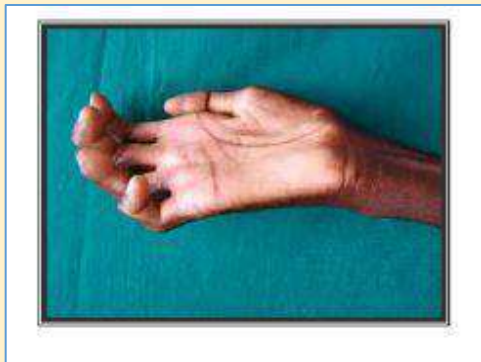


Figure 9 and 10: Claw hand with intrinsic muscle contracture



Figure 11 and 12: Right foot drop (unable to dorsiflex right foot) and Lagophthalmos of left eye (unable to close the eye completely)

RBSK Screening and Referral Tool for Children (0 - 6 years)

C7. Childhood Leprosy or HANSEN'S DISEASE: LOOK, ASK & PERFORM?

C7	Childhood Leprosy or HANSEN'S DISEASE: LOOK, ASK & PERFORM?			
C7.1	Look for Single Localized and discrete lesions or Multiple hypo pigmented patch predominantly on the exposed body parts and not present from Birth. Patch should not be painful, not changing periodically with seasons i.e. appearing or disappearing, is not itchy, is not shedding scales, not preceded by any inflammation or any local Injection and is not dark red, or completely depigmented . if yes: tick and Refer	<input type="checkbox"/>	C7.1.1	If yes, Number of lesions present?
				1 to 5 lesions <input type="checkbox"/>
				> 5 lesions <input type="checkbox"/>
			C7.1.2	If yes, lesions type?
				Linear <input type="checkbox"/>
				Non-linear <input type="checkbox"/>
				Raised <input type="checkbox"/>
				Flat <input type="checkbox"/>
C7.2	Ask for any history of close contact with leprosy affected person in the family or immediate neighborhood. tick if yes	<input type="checkbox"/>	C7.3	Perform and check for any: Definite impaired of sensations at the hypo pigmented patch tick if yes <input type="checkbox"/>
C7.4	Perform and check for any loss of sensation at hands and feet on both sides. Provided one has ruled out Neural tube defect and any other neurological problem like Cerebral palsy.	<input type="checkbox"/>		
C7	If anyone is positive: refer for Hansen's Disease <input type="checkbox"/>			
Please Note: Differential diagnosis: atopic dermatitis Pityriasis Alba, Pityriasis versicolor, Vitiligo, post inflammatory hypopigmentation, Morphoea, Nevus depigmentosus, Hypopigmented mycosis fungoides. Hypomelanosis of Ito, halo nevus, Linear lesion (tuberous sclerosis &, incontinentia pigmenti)				
C8	CHILDHOOD TUBERCULAR DISEASE: LOOK, ASK & PERFORM? <input type="checkbox"/>			

Rashtriya Bal Swasthya Karyakram (RBSK) Screening and Referral Tool for Children (6 - 18 years)

C7	Childhood Leprosy Disease (Hansen's disease)			C8	Childhood tuberculosis both pulmonary and extra-pulmonary	
C7	CHILDHOOD LEPROSY DISEASE: LOOK, ASK & PERFORM for a) Skin lesion; b) Peripheral Nerve involvement; or c) Contractures & Deformity ? If any of these below is positive, refer for Leprosy Disease					
C7.1	Look for Hypo-pigmented or reddish skin lesion with Definite Sensory Deficit . Skin Lesion should not be painful, not changing periodically with seasons i.e. appearing or disappearing, not itchy, not shedding scales, not preceded by any inflammation or any local Injection and is not dark red, or completely depigmented . if yes: tick and Refer					<input type="checkbox"/>
C7.1.1	If C7.1 is yes, Number of lesions present?		C7.1.2			If C7.1 is yes, Type of skin lesion; tick accordingly
	1 to 5 lesions	<input type="checkbox"/>	Patchy	Plaque	Nodular	Diffuse infiltration <input type="checkbox"/>
	> 5 lesions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
C7.2	If Involvement of the peripheral nerve present then tick as appropriate nerve					<input type="checkbox"/>
	Behind the Ear (Greater Auricular Nerve)	<input type="checkbox"/>	Definite thickening with or without tenderness			<input type="checkbox"/>
	Around Elbow (Ulnar nerve)	<input type="checkbox"/>	Loss of sensation			<input type="checkbox"/>
	Wrist (Radial cutaneous nerve)	<input type="checkbox"/>	Weakness of the muscles of the hands			<input type="checkbox"/>
	Knee (Peroneal Nerve)	<input type="checkbox"/>	Weakness of the muscles of the feet			<input type="checkbox"/>
	Ankle joints (Posterior tibial nerve)	<input type="checkbox"/>	Weakness of the muscles of the eyes			<input type="checkbox"/>
C7.3	Look for Contractures and deformity: only if presented after infancy and with no history of Meningitis, Encephalitis or Trauma in the past, if yes, Note location, Mark as appropriate					<input type="checkbox"/>
	Right Hand	Left Hand	Right Feet	Left Feet	Eyes	Face
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	If any of the above is positive i.e Skin lesion (C7.1)/Nerve involvement (C7.2)/Contracture (C7.3) refer for Leprosy					<input type="checkbox"/>