

COMMUNICABLE DISEASES

STUDENT TEXT

1980
Rural Health Development Project
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ACKNOWLEDGEMENTS

Nurse Clinician training materials are Lesotho adaptations based upon the MEDEX prototype curriculum for training mid-level health workers.

The prototype MEDEX materials were developed by the Health Manpower Development Staff of the John A. Burns School of Medicine, University of Hawaii. The original prototypes were based on training experience in over a dozen third-world countries. These were revised on the basis of HMDS experience in Micronesia, Thailand, Pakistan, and Guyana before being made available to Lesotho under a U.S.A.I.D. funded contract.

Major adaptation in Lesotho began at the National Nurse Clinician Training Programme Curriculum Adaptation Workshop held at Mazenod in January 1980. The nearly fifty participants represented all major health and health related activities in Lesotho, both Government and private. These participants and others working as individuals and then as review committees have adapted the Nurse Clinician training materials to meet the conditions and needs of Lesotho.

The Government of Lesotho and particularly the staff of the Nurse Clinician training Programme are grateful to HMDS for supplying the prototype materials and to all those individuals who have helped in the Lesotho adaptation process.

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COMMUNICABLE DISEASE MODULE

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Leprosy Chart

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SCHEDULE

DAY 1	DAY 2	DAY 3	DAY 4	DAY 5

STUDENT GUIDE

MENINGITIS AND TETANUS

I. Entry Level Knowledge and Skills

Before starting this unit, you should be able to:

1. Describe the associated anatomy and physiology of the nervous system including:
 - innervation of muscles
 - brain and spinal column and their relationship to the fontanelles
 - and respiration
2. Explain infection process (bacteria and virus) including spread by droplet and wound contamination.
3. Actions and dosages of the following drugs: Ampicillin, Sulfadimidine, Penicillin, Chloromycetin .
4. Recognize and describe: headaches, fever, photophobia, seizures, infection of the ear, throat and/or lungs and spasms.
5. Demonstrate wound cleaning and debridement (See Emergency Module).
6. Discuss active and passive immunizations and antibodies.
7. First aid for convulsions (See Emergency Module).

II. Objectives:

Using the information and experiences provided by the instructor and module text, you will be able to:

1. Identify the physical signs and complications associated with meningitis and tetanus.
2. Demonstrate physical exam procedures associated with meningitis and tetanus.
3. Describe general characteristics and course of the following diseases including the discriminations:
 - Meningitis: Neck stiffness, bulging anterior fontanelle in children, levels of consciousness.
 - Tetanus: Jaw muscle spasm, localized vertebral pain with muscle spasm.

4. Describe the management procedures for meningitis and tetanus.
5. Explain the spread of meningitis from person to person and how this can be prevented.
6. Discuss the etiology, transmission and risk factors of tetanus.
7. Discuss the immunization and prevention principles of tetanus.

III. Evaluation:

Module Phase: Upon completion of the module you will be assessed on:

1. Knowledge: Written test based upon contents of unit in module text. Acceptable performance, 80%.
2. Skills: Your ability to recognize signs and symptoms of meningitis and tetanus.
Your ability to describe management and prevention procedures for each of the above listed diseases.

Rotation Phase: Upon completion of the rotation phase, you will be assessed on:

1. Your ability to diagnose and manage the following diseases with the use of appropriate protocols and treatment guides.
2. Your ability to perform physical examination indicated for meningitis and tetanus.

IV. Activities you will be using to accomplish the objectives:

1. Read module text and answer review questions. Discussion.
2. Instructor demonstration of physical exam procedures for meningitis (stiffness of neck or back and bulging fontanelle).
3. Students practice examination of discriminations for meningitis and tetanus.
4. Student groups write and present community prevention methods for meningitis and tetanus.
5. Clinical practice for students to identify abnormal signs associated with meningitis and tetanus.

MENINGITIS

General Considerations

Meningitis is the inflammation of the membranes covering the brain and spinal cord. These membranes are tough, fibrous sheaths that protect the central nervous system. The membranes can become infected by almost any bacteria or virus. Meningitis can result from a spreading bacterial infection. The most common cause is by a type of bacteria that can also cause sore throats, middle ear infections, or pneumonia. The symptoms are the same, regardless of which bacteria or virus causes the meningitis. Meningitis can also be caused by tuberculosis, especially in children aged 1 to 5 years. In this case, the symptoms may have a more gradual onset. Regardless of which type of infection causes meningitis, when the membranes become infected they become inflamed, so any movement which stretches them becomes very painful. As a defence against this pain, the body's muscles in the neck, back and legs tighten to "splint" or prevent movement of the spine. Therefore, a patient with meningitis is very uncomfortable and sick with a high fever from the widespread infection and has severe pain with movement of their neck or back. Unless treated, the patient may become drowsy, semicomatose or even comatose and may die.

Epidemiology

Meningitis occurs all over the world, in all ages. The bacteria or virus causing meningitis is usually passed in droplets of saliva, when people breathe and cough near each other.

People most at risk to get meningitis are those who are already weak or sick. Children exposed to someone having tuberculosis are more likely to get tuberculosis meningitis than adults.

One of the best methods of preventing meningitis from spreading is early detection and treatment.

Skills

1. Neck Stiffness

To examine for neck or spine stiffness, have the patient lie on his back on the examining table while you support his head. (A small child can lie on his mother's lap, his shoulders supported on her knees.) Hold the patient's head with one hand and gently bend it forward (chin toward chest). (See Figure CD 1)



Figure CD 1 - Testing for neck stiffness.

If there is neck stiffness, you will feel tightened muscles resisting the bending, and the patient may complain of pain. If there is spine muscle stiffness, the patient's knees may draw up when you try to bend the neck forward. If you are in doubt for example, (the neck does bend, but seems stiff or the patient complains of even mild pain), consider this to be stiffness and refer the patient.

- Summary:
1. Have the patient lie on his back with one hand behind his head which you support with your hand.
 2. Gently try to bend the neck, bringing patient's chin to his chest.
 3. If the neck will not bend, feels stiff, causes pain, or the knees bend up, there is neck stiffness.

2. In Child up to 6-months old, Palpation of the Fontanelle
 The anterior fontanelle is the front, diamond-shaped soft spot on the top of a baby's head where the skull bones have not yet fused. In a quiet baby, the fontanelle feels like a soft, diamond-shaped indentation. When a healthy baby cries or coughs, the anterior fontanelle bulges, so the exam must be done when the baby is quiet. When a baby has meningitis, a bulging fontanelle that feels full and tense may be present. (See Figure CD 2)

If the soft spot is
 SWOLLEN,
 the
 baby
 may
 have
 MENINGITIS



Figure CD 2

Summary:

1. When the baby is quiet, feel the fontanelle.
2. If the fontanelle feels tense and bulging, the baby may have meningitis.

Clinical Picture

The signs and symptoms will be the same regardless of which bacteria or virus causes the meningitis. However, in tubercular meningitis the symptoms come on slowly over about two weeks and in other forms the symptoms develop within two to three days.

The signs and symptoms vary depending on the age of the patient.

Infant - An infant or young child may cry or seem irritable without any visible cause. This may gradually progress until the infant becomes difficult to arouse and just lays quietly. If untreated the infant finally becomes totally not arousable and dies.

- a fever may or may not be present in very small children
- neck stiffness may or may not be present in very small children
- bulging fontanelle

Child or Adult - A child or adult will often have a severe constant headache which may be accompanied by vomiting. Photophobia (squinting when in bright light) is also common. Fever is usually present.

Neck stiffness or pain when bending the neck forward is usually present.

In children you may find signs of infection in the throat, ears or lungs or enlarged lymph glands.

As the disease progresses, the patient will become irritable, drowsy and confused. A history of seizures is common. Eventually the patient can become comatose if untreated.

In addition, in some cases you may find small, dark red spots on the skin that do not blanch when you press on them. These result from bleeding under the skin. You may also see larger areas of bruising.

Management

1. All suspected cases must be started on treatment immediately.

Child: give Ampicillin 300 mg/kg/24 hours
IV in 6 divided doses, and
Chloramphenicol 100 mg/kg/24 hours
IV in 3 divided doses

Adult: Penicillin G. 1 million units IV

2. Refer immediately after treatment has begun.

Prevention

Patient Education:

There is no practical way to prevent isolated cases of meningitis from occurring. If one family member has it, you can warn the mother to watch for other members complaining of headache, neck or back pain or stiffness, or fever.

Community Action:

You can take action to prevent or stop a major outbreak by decreasing the chances of meningitis being spread through coughing or breathing in crowded areas.

- 1) If you see several cases of meningitis within a week, public meetings and gatherings should be suspended until there are no new cases.
- 2) If small dark red spots are seen on the patient, sulphonamide drugs should be given to family members and others already weak or otherwise ill.

Sulfadimidine - Adults: 2 tabs (1 gm) four times a day
for 5 days

Children: 1 tab (500 mg) four times a day
for 5 days

REVIEW QUESTIONS

Read the following statements and determine if each one is true or false. If true, place a "T" before it. If false, place an "F" in front of it.

- ___ 1. Meningitis can result from a spreading bacterial infection.
- ___ 2. The spread of meningitis is due primarily to infected insects biting people.
- ___ 3. The anterior fontanelle of a baby with meningitis is tense and bulging.
- ___ 4. Persons who are already sick or weak are at a particularly high risk for developing meningitis.
5. Describe the signs and symptoms of meningitis in an infant.
6. Describe how you would elicit neck stiffness.
7. What types of information would you expect to get in a history from a person with meningitis?
8. You have a patient who you have diagnosed as having meningitis. He weighs 20 kg. Determine the dosages of ampicillin and of chloramphenicol you will administer until he can be referred.
9. You have diagnosed several cases of meningitis in the past four days. What measures can be taken to prevent more people in the community from becoming ill?

TETANUS

General Considerations

Tetanus is a poisoning of the central nervous system by a toxin produced by tetanus bacillus. This tetanus bacillus enters the body through an open contaminated wound and begins growing at the wound site. The growing bacillus produces, as a by-product, a toxin which gets into the blood stream, spreads through the body, and quickly attacks the central nervous system. When the nervous system is poisoned, it causes muscles to spasm tightly. Thus, the disease "tetanus" is caused by a toxin poisoning the central nervous system rather than the muscles themselves, although the first visible symptom is muscle spasm. There is some evidence that the tetanus toxin can also affect peripheral nerves right at the wound site and pass up to the central nervous system along the nerve route. This results in the symptom of muscle spasm occurring first at the wound site and gradually spreading.

Because it is a disease of the central nervous system, which affects all muscles, it will affect the patient's ability to open his mouth, to move, and finally to breathe. Also, the patient remains conscious and the muscle spasm is extremely painful. Untreated, tetanus is usually fatal. Even with the best treatment, some patients die.

Epidemiology

This disease occurs all over the world. The tetanus bacillus lives in soil and dung. Therefore, any open wound that has dirt in it can have tetanus bacillus growing in it. Examples of such wounds are:

- 1) Any cut that has dirt in it.
- 2) Any "puncture" wound (like one by a nail or rake, especially in a field where dung is used for fertilizer).
- 3) Any wound (even a clean one) that has much dead tissue.

Tetanus can result from minor, seemingly "clean" wounds as well as the more obviously contaminated wounds.

Anyone who has not been immunized can get tetanus. Newborn babies and those over 50 years old are more susceptible.

Clinical Picture

Signs and Symptoms:

There may be a history of a wound (cut, puncture, stab, etc.) and ulcer of the skin, or an operation done with unsterile instruments in the past two weeks, but often no such history is available.

The first problem the patient notices will be pain in his arms, legs, back, head, and neck due to the tightening spasms of those muscles. On examination, the neck, back, limbs and also the abdomen will feel stiff with muscle spasm. As the tetanus toxin further poisons the central nervous system the spasms become more severe, developing into episodes a few seconds long of severely painful muscle spasms, in which the back is arched and extremities rigidly extended. These episodes closely resemble seizures, and in severe cases, come very frequently. The episodes will be touched off by any noise or by touching or moving the patient.

The muscles around the mouth are also affected by spasms. The patient will notice that suddenly he has difficulty opening his mouth or swallowing. The face will freeze in a constant, forced "smile" with the jaws tightly closed.

In tetanus, the patient remains fully conscious. There is usually a fever, which can be very high but often is only moderately high.

Course and Complications:

The muscle spasms can progress to constrict the pharynx and larynx, so the respiratory airway is blocked. Some of these secretions are often aspirated into the lungs, causing pneumonia.

If untreated, the tetanus toxin can depress the breathing centre in the brain.

Summary:

1. There may be a history of a wound, skin ulcer or recent operation.
2. Patient complains of pain in extremities, head, back and neck.
3. On examination, the extremities, back, neck and abdomen feel stiff and hard.

4. The patient will have severe, painful spasms resembling seizures that last a few seconds, causing an arched back and rigid extremities. The spasms are touched off by noise or movement.
5. The face will show a fixed smile with clenched jaws.
6. The complications of tetanus include the following:
 - a. Secretions and muscle spasms around the pharynx and larynx can lead to strangulation unless relieved by suction.
 - b. Pneumonia develops because of aspirated secretions.
 - c. If the tetanus toxin affects the brain, breathing may stop.

Management

Most patients with tetanus will die unless treated in a hospital. Refer all patients immediately. Preparation of patient for transfer:

1. Start Penicillin G 4 million units IM for adult.
2. Clean the wound and debride all dead tissue (where tetanus bacillus grows rapidly).
3. Sedate the patient and control the muscle spasms by giving Diazepam 0.5 to 1 mg/kg IM every 4 hours.
4. For severe rigidity and spasm already present, give Amobarbital 30 mg IM for an adult.

Prevention

As discussed, tetanus can occur anywhere in the world in any age group.

A. Basic Prophylactic Measures:

The only way to effectively prevent tetanus is by active immunizations with tetanus toxoid. The body usually neutralizes poisons by forming antibodies which circulate in the blood stream to neutralize the foreign substance. Active immunization means receiving tetanus toxoid. This toxoid must be given in a series of three injections (often given in childhood as the DPT series). Then give tetanus toxoid boosters every 10 years to maintain this level of antibodies.

B. Prophylactic Measures in the Injured:

The original toxoid series plus boosters provide general protection against tetanus. However, one who gets a serious wound should be seen by a practitioner, who will decide if further boosters and/or antibiotics are needed. The following types of wounds are those that require such evaluation:

1. any infected or "old" (more than 24 hours) wound;
2. any puncture wound;
3. any skin ulcer with dead tissue;
4. anyone having recent surgery with possibly unsterile instruments;
5. anyone having gangrene;
6. anyone who had a septic abortion.

In case of injury, do the following:

1. Find out if the patient ever had basic, active immunization (at least two doses of toxoid). If the patient or family is uncertain, assume he has not. Also ask when the patient's last booster was given.
2. If the patient has had active immunization and/or a booster within the past 5 years and the wound is new (within 6-12 hours) and minor, cleanse and debride the wound. No booster is needed.
3. If the patient had basic immunization but the last booster was more than 5 years ago, but the wound is minor:
 - a. give a booster dose of tetanus toxoid;
 - b. treat the wound as described in No.2 above.
4. If the patient is uncertain or has not had basic immunization, or if the wound is "old" or serious (e.g. compound fracture, gangrene present), treat prophylactically to prevent tetanus:
 - a. Clean and debride the wound and start penicillin.
 - b. Start basic toxoid immunization series.
 - c. Have patient return for follow-up check for infection, if possible, or refer for further evaluation, if necessary.

Summary

A. For basic prophylaxis:

1. A series of three (3) injections of tetanus toxoid and
2. Boosters every 10 years.

- B. For prophylaxis in the injured:
1. Find out if the patient has had basic immunization (at least 2 doses of toxoid) and when the last booster was given.
 2. If the wound is recent (within 6 to 12 hours) and minor, and the patient had basic immunization:
 - a. with a booster in the past 5 years: clean and debride
 - b. with a booster more than 5 years ago: give toxoid booster, clean and debride
 3. If the wound is "old" or serious:
 - a. inform patient you cannot guarantee protection against tetanus
 - b. clean, debride and start penicillin
 - c. start basic toxoid series
 - d. arrange for follow-up treatment or referral

REVIEW QUESTIONS

1. Describe how tetanus starts and spreads in a patient.
2. Anyone can get tetanus. However, there are certain wounds which are more likely to be infected with tetanus bacillus. Describe three of those types of wounds.
3. The severe muscle spasms of tetanus resemble seizures. What will cause the tetanus spasms to occur?
4. List four of the signs or symptoms of tetanus.
 - 1)
 - 2)
 - 3)
 - 4)
5. All patients who are diagnosed as having tetanus must be referred. Before referral, some emergency treatment should be administered.
 - a. Describe your management of a patient who will reach the hospital within six (6) hours.
 - b. Describe your management of a patient who will not reach the hospital for ten (10) hours
6. Describe how tetanus can be prevented.
7. Under what conditions would you treat a person prophylactically for tetanus?

STUDENT GUIDE

LEPROSY

I. Entry Level Knowledge and Skills

Before starting this unit, you should be able to:

1. Examine the skin for lesions.
2. Use protocol for diagnosis based on signs and symptoms.
3. Locate major nerves (review).

II. Objectives:

Using the information and experiences provided by the instructor and module text, you will be able to:

1. Classify the different types of leprosy by signs and symptoms and using the protocols.
2. Demonstrate the physical examination for leprosy symptoms, including detecting dry skin patches with loss of feeling, loss of feeling in hands and feet, enlarged nerves, loss of strength in hands, feet and eyelids.
3. Identify the complications of leprosy and know when to refer them for specialised hospital care.
4. Manage leprosy and its complications with appropriate drug therapy and patient and community education.
5. Advise and manage patients with anaesthetic hands and feet, including the treatment of sores and ulcers.
6. Fill in appropriate record forms correctly.
7. Understand the principles of leprosy control.
8. Co-operate with existing leprosy control programme.

III. Evaluation

Module Phase

Upon completion of the module, you will be assessed on:

1. Knowledge: Written test based on contents of module text. Acceptable performance, 80%.

2. Skills: a) Your ability to perform examination of skin, for anaesthesia and enlarged nerves, loss of strength, and use of protocols.
- b) Your ability to describe leprosy patient/family education.
- c) Your ability to do skin smears.

Rotation Phase

Upon completion of the rotation phase, you will be assessed on:

1. Your ability to diagnose and manage leprosy.
 2. Your ability to differentiate the forms (types) of leprosy based on signs and symptoms.
 3. Your ability to recognize complications.
 4. Your ability to involve the community in leprosy control efforts through education, screening suspected cases, and supervising patients under treatment.
 5. Your ability to cooperate with existing leprosy control programmes.
- IV. Activities you will be participating in to complete the above objectives.
1. Read module text and answer review questions. Discussion.
 2. Instructor will demonstrate and students practice the clinical examination of patients including tests for anaesthesia and palpation for enlarged nerves.
 3. Student presentations of patient and community education.
 4. Slide presentation of leprosy.
 5. Student presentation of diagnosis and management of the different forms of leprosy.

General Considerations

Leprosy is a chronic infectious disease of man caused by a bacillus; it affects chiefly the skin and peripheral nerves, but in some forms of the disease the bacilli can be found in large numbers in other tissues particularly the nasal mucosa, the eye, muscle, bone and testes. While leprosy is a communicable disease, it is less contagious than other communicable diseases. The only source of infection is a person who has leprosy.

Epidemiology

Leprosy is present in almost every country of the world. It is most prevalent in tropical and semitropical areas such as India, Central Africa and Southeast Asia. Leprosy can occur at any age but is rare in infants. The peak age for diagnosis is between 15 and 25 years of age, but new cases are seen in old age. Males are affected rather more commonly than females but the sex difference is less noticeable in children.

It has been established that the usual route of exit of the bacilli is the nasal mucous secretion, and it is uncommon to find leprosy bacilli on the surface of the skin. The mode of transmission and the route of entry is still uncertain. Most people have a high resistance to leprosy and therefore do not develop the disease. There is some evidence to suggest that certain families are more susceptible to leprosy than average. Studies have shown that it takes approximately 3 - 7 years for symptoms to develop. The symptoms appear on a gradual basis and may become progressively worse if not treated.

Clinical Picture

Four types of leprosy are described; the variations in the clinical picture are due to different degrees of resistance to the infection. The length of treatment and the risk of complications differ with each type, so accurate classification of patients is important.

A. 1. Signs and Symptoms of Indeterminate Leprosy.

The earliest sign is usually a single light patch on the skin which may or may not be anaesthetic to light touch. At this stage the disease is said to be in the indeterminate stage, since it cannot be determined yet whether the patient is developing tuberculoid or lepromatous leprosy. Some cases of indeterminate leprosy cure themselves. Skin smears are negative.

2. Signs and Symptoms of Tuberculoid Leprosy

- a) There are few anaesthetic skin lesions (1-3) usually asymmetrical; hypo-pigmented.
- b) Nerve damage; usually one or two nerves only.
- c) Bacilli are not found in the skin smears.

In tuberculoid leprosy the patient has a high resistance to leprosy.

3. Signs and Symptoms of Lepromatous Leprosy

This is the other end of the spectrum, and patients who develop lepromatous leprosy have no resistance against leprosy bacilli which multiply unchecked; they can be found in the skin, nerves and nasal lining (mucosa).

- a) Many skin lesions of different kinds - nodules (especially on the lower third of the ears), raised patches, flat red patches, areas of thick skin.
- b) Bacilli are easy to find and skin smears are strongly positive.
- c) Nerve involvement is a late sign, but then usually many nerves are affected.
- d) Other organs may be involved - eyes, testes, lymph nodes, liver, spleen. Slit skin smears are used as a diagnostic test in suspected multi-bacillary cases. Bacilli may be obtained from skin lesions by the 'slit and scrape' method. The material obtained is spread on a microscope slide, stained and examined under a microscope. The findings are recorded as a bacterial index (BI) indicating very approximately the total bacterial load. The B.I. falls during treatment. The M.I. (morphological index) indicates how many of the bacilli are alive.

4. Signs and Symptoms of Borderline Leprosy.

This group includes a large number of patients with a moderate degree of resistance to the infection.

- a) 3 - 25 skin lesions; outline usually irregular; some loss of feeling.
- b) Nerve damage often involves many nerves, and it may occur early or late and is often severe.
- c) Bacilli may or may not be found in the skin smears.

The Relationship of the Different Forms of Leprosy

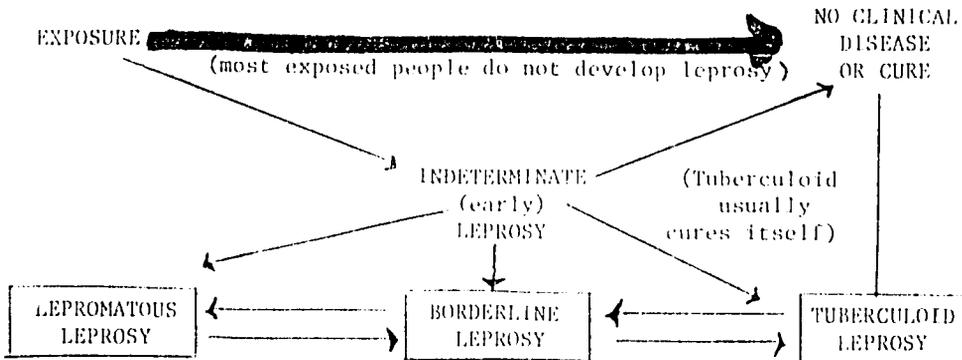


Figure CD 3

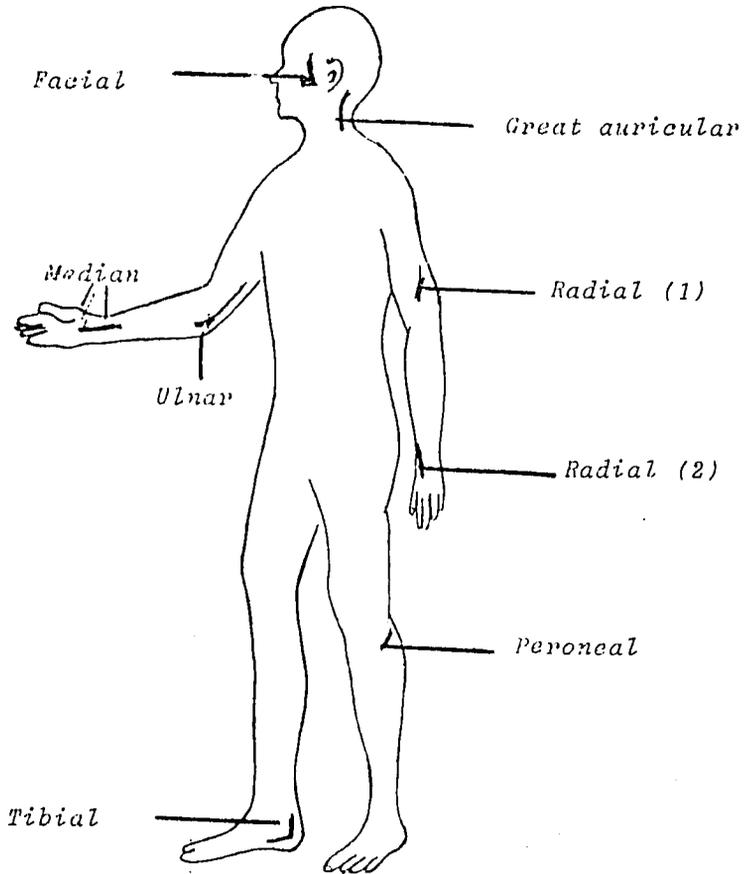
B. Nerve Involvement

Nerve involvement is always present in leprosy, and places where enlarged nerves can be felt are shown in the Figure CD 4. When nerves are damaged in leprosy there may be either loss of sensation, loss of sweating, or muscle weakness and paralysis. The main nerves which are damaged in leprosy together with the effects of damage are:

- Facial nerve; weakness of the eyelid, and sometimes of the lips.
- Great auricular nerve; usually symptomless.
- Ulnar nerve; weakness of 4th. and 5th. fingers and muscle wasting; impaired sensation of ulnar border of hand.
- Radial nerve; 'wrist drop' when affected in upper arm.
- Median nerve; weakness of the thumb and wasting of the muscles; impaired sensation in palm of hand.
- Peroneal nerve; 'drop foot'.
- Tibial nerve; claw toes and impaired sensation of the sole of the foot.

When there is severe and permanent nerve damage, these abnormalities can easily be recognized. But it is more important to recognize mild nerve damage, which may recover with treatment and so deformity may be prevented.

Sites at which nerves are damaged in leprosy.



All these nerves (except the facial) can be felt when enlarged.

Figure CD 4

A DIAGNOSIS can be made from any of the three cardinal signs and symptoms:

1. Typical skin lesions which are anaesthetic to cotton wool touch.
2. Enlargement of peripheral nerves in specific sites.
3. Demonstration of acid fast bacilli in skin smears.

C. Complications

1. Reversal Reaction. This occurs in borderline leprosy; signs and symptoms are:

- a) increased oedema and redness of existing lesions
- b) in severe reactions: fever and general oedema
- c) sudden and severe damage to nerves in which bacilli are already present, resulting in increasing anaesthesia and loss of function; nerve pain or tenderness
- d) swelling of hands and feet
- e) appearance of new small lesions.

2. E.N.L. Reaction (Erythema nodosum leprosum).

This occurs in lepromatous leprosy; it may be mild or severe and attacks are frequently prolonged or recurrent. Signs and symptoms are:

- a) red nodules or plaques which are tender, appear on face, arms and thighs
- b) fever
- c) tender and painful nerves
- d) painful and swollen joints
- e) lymph nodes, testes and eyes may also be inflamed.

3. The Eye

In lepromatous leprosy nodules can form in the eyeball itself; bacilli may be present in the iris and ciliary body and if untreated cause blindness.

In non-lepromatous leprosy, only the 'outside' of the eye is affected. There is anaesthesia of the cornea and weakness of the eyelids, so that a patient may not be able to blink or close his eyes.

4. The Foot

The foot in leprosy patients may be damaged and deformed as the end result of anaesthesia, paralysis of the small muscles or bone damage. There may be 'claw' toes or 'drop foot' so abnormal stress is put on the lateral part of the forefoot when walking. When the foot is anaesthetic the patient continues to walk long after pain would have stopped a normal person and forced them to rest.

All ulcers will heal given time and rest without weight bearing. Principles of treatment are: rest, soak and protect with shoes; antibiotics only for infected ulcers; deep ulcers need hospital treatment.

5. Complications due to nerve damage - preventable secondary deformity.

Hands - dry skin; soak in water and rub on oil.
Exercises help prevent fixed deformity of the hands. Anaesthesia; watch for hot objects and working with things that are sharp or rough.

Feet - dry skin cracks easily and gets infected.
Prevent this by soaks in cold water, then remove any thick skin and rub in oil. Exercises help prevent fixed deformity.

D. Management of Leprosy

All suspected cases of leprosy should be confirmed by a doctor or supervisor. If this is not possible locally, the patient should be sent to the leprosy referral unit. If it is a single lesion - (indeterminate leprosy) the patient is observed for some weeks before the diagnosis is confirmed. When a patient is diagnosed in a rural clinic the appropriate form is completed and sent to the leprosy referral unit for registration. (See Leprosy Form 1 - Notification of a new case of Leprosy). The case record form is then filled in (see Leprosy Form 2); it is sent to the clinic together with a red identity card for the patient. Most patients still start their treatment as in-patients at Botsabelo. On discharge, full details are sent on a form to the clinic undertaking treatment.

1. Treatment:

a. Dapsone therapy. DDS (diamino-diphenyl sulphone). This is the standard drug used in leprosy. All adults start and continue with 100 mgs. daily; children 50 mgs. daily. Dapsone should not be discontinued or reduced during reaction but the patient should be sent to hospital for treatment when reactions occur. Side effects of dapsone are not common. They include drug allergy (skin rash, fever, jaundice), anaemia, insomnia, nausea, intestinal disturbance and fixed drug eruption. Length of treatment:

- Tuberculoid leprosy - 2-5 years
- Borderline leprosy - 5-10 years
- Lepromatous leprosy - continue for life

Dapsone resistant leprosy:

This occurs in patients with lepromatous leprosy and can be related to irregular, interrupted or low dose treatment with DDS. Resistance can be suspected if there is initial improvement under DDS treatment followed by a relapse despite continued treatment with dapsone.

New nodules appear sometimes in unlikely places such as the eye. Resistance can be proved by tests which are not available locally, but if it is certain that the patient is taking his treatment regularly and his condition is worsening, i.e. he has progressive lepromatous leprosy and not an ENL reaction, then he is resistant. Patients with dapsone resistant leprosy are able to pass on a type of leprosy known as primary resistant leprosy to others.

Treatment for dapsone resistant patients:

Patients on whom dapsone resistant leprosy is suspected should be referred to the Leprosy control programme. If resistance is proved, Rifampicin is given, 600 mgs. daily for 1 month plus Clofazamine 100 mgs daily for 6 months. Then Clofazamine 100 mgs. 3 times a week indefinitely.

b. All multi-bacilliary patients should be treated initially with two drugs, to prevent DDS resistance occurring. The drugs used are DDS and Clofazamine, or DDS and thicetazone, or DDS and Rifampicin according to the regimes recommended by the Lesotho Leprosy Control Programme. Two drugs are given for 3 to 6 months; thereafter dapsone is continued alone.

c. Treatment of reversal reaction and neuritis and ENL

Reactions and neuritis represent the same process occurring in the skin and nerves; they occur singly or together but the principles of management are the same. Early recognition of reaction is important and patients should be referred to the leprosy unit; treatment is corti-costeroids for several months, and physiotherapy, in order to prevent deformity.

All patients with ENL should be referred to the leprosy referral unit. ENL is treated with analgesics and rest; clofazamine, or steroids; or thalidomide (male patients).

2. Patient Education

- a) The medical treatment of leprosy is a long term procedure. The patient must be encouraged to take medication regularly and to return to the clinic for scheduled visits. If possible the health worker should visit the patient's home occasionally. The VHW should be encouraged to visit frequently.
- b) If his hands have lost sensation, patient is instructed to avoid injury due to heat (by insulation), to localized pressure (by padding) and to sharp objects. Instruction is given as to how to care for small wounds. Special shoes are necessary for anaesthetic feet.
- c) If nerve damage has resulted in muscle paralysis, teach the patient to perform passive exercise of all parts affected.
- d) Teach skin care for patients with anaesthetic hands and feet.
- e) Explain the symptoms of reaction and the necessity of reporting any increase of sensory loss in hands or feet and nerve pain. Record sensory loss and loss of strength on appropriate charts on Form 2.
- f) Teach patients who are parents to observe their children for early signs of leprosy.

3. Long Term Education

- a) Maintain drug therapy
- b) Continue to observe and treat for the following:
 - increased loss of sensation
 - increased stiffness needing exercise
 - hard skin of hands or feet; needing soaking, paring and oiling
 - plantar ulcers and wounds; needing rest and protective footwear.

Prevention

At present there is no specific vaccine for leprosy and therefore no possibility of primary prevention (i.e. the detection and protection of persons at risk).

Leprosy control is based on secondary prevention - that is early detection and regular treatment for a sufficiently long period of all cases existing in an area. Prevention of leprosy depends on informing communities about the disease and gaining their cooperation. This information can be divided into three areas: 1) how to recognize leprosy in the early stages; 2) how it is treated and what the prognosis is; and 3) what can be done to avoid further spread.

Only certain patients are infectious and the most infectious period occurs before there is established deformity. A patient taking regular treatment soon becomes non-infectious. Therefore, early detection and regular treatment are very important in protecting the rest of the family.

When a case is detected, family members and close contacts should go to the clinic for examination or be visited by a VHW every 4 months for 10 years.

Isolation of patients is not an effective measure in controlling leprosy and only increases fear. Untreated multibacilliary patients spread the infection and therefore it is essential that this group should be brought under treatment and so reduce the reservoir of infection. This particularly applies to patients whose jobs are such that they mix freely with the general public (taxi driver, shop assistant, etc.).

DIAGNOSTIC SKILL

EXAMINING LESIONS
FOR ABSENCE OF FEELING (ANAESTHESIA)Procedure

Put the patient at ease, ask him to sit down and explain first what you are going to do. Demonstrate the examination on yourself or another patient who is familiar with this examination.

To Examine a Lesion for Lack of Feeling or Anaesthesia

First, touch with the pointed end of a piece of cotton wool the normal skin of the patient and ask him to indicate with his finger exactly where he was touched. Then ask the patient to close his eyes and to keep them closed throughout the examination. Turn his head upwards or in a direction which prevents him from seeing the site to be examined if he opens his eyes. Do not blindfold the patient or close his eyes with your hands, but use your hand or else a piece of cardboard as a screen. Touch healthy skin and ask the patient to indicate the site each time he feels the touch.

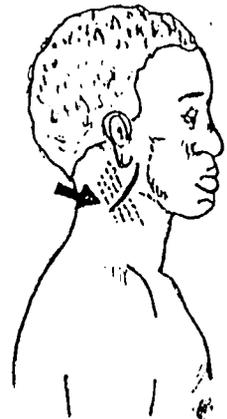
Do not sweep the skin with the cotton wool. Repeat the action until the patient responds. Then touch the lesion, exerting about the same pressure. If the patient does not respond, touch normal skin again. Alternate touching lesions and normal skin.

EXAMINING PATIENT FOR ENLARGED NERVES

Examination of Nerves

1. Great auricular nerve (see Figure CD 5). Ask the patient to turn his head to one side. The great auricular nerve crosses the sternocleidomastoid muscle (see dotted lines) in the middle.

Figure CD 5 -
Great auricular nerve.



2. The ulnar nerve (see Figure CD 6). Take the patient's right hand with your left and bend his arm in the elbow. Place the right forefinger on the inner bonehead of the elbow joint (medial epicondyle of the humerus). Let your finger slip into the groove behind this bonehead at the elbow. You can feel the ulnar nerve in this groove. Now follow the nerve upwards with two fingers, not losing contact with the nerve (to avoid getting mixed up with the tendons). Examine the left ulnar nerve by taking the patient's left hand in your right hand and palpating the nerve with your left forefinger.

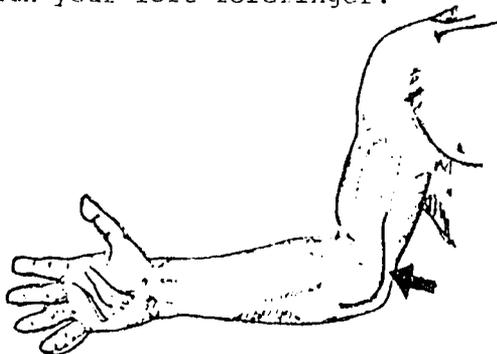
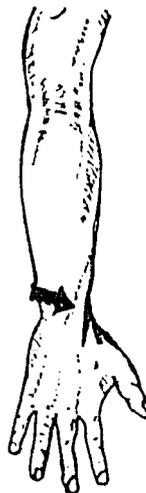


Figure CD 6 - Ulnar nerve

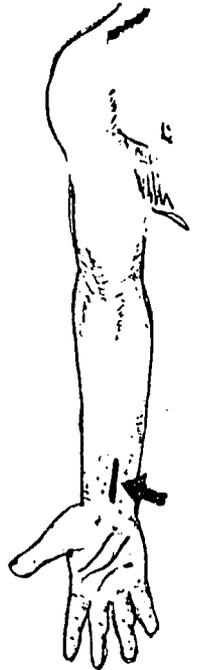
3. Cutaneous branch of radial nerve at the wrist (nervus radialis cutaneous). (See Figure CD 7) This superficial branch of the radial nerve is located at the side of the wrist and can be palpated easily.

*Figure CD 7 -
Cutaneous branch of
radial nerve at the
wrist.*



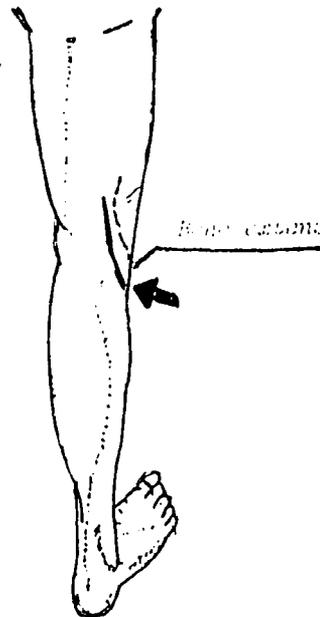
4. Median nerve (See Figure CD 8) This nerve is located at the inner side of the wrist in the middle. It is more difficult to palpate because of the two large tendons, which cover the nerve for the most part. (See dotted lines.)

Figure CD 8 - Median nerve



5. Lateral popliteal nerve (common peroneal nerve). (See Figure CD 9.) Stand in front of the patient and ask him to sit down with his knees slightly flexed. Put your finger on the bone extension at the upper outer part of the lower leg, right beneath the knee. Let your finger slip into the kneehole. First you will feel a very strong tendon (see dotted line). Just behind this tendon you feel the popliteal nerve. Follow this nerve upwards and downwards in the kneehole with two fingers.

Figure CD 9 - Lateral common popliteal nerve



6. The posterior tibial nerve (See Figure CD 10.)

This nerve can be felt just behind the inner ankle bone, between two small tendons (see dotted lines).

Several other cutaneous nerve branches may be enlarged in or near skin lesions; e.g. on the dorsum of the foot, above the eyebrows, etc.

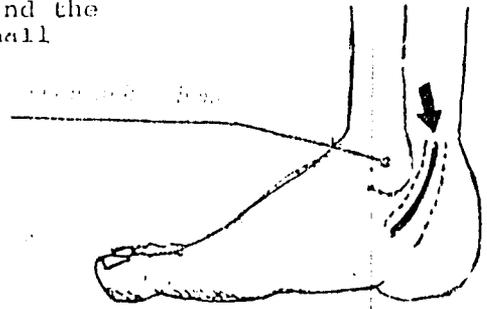


Figure CD 10 - Posterior tibial nerve

SKIN SMEARS

1. Choose 2 sites for your smears:
 - a) The forehead just above the bridge of the nose, or the most active looking edge of the most active looking lesion.
 - b) One ear lobe.

2. Prepare a microscope slide: Hold it at the sides and clean it with cotton wool so that there are no finger-prints.

Take a piece of white tape and put it on the top side and across the end and write the name of the patient with a pen.



Figure CD 11

(See Figure CD 11.)

3. Clean the skin at the two sites with a piece of cotton wool dipped in spirit. Leave the skin dry.

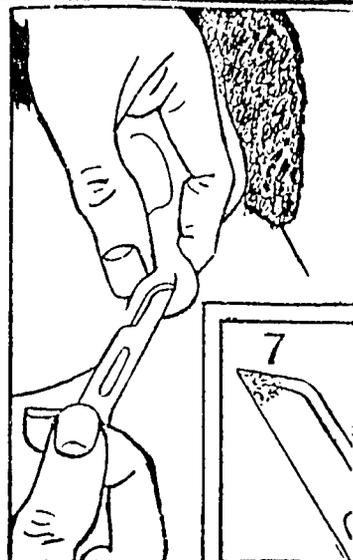
4. Take a sharp, clean scalpel and hold it for a few seconds in the flame of a spirit lamp till the cutting edge glows red; let it cool for some seconds.

5. Take a fold of skin between your thumb and forefinger at the site you have chosen, and squeeze it so that the blood in the capillaries is forced out (Figure CD 12). The reddish colour disappears, and the skin fold looks pale. If you squeeze hard, this reduces the slight pain you cause when you take the next step.



6. With the scalpel make a cut 2 - 3 mm deep and about 7 mm long. Do not release your pressure with your other hand, but turn your blade and draw it firmly once along the edge of the cut, so that you collect a little tissue fluid on the blade. (See Figure CD 13.)

7. Spread the tissue fluid on the blade as evenly as possible on the slide in the places shown (See Figure CD 14 - next page)



8. Clean the scalpel with cotton wool moistened with spirit, and hold it again in the flame. Take the smear from the second site in the same way.

9. Hold the slide, smears uppermost, and pass it slowly three times through the flame to fix the smears (See Figure CD 15 - next page).

10. Record (on the form) the patient's number, name, and whether the smear is taken for leprosy control or for case finding (new cases). Wrap the slide carefully in a piece of paper and pin it to the form.

11. Send the slide to Q.E.II Hospital Laboratory for staining and reading. If you send it by post, be careful to pack it so that it does not get broken.



Ear Lobe Forehead or other sites

Figure CD 14

12. The result should give you the B.I. (bacterial index) and the M.I. (morphological index). The M.I. indicates how many of the bacilli are alive.

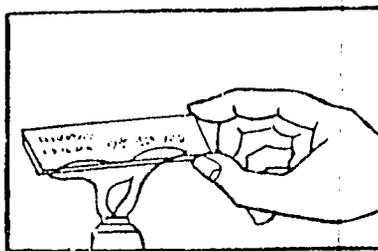


Figure CD 15

Requirements for taking Skin Smears

1. Scalpel knife
2. Microscope slides
3. Spirit burner (if not available you can manage by lighting cotton wool which is soaked in spirit and holding it in a pair of forceps).
4. Methylated spirit
5. Cotton wool
6. Matches
7. Forms for recording (obtainable from Botsabelo)

REVIEW QUESTIONS

1. Leprosy is an infectious disease caused by a bacillus, that is: (check one)
 - a. acute
 - b. chronic

2. Lepromatous leprosy chiefly affects the: (check four)
 - a. skin
 - b. bones
 - c. mucous membrane
 - d. brain
 - e. upper respiratory tract
 - f. periperal nerves

3. Tuberculoid leprosy chiefly affects the: (check two)
 - a. skin
 - b. bones
 - c. mucous membrane
 - d. brain
 - e. upper respiratory tract
 - f. peripheral nerves

4. Name the three important diagnostic signs and symptoms of leprosy:
 - a.
 - b.
 - c.

5. Identify the following characteristics as belonging to tuberculoid or lepromatous leprosy.
 - a. Few anaesthetic skin lesions
 - b. Many bacilli in skin smears
 - c. Many skin lesions
 - d. Early damage of a single nerve

6. Name three characteristics of ENL (erythema nodosum leprosum).
 - a.
 - b.
 - c.

7. A patient arrives at your clinic with a single light macular skin patch which is anaesthetic to light touch, and you suspect he has leprosy. The physician or leprosy worker is at the hospital 80 kilometres away and will be visiting your clinic in two months. How will you manage this patient?

8. Some borderline patients develop a reversal reaction.
 - a. What patient complaints would cause you to suspect a reversal reaction?

 - b. What action would be most important for you to take if a patient appears to have a reversal reaction?

9. A patient with leprosy will sometimes arrive at the clinic with a small uninfected ulcer on his foot that has gone unnoticed. Such ulcers frequently occur when a patient has leprosy.
 - a. Why has the ulcer on his foot gone unnoticed?

 - b. What treatment will you provide?

 - c. What information will you give the patient?

10. Although all ages of people can become affected with leprosy, to which age group would you pay particular attention? (check one)

a. 3 - 6 month olds

b. 3 - 14 year olds

c. 15 - 25 year olds

d. 26 - 40 year olds

Leprosy Form I

NOTIFICATION OF A NEW CASE OF LEPROSY

NAME SEX DATE OF BIRTH

ADDRESS:

TYPE OF LEPROSY:

SKIN SMEAR:

DISABILITIES:

HOSPITAL OR CLINIC UNDERTAKING TREATMENT:

DATE FIRST TREATED:

SIGNED: DESIGNATION:

DATE:

When completed, this form should be sent to:

The Leprosy Control Programme
 Botsabelo Hospital
 P. O. Botsabelo
MASERU

LESOTHO NATIONAL LEPROSY CONTROL PROGRAMME

CASE RECORD

Index No: _____

Name: _____ Date: _____

Address: _____

Sex: _____ Date of birth: _____ Father's/Husband's
Name: _____

Name of Hospital/
Clinic _____ Type of
Leprosy: _____

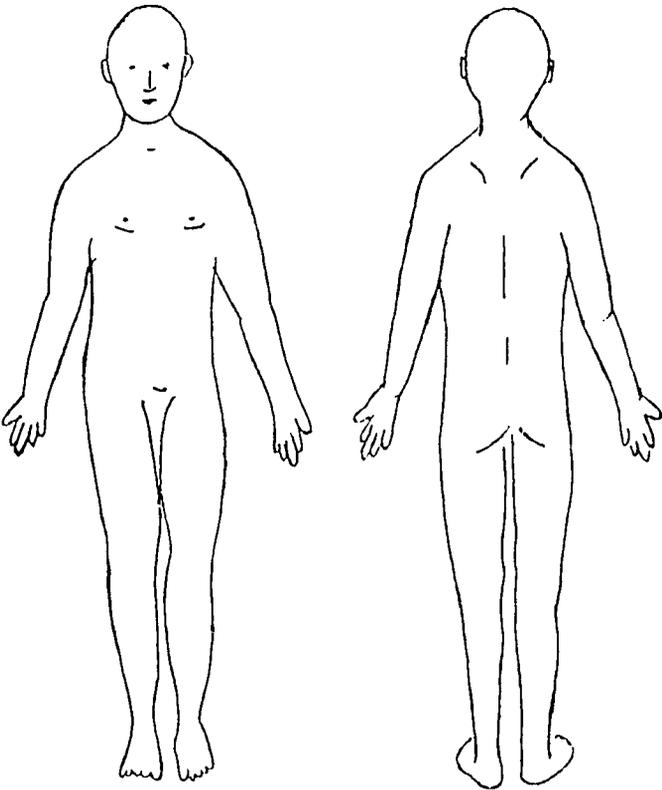
Disabilities: _____

HISTORY:

- Main complaint
- Time & nature of onset
- Changes since onset
- Treatment received
- Other medical problems
- Family history (of leprosy)

PHYSICAL EXAMINATION:

Skin patches: (Draw the patches on the diagrams)
Describe: Edges, centres, colour, sensitivity,
raised or flat.



Index no:

Case record

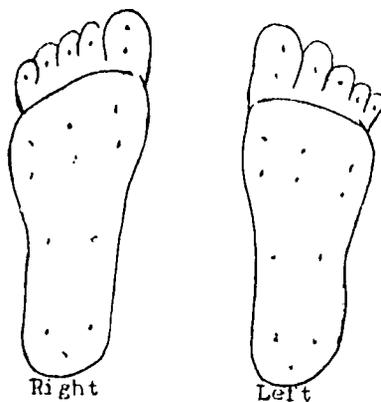
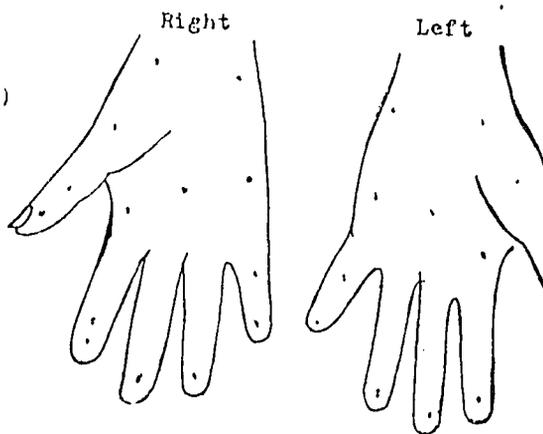
Skin smear:

<u>EYES:</u>	Right	Left
	Lids	Light closure ___ mm.
Blink reflex		
Lashes		
Conjunctiva		
Sclera		
Limbus		
Cornea (+ sensitivity)		
Pupil		
Visual acuity		

HANDS & FEET: Record duration of all sensory/strength loss

Test here, skin

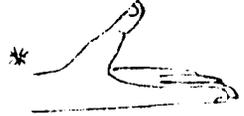
- . = dinting with ballpoint
- ✓ = feels
- X = does not feel
- Number = misreference (in cm)
- ▭ = open crack
- ▭ = open wound (state cause)
- ⊙ = scar
- = absorbed or amputated



Strength:	Right	Left
Little finger out		
Thumb out at 75° to palm *		
Foot up		
Foot out		

Key:

- N = normal for this patient
- RR = resistance much reduced
- MR = movement reduced
- P = paralysed



NERVES: Key. + or ++ = increase; - = normal

Nerve	Cervical		Radial		Ulnar		Median		R.Cut.		Peroneal	
	R	L	R	L	R	L	R	L	R	L	R	L
Side												
Size												
Tenderness												

SOCIAL ASPECTS:

- Education
- Means of livelihood & income
- Marriage & dependants
- Problems or changes since onset of leprosy
- Ideas about leprosy - cause
- treatment
- Any problems in attending O.P.Clinic

HEALTH EDUCATION GIVEN:

- Cause and treatment of leprosy
- To report:
 - added nodules
 - redness of lesions
 - added sensory or strength loss
 - injuries
 - eye problems
- Home care:
 - eyes
 - hands
 - feet

(NOTES:)

STUDENT GUIDE

TYPHUS AND DIPHThERIA

I. Entry Level Knowledge and Skills

Before starting this unit, you should be able to:

1. Make the following physical discriminations:
 - conjunctivitis
 - rashes
 - rales
 - enlarged lymph nodes
 - splenomegaly
 - red throat
2. Calculate drug dosages.
3. Describe the anatomy and physiology of the respiratory system.

II. Objectives:

Using the information and experience provided by the instructor and the module text, you will be able to:

1. Describe the transmission of louse-borne typhus and tick typhus (spotted fever).
2. Describe general characteristics and course of the following diseases including the discriminations:
 - typhus-flu like symptoms with skin rash
 - diphtheria-red, sore throat covered with clear and later a gray membrane.
3. Diagnose and manage both types of typhus and diphtheria.
4. Identify complications of diphtheria and both types of typhus.
5. Describe prevention procedures for typhus and diphtheria.

III. Evaluation:

Module Phase: Upon completion of the module, you will be assessed on:

1. Knowledge: Written test based on contents of module text. Acceptable performance, 80%.
2. Skills:
 - a. Your ability to make physical exam discriminations for diphtheria and louse/tick typhus.
 - b. Your ability to describe louse and tick prevention.

Rotation Phase: Upon completion of the rotation phase you will be assessed on:

1. Your ability to diagnose and manage diphtheria and typhus.
2. Your ability to describe prevention procedures for typhus and diphtheria.

IV. Activities you will use to accomplish the objectives:

1. Students read module text on Diphtheria and Typhus and answer review questions.
2. Instructor conducts a discussion of the diagnosis and management of typhus and diphtheria.
3. Student panel lead discussion of prevention procedures for diphtheria and typhus.

TYPHUS

General Considerations

Typhus is really a group of diseases caused by a small bacteria-like organism. Once a human is infected, the organism spreads throughout the bloodstream and inflames the lining of the blood vessels. This infection of blood vessels is the cause of the signs and symptoms seen in typhus. These commonly include skin rash, fever and the formation of clots in the vessels. The body organs that are affected by this process also begin to function poorly causing more symptoms of the disease.

Typhus is an infection carried to man by lice, fleas, ticks, and mites. Humans can become infected when bitten by one of these, or when their faeces are scratched into the skin, or by breathing the infected faeces into the lungs. Different types of typhus organisms exist and these cause different symptoms.

Louse-Borne Typhus

This type of typhus is spread by a louse first biting an infected person. That louse then transfers to a new person and when its faeces are scratched into the skin, the next person becomes infected. This type of typhus is particularly prevalent in crowded living conditions and cold climate areas where clothes and blankets are not regularly taken off and washed.

Clinical Picture

The incubation period is 10 to 14 days from the time of first infection to observable signs and symptoms.

The disease usually begins with cold/flu-like symptoms, tiredness, cough and headache. Then, the patient abruptly becomes more severely ill with chills and high, constant fever. The headache becomes severe and constant and this continues to progressive loss of consciousness.

On examination one often finds conjunctivitis, rales in the lung bases and an enlarged spleen.

Typically, a flat (macular) red rash soon becomes raised (papular). It first appears in the arm pit and spreads over the trunk and then to the extremities. The rash appears on the fifth (5th) day of the illness. As the patient becomes more severely ill, the rash becomes more spread out and bruise-like over the body..

The cold/flu-like first stage is similar to many other diseases and may not be specific enough to permit diagnosis in non-outbreak situations. The keys to the diagnosis are the rash, the fever, and the ever-constant headache. In outbreak louse-borne typhus, many cases appear at the same time.

Complications

The complications of this type of typhus can include:

- a. Pneumonia
- b. Skin that turns black and gangrenous
- c. Hypotension
- d. Low urine output
- e. Mental confusion and coma
- f. Some people who recover may continue to have the infection carried in the lymphatic system and have relapses of this type of typhus without being re-infected.

Management

This can be a very serious disease requiring intensive nursing care and supportive therapy even though antibiotics are required and helpful.

1. The patient should be transferred to a hospital for care, but if there is delay in transferring, begin antibiotics.
2. Tetracycline*
 - Adults: First give 4 capsules (1 gram) every hour for three hours. Then, give 1 capsule (250 mg) every six hours until the patient has been afebrile for 48 hours.
 - Children: 0 to 5 years - 1 capsule (250 mg) every 6 hours until the temperature returns to normal. Then, 1/2 capsule every 6 hours for 5 days.
5 to 12 years - 2 capsules (500 mg) every 6 hours until the temperature returns to normal. Then 1 capsule (250 mg) every 6 hours for 5 days.

*Chloramphenicol may be substituted for tetracycline using the same sized doses.

Prognosis:

The prognosis of louse-borne typhus depends on age and immunization status. In children, the disease is usually mild. But the death rate in the elderly is very high. Middle aged people also have significant deaths related to typhus.

Prevention

1. Typhus of this type cannot be spread if the louse carrying organism is killed. This can be done by:
 - a. Treating all typhus cases and their contacts with Benzyl Benzoate.
 - b. All clothing and bedding of typhus patients have had contact with should be treated with insecticide or washed and boiled.

Tick Typhus (Spotted Fever)

This disease occurs in many different regions of the world and is given different names according to region. People become infected by the bite of a diseased tick. This disease begins in small animals like rats and dogs. The ticks become infected by biting the diseased animal. (See Figure CD 16)

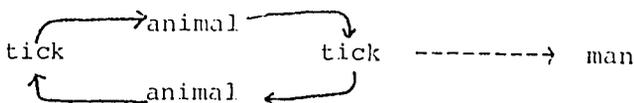


Figure CD 16 - Disease Cycle in Tick Typhus

When man is bitten by an infected tick, he then gets the disease.

Clinical Picture

The incubation period is 3 to 10 days. The first signs and symptoms begin after the bite of an infected tick.

The disease usually begins with flu/cold-like symptoms; lack of appetite, nausea, tiredness, headache and sore throat. Then, the symptoms quickly progress to include chills and fever, body aches and pains all over, abdominal pain and vomiting, and changes in mental status progressing from restlessness and irritability to delirium and even coma.

Sometimes during the illness, one might obtain a history of a tick bite or even find the tick still buried in the skin.

The signs of tick typhus or spotted fever include red eyes, enlarged liver and spleen and jaundice. After 2 to 6 days of fever, a rash appears. The rash begins spreading up the arms and legs to the trunk. This rash is initially small, red and macular and then becomes more spread out, covering a larger area. The rash spreads over the entire body over a period of 3 to 5 days. In addition, a black sore may be present at the site of the tick bite.

The early signs and symptoms are the same as many other infectious diseases. The key to the diagnosis is fever, the characteristic rash and a history of tick bite.

Complications

In severe illness, a patient may have extremely high fever, become comatose, and have gangrene of the skin.

Complications are rare with this type of typhus. The mortality varies with different age groups - older people being at more risk than children.

Management

This can be a very serious disease requiring intensive nursing care and supportive therapy even though antibiotics are required and helpful.

1. The patient should be transferred to a hospital for care, but if there is delay in transferring, begin antibiotics.
2. Tetracycline or chloramphenicol
 - Adults: First give 4 capsules (1 gm) every hour for 3 hours. Then give 1 capsul (250 mg) every 6 hours for 5 days.
 - Children: 0 to 5 years - 1 capsul (250 mg) every 6 hours until the temperature returns to normal. Then, 1/2 capsul every 6 hours for 5 days.
 - 5 to 12 years - 2 capsuls (500 mg) every 6 hours until the temperature returns to normal. Then, 1 capsul (250 mg) every 6 hours for 5 days.

Prevention

The basis for prevention is protection from tick bites by:

- a. using protective clothing,
- b. using tick repellent chemicals,
- c. prompt removal of ticks.

REVIEW QUESTIONS

1. Explain how people become infected with typhus.
2. Describe the clinical picture of louse-borne and tick-borne typhus.
3. What is the key to prevention of both types of typhus?

DIPHTHERIA

Diphtheria is an acute infectious disease caused by bacteria. The infection is located primarily in the tonsils and throat. The bacteria produce a toxin which affects the heart and peripheral nerves.

Clinical Manifestation

The incubation period is 2 to 7 days. Early symptoms include a sore throat and fever. On examination one will find a red throat, and eventually this becomes covered with a membrane.

To begin with, the membrane is soft and easily removable. Later it becomes a thin sheet which covers the tonsils and/or throat and then progresses to become thicker, bluish-white, gray or black and becomes firmly attached to the tissue below. Removing it at this stage results in bleeding.

As the disease progresses, tiredness and generalized illness become more severe. Swelling of the throat makes swallowing and breathing difficult. The lymph nodes of the neck may enlarge forming a "bull neck."

Complications

Related to the membrane:

The membrane may spread into the trachea blocking the airway or break off causing sudden obstruction of the airway.

Effects of the Poison (Toxin):

The toxin may affect the heart causing rhythm problems or congestive heart failure. Even after recovering the patient may have permanent heart damage.

The toxin may affect the peripheral nerves causing localized paralysis which contributes to swallowing difficulties, and causes paralysis of the muscles of the face.

Management

Patients with suspected diphtheria should be transferred to a hospital as soon as possible so that antitoxin can be administered. Strict bed rest, antibiotics and isolation are required.

Transfer as soon as possible. It is not necessary to give antibiotics (penicillin is the choice) before transferring because it only has a mild immediate effect.

Prevention

1. All people should be immunized against diphtheria in childhood. Diphtheria toxoid is usually given as the "D" in DPT.
 - Three doses of DPT at least one month apart during infancy, starting as early as 3 months of age.
 - Booster at 18 months or one year after primary series.
 - Booster before entering school.
2. During an outbreak of diphtheria, all community members who have not had immunizations should begin their series and those who have been immunized should be given a booster.

REVIEW QUESTIONS

1. Discuss the complications of diphtheria.
2. Describe the clinical picture of diphtheria.
3. What prevention is available routinely for diphtheria?
4. What preventive steps are taken during an outbreak of diphtheria?

COMMUNICABLE DISEASES

MODULE PHASE

SKILL EVALUATION

Before you are advanced to the rotation/preceptor phase of training, a staff member will evaluate your mastery of the physical examination procedures and discriminations which have been identified in the modules.

You will have the opportunity to be rated on your performance of these skills at any time during the module phase that you feel prepared.

To help you prepare, a list of the skills to be evaluated has been included in each module. You are advised to do the following:

1. Work on perfecting your techniques of examination with another student.
2. During the clinical practice time provided during the teaching of each module, practice the skills applicable to that module.
3. Have a fellow student observe and evaluate your performance.
4. When you feel you are ready, ask a trainer to observe and rate your performance.
5. If your performance is unacceptable, the trainer will give you specific comments on how to improve.
6. Practice again until you are ready for evaluation, and arrange to be rated.
7. If after two attempts you are unable to perform a skill at an acceptable level, arrange for a meeting with members of the training staff, who will help you obtain the experiences necessary for improving your performance.