BASIC EYE CARE

TRAINING ACTIVITIES FOR COMMUNITY HEALTH WORKERS

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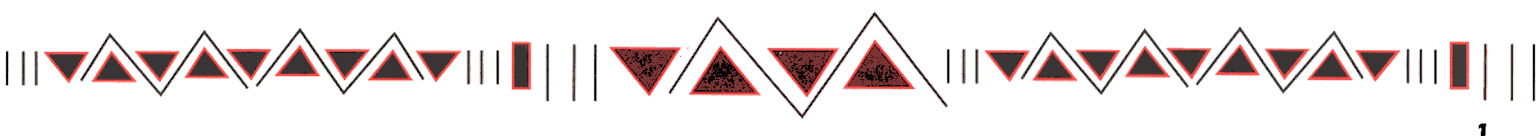

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Kirsten Laursen
Director, Training and Community Education

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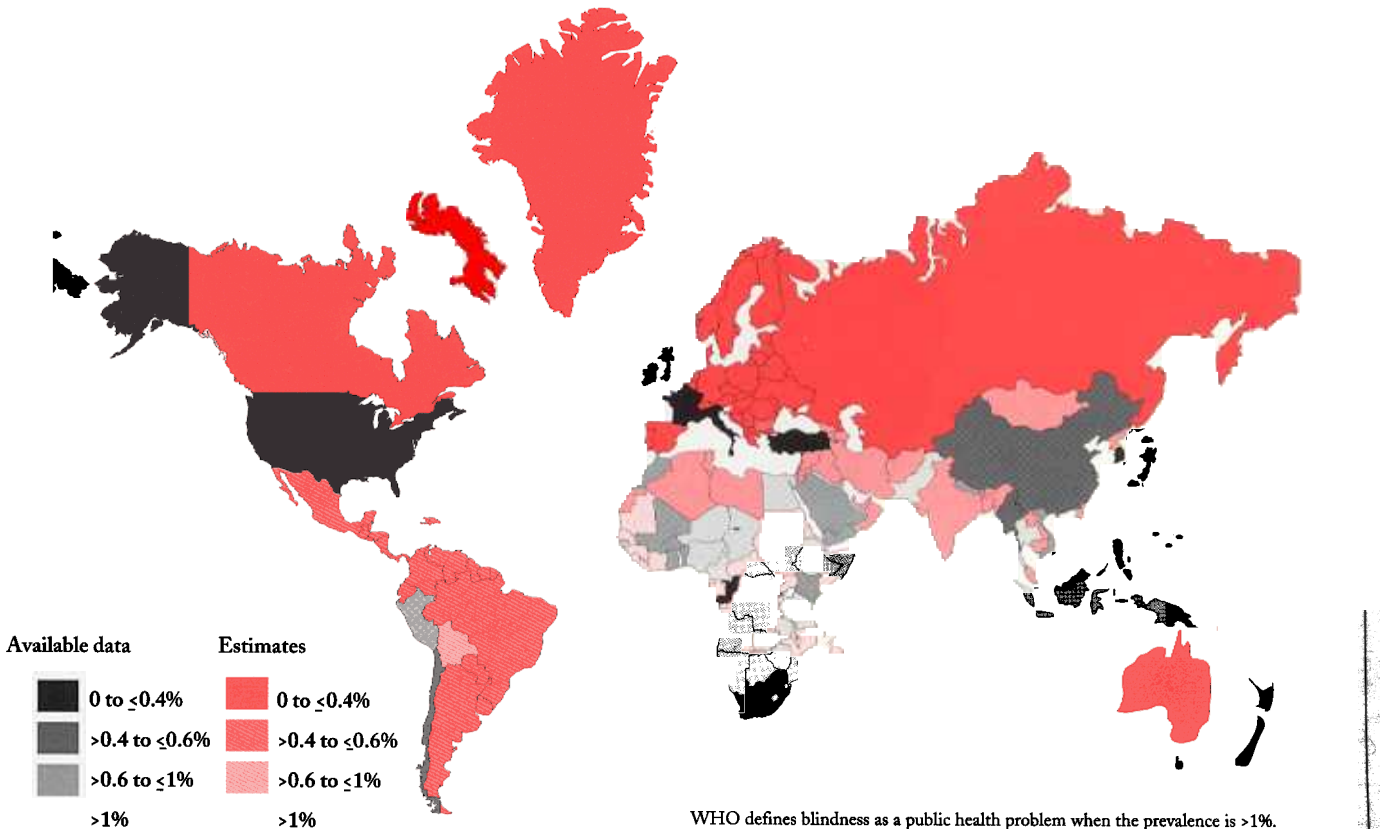
Director, Eyecare

INTRODUCTION AND OVERVIEW OF WORLD BLINDNESS:

It is estimated that there are 38 million blind people in the world. Another 110 million are at risk of becoming blind (WHO 1995). The number of blind people in the world is increasing and most of the increase is occurring in Asia and Africa.. Seventy five percent (75%) of world blindness occurs in these two continents where high population growth, an increase in the elderly population, and limited access to public health services contribute to rising blindness figures.

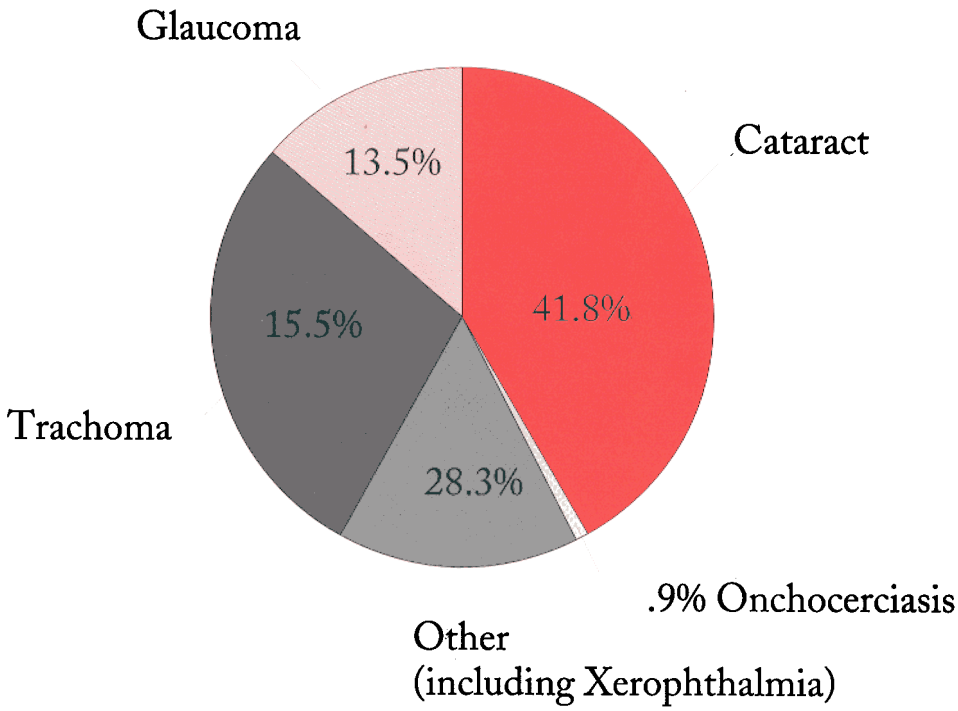
WORLD PREVALENCE OF BLINDNESS (Available data and estimates)



WHO defines blindness as a public health problem when the prevalence is >1%.
WHO 1995

Four out of five cases of blindness are either avoidable or curable (WHO 1987). Many countries with high rates of blindness have few available trained ophthalmic personnel; in some countries there is only one ophthalmologist for more than 1.5 million people. But there is hope. Experienced program officers from HKI estimate that only about 15% of eye health problems require specialized attention*. Basic eye care programs can therefore play a key role in reducing avoidable blindness by teaching health care workers to diagnose and treat eye diseases which may cause blindness if left untreated.

CAUSES OF BLINDNESS WORLDWIDE



Cataract is the leading cause of blindness in most parts of the developing world. Vitamin A deficiency is most commonly found in Asia and Africa. Trachoma is found in Africa, as well as some parts of Asia and Australia. Onchocerciasis is found in Africa and in some parts of Latin America. Each of these four diseases can be prevented through public health programmes, and are addressed in the final section of this manual.

We can define three levels of eye care:

First (primary) level: This is the most basic and straightforward level of eye care. The task of the health worker is to recognize, treat or refer patients for treatment and promote eye health in the community. General physicians and nurses who are trained to diagnose and treat patients with relatively simple conditions can also be included here.

Second level: More complex or serious eye problems which cannot be resolved at the primary level should be referred to secondary care centers (usually hospitals). Ophthalmologists, ophthalmic technicians or ophthalmic medical assistants are responsible for diagnosing and treating those more serious eye problems which do not require highly specialized equipment.

Third level: Services at this level are usually found in institutes of ophthalmology or specialized departments of hospitals in major cities. This level usually involves the use of specialized equipment. Ophthalmologists working at this level are often specially trained.

Primary, or basic eye care consists of straightforward promotional and clinical activities for the prevention and/or treatment of eye diseases. These training activities will teach primary health or eye care workers to distinguish three kinds of situations and the actions required for each:

Common eye problems which can be *recognized and treated locally;*

Eye problems which can be *recognized and initially treated at the community level, but then referred;*

Eye problems which require *immediate referral* for further action.

References:

"Global Data on Blindness," B. Thylefors, A.D. Negrel, R. Pararajasegaram & K.Y. Dadzie, *Bulletin of the World Health Organization,* 1995, 73 (1): 115-121.

"Much Blindness is Preventable", B. Thylefors, *World Health Forum,* World Health Organization, Volume 12, Number 1, 1991.

* PEC Program Document, 1983-84, HKI Philippines.

* Similar categories were defined during the WHO Subregional Workshop on Blindness Prevention, Accra, Ghana in 1988.

HOW TO USE THIS MANUAL:

This training manual is designed for trainers who will teach community health workers and medical assistants to provide basic eye care services at the community level:

Community health worker: A local person who lives in the community. It is not necessary for this individual to have any formal medical training, though it is advisable that he/she be literate, and highly motivated.

Medical assistant: Any health worker who has some formal medical training and who is required to see eye patients during the course of routine medical work (midwives, nurses, health officers, etc).*

The manual is made up of individual training activities organized into sections as presented in the Table of Contents. Many of the activities include practical exercises to master information and skills. Others include teaching the signs and symptoms of common eye diseases by reviewing slides of actual eyes. The activities cover the following subjects:

Structure and parts of the eye
Eye examination
Measuring visual acuity
Recognizing and managing eye infections
Recognizing and referring serious eye injuries
Removal of foreign bodies
Administering eye medications and applying eye dressings
Detection, treatment, and prevention of xerophthalmia/vitamin A deficiency
Ivermectin treatment to prevent blindness caused by onchocerciasis (river blindness)
Detection, prevention and treatment of trachoma, including improved hygiene
Recognizing and referring cataract patients
Basic eye care health education

The amount of time you will need for training will depend on how many activities you are planning to use. This manual includes the most common eye problems that a health worker will see. If you would like to include any additional diseases which are not mentioned in this manual, simply add a slide and follow the procedure as described in the activities about Detection and Treatment of Common Eye Problems.

Some sections of the manual may not be appropriate to a particular area of the country — for example, onchocerciasis is only found in certain parts of Africa and Latin America. We strongly recommend that activities on vitamin A deficiency and cataract be included in all basic eye care training.

Each activity states the approximate amount of time needed to complete the session. The materials needed and training methods are also described. Some of the activities also include handouts which can be photocopied directly from the manual. There is a Pre/Post Test which can be used as an evaluation tool, or you may choose to create your own, based on your specific training plan.

You can estimate your total training time by adding the time for each activity together. We suggest that you treat the manual by section, rather than by individual activity, as each section is designed as a complete package. Whenever possible, arrange a practical session for the participants for seeing real patients. This session can be arranged through a school or clinic visit.

You will need a slide projector, paper, pencils, flipchart and markers (or chalkboard and chalk), tape, and copies of any of the handouts from the activities you plan to use. Each activity tells you the specific materials needed.

We hope you will find the activities in this manual useful for establishing basic eye care skills. Your comments are welcome.

Similar categories were defined during the WHO Subregional Workshop on Blindness Prevention, Accra, Ghana in 1988.

Activity

WHERE DO I STAND: A PERSONAL LOOK AT ATTITUDES TOWARDS BLINDNESS

Purpose: This exercise creates opportunities to discuss different attitudes towards blindness and disability, and to explore how those attitudes influence our behavior towards blind or visually impaired people.

Time: 1 hour

Method: Sociogram (group opinion survey)

Materials:

- 4-6 statements, written on flip chart

Procedure:

1) Choose 3-4 of the following statements and write them separately on flip chart paper. Cover the statements before the group sees them. Explain to the group that as each statement is read, they are to decide individually whether they AGREE or DISAGREE with the statement as it has been read and understood.

2) Read the first statement. The facilitator should not attempt to interpret or rephrase any of the statements. Those who agree should stand on the RIGHT side of the room; those who disagree should stand on the LEFT. Repeat this process for each of the statements.

Statements:

- Blindness is a tragedy.
- It is more difficult to be born blind than to lose sight later in life.
- Sighted people (people who can see) cause more of a problem to blind people than their blindness does.
- A physical challenge like blindness represents a great opportunity.
- Most people think blind people cannot be independent.
- Rich people can solve the world's problems.
- Blind people end up depending on charity no matter what we do.

3) Show the statements one by one. Once everyone has taken a position, the facilitator can engage a discussion by asking people from each side why they take that position. In this way you can have debate between various opinions and ideas. If there is more time, you can also have small group discussions with each side presenting a summary of their group's opinions. A brief discussion should follow each of the statements:

What are some of the reasons why people agree or disagree with the statement? (ask representatives from each side)

What are some of the different ways the statement was interpreted?

What values (important principles) are held by those who agreed with the statement? Disagreed?

How might the opinions and positions which we have discussed here influence how we behave towards those who are blind or visually impaired?

How has this discussion helped us to think in new ways about our actions and attitudes?

Note: There will likely be a variety of opinions even on the same side of the room, and so the different interpretations will provide a rich resource for discussion.

PRE/POST TEST

Time: 30 minutes

I. Multiple Choice

Choose the letter that corresponds to the single best answer:

1. The first step in treating a chemical burn is:
   a) measuring the vision
   b) irrigation/washing out the eye with clean water
   c) applying antibiotic ointment and patching the eye
2. The best action to take in case of subconjunctival hemorrhage is:
   a) avoiding heavy lifting and other hard activity
   b) reassurance and time
   c) applying antibiotic ointment
3. The USUAL treatment for a painful bump or lump on the eye lid is:
   a) warm compresses for 5-10 days and good eye hygiene
   b) antibiotic tablets
   c) incision and drainage of the lump
4. Which of the following blinding diseases are preventable?
   a) acute glaucoma
   b) vitamin A deficiency
   c) cataract
5. If there is blood behind the cornea, but you can still see the pupil, you should NOT:
   a) advise complete bedrest with cushions for the head
   b) bandage both eyes
   c) give aspirin to the patient

II. Answer the following questions in the space provided.

1. What is the difference between a hyphema and a subconjunctival hemorrhage?

2. What is the purpose of an occluder? How do you make one?

3. What are the three parts of an eye examination?

4. Name two major causes of blindness.

5. Trichiasis is caused by _____ infections, repeated over many years. It causes the _____ to turn inward, which scratches the eye and may cause scarring and blindness.

6. Name at least six parts of the eye.

7. What is the prevention for neonatal conjunctivitis?

8. What is the standard treatment for infectious conjunctivitis?

9. A _____ is a fleshy growth which grows from the corner of the eye near the nose and grows onto the cornea. There is no known prevention of this condition.

10. List three kinds of conjunctivitis:

III. Match the problems below with one of the following actions:

A. Needs emergency referral to a hospital

B. Can be treated at the community level

C. Needs to be examined by an eye specialist, but is not an emergency

1. Sudden loss of vision with severe pain
2. Nightblindness with or without a Bitot's spot
3. Eyelids sticky with discharge, vision normal
4. A dirt particle stuck on the surface of the eye
5. Eye cut by a sharp object
6. Part of the cornea (clear part of the eye) is white, the rest of the eye is red, and there is discharge and blurred vision
7. Squint in a child (the two eyes do not look in the same direction)
8. After being hit with a ball, there is a small red spot on the conjunctiva (white part of the eye)
9. Many members of a household have red, sore eyes
10. Gray or white pupil with cloudy vision

Pre/Post Test Answer key:

Part I:

1. b
2. b
3. a
4. b, c [Cataracts cannot be prevented, but they can be removed to restore sight.
5. c [Aspirin should not be given because it may increase bleeding.]

Part II:

1. A hyphema represents bleeding behind the cornea, and a subconjunctival hemorrhage means bleeding under the sclera (outer layer of the conjunctiva).
2. An occluder covers the eye which is not being tested during a visual acuity test. It can be made from card board or any other materials which you cannot see through.
3. Taking the patient's history
   Measuring the visual acuity/Testing the patient's vision.
   Examining the eye
4. Cataract, trachoma, trauma, glaucoma, vitamin A deficiency.
5. Trachoma, eye lashes
6. See list on Handout in *Understanding the Parts of the Eye*
7. One drop of silver nitrate (if this medicine is used in your country) in each eye at birth OR a little antibiotic eye ointment in each eye at birth
8. Tetracycline ointment 2 times a day for one week
9. Pterygium
10. Bacterial, viral, allergic

Part III:

1. A
2. B
3. B
4. B
5. A
6. A
7. C
8. B
9. A
10. C

BASIC EYE CARE MANAGEMENT SKILLS

TRAINER'S INTRODUCTION

Proper examination of the eye is very important in order to detect any condition that may require treatment or referral. It is best to examine the eyes of every person who comes to the health center for a check-up, even those who did not come specifically seeking eye care. Special attention should be given to the eye exams of those patients who complain of headaches, tearing, eye strain or dizziness.

Each activity includes handouts and exercises for the group to practice any new knowledge and skills.

Activities:

Understanding the Parts of the Eye (1 hour)

Purpose: To explain the parts of the eye and how they function.

Taking a Patient's History and Examining the Eye

Purpose: To review and practice the three procedures required in routine eye examinations.

Part 1: Taking the Patient's History (30-45 minutes)
Part 2: Testing the Vision by Measuring Visual Acuity (2 hours)
Part 3: Looking at the Patient's Eyes (External Examination) (1 hour)

Activity

UNDERSTANDING THE PARTS OF THE EYE

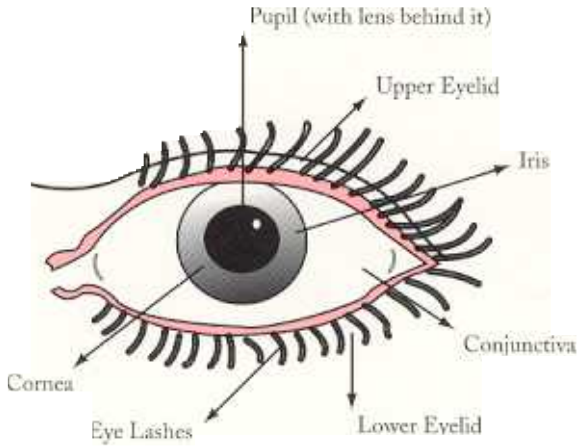
Note to the trainer: Please review the handout to understand all of the parts of the eye and their functions before conducting this activity.

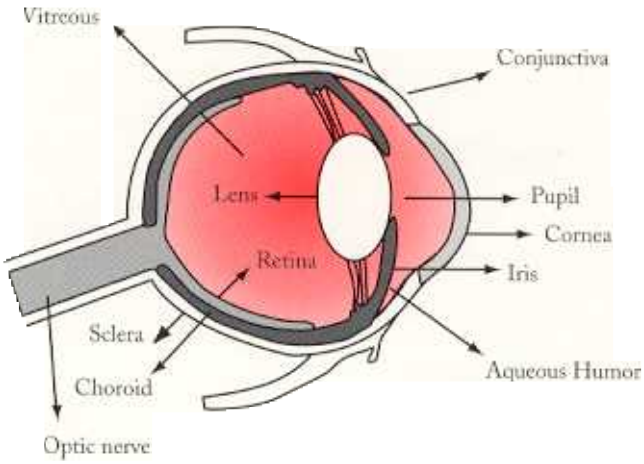
Purpose: To explain the parts of the eye and how they function.

Materials:
- White paper
- Pens/Pencils
- Flip chart: Two large unlabelled drawings of the eye (a front and side view)
- Handouts: **"Unlabeled drawings of the eye with a front and side view"**
  "The parts of the eye and their functions"

Time: 1 hour

Procedure:
1) Give every participant a clean piece of paper and a pencil. Have everyone select a partner. Ask each person to look at their partner's eyes and draw what they see. How many parts do you see?
2) Present the large drawing of the front view of the eye, and ask the participants to name the parts they know, and write these on the drawing. Encourage the group to explain as much as they know about these parts. The trainer helps to explain each part, and adds any parts which are not named by the group.
3) Next, show the side view drawing of the eye and review the parts as seen from this position.

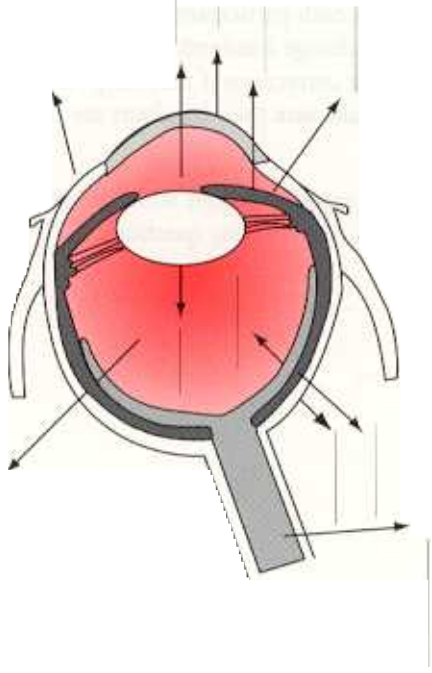


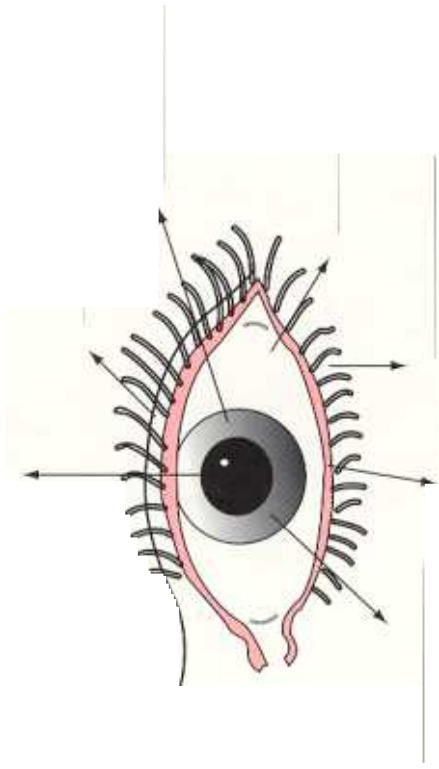


4) Cover the two eye drawings with the flip chart. Distribute the handouts of the eye drawings. Ask each participant to label all the parts of the eye. When finished, ask everyone to exchange handouts with another person in the room. In pairs, discuss the work and make corrections if necessary. Uncover the two labeled drawings and ask everyone to make sure their handouts are correct. Discuss any difficult terms and answer any questions.

5) Distribute the second handout which describes and summarizes the parts of the eye and their functions. Answer any questions.

Handout





Handout

THE PARTS OF THE EYE AND THEIR FUNCTIONS

- **Conjunctiva:** The conjunctiva is a clear tissue which covers the white part of the eye (sclera). It covers the front part of the sclera and the inner side of the eyelids. The conjunctiva helps to protect our eyes against infection. It also contains blood vessels.
- **Sclera:** The white part of the eye, protected by the conjunctiva, is what gives the eye its round shape. It is like a hollow ball except there are two holes, one in front and one in back. Covering the front hole is the cornea, and the back hole is filled by the optic nerve.
- **Eyelids and Eyelashes:** The eye is covered or uncovered by two folds of skin tissue called the eyelids. The eyelids and eyelashes protect our eyes from foreign bodies, exposure to the elements (such as wind and sun) and infection. The eyelids also spread our tears to keep the eye wet.

In the middle of the eye we see three structures:

- **Cornea:** The cornea is a clear dome-shaped structure covering the pupil and the iris. In order to see this dome shape better, look at someone's eye from the side. It is connected to the sclera. The cornea focuses light, helping us to see.
- **Iris:** Behind the cornea, the iris is a flat, donut or tire-shaped structure which gives the eye its color. The iris controls the amount of light that gets inside the eye by expanding or contracting to change the size of the hole in its center.
- **Pupil:** The hole in the center of the iris is known as the pupil. It looks black because we are really seeing through it into the inside of the eye.

The parts of the eye described above can be seen without special equipment. The following parts of the eye cannot be seen without special equipment, but are shown on the side view drawing of the eye.

- **Lens:** The lens of the eye is located behind the pupil. It is a small transparent structure which cannot be seen in a healthy eye. It can sometimes be seen in a diseased eye. The purpose of the lens is to focus light as it comes through the pupil and continues to the back of the eye. Unless light reaches the back of the eye properly, we will not be able to see.
- **Choroid:** The choroid is the layer between the sclera and the retina. It is connected to the iris. It is made up of blood vessels which nourish the eye.
- **Retina:** The retina lines the inside, back portion of the eye. It is like the film of a camera. When it receives light, it sends messages to the brain. The brain then tells us what we are seeing.
- **Aqueous:** The aqueous is the liquid which fills the space between the cornea and the lens. It gives the cornea its dome shape and nourishes the cornea and the lens.
- **Vitreous:** The vitreous is the clear jelly-like substance which fills the inside of the eye between the lens and the retina. It helps give the eye its shape.
- **Optic nerve:** The optic nerve connects the eye to the brain.

Handout (cont.

SUMMARY CHART

Eye Part	Function
Conjunctiva	Protects against infection
Sclera	Gives shape to the eye
Pupil	Allows light to enter
Iris	Controls amount of light
Cornea	Focuses light
Lens	Focuses light
Retina	Senses light
Eyelids and lashes	Protect eye
Vitreous	Fills the eye between lens and retina
Optic nerve	Connects the eye to the brain
Aqueous	Nourishes cornea and lens and gives shape to the cornea
Choroid	Nourishes the eye

Activity

TAKING A PATIENT'S HISTORY AND EXAMINING THE EYE

Purpose: To review and practice the three procedures required in routine eye examinations.

An eye examination includes:

1. Taking the Patient's History
2. Testing the Vision/Measuring the Visual Acuity
3. External Examination of the Eyes

Part One: Taking the Patient's History

Materials:
- Flip chart and markers
- Paper and pens

Time: 30-45 minutes

Procedure: 1) Ask the group the following questions:

What do we mean by "patient's history"? Once the group has expressed their ideas and come up with a common definition, present the following definition:

A patient's history is his/her own description of the eye problem or complaint .

What questions would you want to ask the patient to help him/her describe the problem? What questions would you want to ask the patient so that you are able to make the correct diagnosis?

List all of the questions the group thinks of on flip chart.

2) Compare the group's list of questions with the following (written on flip chart):

- What is the major complaint?

  Are there other complaints?

  How long has the problem existed? Did it occur suddenly or gradually?

  Is the problem in one eye or both eyes?

  What does the eye feel like? (For example: Is it painful? itchy?)

  Is the condition improving or getting worse?

  Is there any change in vision? Is it sensitive to light?

  Was there an accident or injury?

3) Provide an example of a case history on flip chart as shown below.

TAKING A PATIENT'S HISTORY: AN EXAMPLE
Q: What is the main reason you came to the clinic?
A: My right eye is red and sticky.
Q: How long has your eye been like this?
A: It started three days ago.
Q: Are your eyelids stuck together in the morning when you wake?
A: Yes.
Q: Does your eye hurt? Is it sensitive to light?
A: It's not painful, just uncomfortable and runny.
Q: Do you know anyone else with the same problem?
A: Yes, my wife has the same thing.
The possible condition being discussed here is bacterial conjunctivitis.

4) Ask a volunteer to summarize the procedure for taking a patient's history.

5) Ask if anyone can summarize why it is important to take a patient's history. Compare their answers with the following list (written on flip chart):

- Helps in the diagnosis of the disease
- Helps the health worker to decide on the proper action (treatment or referral)
- Helps the doctor or health worker evaluate the treatment by finding out if the patient is improving
- Helps health workers educate the community about prevention, safety, or to advise of an epidemic

Part Two: Testing the Vision by Measuring the Visual Acuity (VA)

Materials:
- Snellen Eye Charts (Tumbling "E" chart) [Other kinds of eye charts with black letters or characters of different sizes can also be used.]
- 6 meter long string or cord
- Handout: **"How to Test the Patient's Vision by Measuring Visual Acuity"**
- Occluders. If you will be making occluders, you will need
  - Rulers
  - Cardboard or heavy dark paper
  - Scissors
  - Safety pins or needles (for the pinhole test)
  - Actual size drawing (as shown below) of an occluder
- Recording forms used in your area

Time: 2 hours

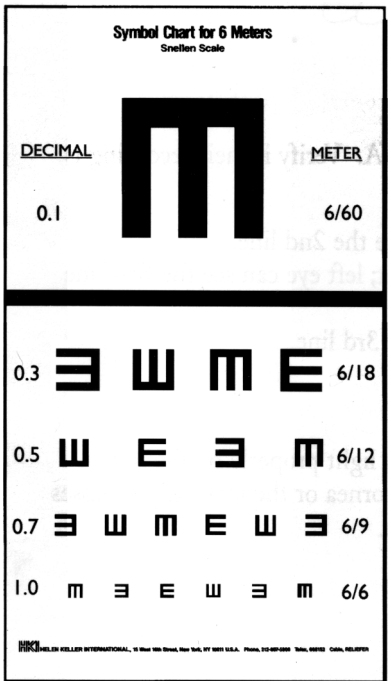
Procedure:

1) Ask if anyone can explain **visual acuity.** Once the group has shared their knowledge, review the following information:

   Visual acuity (VA) is a measure of our ability to see details clearly and sharply. Refractive error and certain eye diseases may affect the visual acuity. This means that light is not focused properly in the eye. A refractive error can usually be corrected with glasses.

2) Distribute the Snellen eye chart to the group, and explain it.

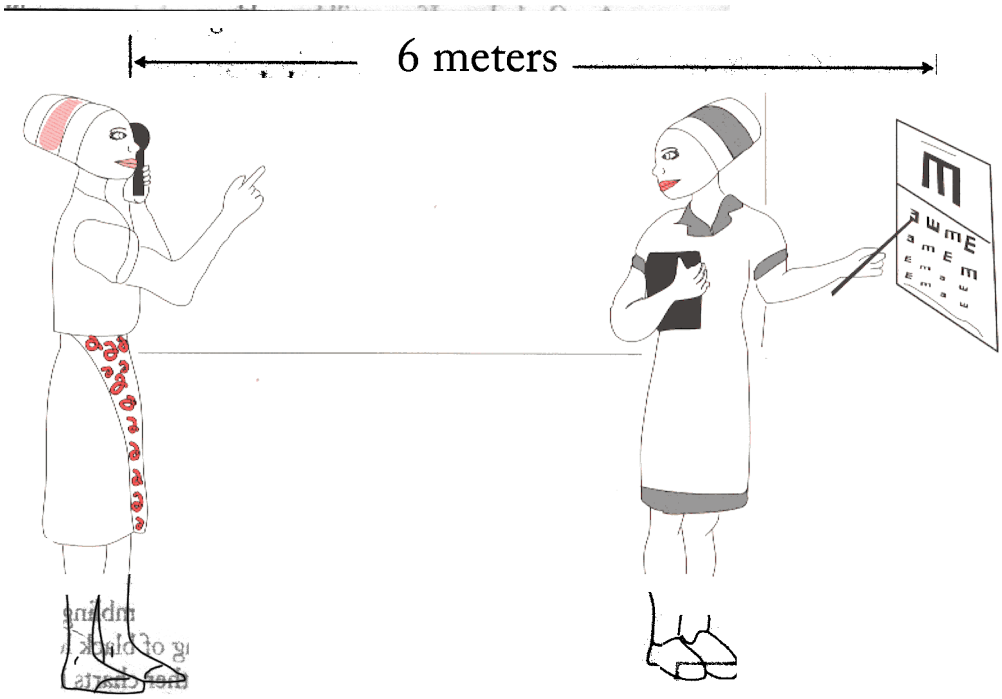
   The Snellen eye chart with a series of tumbling E's, is often used to measure visual acuity. There are other charts consisting of black letters of different sizes. Tumbling E charts are often easier to use than other charts because the type can be understood by people who do not read, or who use a different alphabet system.



   Notice the fractions close to the right margin of the Snellen chart. These numbers represent the visual acuity. **The numerator (first or top number) is the distance in meters at which the test is being conducted. The denominator (second or lower number) represents the distance at which a person with perfect vision could see that particular line of letters.**

   A normal visual acuity is 6/6 or 1 or 20/20 (depending on the eye chart you use).

3) Demonstrate how to take and record the visual acuity by asking a participant who seems to have normal visual acuity to act as a patient. As you go through the steps in taking the VA, explain each one and make sure that everyone understands each step before proceeding to the next step. Distribute the handout after the demonstration.



4) Give examples and ask the participants to record the VA. Verify if their recording is correct.

Right eye can only see the 4th line, left eye can see the 2nd line.
Right eye cannot see the first line but can see light; left eye can see the first line only.
Right eye can see the last line, left eye can see the 3rd line.

5) Ask if anyone can define "refractive error.

Refractive error means that the eye is not able to focus light properly on the retina. Refractive error can be caused by a problem with the cornea or the lens. Light passes through these parts of the eye on the way to the retina.

Optional information: *There are four common kinds of refractive error:*

Nearsightedness (myopia): The patient can see close objects more clearly than distant objects.

Farsightedness (hyperopia): The patient can see distant objects more clearly than near objects.

Astigmatism: The patient cannot focus clearly either at a distance or near.

Presbyopia (accommodative error): After a certain age, the patient loses ability to read small print.

6) Introduce the use of the "pinhole test" to detect refractive error.

The pinhole test is a quick and easy way to determine whether a patient's poor vision is caused by refractive error or disease. *The pinhole test is only used after the patient's visual acuity has been measured and recorded for each eye. Both measures of visual acuity should be recorded in the patient's file.*

You can make your own pinhole. Repeat the steps for making an occluder and then poke one or more holes in it by using the tip of a safety pin or needle. The diameter of the holes should be 1mm.

If the patient's visual acuity is improved with a pinhole test:

1. The patient may have a refractive error;
2. The patient may have an irregular cornea.

If the visual acuity is not improved through the pinhole test, there is probably another problem which will need further testing from an eye specialist.

7) Give the group an exercise. Distribute the materials for making an occluder. Have everyone in the group make an occluder and pinhole test. Divide into small groups. Have members of the group take turns measuring and recording each other's visual acuity.

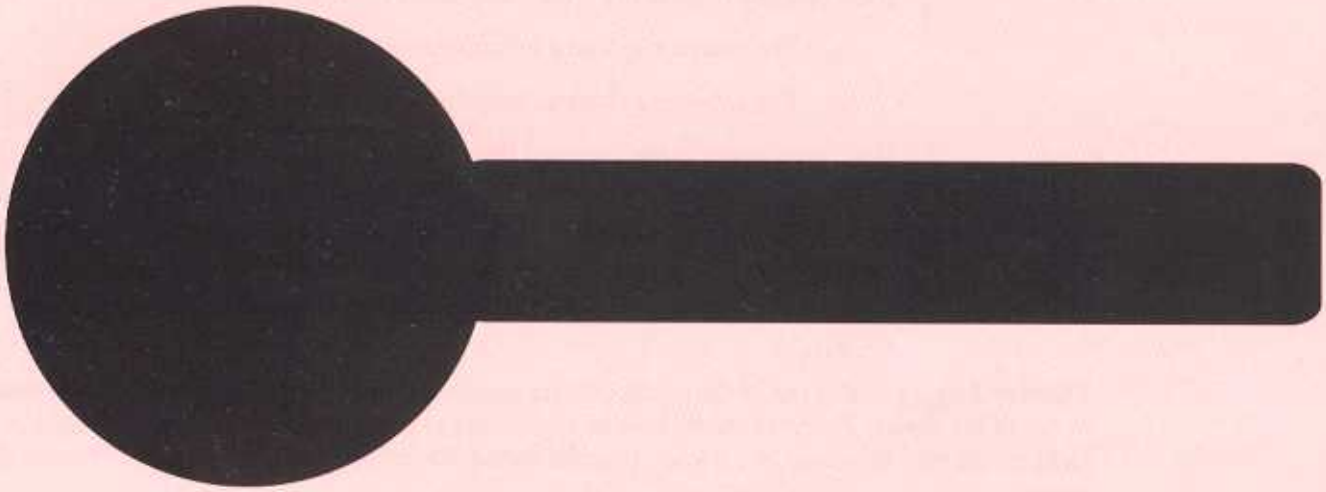
Option: Arrange to visit one of the nearby primary schools and measure the visual acuity of the students in one of the classes. Everyone should have an opportunity to correctly perform the visual acuity test. If a child should need to be seen by a doctor, make the appropriate referral and ask the teacher to notify the parents.

Handout

How To Test the Patient's Vision by Measuring Visual Acuity (VA)

- Explain to the patient that this test will help understand the problem and find the correct treatment.
- Place the eye chart in good light with no glare and no wind.
- The patient should stand or sit 6 meters (6 long steps) from the visual acuity chart. You can also measure the 6 meters with string and tape. The chart should be close to or at eye level.
- Remember: If the patient wears glasses all the time (not just for reading books or other close-up activities), he should wear the glasses for the distance vision test. Record his vision as VA with eye correction (vacc).
- Measure each eye separately. Measure the right eye first while covering the left eye. Then measure the left eye.

An occluder is a good way to cover the eye which is not being tested. Although the patient can use the palm of his hand, there are two problems: he may look between his fingers, or may press too hard on his eye.



Occluders are made of various shapes and sizes. They are often black and made of plastic. An occluder should have a HANDLE and completely COVER one eye. It should be able to cover the area surrounding the eye to completely block the vision of that eye. You can make an occluder from cardboard or other heavy paper according to the example here.

Ask the patient to "read" the chart from left to right by pointing his/her fingers in the same direction of the "E" - up, down, right, or left. Start with the top letters.

Handout (cont.

Find the lowest line that the patient can read with each eye. The fraction (numbers on the right side of each line) next to the line of smallest letters that the patient is able to see is the visual acuity. For example, if that patient is able to correctly identify most of the letters in the 6/18 line, but fails to identify the letters in the 6/12 line, record the visual acuity as 6/18.

If a patient cannot read any of the lines, repeat the test from a distance of 3 meters. If the patient is able to see the top (biggest) letters, record his/her VA as 3/60. If the patient is still unable to read the top line, ask him/her to count your fingers. If he is able to count fingers, record his VA as counting fingers. If he is unable to count fingers, test for light perception.

To test for light perception, ask the patient to cover one eye completely with the palm of his hand. Shine a light from different directions. If he/she is able to see the light, record light perception (LP). If the patient cannot perceive light in that eye, record no light perception (NLP).

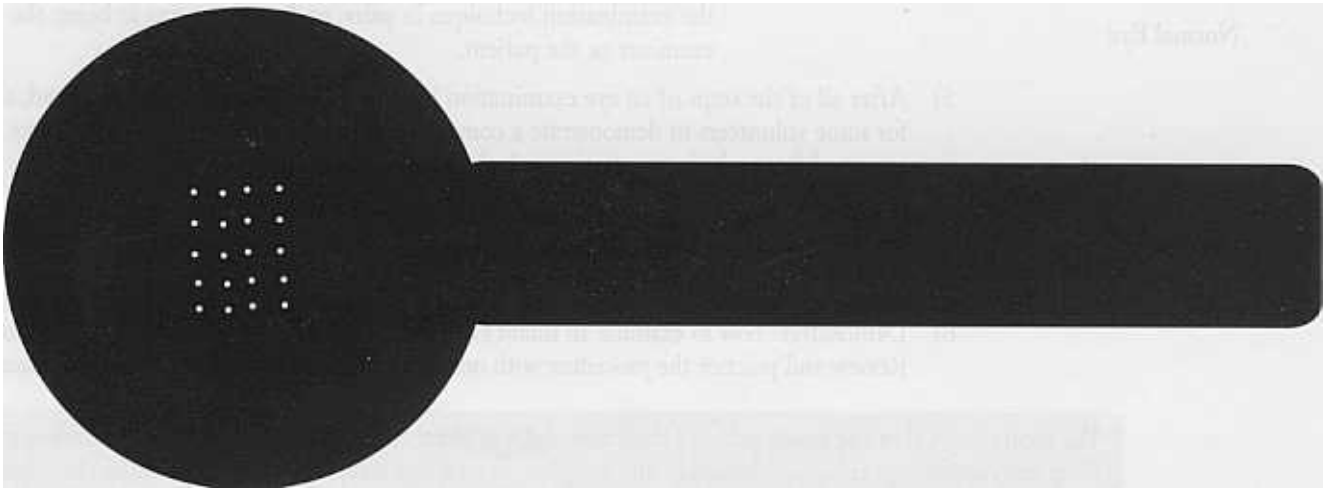
Repeat all of the steps for the other (left) eye.

To test the vision of a very young child who cannot follow the above directions, move an object in front of his/her eyes and observe if the eyes are able to follow the object. Record the VA as Follows Object.

Using the Pinhole Test

- The pinhole is used to determine whether a patient has refractive error. Use the pinhole test whenever the vision of an eye is less than 6/6. However, if the vision is worse than 6/60, the pinhole test is no longer useful.

  To use the pinhole, ask the patient to look through the holes while the other eye remains covered/closed. Record the vision as PH and the last line the patient can read (for example, PH 6/6). If the vision is not improved by the pinhole, record the vision as VA not improved by pinhole.



Part Three: External Examination of the Eye

Materials:
- Torch, penlight or flashlight
- Clean cotton swabs
- Flip chart and markers or chalkboard and chalk
- Handout: **"Examining the Eye Checklist"**
- Doll to demonstrate how to examine an infant's eyes
- Pens/pencils
- Slide 1

Time: 1 hour

Procedure:

1) Show slide 1, which is an example of a healthy, normal eye. Ask someone to describe the features of a healthy eye. Present the rules of a healthy eye:

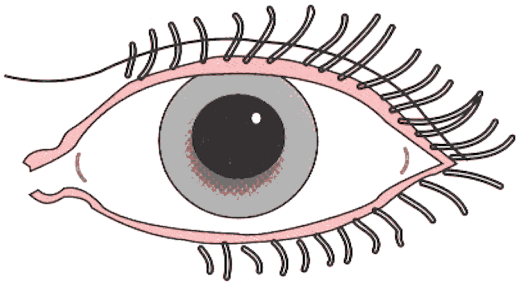
   - The conjunctiva and sclera should look white and smooth.
   - The pupil should be black.
   - The cornea should be clear.
   - The eyelids should open and close properly, with the eyelashes pointing away from the eye.
   - The vision should be good.

2) Distribute and review the handout, "Examining the Eye Checklist".

3) Present and demonstrate each step of the external examination as described in the handout. Demonstrate the steps with a volunteer "patient".

   Step 1: Examining the Conjunctiva
   Step 2: Examining the Cornea
   Step 3: Examining the Pupil
   Step 4: Examining the Eyelids

4) After each step of the exam is demonstrated, have the group practice the examination technique in pairs, each taking turns at being the [illegible] or the patient.



Normal Eye

5) After all of the steps of an eye examination have been demonstrated and practiced, ask for some volunteers to demonstrate a complete eye examination in front of the large group. After each demonstration, ask the group for comments:

   What was well done?
   What could be improved?
   How?

6) Demonstrate how to examine an infant's eye by using a doll as explained on the handout. Review and practice the procedure with one or two volunteers and allow time for questions.

We recommend that the group practice their new skills in a real clinic setting. This activity requires planning and careful supervision. Medicines and supplies, as well as a referral system, must be in place before consulting with actual patients.

Handout

EXAMINING THE EYE: CHECKLIST

Part 1: TAKING THE PATIENT'S HISTORY

Ask the patient about his/her eye problem:

What is the major complaint? Are there other complaints?
How long has the problem existed? Did it occur suddenly or gradually?
Is the problem in one eye or both eyes?
What does the eye feel like? (Is it painful? itchy?)
Is the condition improving or getting worse?
Is there any change in vision? Is it sensitive to light?
Was there an accident or injury?

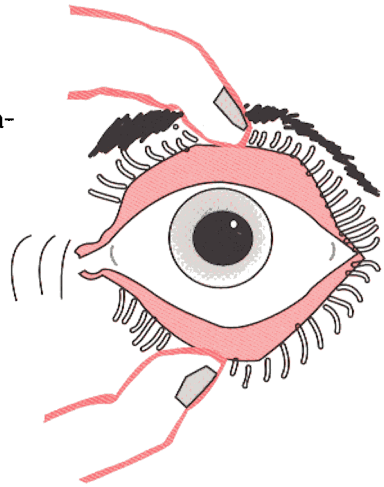
Part 2: MEASURE THE VISUAL ACUITY

Part 3: EXTERNAL EXAMINATION OF THE EYE

- Make sure that the patient is comfortable.
- After washing your hands, look at each eye carefully, always starting with the right eye.
- Use a flashlight or torch to examine the patient's eyes. If you do not have one, ask the patient to stand near a window with good daylight.
- Use the following steps to examine the eye.
- Note your findings and any abnormalities.

STEP 1. Examining the Conjunctiva:

Use your thumb and forefinger to open the patient's eye. Pull the upper eyelid with your forefinger and gently press it against the brow bone. At the same time, use your thumb to pull the lower lid and press it against the top of the cheekbone. With your other hand, shine the light on the conjunctiva. Ask the patient to look to the right, to the left, up, and down. Note anything that is not normal, and then examine the second eye.



Note the color of the conjunctiva. **A healthy conjunctiva will generally appear white (the color white comes from the sclera it covers), although it is normal to see some blood vessels.**

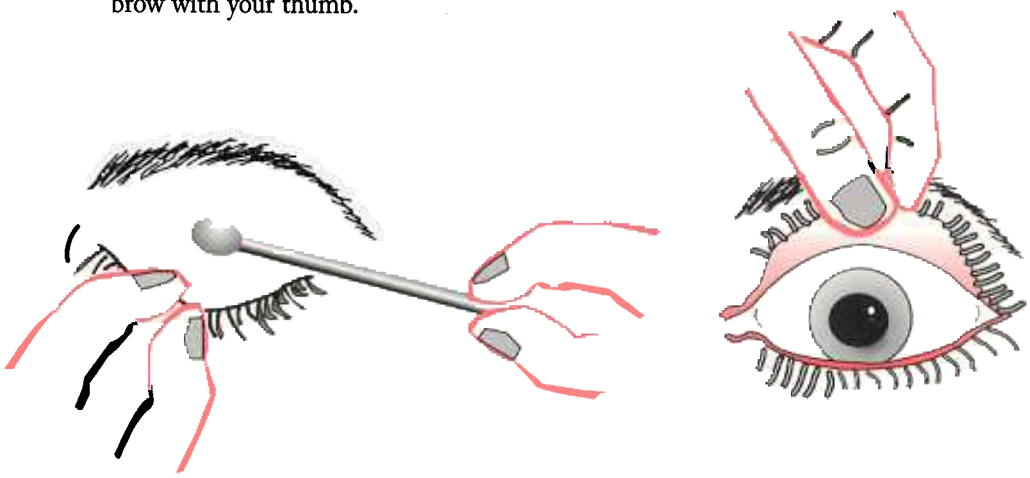
Are there any red spots?
Is there any bleeding, pus, or tearing?
Are there cysts, masses, moles or foreign bodies?

Handout (cont.

To look at the **upper eyelid conjunctiva** (to evert the upper eyelid),

Instruct the patient to look down at his/her lap. He should not close his eye. Hold the eyelashes or eyelid margin with your thumb and forefinger, and gently pull down the eyelid a little.

With your other hand, gently press the upper eyelid using a finger, cotton swab, or blunt end of a pen/pencil and quickly turn up the eyelid. Gently hold the everted eyelid against the brow with your thumb.



Examine the eyelid and conjunctiva under the eyelid in good light.

The patient should be looking down throughout the whole procedure, otherwise the eyelid returns to its normal position.

Are there any foreign bodies, growth, or lumps?
Is there any redness, swelling or discharge?

After you are through, ask the patient to look up and the eyelid will go back to its normal position.

To look at the **lower eyelid conjunctiva:**

Using the thumb of the left hand, pull down the lower eyelid and hold it down.

Instruct the patient to look up.

Examine the lower eyelid conjunctiva in good light.

Are there any foreign bodies, growth, or lumps?
Is there any redness or discharge?

STEP 2: Examining the Cornea

Hold the patient's eyes open as in examination of the conjunctiva. Look at the cornea in good light or with a penlight that shines directly on the eye. Examine the cornea from both the front and side views.

Is it clear?
Is there any infection?
Is there a scar?
Is there an injury or a cut?
Is there a foreign body?
Is there blood behind the cornea?

Note: In certain conditions, the eye will be very light sensitive and may be hard to examine.

STEP 3: Examining the Pupil

Hold the patient's eyes open as in examination of the conjunctiva. The pupil should become smaller as you shine your light in it or when the patient looks into the daylight.

Is it black? If not, is it gray or white?
Is it round or is it irregular in shape?
Does it react to light?
Are the two pupils the same size?

STEP 4: Examining the Eyelids

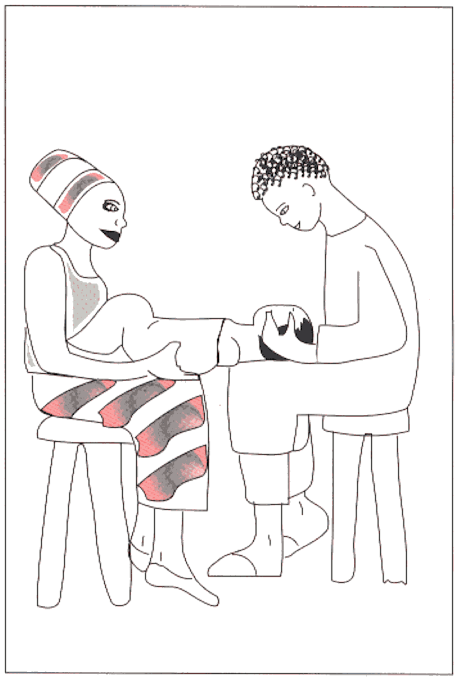
Instruct the patient to open and close his/her eyes. Run your thumb gently over the closed eyelid.

Do they open and close properly?
Are they clean?
Are they puffy, red or swollen?
Are there any lumps?
Is there an injury? Is there a foreign body or laceration?
Are the eye lashes turned away from the eye?
Are the eye lashes clean or crusty?

STEP 5: Wash your hands after the examination.

EXAMINING AN INFANT'S EYE

a. Roll the infant in cloth but leave the head free.
b. Sit on a chair with your knees closed and face a helper who is already seated (parent).
c. Lay the infant between you and the helper.
d. Place the infant's head between your knees.
e. Have the helper hold the arms and legs of the infant.
f. Proceed with the examination of the baby's eyes.



DETECTION AND TREATMENT OF COMMON EYE PROBLEMS

TRAINER'S INTRODUCTION

The activities in this section cover the most common eye problems that a community health worker will see. A set of slides which show each of these problems is found in the back of the manual. If you are unable to use the slides, you may substitute the cards from the Reinforcement Game. Cards are not provided for slides 4 (allergic conjunctivitis) and 13 (cut in the eyelid). You may need to find additional slides and photos of eye problems common to your area as well.

We can divide these common eye problems into four groups, based on the main reasons patients seek eye care:

1. Eyes which are Red and Painful
2. Eye Injuries

   Poor Vision
4. Other Eye Problems

Each eye problem is described in terms of its Signs and Symptoms, and the Action required. The suggested actions should include reminders of the basic eye examination steps as taught earlier in the Activity *Examining the Eye.* These reminders will appear in the margins as shown below:

History What can the patient tell you about what happened and how he/she feels?

Examination: How is the vision? What parts of the eye are functioning normally? What parts of the eye are not functioning normally? What do you see in the eye?

What you find during the history and examination will help you make a diagnosis and decide on the correct treatment.

Treatment: What is the correct action to take for this condition?

A handout **"Common Eye Problems: Reference Guide for Health Workers"** is included at the end of this section. The handout summarizes the signs and symptoms, and correct management of the Common Eye Problems covered in this section. It can be photocopied and distributed after completing the following activities.

Activities:

Orientation Game (30-45 minutes)

Purpose: To help participants understand how organizing information can make learning more effective.

Pain and Redness of the Eyes (1 hour)

Purpose: To understand the common causes of eye pain and/or redness and to develop the skills to examine, diagnose, treat and refer patients with these problems.

Eye Injuries (1 hour 15 minutes)

Purpose: To learn how to correctly examine, diagnose and treat an injury to the eye. This activity also includes a discussion of how to prevent common eye injuries.

Poor Vision (30 minutes)

Purpose: To review the most common causes of poor vision.

Other Eye Problems (45 minutes)

Purpose: To learn about common eye conditions which can cause the eye to look abnormal although there may be no pain or loss of vision.

Think Fast: Review of Eye Care Management Levels (45 minutes - 1 hour)

Purpose: To review the management levels of basic eye care.

Basic Eye Care Medicines and Materials (1 hour)

Purpose:
1) To demonstrate how to make Basic Eye Care Materials, and
2) To review a list of medicines and supplies which should be included in a Basic Eye Care Kit.

Basic Eye Care Reinforcement Game (1 hour)

Purpose: To reinforce the recognition of common eye problems and determine the appropriate action.

Basic Eye Care Health Education (1 hour 30 minutes - 2 hours)

Purpose: To develop and demonstrate community eye health education ideas.

Group Self Review Quiz (1 hour - 1 hour 30 minutes)

Purpose: To prepare a simple quiz which can be used as a review activity.

Activity

ORIENTATION GAME: DETECTION AND TREATMENT OF COMMON EYE PROBLEMS

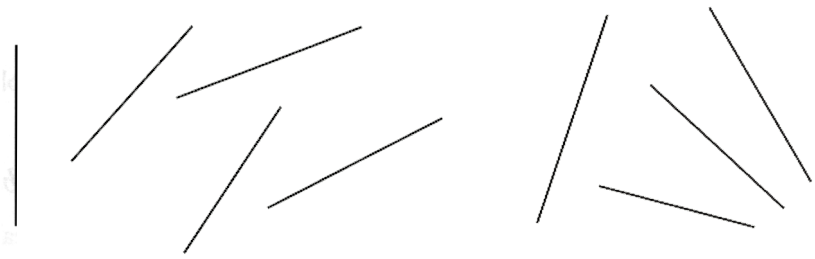
Purpose: To help participants understand how organizing information can make learning more effective.

Materials:
- Large copies of drawing A and B
- Paper and pens

Time: 30-45 minutes

Procedure:
1) Show the group Drawing A. Cover the drawing and ask the group to draw what they just saw.
2) Show the group Drawing B. Again, cover the drawing and ask the group to draw what they just saw.

(A)



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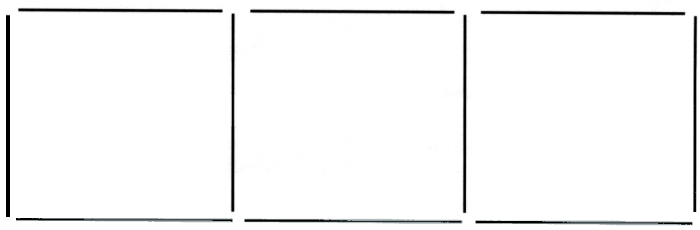


3) Uncover both of the large drawings again, and ask the group to share their copies of first Drawing A, and then, Drawing B.

Discussion questions:

Which drawing were you able to copy more accurately? Why?
How does this game apply to our health work?

NOTE TO THE TRAINER: Diagram B was easier to draw because it has a pattern to it which is easy to remember. Diagram A has no organized sense or pattern, and therefore is harder to remember.

The exercise should show that as health workers, it is useful to be organized and to think systematically. It is sometimes easier to remember correct action when we are familiar with patterns and common features of eye problems.

4) Provide an overview of the following activities in *Detection and Treatment of Common Eye Diseases.* A patient will likely complain of one of the following problems:

REDNESS and PAIN
INJURY
POOR VISION
OTHER EYE PROBLEMS

Explain that the next activities will discuss these four areas. The eye problems covered in these activities are those which are most likely to be seen by the health worker. Some diseases such as vitamin A deficiency and cataract are also addressed in the next section of the manual as public health problems, since they are among the main causes of avoidable blindness.

The activities will help health workers recognize common eye problems and know what action to take. If a health worker is able to recognize the problems and take the correct action, unnecessary blindness will be avoided.

Activity

PAIN AND REDNESS OF THE EYES

Purpose: To understand the common causes of eye pain and/or redness and to develop the skills to examine, diagnose, treat and refer patients with these problems.

Time: 1 hour

Materials:
- Slides 2, 3, 4, 5, 6, 7 or picture cards
- Large drawing of the front and side views of the eye

Methods: Slide presentation, lecturette, discussion

Procedure:
1) Provide the background information included in the trainer's guide (below).
2) Show each slide and give a brief description of the condition shown. Ask the trainees to describe the eye as shown in the slide or picture card. Explain what the condition is, its probable cause, and how it is managed at the basic eye care level.
3) Use the large drawing of the front and side views of the eye to show which parts of the eye are affected in each slide.
4) Repeat the above steps with the other slides.
5) You may make the activity more interesting by dividing the group into two, and see which group can name the most abnormalities in the eye.

Trainer's Guide for Pain and Redness

Eye discomfort can be described by the patient in many ways. Some patients will report pain, ache, itch, irritation, or the sensation of dirt in the eye. The patient's description can be very useful to help the health worker identify the problem.

A red eye results when the blood vessels on the surface of the eye (in the conjunctiva) become larger than normal because of irritation or infection. Redness also occurs when a small blood vessel on the surface of the eye breaks open, releasing a small amount of blood into the thin membrane on the surface of the eye-ball (subconjunctival hemorrhage). From a distance, these two conditions can look similar, but you can see the difference if you look closely.

This activity will cover the following common eye diseases causing eye redness and pain:

NEONATAL CONJUNCTIVITIS
INFECTIOUS CONJUNCTIVITIS
ALLERGIC CONJUNCTIVITIS
TRICHIASIS
CORNEAL ULCER
CLOSED ANGLE GLAUCOMA

Neonatal Conjunctivitis

Slide 2 (infectious conjunctivitis in newborn baby)

A newborn baby may develop red eyes a couple of days or weeks after birth. If the baby has red eyes and discharge (pus), the baby's eyes probably became infected while in the mother's birth canal. The baby may get this infection even if the mother says that she feels fine and has no pain or discharge in her birth canal. In a newborn baby, **this condition is very serious** because the infection can quickly destroy the eyes and may spread into the body.

Signs and Symptoms

- starts in first 2 weeks of life
- both eyes are usually affected
- red eyes with discharge/pus
- eyelids may be swollen
- cornea may be hazy

Neonatal Conjunctivitis

Action

History
- Ask the baby's parent or guardian:
  How old is the baby? When did the redness or discharge begin? Are both eyes affected, or only one eye?

Examination
- Clean the eyes and examine them:
  Is the cornea clear? Are both eyes affected, or only one eye? Are the eyes swollen? Is there any discharge/pus?

Treatment
- If the cornea is not clear after cleaning the eye, apply tetracycline and refer immediately to an eye specialist.
- If the cornea is clear, apply antibiotic eyedrops every 1 to 2 hours for 7 days, or antibiotic ointment 2 times a day for 7 days. If there is no improvement after 3 days, refer to a specialist. Otherwise complete the 7-day treatment.
- Discharge should be cleaned from the lids as often as possible, using cotton and sterile saline solution (or cool water which has been previously boiled).
- If the discharge appears in the first 3 days of birth, the infection is probably gonorrhea. The baby and parents should be immediately referred for additional treatment and counseling.

PREVENTION: Tetracycline ointment should be applied to the eyes of all babies at the time of birth.

In some countries, one drop of silver nitrate is applied to each of the baby's eyes to protect against neonatal conjunctivitis. Silver nitrate spoils easily in tropical climates, however, and can cause burns. Check with your local medical authority to find out the policy on silver nitrate in your country.

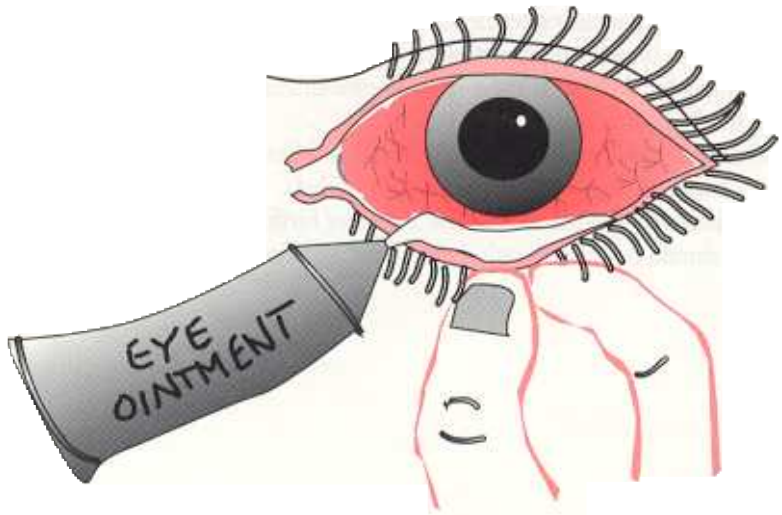
Infectious Conjunctivitis

Slide 3 (infectious conjunctivitis in an adult)

In older children or adults, eye infections are common. As long as the infection was not caused by a trauma and the cornea is not affected (there is no corneal ulcer), this condition is not very dangerous. These infections do not usually spread to cause other medical problems, but may be contagious to other people. Infections may be caused by viruses, bacteria, fungus or *chlamydia*. *Chlamydia* can cause the infection called *trachoma*. Over many years, repeated trachoma infections may cause blindness [see Trachoma activities]. It is difficult to know the cause of the infection by examining the eye because these infections may look similar, causing redness and discharge.

Signs and Symptoms

- normal vision (same as before infection)
- situation may start in one eye and spread to the other eye causing redness and discharge/pus
- eyelids may be swollen



Conjunctivitis

Action

History

- Ask the patient what happened.
  When did the redness or discharge begin? Are both eyes affected, or only one eye? Did someone else with an eye infection transmit this problem to the patient? Has anyone else in the family got a similar problem? Is the patient already using some medicine or traditional medicine that may be irritating the eye?

Examination

- Examine the eye.
  Is the vision normal or blurred? Are both eyes affected, or only one eye? Are the eyes red? Is there any discharge/pus? Is the cornea clear? If there is any discharge or pus, clean the eye using dry cotton or soft cloth. Start with the eyelids. If there are crusts, remove these carefully using damp cotton. Do not forcefully remove a scab because it may cause bleeding. Clean the conjunctivas by everting the eyelids and cleaning them with dry cotton. Wash your hands with soap and water after cleaning each eye. Use different cotton for each eye. Clean from the inner to the outer corner of the eye. Evert the eyelid and examine. Make sure there is no foreign body.

Treatment

- Tetracycline or other antibiotic ointment should be applied 2 times a day for 7 days. If the eye has not improved after one week, or if the vision has gotten worse, refer to an eye specialist because this may be a bacterial infection which will need other medicines. Conjunctivitis caused by trachoma requires longer treatment, as explained in the trachoma activities.

PREVENTION: Many eye infections can be avoided by good hygiene and frequent face washing. One handful of water is usually enough to wash the face and remove any discharge from the eye.

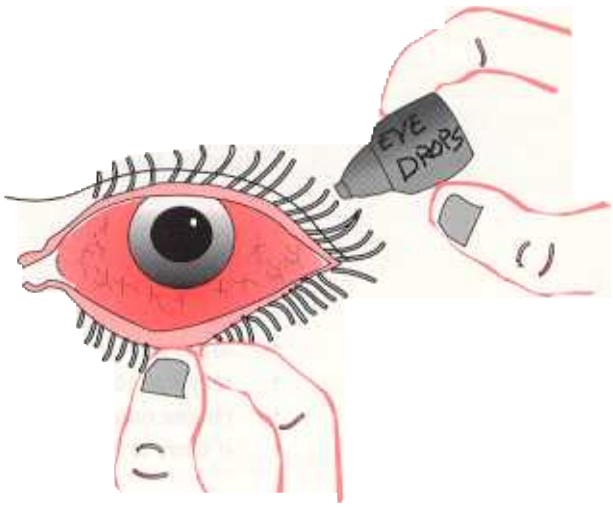
Allergic Conjunctivitis

Slide 4 (allergic conjunctivitis)

Allergies can be caused by contact with ordinary things such as soap, cosmetics, or feathers. Some allergies to plants occur at specific times during the year, and may occur every year. The allergy may also cause a runny nose, sneezing, or asthma.

Signs and Symptoms

- normal vision (same as before infection)
- itchiness (desire to rub the eyes)
- usually affects both eyes
- red eyes without discharge (may have tearing)
  Note: sometimes there may be a white stringy discharge
- eyelids may be swollen
- may also have other symptoms such as runny nose, sneezing, or asthma



Eye Drops

	Action
History	• Ask the patient: *When did the problem begin? How does the patient describe the discomfort? Is there itching? Is the patient in contact with any new item that may be causing an allergy such as soap, cosmetics, or eyedrops? Has the patient already started taking any medicine or drops? Have these symptoms occurred before? At the same time of year?*
Examination	• Examine the patient. *Is the vision normal or blurred? Are the eyes red? Is there any discharge/pus? Is the cornea clear? Does the patient also have a runny nose, sneezing, or asthma?*
Treatment	• Try to identify the irritant (allergen) and avoid if possible. • If symptoms are limited to the eyes, use drops such as topical antihistamines. • If patient also has symptoms such as runny nose and sneezing, use an oral antihistamine. • Cold compresses can help relieve the itching.

PREVENTION: Avoid known irritants (allergens). People who often suffer from itchy eyes may use baby shampoo to wash the eyelashes.

Trichiasis

Slide 5 (trichiasis)

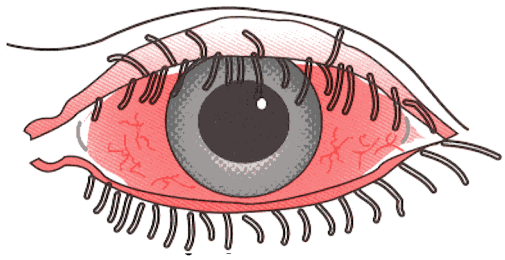
Trichiasis is usually caused by trachoma, a type of conjunctivitis. It usually occurs after many infections when the inside layer of the eyelid becomes scarred and pulls the eyelashes so that they turn inward and scratch the eye. This condition is very painful.

The most serious problem from trichiasis develops when the lashes scratch the eye and an infection gets into the cornea (corneal ulcer). Corneal infections (corneal ulcers) from trichiasis frequently lead to blindness. If a patient has trichiasis, it should be corrected by eyelid surgery (tarsal rotation surgery) so the patient does not get a corneal infection in the future. Tarsal rotation surgery refers to a simple operation which can turn out the eyelashes and stop them from scratching the cornea. The procedure can be performed by those who have had surgical training: eye doctors, eye nurses, or eye care assistants.

Signs and Symptoms

- patient reports a scratchy sensation
- one or both eyes may be affected
- often red eyes without discharge (may have tearing)
- may have one or more inturned lashes, or entire lid may be turned inward
- cornea may look normal; or may have abrasion, infection, or scar from previous infection
- if there is an infection, there may be discharge

	Action
History	• Ask the patient: *Is the eye painful? Have you had red eyes or eye infections in the past?*
Examination	• Examine the eye: *Are the eyelashes turning in towards the eye? Are they touching the cornea?*
Treatment	• If only a small number of lashes are inturned, and are not scratching the cornea, as a temporary measure they may be pulled out with tweezers or forceps. This will need to be repeated regularly (every six weeks) by the health worker or patient. • If there is at least one inturned lash which scratches the cornea when the patient looks straight ahead, eyelid surgery is necessary so that the lashes do not rub the eye. The patient should be referred to an eye specialist or eye nurse who is experienced with tarsal rotation surgery. As a temporary measure to make the patient comfortable and reduce the chance of infection, the health worker may pull out a number of the inturned lashes until the time that the patient can have surgery. • Antibiotic ointment (such as tetracycline) can be useful as a lubricant, and to prevent an infection if the surface of the eye is rough because the lashes are scratching the eye.



Trichiasis

PREVENTION: Patients with conjunctivitis who live in regions where trachoma is a problem should use tetracycline promptly. Proper use of tetracycline to treat conjunctivitis may lessen the future risk of trichiasis for the patient. Regular face-washing of children and environmental improvements such as improved water supply and waste removal will also reduce trachoma in the community.

Corneal Ulcer

Slide 6 (corneal ulcer)

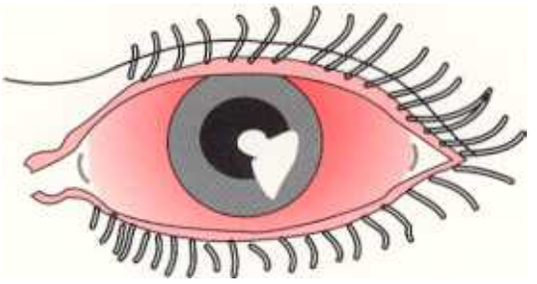
When the cornea is healthy, it rarely gets infected (corneal ulcer). The surface layer of the cornea protects the cornea from infection by preventing organisms from entering the deeper parts of the cornea. If the surface of the cornea is injured by a scratch, dryness, or vitamin A deficiency, an infection can get in through the surface and cause a corneal ulcer.

A patient with a corneal ulcer will usually complain of pain, redness, blurry vision, and discharge. Sometimes, the discharge (pus) dries on the eyelashes during the night and causes the eyelids to be stuck together in the morning. When the patient is examined, the vision is usually blurry (worse than before the problem began), the conjunctiva is red, and discharge can usually be seen. The cornea usually shows a white area. An old corneal scar from a previous problem will also appear white, but the patient will not have pain, redness, or discharge.

Corneal ulcers are very serious and often lead to blindness because the infection frequently damages the central part of the cornea that is needed for good vision. Any corneal ulcer should be referred immediately to an eye specialist, if possible. The health worker should begin antibiotics immediately, in case there is a delay before the patient sees the eye specialist. A dose of vitamin A should be given immediately to any child who has corneal ulcers and may have vitamin A deficiency (see Vitamin A section).

Signs and Symptoms

may have had a scratch, trauma, or dry eye before the infection started
usually blurry vision (may have good vision if the infection is not in the center)
severe pain
usually affects only one eye
red eye
cornea has a white area of infection
discharge is present, frequently causes eyelids to be stuck together in morning
eyelid may be swollen



Corneal Ulcer

Action

History

Ask the patient the following questions:
When did the problem begin? Was there some event that caused damage to the cornea such as a scratch or trauma? Was the eye injured by some organic material such as wood, rice husk, or other? Is there any discharge/pus? Are the eyelids stuck together in the morning? Has the patient already started any medicine or drops? What are they?
If the patient is a child, ask the parent:
Does he/she have nightblindness? Is the child malnourished? Has he recently been ill because of measles, diarrhea, or respiratory infections?

Examination

Examine the patient.
Is the vision normal or blurred? Are the eyes red? Is there any discharge/pus? Does the cornea have a white area of infection?

Treatment

Refer to an eye specialist immediately, as this is a very serious condition. The eye specialist will likely prescribe one of the following antibiotic eye drops every hour for the first 24 hours: gentamicin, chloramphenicol, or sulfa drops. After 24 hours the dosage is reduced to 4-6 times a day for one week. If an eye specialist is not available, and you have the above medicines, use the treatment and re-examine every day. If the patient does not improve, and if the original injury was caused by organic material, the infection may be caused by fungus. Consider using anti-fungal ointment such as natamycin, if available, or change antibiotics.
If the patient is a child, also treat with vitamin A capsules. Give one 200,000 I.U. capsule on the first day, one on the following day, and another 1-4 weeks later. A child who is less than 1 year old should have the same treatment, but in doses of 100,000 I.U. Advise the mother about feeding vitamin A-rich foods to the child and herself.

PREVENTION: Avoid corneal injuries by using protective eyewear when necessary. Do not rub the eye if you suspect there is a foreign body. A healthy diet which includes vitamin A-rich foods will help prevent vitamin A deficiency which can lead to corneal ulcers and blindness in children.

Glaucoma

Slide 7 (closed angle/acute glaucoma)

Glaucoma is one of the three main causes of blindness in the world. Glaucoma can happen gradually or very suddenly. It destroys vision by damaging the optic nerve which sends information about what you are seeing from your eye to your brain. There are two main types of glaucoma: open angle glaucoma and closed angle glaucoma. Open angle glaucoma is not associated with redness or pain, and will not be discussed here. *

The eye produces a watery fluid (called aqueous humor) which cleans and nourishes the cornea and lens. This fluid is constantly produced, circulated, and drained within the eye. In glaucoma, the fluid does not drain as it should. The extra fluid causes pressure to build up inside the eye. If the eye pressure is too high, the vision to the right and to the left (side vision) can decrease, and the patient is only able to see straight ahead. Eventually all vision can be lost.

Closed angle glaucoma is usually caused when the iris blocks the drainage area inside the eye. Usually, closed angle glaucoma occurs suddenly over several hours or a day. Severe pain, redness, and blurry vision are common. Sometimes the patient has nausea or vomiting. If the patient closes both eyes, and the health worker uses the fingers to touch both eyes, the eye with the closed angle glaucoma may feel harder than the other eye.

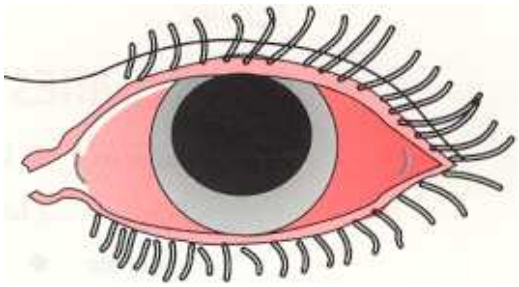
There are other serious conditions which look similar to closed angle glaucoma so the patient should be immediately referred to an experienced eye specialist.

Signs and Symptoms

- starts suddenly over hours or a day
- severe pain, headache, redness, blurry vision common
- may have nausea or vomiting
- usually affects only one eye at a time (rarely affects both eyes at the same time)
- cornea may appear hazy or gray
- pupil is dilated, does not react to light, or reacts only slightly
- when the health worker uses the fingers to touch both eyes, the eye with glaucoma may feel harder than the other eye.

Open angle glaucoma is caused when the drainage area inside the eye does not work very well resulting in high eye pressure. Open angle glaucoma happens gradually over time, and there is no redness or pain. When examined from the front, an eye with open angle glaucoma usually looks normal (although the nerve inside the eye looks damaged) and the patient usually has no pain, even though the pressure is elevated. This condition must be diagnosed by an experienced eye specialist.

	Action
History	• Ask the patient what happened. *When did the problem begin? Did the problem start suddenly over hours or a day, or did it come on very slowly over a long time? Does the eye hurt? Is the vision blurry? Does this affect one or both eyes?*
Examination	• Examine the patient. *Is the vision normal or blurred? Are the eyes red? Is there any discharge/pus? Is the cornea hazy or gray? Is the pupil fixed (not reactive) to light? Does the eye feel hard when you touch with the eyelids closed?*
Treatment	• Refer to an eye specialist immediately.



Closed Angle/Acute Glaucoma

PREVENTION: No known prevention. An eye specialist may recommend medicine and/or surgery may be recommended to prevent further loss of vision.

Activity

EYE INJURIES

Purpose: To learn how to examine, diagnose, and treat an injury to the eye.

Time: 1 hour 15 minutes

Materials:
- Slides 8, 9, 10, 11, 12,13, 14, 15 or picture cards
- Large drawing of the front and side views of the eye

Method: Slides, lecturette, discussion

Procedure:

1) Ask the group to help you make a list of the ways in which the eye can be injured. When all ideas have been written on the flip chart, try to organize the list into categories. Organizing the list can also be done as a small group activity, with group presentations. The group should identify the following categories:

   FOREIGN BODIES
   ABRASIONS
   BLUNT TRAUMA
   PENETRATING INJURIES from sharp and pointed objects
   CHEMICAL BURNS

   Ask if anyone has experienced any of these problems in their eye.

   a. How did it feel?

   b. How did it get there?

   c. What did you do?

2) Show each slide and provide the background information included in the trainer's guide. Ask the trainees to describe the eye as shown in the slide or picture card. Explain what the condition is, its probable cause, its signs and symptoms and how it is managed at the basic eye care level.

3) Use the large drawing of the front and side views of the eye to show which parts of the eye are affected in each slide.

4) Repeat the above steps with the other slides.

5) You may make the activity more interesting by dividing the group into two, and see which group can name the most abnormalities in the eye.

Trainer's Guide for Eye Injuries

Foreign Bodies

Slide 8 (foreign body)

When foreign material comes in contact with the eye, it can:

- gently rest anywhere on the surface of the eye or under the eyelid;
- be embedded in the surface of the eye or under the eyelid; or
- can penetrate the outer wall of the eye to go inside the eyeball.

If we know exactly how the problem began, we can get an idea whether the foreign body gently fell into the eye (such as some dust on a windy day), or forcefully flew into the eye (such as a gunshot or a broken piece of metal while hammering a nail).

A foreign body can cause different problems:

- It can scratch the surface of the eye (an abrasion);
- A scratch can become infected;
- The eye can be cut in such a way that the parts inside the eye are damaged.

Signs and Symptoms

Small foreign body on surface of the eye:

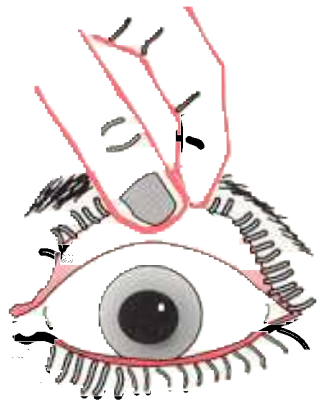
- no change in vision (if the foreign body is not on the cornea)
- patient feels that there is a foreign body in the eye
- usually only one eye is affected
- red eye without discharge (may have tearing)
- eyelids may be swollen
- may have one or several small foreign bodies present
- sclera and cornea have no laceration (unless the foreign body is in the eyelid and is scratching the cornea with every blink)
- pupil is normal (round)

Foreign body embedded deep in eye or possibly inside eyeball:

- may sometimes cause decreased vision
- patient feels that there is a foreign body
- usually one eye affected
- red eyes without discharge (may have tearing)
- eyelids may be swollen
- may see blood in the conjunctiva, a cut in the eye (sclera or cornea), blood behind the cornea (hyphema), or an irregular pupil (not round)
- the eye may be soft to the touch

DO NOT PRESS ON THE EYE DURING EXAMINATION.

When a health worker evaluates a person who may have a foreign body in the eye, **the most important thing to decide is whether the foreign body is gently resting on the surface of the eye or has penetrated the eye and caused damage to the inner parts of the eye.** Find out what happened and carefully check the vision. If the vision has decreased, it is possible that the injury has hurt the interior parts of the eye, or that the injury has scratched the surface of the eye directly in the center of vision (on the cornea).



Foreign Body

Action

History

Ask the patient:
How did this problem occur? What may have gotten in the eye? Did the object get into the eye gently or forcefully? How long ago did the problem begin? Is the vision normal or blurry?

Examination

Examine the eye. Look at the conjunctiva and cornea with good light (penlight or daylight).
Is the vision normal or blurred? Are there any foreign bodies seen on the surface of the eye or stuck under the eyelid? Are the eyes red? Is there any discharge/pus? Is the cornea clear? Can the entire front part of the sclera and cornea be seen or is blood blocking the view? Is the pupil round? Is there any blood in the eye behind the cornea (hyphema)?

The health worker must examine all parts of the eye very carefully to find any small pieces of foreign material and to look for signs of injury. ***It is important to evert the lid to look for hidden pieces of debris.*** **If the health worker cannot see the entire front part of the sclera because blood is blocking the view, the patient must be referred to an eye specialist because it is possible that the wall of the eye is cut.**

Treatment 1

If there is a small foreign body on the surface of the eye:

- Remove all foreign bodies using a cotton swab.
- If the foreign body cannot be seen because it is too small, wash the eye with clean (boiled and cooled) water. If a syringe is available, remove the needle and squirt water on the eye.
- Wipe the eyelids gently with a clean, moist cotton swab or the corner of a clean, moist cloth.
- Apply antibiotic ointment (such as tetracycline) to prevent infection.
- Patch the eye for one day to help healing.
- The next day, take off the patch and examine for infection. Use antibiotic ointment 2 times a day for one week until the eye feels back to normal.
- Recheck the eye and vision the next day (and every day if possible). If there is a problem (increasing pain, pus discharge, worsening vision), refer the patient for further treatment.

If the foreign body is not removed after a few days it can cause:

- *redness and swelling of the conjunctiva*
- *opacity of the cornea and blurring of vision if the foreign body is on the cornea*
- *abrasion of the cornea if the foreign body is under the eyelid (scratches with every blink)*
- *infection, especially if the foreign body was dirty (soil, fingernails, etc.)*
- *swelling of the eyelids*
- *tearing*

Treatment 2

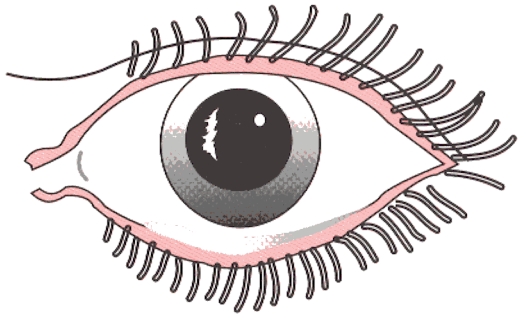
If the foreign body is embedded deep in eye or possibly inside eyeball:

- Do not attempt to remove the foreign body (this might open up a hole and the contents of the eyeball might come out).
- Wash the eye and apply antibiotic ointment. If there is an open wound, do not use ointment.
- Tape a shield or plastic cup over the eye so that the patient cannot press on the eye or cause further damage.
- Immediately refer to an eye specialist, if available.

Corneal Abrasions

Slide 9 (Abrasion)

Corneal abrasions are caused when a part of corneal surface is scraped off.



Corneal Abrasion

Signs and symptoms

- Pain, tearing
- Foreign body sensation
- Loss of vision

Action

History Ask the patient what happened to the eye.
Was the injury caused by organic matter (stick, leaf, fingernail etc.)?

Examination Measure the visual acuity.
Look at the patient's eye. If the patient's complaints and your observations are consistent, and there is no foreign body, then treat for an abrasion.

Treatment Apply antibiotic ointment or drops.
Cover the eye with a firm eye patch so that the eyelids are closed over the front of the eye.
Examine the patient after 24 hours. Change the patch and apply antibiotic daily for 5-7 days until the eye is healed. If there is no patch, then apply ointment 2 times a day or antibiotic eyedrops 4 times a day.
If the eye has not improved in 2 days, refer for further treatment. This is especially important if the abrasion was caused by organic matter (stick, leaf, fingernail etc.) because these types of abrasions may cause fungal infections that do not respond to antibiotics.

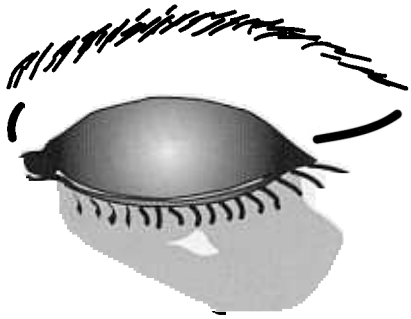
Blunt Injuries

Slides 10 (bruised eye/black eye) *and 11* (subconjunctival hemorrhage)

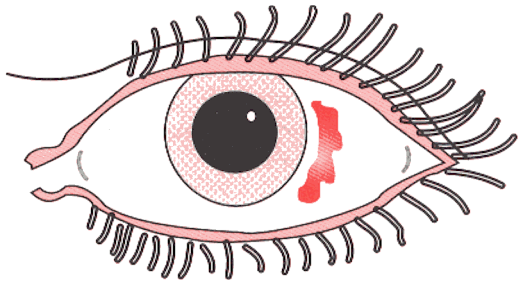
Ask what the participants understand by the term "blunt injury". It is an injury from a "hit" to the eye without rupturing it. If a large object hits the eye, most of the impact is absorbed by the bones around the outside of the eye, causing a black eye. Smaller objects may hit the eye itself causing hemorrhage, or cause blood to collect behind the cornea (hyphema).

Signs and symptoms

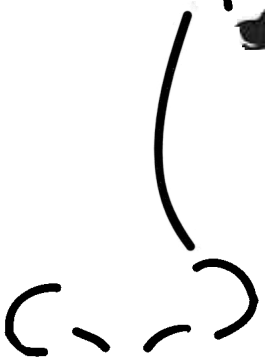
- the conjunctiva and the eyelids are discolored, depending on the force of injury. "Black eye" is a commonly used term for this injury.
- sometimes there is subconjunctival hemorrhage — bleeding of the conjunctiva. This is a blood-red patch in the white part of the eye.
- there may be pain.



Black Eye



Subconjunctival Hemorrhage



Action

History Ask the patient what happened.
Examination Check the vision and check for subconjunctival hemorrhage.
Treatment If there is subconjunctival hemorrhage, vision is good and there are no other injuries, reassure the patient that in two weeks the redness will be gone. Cold compresses for the first 24 hours will prevent further bleeding. Bed rest will also help.

Note: As a subconjunctival hemorrhage heals the blood can appear to spread. The hemorrhage may then appear larger, but less red. Do not confuse this with increased bleeding.

- If the entire white of the eye is hemorrhaged, but vision is good and there is no injury, apply cold compresses to prevent further bleeding.
- Check the eye the following day. If vision is good and there is neither pain nor increase in bleeding, healing is going well. If there is no improvement, refer to an eye specialist.
- A bruise will disappear in a week or so even without treatment. Icepacks to the eyelids will stop further bleeding. After the first day (24 hours), warm moist compresses will lessen the hematoma (discoloration of the skin around the eye).

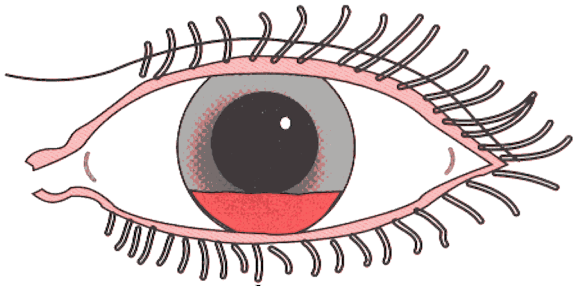
Subconjunctival hemorrhage may also occur without any blunt injury. Spontaneous bleeding of the conjunctiva is usually painless and can happen after heavy lifting, coughing or other physical strain. It may also be caused by high blood pressure. Patients with high blood pressure should be referred.

Slide 12 (hyphema)

After a blunt injury, blood vessels may be damaged and cause blood to collect between the cornea and the iris. This condition is called hyphema. It is a serious condition, especially if the blood fills up the area behind the cornea (anterior chamber) so that you cannot see the pupil or iris. In this case, the pressure inside the eye increases and may cause secondary glaucoma, which is very painful.

Signs and symptoms

- blood behind the cornea
- pain or poor vision
- conjunctiva and eyelids may be discolored



Hyphema

Action

History
- Ask the patient what happened.

Examination
- Measure the visual acuity, and examine the eye.
- Look for blood behind the cornea.

Treatment
- If there is a trauma with a hyphema, bandage both eyes.
- Advise complete bedrest with cushions under the head for five days. If there is no improvement, and there is no decrease in the amount of blood in the eye after 48 hours, refer the patient to the eye specialist.
- A hyphema which has filled up the entire space behind the cornea (the pupil is no longer visible) should be referred immediately to an eye care specialist.
- If the bleeding begins again during the first five days, refer the patient. *As a general rule any child with a hyphema or an adult with renewed bleeding should be referred.*
- Do not give aspirin to patients with hyphema, as this can increase bleeding. Give juices or other foods rich in vitamin C.
- All patients with visual impairment after a blunt injury should be referred.

Lacerating Injuries

Slide 13 (cut in the eyelid)

A lacerating injury is a cut on the surface of the eye or eyelid.

Signs and symptoms

the eye or eyelid is cut and bleeding

Action

History Ask the patient what happened and when.

Examination Measure and record the vision of each eye.
Look for laceration in the cornea or sclera.

Treatment Apply an eye pad with gentle pressure to stop the bleeding.
Refer to an eye specialist for proper suturing. A lid laceration, especially one involving the lid margin should always be sutured by a specialist to be sure that the eyelids will open and close properly later.

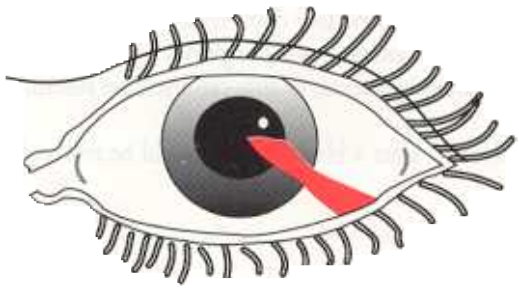
Penetrating Injuries

Slide 14 (penetrating injury/corneal laceration)

Penetrating injuries mean that a sharp object has entered or punctured the eye. These injuries are usually caused by high speed or sharp objects.

Signs and symptoms

- a sharp object has cut the eye
- there may be liquid coming out of the wound
- vision is blurred if the cornea or sclera has been cut.



Penetrating Injury

Action

History Ask the patient what happened and when.

Examination Measure the visual acuity.
If possible, clean the eye gently. Do not press on the eye.

Treatment If the sharp object is still in the eye, do not remove it. Do not remove blood clots on the eye.
Give aspirin and antibiotics by mouth.
Apply a protective eye pad without pressure. Put an eye shield over it.
Do not press on the eye.
Refer immediately to the hospital where they will remove the object, suture the wound and give antibiotics as necessary.
If the cornea or sclera was penetrated, a tetanus injection is recommended.
A collapsed eye is very serious. Refer immediately.

PREVENTION OF EYE INJURIES:

- Wear protective eyewear when there is the risk of dirt or foreign material getting in the eyes.
- Advise children not to play with pointed objects and keep sharp objects away from their reach.
- Do not rub an eye when there is a foreign body to prevent further damage.

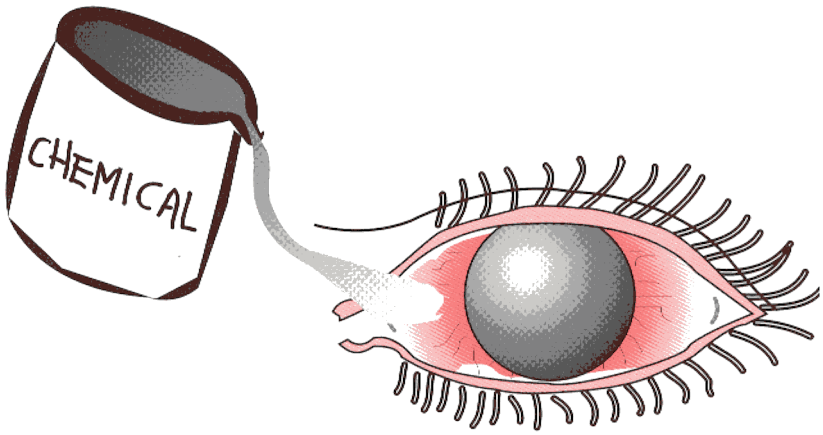
Chemical Burns (battery acids, cleaning fluids, poisonous sap, snake venom, etc.)

Slide 15 (chemical burn)

There are basically two kinds of chemicals, alkalis and acids. ALKALIS, which include lye, cleaning fluids, and lime, are very dangerous to the eye. They are able to penetrate and "eat up" the eye in seconds. If alkali got into the eye, the chances of recovering vision is very slim unless you were able to wash the eye immediately after the injury. ACIDS, such as vinegar, or battery acid, are generally less dangerous to the eye. They usually stay on the surface of the eye, and do not penetrate the inside of the eye, and although an acid burn may look very bad at first, the eye has a better chance of recovery after washing and treatment.

Signs and symptoms

burning, stinging or pain in one or both eyes
watering from both eyes
conjunctiva is red
poor vision
cornea is not clear, and may look dull and white, depending on the type of chemical which caused the burn



Chemical Burn

Action Note: In this case, you must begin treatment by washing the eye thoroughly before examination to remove the chemical and prevent further damage.

History
- Ask the patient what got into his/her eye. The history allows you to make the diagnosis.

Treatment
- Hold open the eye and immediately pour clean water (preferably boiled and cooled) over it for 15-30 minutes. If you know the burn was caused by an alkali such as lime, wash the eye for 30 minutes. Remove any loose particles. Use a jug, or an eye cup, or place the eye under a slow running tap. Lift the eyelids while irrigating to make sure that the chemical is not trapped underneath the eyelids. Do not use antidotes to wash the eye.
- Apply tetracycline eye ointment or other available antibiotic ointments to prevent infection. Refer immediately for further treatment, especially if the chemical was an alkali.
- If there is no eye specialist, apply antibiotic ointment 2 times a day for a week.

Examination
- The next day, examine the eye. Is the cornea hazy instead of shiny and clear? This is expected in any chemical injury but more so in alkali injury. If the chemical was an acid, advise the patient that his vision might be restored. If the chemical was an alkali, advise the patient that the vision may be lost.
- Test the visual acuity if possible.

PREVENTION OF CHEMICAL BURNS:

- Label all bottles containing chemicals.
- Store chemicals properly in a place out of the reach of children and away from the kitchen. Make sure containers are closed after each use.
- Open bottles away from the face.
- Throw away unused and expired chemicals.
- Do not use empty chemical bottles to store water except when the latter will be used for the garden.
- Work with chemicals near a source of water or have water at hand in case accidents happen.
- In factories or work places where chemicals are often used, particularly alkali, have posters demonstrating how to wash the eyes thoroughly in case of a chemical accident. Doing this before taking the patient to the clinic might save the victim's vision.

Activity

POOR VISION

Purpose: To review the most common causes of poor vision.

Time: 30 minutes

Materials:
- Slide 16 (cataract)
- Diagrams of the front and side views of the eye (use handout from *Understanding the Parts of the Eye and Their Functions)*

Method: Lecturette and Discussion

Procedure: 1) Discuss the following information with the participants:

Loss of vision can be sudden or gradual. It can be painless or painful. Ask if anyone can name any eye problems which have already been discussed which can cause loss of vision. Some examples would include: glaucoma, corneal ulcer, and some injuries. These problems are usually sudden and painful.

The most common causes of gradual and painless loss of vision are **refractive errors** and **cataract.** We have discussed refractive error earlier when we learned about visual acuity. Refractive error can be diagnosed through the pinhole test.

Any person who is unable to read small print and has a visual acuity of less than 6/6 or 20/20 should be referred. Persons who see well but complain of headaches and/or occasional blurred vision should also be referred. These patients probably need eye glasses.

Show the slide and provide the information provided in the Trainer's Guide.

Note to trainers: Cataract is discussed in more detail in later activities included in the section Public Health Issues and Their Prevention.

Trainer's Guide for Poor Vision

Cataract

Slide 16 (cataract)

A cataract is the term which describes any loss in transparency of the lens. It is more common in older persons. It is rarely found in babies and children.

Signs and Symptoms

- patient complains of gradual and painless loss of vision
- patient describes vision as cloudy or misty
- the pupil is not black, but looks white, brown or gray

Action

History
- Ask the patient to describe his/her vision.

Examination
- Measure the patient's visual acuity.
- Examine the patient's pupil.
  If the person can still tell light from dark and notice movement, cataract surgery may allow him/her to see again.

Treatment
- Refer for surgery.
- After surgery, the patient may need a *phakic glasses.* These are high powered glasses for people who have had their natural lenses removed. If the patient has had a lens implant, he/she will not need aphakic glasses.

PREVENTION: There is no known prevention for cataract. The following factors may contribute to cataract: aging, sunlight, malnutrition, diarrhea, some medicines such as steroids and some diseases such as diabetes.

OTHER DISEASES CAUSING POOR VISION

Refer to handout showing the front and side views of the eye. Point out the parts which cannot be seen or examined without special equipment (vitreous, choroid, aqueous, and optic nerve). Tell the participants that any disease in these parts of the eye will cause poor vision. Only an eye specialist will be able to diagnose the condition.

Some of the diseases which may damage the inner parts of the eye and cause poor vision are tuberculosis, leprosy, diabetes, AIDS and some cancers.

Signs and Symptoms

- eye looks normal
- patient complains of poor vision
- vision is not improved with pinhole test

Action

History
Ask the patient to describe the problem:
When did it start? How? Was the loss of vision sudden or gradual? With or without pain? Ask if he/she is suffering from any other diseases?

Examination
Examine the eye. Measure the visual acuity.

Treatment
The eye may look normal, even though there is a loss of vision.
Patients should be referred for evaluation. If there is sudden loss of vision, refer immediately.

Activity

OTHER EYE PROBLEMS

Purpose: To learn about common eye conditions which can cause the eye to look abnormal, although there may be no pain or loss of vision.

Time: 1 hour

Materials:
- Slides 17, 18, 19, 20, 21, 22 or picture cards
- Large drawing of the front and side view of the eye

Method: Slide presentation, lecturette, discussion

Procedure:

1) Explain that some eyes can see well but still have a medical problem. Often, the eye has an unusual appearance, although there may be no pain or loss of vision. Ask the group to describe some examples of these conditions which they have seen in their community. After the group has made a list, identify some of these problems. The list should include:

   BUMP OR LUMP (Stye)
   SQUINT (Cross Eye)
   PTERYGIUM
   SCAR
   BITOT'S SPOTS

2) Using the Trainer's Guide, show each slide and give a brief description of the condition shown. Ask the trainees to describe the eye as shown in the slide or picture card. Explain what the condition is, its probable cause, and how it is managed by basic eye care workers.

3) Use the large drawing of the front and side views of the eye to show which parts of the eye are affected in each slide.

4) Repeat the above steps with the other slides.

5) You may make the activity more interesting by dividing the group into two, and see which group can name the most abnormalities in the eye.

Trainer's Guide for Other Eye Problems

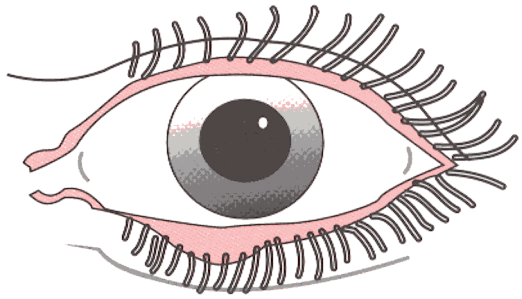
<u>Bump or lump (stye)</u>

Slide 17 (bump or lump on eyelid)

A lump on the eyelid is caused by an infection, inflammation, or irritation. The eyelid is usually swollen and sometimes painful. These lumps are also known as styes. They usually disappear without surgical intervention. In severe cases, they may also cause bleeding in the conjunctiva or behind the cornea.

Signs and Symptoms

red, swollen lump on the eyelid, probably near the edge



Bump or Lump (Stye)

Action

History
- Ask the patient:
  Is there any pain when you touch your eyelid? How long have you had this problem?

Examination
- Test the vision and examine the parts of the eye.

Treatment
- If the bump hurts, it may be infectious. Treat with antibiotic ointment 2 times a day or antibiotic eyedrops 4 times a day for 7 days.
- Apply warm moist compresses for 10-15 minutes at least twice a day. One way to do this is to boil an egg and while it is still hot — but not too hot — wrap it in a moist cloth and let its steam warm the eyelid. Otherwise simply use a clean cloth.
- If the side of the face is swollen and there is severe pain, pain relievers may be given. Antibiotic tablets to treat other infections in the body may also be needed.
- A persistent eyelid lump may need to be lanced or incised in order to express the pus out. This should be done in the health center. The eyelash which is in front of the eyelid lump may also be pulled out in order to let the pus out.

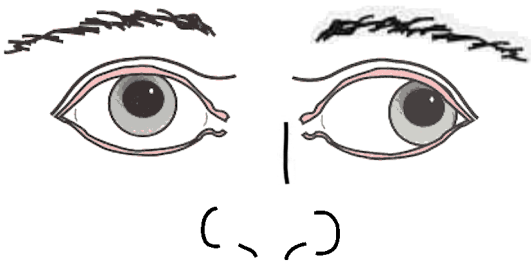
PREVENTION: Good eye hygiene will help prevent eyelid infections.

Squint (cross eye)

Slide 18 (squint)

Squint may occur in childhood without any apparent cause. It usually develops in the first months or years of a child's life. It is also important to note that squints can be secondary to refractive errors or other eye diseases, so it is advisable to refer a child for further testing.

WARNING: If a squint develops suddenly in an adult, he or she may have double vision. This can be a sign of a serious disease and he/she should be referred for further examination



Squint

Signs and Symptoms

- both eyes do not look in the same direction
- only one eye at a time is able to fix on a visual target
- eye **sometimes** wanders (does not look ahead normally), particularly if the patient is tired

Action

History Ask the patient:
How long have you had this condition?

Examination Examine the patient and take the visual acuity.
Does one eye see better than the other?

Treatment A child with a squint should be treated as soon as possible. Refer to an eye specialist. If there is no specialist, the "good" eye (not the squinting eye) should be patched for six days per week. On the seventh day the eye should be left unpatched. This process helps the weak eye to "learn to see." Continue this patching until the weak eye that wasn't focusing holds focus.

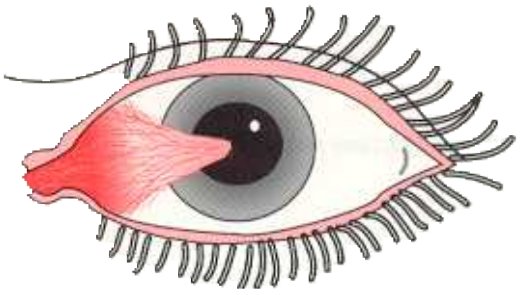
Pterygium

Slide 19 (pterygium)

A pterygium is a fleshy growth which usually begins growing from the nasal corner of the conjunctiva. There is no known prevention for a pterygium. It is not known what causes pterygium, although strong sun and wind can contribute to its development. If available, sunglasses or a brimmed hat should be worn on sunny days.

Signs and Symptoms

fleshy, triangular growth usually at the nasal corner of the conjunctiva that grows over the cornea (although it can also appear at the outer corner of the eye)
if growth has reached the pupil area, there may be poor vision
eye looks red and irritated



Pterygium

Action

History Ask the patient:
Does the eye hurt, look red, or feel dry? Is the vision being affected?

Examination Ask the patient to look to the right and to the left, then straight ahead.

Treatment Nothing should be done unless the pterygium grows too far over the cornea and is affecting vision. If the pterygium covers all or part of the pupil or if the patient complains of poor vision, refer the patient for surgical evaluation.
Refer the patient for advice if the pterygium is causing problems either due to its size, position, or inflammation.
In such cases, surgery may be required to remove the pterygium.

Scar

Slide 20 (corneal scar)

A scar that does not block the pupil will not cause loss of vision, but will affect the appearance of the eye, and no action is necessary. However, if there is a corneal scar that is blocking the pupil and causing severe loss of vision, the patient can be referred to an eye specialist for advice. In some situations, the scarred cornea may be replaced through surgery.

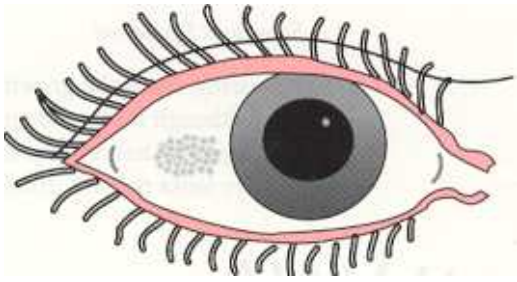
Bitot's Spot

Slides 21, 22 (bitot's spots)

Children who are malnourished will sometimes develop a white spot on the conjunctiva. This condition is called a Bitot's spot. It can appear to be bubbly or foamy. These spots are an early sign of xerophthalmia which is caused by vitamin A deficiency. Some children with Bitot's spots may also have nightblindness. Otherwise, the vision is normal, and the cornea looks shiny and clear. Bitot's spots tell us that a child is lacking vitamin A. If left untreated, this can become more serious, and may cause further illness and even blindness.

Signs and Symptoms

white spot on the conjunctiva
the spot may look bubbly or foamy
may appear in both eyes
child may be malnourished
child may also have nightblindness



Bitot's Spot

Action

- Ask the child's mother:
  Has the child had any nightblindness, diarrhea, measles, or respiratory infections recently? What does the child eat? How is his/her appetite?
- Examine the eye.
  Is there any white spot on the conjunctiva? Does the eye seem dry?
- Treat the child with vitamin A capsules. Give one 200,000 I.U. capsule on the first day, one on the following day, and another 1-4 weeks later. A child who is less than 1 year old should have the same treatment, but in doses of 100,000 I.U.
- Advise the mother about feeding vitamin A-rich foods to the child and herself.

Activity

THINK FAST!! REVIEW OF EYE CARE MANAGEMENT LEVELS

Purpose: To review the management levels of basic eye care.

Time: 45 minutes - 1 hour

Materials:

- Flip-chart and markers
- Paper and pens

Procedure:

1) Divide the group into teams of five. Ask the teams to make three lists of common eye problems in 15 minutes. Time the activity. The three lists should be:

   a. Problems which need immediate referral to en eye specialist;

   b. Problems which need to be referred but are not emergencies;

   c. Problems which can be treated locally but need careful follow-up.

2) After 15 minutes has passed, have each group present their lists. As a group, review and discuss whether specific problems have been placed on the appropriate list. For each correct response on a list the team gets one point. Discuss any incorrect information to make sure everyone is clear.

3) For bonus points, the trainer can randomly select a short list (5-6) of eye problems from the group lists. Ask one team at a time to identify the correct action for one of the eye problems. If the response is correct, give the answering team a bonus point. Repeat with the next eye problem and ask the next team. There should be one or two eye problems for every team.

Activity

BASIC EYE CARE MATERIALS AND MEDICINES

Purpose: Part One: To demonstrate how to make Basic Eye Care materials:

eye patch
eye shield
eye swab
irrigating solution

Part Two: To review a list of medicines which should be included in a Basic Eye Care kit.

Time: 1 hour

Materials:

- Flipchart and markers
- Plaster
- Gauze
- Pair of Scissors
- Cardboard
- Tape
- Cotton
- Irrigating Solution
- Handout: **"How to Prepare Basic Eye Care Materials"**

Procedure: **PART ONE:**

1) Ask participants to make a list of materials that they think are needed for Basic Eye Care. Write the list on flipchart. Be sure the following key materials are included:

eye patch
eye shield
eye swab
irrigating solution

The group may also mention materials which have already been discussed, such as occluders and pinholes.

2) Check with the group which of these materials they think they can prepare by themselves and discuss why it is important. Explain that in this activity we will learn how to make the materials mentioned above. Since we made occluders and pinholes in an earlier activity, we will not repeat those here.

3) Distribute the handout on Preparing Basic Eye Care materials, and the materials and supplies. Allow 20-30 minutes for everyone to make an eye patch, eye shield, and eye swab.

4) Ask for volunteers to present their work. Ask the group to make any necessary corrections.

5) Review with the group how to prepare irrigating solution.

6) Process the activity by asking the following questions:

- What was easy/difficult about doing them?
- How would you use these materials in your community?
- What difficulties, if any, do you see about making these materials when you go back to your areas?

PART TWO:

1) Review each of the basic medicines and supplies listed below, including their purpose and how they are administered. Write the list on flipchart.

Basic Eye Care KITS

Basic eye care workers need adequate supplies of the following medicines and materials:

- A flashlight with spare batteries
- Cotton
- Gauze
- Adhesive tape or plaster
- Scissors for cutting gauze or tape
- Visual Acuity Chart (Snellen chart)
- Tetracycline 1% ointment
- Vitamin A 200,000 IU (remember to store in cool dark place to prevent spoiling)
- Silver nitrate [**Note:** Check with your local authorities. This medicine spoils quickly in tropical climates and can cause burns.]

Optional: The following medicines are sometimes also included as part of a basic eye care kit. Check with local officials in your area.

Other Medicines	Purpose
Chloramphenicol drops & ointment 1%	Bacterial conjunctivitis
Dexamethasone ointment/drops	Ocular inflammation
Anaesthetic topical (eg amethocaine or tetracaine)	Lessens pain during examination
Zinc sulfate drops	Allergic conjunctivitis
Acetazolamide (Diamox) 250mgs tablets	Closed angle glaucoma attack
Pilocarpine drops 1% 2% 4%	Closed angle glaucoma attack

Handout

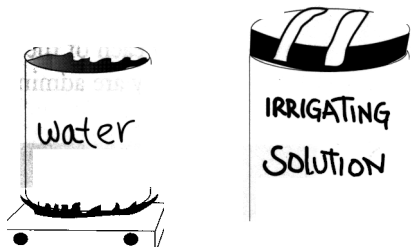
HOW TO PREPARE BASIC EYE CARE MATERIALS

How to Prepare Irrigating Solution

Prepare clean bottles by boiling them in water for at least 15 minutes.

Fill the bottles with the water that has been boiled for 15 minutes and allowed to cool.

Seal off with plaster or gauze.



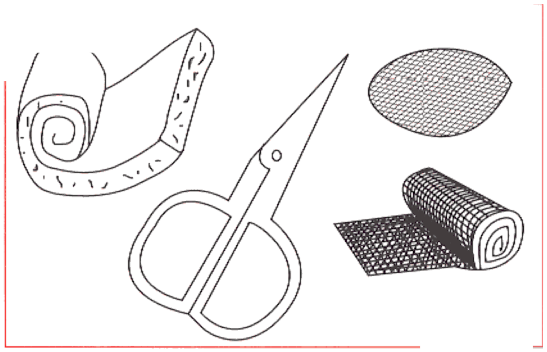
How to Make an Eyeswab

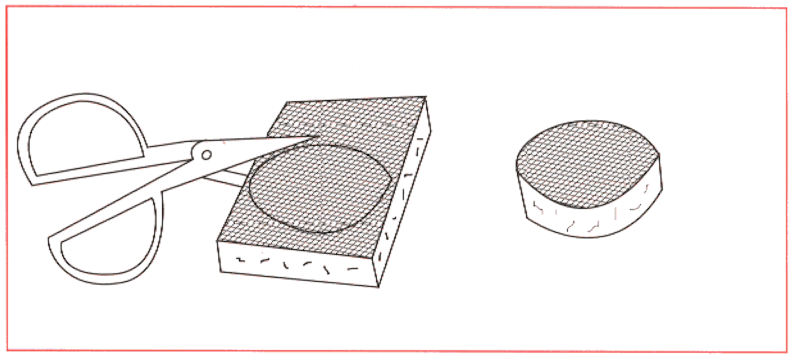
Cut coconut midribs or other small sticks into 7 centimeters lengths.

Roll a piece of cotton onto each end. Be sure it is tight enough so it won't loosen when used.

How to Make an Eyepatch

Put a layer of cotton about one centimeter thick between 2 pieces of gauze and cut into an oval shape. Use an oval cardboard pattern 4 x 6 centimeters.





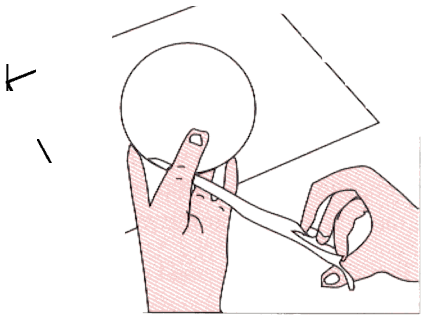
Handout

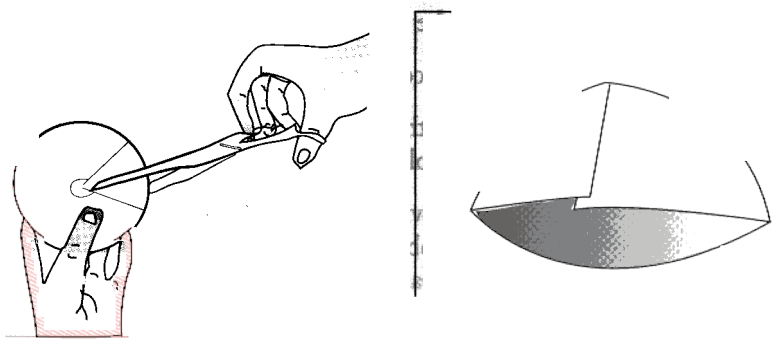
How to Make an Eyeshield

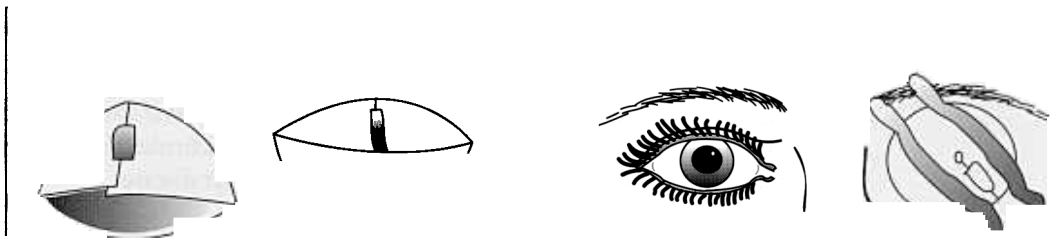
Cut a cardboard into a circular piece about 12 centimeters in diameter.

Cut out a key-hole from this piece as illustrated.

Make into a cone by stapling or taping the cut ends together.







Activity

BASIC EYE CARE REINFORCEMENT GAME

Purpose: To reinforce the recognition of common eye problems and determine the appropriate action.

Time: 1 hour

Materials:

- Cards with pictures and descriptions of eye problems. The correct diagnosis and required action is written on the back of each card.
- Watch with second hand to use as timer
- Small prizes for the winning team

Procedure:

1) Divide the participants into teams of 8-10. The teams should stand in lines facing each other. Place the cards, drawing side up, in a pile on the table. Explain the rules of the game:

   a. The trainer, or other designated person, will pick a card from the pile. S/he will show the drawing to the first team, and read the symptoms which are written there. The correct diagnosis and treatment is written on the reverse side.

   b. The first person on each team looks at the picture and description of symptoms. S/he is asked to identify the eye problem and what action should be taken. Consultation with another team member is not allowed.

      1 point is awarded for the correct diagnosis;

      — 1 point is awarded if the correct action to take is stated;

      — 1 bonus point is given if the team can tell how the eye problem could be prevented (Note: Not all of the problems are preventable.)

   c. If a team is unable to provide the correct information, pass to the next team. If team A is able to name the problem but not the correct action to take, they will receive 1 point, and the turn will pass to Team B. If Team B is able to identify the correct action to take, they will receive one point.

   d. Scoring should be recorded on flip chart for all to see.

2) After all of the cards have been used, total the scores and declare the winning team.

3) Review and discuss any of the eye problems that are unclear to the participants. For example, if the group had difficulty in addressing a particular disease, review the symptoms, treatment, and if known, the prevention for that disease.

Activity

BASIC EYE CARE HEALTH EDUCATION

One of the most important roles of basic eye care workers is providing health education. Since most blindness is avoidable, education can play an important role in protecting the eye health of a community. This activity allows the group to create and share health education ideas which are specific to the communities in which they live.

Purpose: To develop and demonstrate community eye health education ideas.

Time: 1 hour 30 minutes - 2 hours

Method: Brainstorm, role play and group discussion

Materials:
- Paper and pens
- Flipchart and markers
- Tape and scissors
- Any other materials available which may be used to make materials

Procedure:

1) Ask a volunteer to define community education. Ask for other ideas and comments. Write all of the ideas on flipchart and discuss them until there is general agreement. Look for some of the following ideas:

> *Community education ....*
> *Helps people see there is a problem and take action;*
> *Creating awareness that they have a role in keeping their own health and the health of the family and friends;*
> *Talks about local situations and local resources;*
> *Encourages sharing of ideas with community members;*
> *Identifies and involves all levels of people who can help.*

2) Divide the participants into groups who live in similar or nearby communities. Ask each group to make a list of the common eye diseases and eye hazards (things that cause eye injuries) in their community. An example of an eye hazard would be chemicals that workers are exposed to in their workplace, or sharp tools. Ask for some other examples before the small groups start their work, to make sure everyone understands the task (20-30 minutes for small groups).

3) Ask each group to present their list. To save time, avoid repeating anything that has already been reported by another group. Every group has the opportunity to revise their list to add anything they may have forgotten, based on the other presentations.

OPTION: You can also brainstorm one list for the whole group.

4) Ask the groups to choose 2 of the most important eye health problems (eye disease or eye hazard) from their list, and make a community health education plan for these two problems. Each of the health education plans should answer the following questions:

Who is at risk of this disease or problem? Why?
Who is the audience of your health education plan? Be specific.
Who else will be involved in helping you with these activities? Why?
What methods will you use to educate these people?
What materials if any will you use to education these people?
How often will you do these health education activities?
How much time will you need?

Each group will have 30-45 minutes to plan. Give each group some materials to prepare their presentation, including samples of the kinds of materials they plan to use. Each group should be prepared to explain and demonstrate at least one of their health education ideas, according to the above questions.

5) Ask each group to present and act out one of their health education ideas. Allow between 10-20 minutes per presentation. Encourage the group to ask each other questions about the presentations:

What comments do you have on this presentation?
What do you think about the communication skills demonstrated here?
What do you think will be effective and why?
What do you think could be improved and why?
What suggestions do you have for this team?

6) Generate a list of ideas for reducing or preventing blinding disease in the community based on the presentations and any new ideas. The list might include:

Convincing people to seek help as soon as an eye problem develops;
Educating the community about the eye hazards to vision that can be found in the community (workplace dangers, traditional medicines that may be harmful to the eye, dangerous habits, etc.)
Making or using materials that show problems which may lead to blindness;
Explaining to the community the kind of eye services and treatments which are available and where to receive them;
Screening for eye problems in the clinic, schools, or homes.

OPTIONAL: Create a neutral "panel of judges" who will vote on the best health education ideas.

7) If there is time, lead a group discussion to answer the question: *How will you evaluate the success of your health education activities?*

Activity

GROUP SELF REVIEW QUIZ

Purpose: To prepare a simple quiz which can be used as a review activity.

Time: 1 hour - 1 hour 30 minutes

Materials:
- Pens and paper

Procedure: *Option 1:* Divide into small groups of 4-5. Ask each group to prepare a quiz of 10 questions based on the material which has been covered during the training. Each team will give their quiz to the group immediately to the right of them, so that every group takes the quiz prepared by another group. Review the quizzes and answers in small group.

Option 2: Use the prepared pre/post test found in this manual.

It may be helpful to provide some sample questions to the group if they are preparing their own quiz.

Sample questions:

What is the main function of the pupil in the eye?
(Allows light into the eye)

What is one difference between a cataract and a corneal scar?
(A cataract affects the lens (opacity of the lens) and a corneal scar affects the cornea (opacity of the lens).

What is one of the early eye signs of vitamin A deficiency?
(Nightblindness and/or Bitot's spots)

What is the simplest way to prevent conjunctivitis?
(Good hygiene and regular face washing, especially among children)

What is the first thing you should do you if you suspect a patient has a foreign body stuck in their eye?
(Examine the eye including under the eyelids, and remove the body with a cotton-tipped stick or a damp, clean cloth)

COMMON EYE PROBLEMS: REFERENCE GUIDE FOR HEALTH WORKERS

CONDITION	SIGNS & SYMPTOMS	ACTION	PREVENTION
ABRASION	Pain, tearing, blurring of vision	Antibiotic ointment; cover eye with firm patch so that eyelids cover the eye. Change the patch in 24 hours and apply ointment each time patch is changed until eye is healed. If there is no patch, apply ointment or eye drops 4 times/day. If eye has not improved in 2 days, refer for further treatment.	Wear protective eyewear when there is risk of foreign material getting into the eye
BLACK EYE/ BRUISED EYE	Conjunctiva and/or eyelids are discolored. Area around eye is bruised. Sometimes, there is also bleeding of the conjunctiva; vision is not impaired	Cold compresses to prevent further bleeding. After 24 hours, apply warm compresses. Refer if there is no improvement in 3 days.	Avoid injury
BUMP OR LUMP (Stye)	Red, swollen bump on the eyelid	Antibiotic ointment or drops 4 times/day for 7 days; warm compresses 10-15 minutes 2 times/day; sometimes, removing eyelash on bump may help to let pus out.	Good hygiene and washing of the eye
CATARACT	Decreased vision; gray or white lens	Refer for surgery.	No prevention, but sight can be restored through simple surgery
CHEMICAL BURN	Pain or burning, tearing, poor vision, red or white eyes due to chemical exposure	Immediately flood eye and under eyelid with clean water for 15-30 minutes (30 minutes if chemical was alkali); Tetracycline 1% ointment 4 times/day. Refer for further treatment.	Use of protective clothing and eyewear when handling chemicals. Proper storage and handling of chemicals
CONJUNCTIVITIS	Itchiness, red conjunctiva sometimes with pus, eyelids may be swollen	Tetracycline eye ointment 3 times daily for 7 days	Good hygiene and frequent face washing
CONJUNCTIVITIS, Allergic	Red eyes, itchiness; may occur same time every year and there may also be a runny nose, sneezing or asthma	Antihistamines (topical or oral) if available	Avoid known irritants

CONDITION	SIGNS & SYMPTOMS	ACTION	PREVENTION
CONJUNCTIVITIS, Neonatal	Pus in the eyes of newborn; eyelids may be swollen	Careful frequent cleaning of the eyes; Antibiotic eyedrops every 1-2 hours for 7 days or ointment 2 times/day for 7 days. If there is no improvement after 3 days, refer to an eye specialist. Otherwise, complete the 7-day treatment. Refer infant and parents to clinic.	Antibiotic eye ointment in both eyes at birth
CORNEAL SCAR	White spot on cornea; pupil is partially blocked or covered	In some cases, surgery is possible to replace the damaged cornea.	Prevention of vitamin A deficiency, injuries and infections which may cause scarring
CORNEAL ULCER	Redness around cornea; white spot on cornea; pain	Refer immediately. If specialist is not available, treat with antibiotic eye drops (like sulfa drops) every hour on the first day and every three hours for the rest of the week. If patient is a child and has recently had measles or is malnourished, also treat for vitamin A deficiency.	Avoid corneal injuries; Use protective eyewear
FOREIGN BODY	Red, painful eye with particle on surface of eye or under eyelid. Particle may cause scratching, discharge, blurred vision or tearing if not removed within several days	Remove foreign bodies with cotton swab. If too small, wash eye with clean water. Apply antibiotic ointment and patch for 1 day. Continue applying antibiotic ointment 2 times/day for 1 week, especially if there is any discharge.	Wear protective eyewear when there is a risk of foreign material getting into the eye
GLAUCOMA (closed angle-acute)	Red eye, severe pain, headache, blurry vision, pupil is dilated, eye feels hard to the touch	Provide pain relievers and refer immediately.	No known prevention. Medicine or surgery may be recommended to prevent further loss of vision
HYPHEMA	Blood behind the cornea; pain or poor vision. The conjunctiva and/or eyelids may also be discolored	Advise bed rest with cushions under the head for 5 days. Bandage both eyes. Refer immediately if the pupil is not visible, if there is no visual improvement (less blood) in 2 days, or if bleeding resumes again.	Avoid injury
LACERATING INJURY/ Cut in the Eyelid	Eyelid is cut or bleeding	Use an eyepad with firm pressure to stop the bleeding. Refer to an eye specialist for proper suturing of the eyelid.	Wear protective eyewear if there is risk of eye injury

CONDITION	SIGNS & SYMPTOMS	ACTION	PREVENTION
PENETRATING INJURY (on the cornea)	Eye is cut by sharp object	If possible, clean the eye gently. Do not press on the eye. If object is still in the eye, do not remove it. Apply protective eye pad without pressure. Put an eye-shield over it. Refer immediately. Give oral antibiotics and an anti-tetanus injection if available.	Wear protective eye-wear if there is a risk of eye injury
PTERYGIUM	Fleshy growth from the corner of the eye towards the cornea; eye looks red and irritated	If growth covers all or part of pupil or if there is poor vision, refer for surgical evaluation; surgery may be required.	No known prevention, although wind and sun may contribute to their development
SQUINT (Cross Eye)	Wandering eye; both eyes unable to focus straight ahead simultaneously	Patch good eye 6 days/week and uncover on 7th day to help weak eye to "learn to focus"; then stop. *Children:* if possible, refer to eye specialist; *Adults* who develop squints suddenly should be referred immediately.	No known prevention
SUBCONJUNCTIVAL HEMORRHAGE	Blood-red patch or spot in the conjunctiva	Apply cold compresses for 24 hours to prevent further bleeding. If the problem happens again, check blood pressure and refer.	Avoid injury to the eye. High blood pressure or stress sometimes causes this condition.
TRICHIASIS	Eyelashes of upper lid are turned inward and are rubbing the eye. One or both eyes may be affected. Cornea may have an abrasion, be infected or have a scar from previous infection	If only a small number of eyelashes are scratching the eye, they can be removed with tweezers or forceps. Antibiotic ointment (tetracycline) may help prevent an infection. If there are several inturned eyelashes, the patient should be referred for tarsal rotation (eyelid surgery).	Treat with tetracycline in earlier stages of trachoma. Regular face washing, especially in children
VITAMIN A DEFICIENCY	Any of the following: Night blindness; conjunctival and corneal dryness; Bitot's spots	200,000 I.U. Vitamin A capsules. One on first day, one on second day, and one after two weeks.	A healthy diet with green, leafy vegetables, milk and eggs prevents vitamin A deficiency. Vitamin A-rich foods, especially for young children, pregnant women and nursing mothers.

SPECIAL PUBLIC HEALTH ISSUES AND PREVENTION

Trainer's Introduction

As written in the Introduction to this manual, it is estimated that up to 80% of world blindness is preventable. Among the most common causes of blindness are cataract, vitamin A deficiency, trachoma, onchocerciasis, and trauma. Management of trauma, or eye injuries, has been taught in an earlier activity.

This section of the manual is divided into four parts. Each part contains activities about one of the causes of preventable blindness. The four avoidable causes of blindness addressed here are:

- *Vitamin A Deficiency*
- *Cataract*
- *Onchocerciasis (river blindness)*
- *Trachoma*

Cataract is the leading cause of blindness everywhere in the developing world. Although it cannot be prevented, sight can be restored through simple surgery. Trachoma is commonly found in parts of Asia and Africa. Onchocerciasis is mostly found in Africa, and to a less extent in small parts of South America.

The basic eye care worker has a very important role to play in preventing community blindness. It is important that he/she knows how to detect, treat, prevent or refer patients who have these conditions.

The activities include information about the disease, how it can be detected, treated and prevented.

You may not have all of these blinding diseases in your country, so you will only choose to train health workers about those diseases which exist in their communities. Consult with your local public health officials to find out which of these eye problems are important.

NUTRITIONAL BLINDNESS/VITAMIN A DEFICIENCY

The activities included here will teach health workers about vitamin A deficiency (VAD), how to detect xerophthalmia, and how to treat and prevent VAD with vitamin A capsules.

Activities:

Questions and Answers (30–40 minutes)

Purpose: To understand general information about vitamin A and vitamin A deficiency.

Detecting VAD Eye Signs (Xerophthalmia) (1 hour)

Purpose: To learn to detect xerophthalmia, the eye disease caused by VAD.

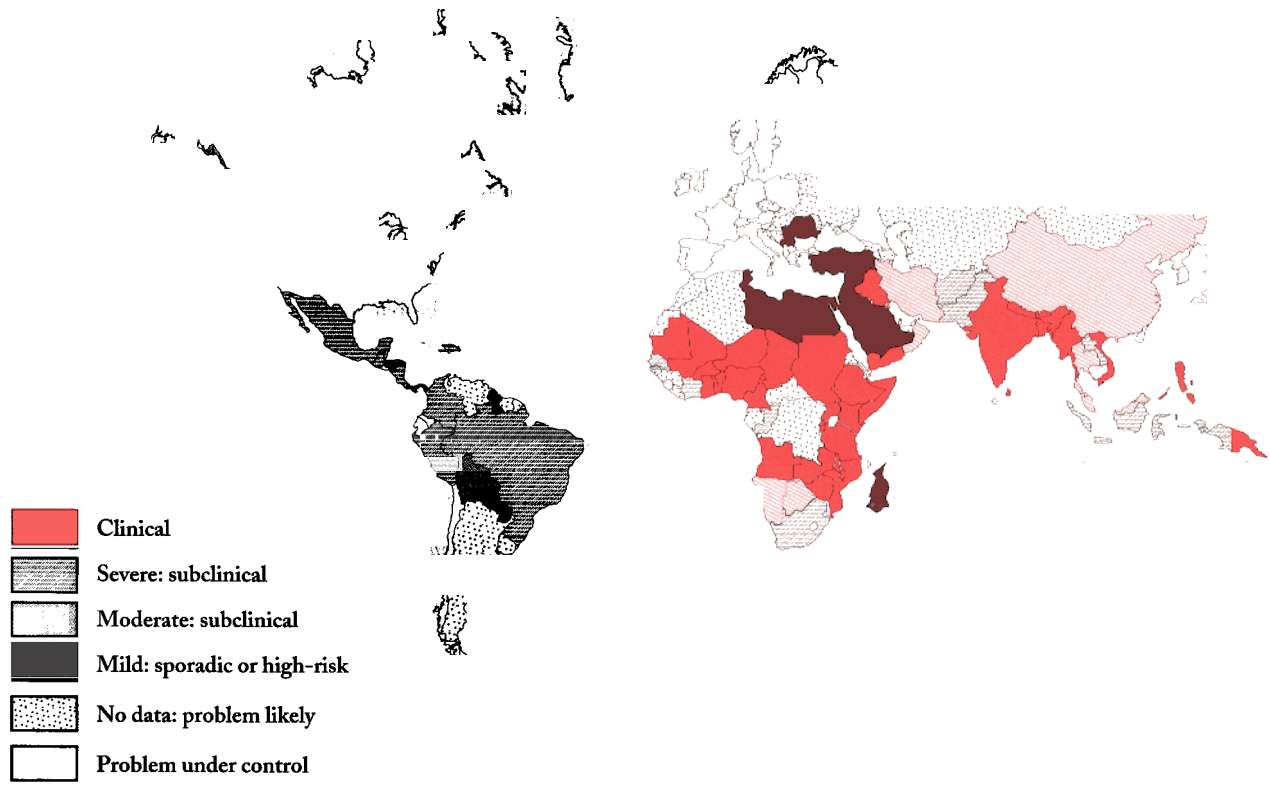
Vitamin A Capsules to Treat and Prevent VAD (2 hours 30 minutes - 3 hours)

Part 1: Treatment
Purpose: To recognize xerophthalmia, and know how to give vitamin A capsules for treatment of VAD.

Part 2: Prevention
Purpose: To identify who is at risk of VAD, and know how to give vitamin A capsules in the correct dosage and schedule for prevention.

For additional training ideas, we suggest HKI's manual, *Vitamin A Training Activities for Community Health and Development.*

COUNTRIES CATEGORIZED BY DEGREE OF PUBLIC HEALTH IMPORTANCE OF VITAMIN A DEFICIENCY, 1995



Activity

VITAMIN A: Q & A MIXER

The following activity is an orientation to vitamin A deficiency that allows participants to participate equally, regardless of how little or much they know about vitamin A. It is designed to encourage interaction among the participants.

Purpose: To understand general information about vitamin A and vitamin A deficiency.

Time: 30-40 minutes

Materials:

- Strips of paper with questions written on them and strips of paper with answers written on them (The strips with questions on them are numbered. The trainer can select which questions are appropriate for the training or create additional ones.)
- Flipchart or transparencies with the same questions and answers as on the strips of paper (This information should remain covered until needed.)

Procedure:

1) Mix up all of the strips of paper in a bag or box. Distribute one piece of paper to each participant.

2) Explain to the participants that they must find a person who has the answer to their question, or the question for their answer, by walking around and sharing their question or answer with the other participants.

3) Once everyone has located his/her partner, the participants sit down. Ask for the person with question #1 to read it and present the answer. The rest of the participants decide if it is correct. The trainer can then read the correct answer to the group. Answers can also be presented on a flipchart or on transparencies. In this way, continue through the rest of the questions.

4) After all the questions are answered, ask the participants the following questions:

   - *What information was familiar to you? Where did you learn it?*

     What information was new or surprising to you?

     Do you have any questions or other comments?

Alternative: If the group is large (more than 20 participants), have them sit down in a circle. Ask the participant who is holding question #1 to read it to the group. Ask who in the group thinks he/she is holding the correct response and have him/her read it aloud. More than one person may think they have the answer, and this can generate a lively discussion. Repeat until all of the questions have been matched with the correct responses. As above, the trainer can present the correct answers once the group members have had a chance to respond.

QUESTIONS AND ANSWERS ABOUT VITAMIN A

Copy and cut into strips.

1. Why is vitamin A important for good health?

   Vitamin A is important for optimal growth, health, and vision, and strengthens the body's resistance to disease and infection.

2. What is vitamin A deficiency (VAD)?

   Vitamin A deficiency (VAD) means that the body's stores of vitamin A have been depleted. This is dangerous because vitamin A deficient children are likely to have more severe measles, severe or prolonged diarrhea, and acute lower respiratory infections. Severe VAD can cause blindness and even death.

3. What are the causes of VAD?

   VAD can be caused by not eating enough foods rich in vitamin A, by poor absorption of those foods, or by depletion of vitamin A stores in the body as a result of measles, diarrhea, or respiratory infections.

4. Who is most at risk of VAD?

   Infants and children from 6 months-6 years of age, infants who are not breastfed, and pregnant or lactating women are most at risk of VAD.

5. What are the first clinical signs of VAD?

   Difficulty or inability seeing in dim light such as at dusk or at night (nightblindness), or foamy white patches on the white part of the eye (Bitot's spots) are often the the first recognizable signs of vitamin A deficiency.

6. Can you always recognize VAD before it becomes very severe?

   No. A child can look perfectly healthy and still have dangerously low levels of vitamin A. If the child had measles, or suffered from a severe or long episode of diarrhea, acute lower respiratory infection, or protein-energy malnutrition, xerophthalmia could appear suddenly. In such a case, an individual could go blind within forty-eight hours if not treated.

What is nightblindness?

Nightblindness occurs when a person sees poorly or not at all in the dark. It is an early sign of vitamin A deficiency, although not everyone with vitamin A deficiency has this symptom. Nightblindness can cause permanent blindness if not treated.

Who goes blind from VAD?

Young children between the ages of 6 months-6 years, particularly those 1-3 years old, are the ones who are usually in danger of going blind from VAD. They are most vulnerable to blindness from VAD because they grow the fastest during the first 3-4 years of life, and their bodies need more vitamin A to support this growth.

9. Do adults get VAD?

Anyone can get VAD, but some groups are more vulnerable than others. Among adults, pregnant or lactating women are the most vulnerable. Normally most adults have sufficient stores of vitamin A in their bodies to prevent VAD.

10. In what parts of the world is VAD common?

The World Health Organization has identified 37 countries as those with the greatest vitamin A deficient problems. The deficiency occurs most often in the Sahel region of Africa, throughout South and Southeast Asia, and in the islands of the Pacific.

Do eye signs of VAD (xerophthalmia) indicate extreme or mild VAD?

Xerophthalmia is one of the final stages of VAD and indicates severe VAD.

12. Why is a vitamin A capsule important when a child has measles, severe or prolonged diarrhea, acute lower respiratory infections, or severe protein-energy malnutrition?

A vitamin A capsule can restore the child's level of vitamin A, which is depleted when he/she has measles, acute lower respiratory infections, severe or prolonged diarrhea, or severe protein-energy malnutrition. A vitamin A capsule can greatly improve a child's chance of surviving these diseases.

13. What is the connection between measles, severe or prolonged diarrhea, acute lower respiratory infections, and vitamin A?

Vitamin A deficient children can have more severe cases of diarrhea, measles, and acute lower respiratory infections, than those who are not deficient. These diseases, in turn, can cause severe vitamin A depletion leading to deficiency, blindness, and death.

14. If one dose of vitamin A capsule is good, are two or three doses better?

    Vitamin A capsules should always be given according to the schedule. Two or three doses are *not* better when given together. In fact, too many doses may be bad for the child, causing harmful side effects.

15. Should a baby receive the same dosage of vitamin A as an older child?

    A child 6 months to a year or weighing less than 8kg should receive half the regular dosage, or 100,000 IU.

16. Why are capsule distribution cards and record-keeping so important in the distribution of vitamin A capsules?

    It is important for a child to receive the correct dose at the correct time. Capsule distribution cards permit the health worker to identify a child who needs a dose but has not received it and to closely follow a child who is or has been at high risk of developing VAD.

17. Why should mothers breastfeed their babies exclusively for the first 4-6 months?

    Breastmilk is the safest and best food source for babies. It provides vitamin A and protects against disease and infection.

18. What is colostrum?

    Colostrum, or "first milk", is produced by the mother immediately after birth and is yellow in color. The child should always have the colostrum because it is especially rich in vitamin A.

19. Why is colostrum the best part of the mother's milk?

    Mother's milk provides all necessary nutrients for the baby, including vitamin A, and provides protection from diseases. Colostrum is even richer and helps the baby fight against infections early in life.

20. Why is it important to include dark green leafy vegetables and yellow and orange fruits and vegetables among the weaning foods?

    When the child is 4-6 months of age, he/she will need foods in addition to breastmilk. The consumption of dark green leafy vegetables and yellow and orange fruits and vegetables as weaning foods will provide vitamin A for nourishment and protection against disease.

21. Why should a mother encourage her child to eat dark green leafy vegetables even if he/she doesn't want them?

    Dark green leafy vegetables are rich in vitamin A and other nutrients, and are often inexpensive. As some varieties have a strong or bitter taste and a stringy texture to which children may object, these vegetables can be cooked, finely chopped, and mixed in with other foods (for example, cereal, rice, or other gruel) to make them more acceptable to children.

22. Why are ripe mangoes and papayas good foods for young children?

    Yellow and orange fruits, such as mangoes and papayas, and vegetables, such as orange squash and yams, are rich in vitamin A and therefore important for a child's growth, eyesight, and health. They also have a soft texture which is appropriate for young children.

23. Why should the mother cook dark green leafy vegetables with a little oil?

    The oil is essential for the body to absorb the vitamin A in dark green leafy vegetables and adds extra energy which children need for play and growth.

24. Does vitamin A deficiency occur simultaneously with other nutritional problems?

    Vitamin A deficiency often occurs with protein-energy malnutrition as well as iron, zinc, and iodine deficiencies in countries where frequent infections, sickness, poverty, geography, and environmental destruction limit dietary sources.

25. Why is it important for a lactating mother to eat vitamin A-rich foods?

    A mother should eat vitamin A-rich foods to maintain vitamin A levels in her milk. Mothers who live in vitamin A deficient areas should also receive a vitamin A capsule within 1 month of giving birth to help protect the breastfed infant.

Activity

DETECTING VAD EYE SIGNS (XEROPHTHALMIA)

Note to the trainer: Many of the technical terms used in this activity may not be the terms most commonly used in your community. You may choose to use familiar or simplified terms, rather than introduce new, complex language.

Purpose: To learn to detect xerophthalmia, the eye disease caused by vitamin A deficiency.

Time: 1 hour

Materials:
- Flipchart and markers
- Slides 1, 21, 22, 23, 6, 24

Procedure:

1) Show the slide of a normal eye and ask the participants to identify the signs of a healthy eye.

   The rules for a Normal, Healthy Eye:

   - The eyelids should open and close properly, and eyelashes should point away from the eye

     The conjunctiva and sclera should look white and smooth

     The cornea should be clear

   - The pupil should be black
   - The vision should be good

2) Show slides 21 and 22 of *Bitot's spot* (yellow or gray patchy areas of foamy or cheesy material on the conjunctiva). Ask volunteers to describe what they see in each slide. Ask them to compare the appearance of the unhealthy eyes with the healthy eye. Note the description on a flipchart. Explain that this eye sign is the most common of xerophthalmia signs.

3) Repeat step 2 with slide 23 of *xerosis* (dull, dry appearance on outer membranes, beginning to wrinkle, may be on both the conjunctiva and the cornea; often this eye sign is misdiagnosed and other conditions are mistaken for this eye sign), slide 6 of *corneal ulcers* (round or oval ulcers; a grayish or dull patch on the surface of the cornea), and slide 24 of *keratomalacia* (opaque, gray to yellow mound bulging from the cornea). You as the trainer can choose to use familiar or simple terms to describe the symptoms, or you may choose to use medical terms.

4) Place the participants in pairs. Mix up the slides showing different stages of xerophthalmia: Bitot's spots, xerosis, corneal ulcers, and keratomalacia. Show each one at a time, giving the pairs a minute or two to work together to identify and write down on a sheet of paper the symptoms that are shown in each slide.

5) After they finish, review the slides shown in the previous step with the whole group. Ask volunteer pairs to present their conclusions about the symptoms shown. Invite the other participants to add comments.

Note: An important follow-up to this activity is to arrange, if possible, a visit to a nursery school, baby clinic, or outpatient hospital where there are many small children. With the permission of the person in charge, it may be possible to examine the children for signs of xerophthalmia. Children found to be vitamin A deficient should receive treatment. Such a visit should be guided by a well-trained professional. The chances of finding children with xerophthalmia may be small, and there is a danger that health workers who are not properly instructed in this activity will over-diagnose the problem.

Slides

DETECTING XEROPHTHALMIA

This reference sheet describes the xerophthalmia slides to help the facilitator lead a discussion on the symptoms shown in the slides. **It is not a script for a lecture, but rather is intended to help the facilitator focus his/her questions for the participants.** You will have much better results if you allow the participants to provide as much information as they can. As the slides are shown, the participants should describe the slide as much as possible, rather than the facilitator. Some example questions are provided for a few of the first slides to show how the facilitator can use the information provided for questions.

The slides of Bitot's spots and xerosis show stages of xerophthalmia that can be cured with vitamin A capsules if treated immediately. An eye with Bitot's spots or xerosis is a medical emergency. However, there will be no permanent damage to the eyes if vitamin A treatment is given immediately to prevent the deficiency from getting worse. The slides of corneal ulcers and keratomalacia show stages of xerophthalmia that cause permanent eye damage.

Slide 1

Healthy Eye

Example questions:

1. *This is a healthy eye. How does the white part of the eye look?*
2. *How does the center of the eye look? What color is the iris? What color is the pupil?*
3. *How does the surface of the eye look?*

This is the eye of a child who is well-nourished, and his eyes are clear and bright. The white *sclera* of the eye is smooth and shiny. It is covered with a thin mucous membrane called the *conjunctiva.* The iris is brown, and the pupil is black. Notice how the *cornea* in front of the iris and pupil is clear like glass, shiny and smooth.

Slide 21

Bitot's Spot

Example questions:

1. *What is different about this eye from the healthy eye? What is not normal?*
2. *How would you describe what you see on the conjunctiva?*
3. *Where is the light reflection? How would you describe it? Notice how it looks carefully, because it will look different in some of the following slides.*

There is a white spot in the conjunctiva on the side of the eye away from the nose, which is not normal. This is a *Bitot's spot.* It is *bubbly,* or *foamy.* Bitot's spots are an early sign of xerophthalmia and are usually present in both eyes. You can see that the cornea looks shiny and clear, which shows there is not yet any damage to the cornea. You can see the light reflection on the eye. Most of the eyes shown in this activity have a *light reflection,* which is the eye reflecting the bright light used by the photographer. The reflection in an eye with more severe xerophthalmia will look different, as you will see.

Slide 22

Bitot's Spot

The Bitot's spot in this eye is larger than the one in slide 21, and is on the side of the eye away from the nose. Bitot's spots can be quite large. In a child, a Bitot's spot usually means a dangerous deficiency. In an adult, it may be the sign of an old deficiency. The adult may not have VAD any more.

Slide 23

Xerosis

Example questions:

1. *What abnormalities do you see in the conjunctiva? Is it as shiny as in the healthy eye? (You may want to show slide 1 again)*
2. *Look at the light reflection. Does the cornea look normal or abnormal?*

This slide shows more advanced vitamin A deficiency (xerophthalmia). The conjunctiva has lost its smooth, shiny appearance. It is thick and folded like skin, and is also dry. Tears do not stay on the conjunctiva, but run like raindrops off a piece of plastic. The cornea does not look normal. The lower section of the cornea, the covering of the dark part of the eye, has begun to lose its color and the texture is not smooth and shiny. It is dry and rough, which you can see because of the light reflection. Xerosis means the eye has dried. The cells of the surface of the cornea have hardened or *keratinized.*

Slide 6

Corneal Ulcer

The cornea has a pale, round ulcer. The damage to the eye goes much deeper into the cornea than xerosis. This is the next stage of vitamin A deficiency and causes permanent damage. It can lead rapidly to blindness. The ulcer has a very clear edge, as if a round piece has been cut out of the eye. This appearance is common. The conjunctiva is red, which is a sign of inflammation caused by the ulcer. The ulcer looks dry in this eye, which tells you that the patient has corneal xerosis, another sign of xerophthalmia.

Slide 24

Keratomalacia

This eye shows the late stages of vitamin A deficiency. The conjunctiva looks red and dry. But the most serious problem is in the cornea. The corneal tissue has become *necrotic,* which means the tissue is dead. The cornea has become soft and cannot keep its normal shape. It has become white, so that light cannot enter the eye. This condition is called keratomalacia. Softening of the cornea can happen very quickly. It may happen without an ulcer forming. You must treat the child immediately, although you probably cannot save the eye. Treatment can save the child's life, and it may save some vision in the other eye. If the disease in the other eye is not so severe, the child may have normal vision in that eye.

Adapted from: *TALC Xerophthalmia slide set* (Tropical Child Health Unit, Institute of Child Health, London)

Activity

VITAMIN A CAPSULES TO TREAT AND PREVENT VITAMIN A DEFICIENCY

Purpose: Part One: To recognize xerophthalmia, and know how to give vitamin A capsules for treatment of vitamin A deficiency.

Part Two: To identify who is at risk of vitamin A deficiency, and know how to give vitamin A capsules in the correct dosage and schedule for prevention.

Time: 2 1/2 - 3 hours

Materials:

- Vitamin A capsules
- Handouts: A) "WHO/IVACG Guidelines for Vitamin A Capsule Distribution for *Treatment* of Xerophthalmia"

  B) "WHO/IVACG Guidelines for Vitamin A Capsule Distribution for *Prevention* of Xerophthalmia"
- Copies of Case Studies for Treatment and Copies of Answers
- Copies of Case Studies for Prevention and Copies of Answers
- Capsule distribution forms used in your country
- Flipchart, paper and pens

If the national schedule in your area is different than the WHO/IVACG guidelines provided here, please substitute the correct national information for use in this activity.

Part One: Vitamin A Capsules to TREAT Vitamin A Deficiency

Procedure:

1) Ask the participants which diseases or childhood illnesses should include vitamin A as part of their treatment. Ask the participants to identify and describe the clinical eye signs of xerophthalmia. Write the responses on a flipchart.

2) Distribute and discuss the national and/or WHO/IVACG (see Handout A) policy for distributing vitamin A capsules for treatment (target groups, dosages, schedules, service delivery mechanisms). Make sure everyone understands that:

   - *half doses (100,000 IU) should be given to children under one year old or who weigh under 8 kg;*

     children with acute or prolonged diarrhea, acute lower respiratory infections, protein-energy malnutrition, or measles are high-risk cases;

- *children over 6 years receive the same doses as children ages 1-6 years;*
- *pregnant or lactating women who live in vitamin A deficient areas are at risk.*

3) Distribute the capsule distribution forms and ask one of the participants to explain how to complete the forms.

4) Distribute the case studies and have the participants work in groups of 3 to determine the correct responses. Have the participants record on the capsule distribution form any capsules they decide to distribute in the case study.

5) In the large group, review the case studies and the completed capsule distribution forms and discuss the correct responses. Draw attention to problems (potential ones or ones that have arisen in the past) concerning follow-up for treatment cases that require second and third doses. Ask the participants for their ideas about avoiding these problems. Note responses on a flipchart.

Copies of *Answers for Treatment Case Studies* can be given to each participant as a handout at the end of this activity.

Part Two: Vitamin A Capsules for Prevention of Vitamin A Deficiency

Procedure:

1) Ask participants which groups are at HIGH risk for vitamin A deficiency. Distribute and discuss the national and/or WHO/IVACG policy for the preventive distribution of vitamin A capsules.

2) Discuss:

the schedule;

children ages 6 months-6 years as a risk group for which prevention is warranted;

the special cases of women who are of childbearing age, women who are pregnant or lactating, and infants less than 12 months of age;

other situations to be alert to, such as a child with worms, an infant given breast-milk substitutes, an infant given foods before 4-6 months of age, and an infant taken off the breast completely before 4-6 months of age; and

- *children and adults in emergency situations such as famines.*

3) With the group, list the reasons why record-keeping is important. Distribute the distribution forms, and ask someone to demonstrate how to fill out the forms correctly.

4) Distribute the case studies for prevention. Proceed as in Part One.

Copies of *Answers for Prevention Case Studies* can be given to each participant as a handout at the end of this activity.

Handout A

WHO/IVACG Guidelines for Vitamin A Capsule Distribution (as of 1988)

TREATMENT OF XEROPHTHALMIA

CATEGORY	*DOSAGE*	
Children over 1 year (and adults, except women of reproductive age) with any stage of active xerophthalmia (nightblindness, conjunctival xerosis, Bitot's spots, corneal xerosis or keratomalacia)	*Immediately on diagnosis*	*200,000 IU vitamin A orally*
	The following day	*200,000 IU vitamin A orally*
	1–4 weeks later	*200,000 IU vitamin A orally*
Children under 1 year and any child weighing less than 8 kg with any stage of active xerophthalmia	*Immediately on diagnosis*	*100,000 IU vitamin A orally*
	The following day	*100,000 IU vitamin A orally*
	1–4 weeks later	*100,000 IU vitamin A orally*
Women of reproductive age, pregnant or not, with nightblindness, or Bitot's spots	*Daily for 2 weeks*	*10,000 IU vitamin A orally (1 sugar-coated tablet)*

Attention: A damaged cornea is a medical emergency and should be referred to a hospital. If possible, an antibiotic eye ointment such as tetracycline or chloramphenicol is recommended. To prevent further trauma to the cornea, the eye should be protected by an eye shield (not a tight bandage).

Case Studies for Treatment

1. Three year-old Elena and her mother come to your clinic. Elena has had diarrhea for two weeks and her mother also says she has difficulty seeing at dusk. *What would be your diagnosis? How would you treat this situation?*

2. Eight month-old Dwi is brought to your clinic by her mother. She has some white, foamy spots on the white part of her eye. *What would be your diagnosis? How would you treat this situation?*

3. Four year-old Jorge is brought to your clinic by his mother. He has foamy, white spots on the white part of his eye. He had been given a vitamin A capsule at the clinic two months ago. *How would you treat this eye problem?*

4. Two year-old Misumba has severe protein-energy malnutrition. Her mid-upper arm circumference is only 11.5 cm. She was given a high dose (200,000 IU) vitamin A capsule five weeks ago. She has just been diagnosed as having measles. She lives in Burkina Faso. *How would you treat this situation?*

5. Meera is seven months pregnant. Because she has a lot of trouble seeing in dim light, her friend who is a health worker recommended that she go to the health clinic. *What is the standard procedure for treating a pregnant woman who most likely is nightblind?*

6. Rahman is one year old. He has developed nightblindness and a corneal ulcer. What is the protocol for treatment? *What other interventions would you recommend?*

Answers for Treatment Case Studies

1. Elena has two high-risk conditions: prolonged diarrhea and nightblindness. According to the WHO guidelines, Elena should be given 200,000 IU immediately upon diagnosis (today), 200,000 IU tomorrow, and 200,000 IU 1-4 weeks later. It is also very important that she receive oral rehydration therapy to prevent dehydration from her diarrhea. She should be encouraged to eat frequently and her foods may be softened. After she recovers from diarrhea, she should be encouraged to eat more than usual to regain any weight she has lost.

2. Dwi appears to have Bitot's spots. She should be given the treatment dose for this active stage of xerophthalmia with a high dosage of vitamin A. However, because she is less than 1 year old, she should only be given half the normal dose [100,000 IU immediately upon diagnosis (today), 100,000 tomorrow, and 100,000 1-4 weeks later].

3. One high-dose vitamin A capsule (200,000 IU) will normally protect a child for 3-6 months. It is possible for vitamin A deficiency to occur several months after a child is given a high-dose supplement, especially if the child experienced several episodes of illness during this period. The white, foamy spots on the white part of the Jorge's eye indicate Bitot's spots. Jorge should be given the treatment schedule of vitamin A (200,000 IU today, 200,000 IU tomorrow, and 200,000 IU in 1-4 weeks).

4. Since Misumba was given a vitamin A capsule 5 weeks ago, she is still considered within the 3-6 month protective period for prevention of vitamin A deficiency without disease. However, she is past the one-month period for disease-targeted prevention. In addition, she has measles, which means that she should be given the full treatment schedule for xerophthalmia regardless (1 dosage of vitamin A immediately, 1 dosage of vitamin A 1 day later, and 1 dosage in 1-4 weeks). Measles and vitamin A status are closely linked. During measles, vitamin A levels fall rapidly, protection against other infections decreases, and potentially blinding corneal damage is frequent. Giving vitamin A immediately limits eye damage and increases survival.

   Misumba should be weighed to determine how much vitamin A she should receive because she may weigh less than 8 kg due to her severe protein-energy malnutrition. If she does weigh less than 8 kg, she should receive 100,000 IU of vitamin A each time. If she weighs more, she should receive 200,000 IU each time.

5. Meera has nightblindness. Since she is pregnant, she should be given 10,000 IU of vitamin A orally every day for 2 weeks.

6. Rahman is at serious risk of blindness and death. He should be treated for xerophthalmia immediately and monitored closely afterwards. He may also be light for his age, so he should be weighed. If he weighs more than 8 kg, the protocol or standard procedure for treatment of nightblindness for a child 1 year of age or older is 200,000 IU vitamin A orally immediately on diagnosis (today), 200,000 IU vitamin A orally tomorrow, and 200,000 IU vitamin A orally 1-4 weeks later. If Rahman weighs less than 8 kg, he should receive 100,000 IU vitamin A today, 100,000 IU vitamin A tomorrow, and 100,000 IU vitamin A 1-4 weeks later. His mother should be encouraged to feed Rahman vitamin A-rich foods that are available locally.

Handout B

WHO/IVACG Guidelines for Vitamin A Capsule Distribution (as of 1988)

PREVENTION OF VITAMIN A DEFICIENCY & XEROPHTHALMIA

Universal-Distribution Prevention Schedule

CATEGORY	*DOSAGE*
Children 1-6 years old	*200,000 IU of vitamin A orally (1 high-dose capsule) every 3-6 months*
Infants 6-12 months old, or older children who weigh less than 8 kg	*100,000 IU of vitamin A orally (1/2 capsule)*
Lactating mothers	*200,000 IU of vitamin A orally once at delivery or within 1 month after delivery*

Attention: When infants less than 6 months old are not being breast-fed, supplementation with 50,000 IU of vitamin A before they reach 6 months should be considered.

Disease-Targeted Prevention Schedule

HIGH RISK GROUPS	*DOSAGE*
Children 1-6 years old with measles, acute or prolonged diarrhea, severe protein-energy malnutrition, or acute lower respiratory infections	*200,000 IU of vitamin A orally (1 high dose capsule) at time of first contact with health worker*
Infants under 1 year, or any child weighing less than 8 kg with measles, acute or prolonged diarrhea, severe protein-energy-malnutrition, or acute lower respiratory infections	*100,000 IU of vitamin A orally (1/2 capsule) at time of first contact with health worker*

Attention: In areas where measles is particularly severe, with a high mortality rate and risk of blindness, as in Africa, it is appropriate to apply the full xerophthalmia treatment schedule for measles cases. The above dosages should not be given to children who have already received a high dose vitamin A supplement within the preceding month, except for cases of measles which should always be treated.

Case Studies for Prevention

Prevention here means the prevention of any eye signs of xerophthalmia, such as nightblindness, Bitot's spots, xerosis, corneal ulcers, and keratomalacia. Remember, an infant, child and/or pregnant/lactating woman can be vitamin A deficient and not have any of the above clinical manifestations of eye problems.

1. Julia, age 22, comes to the health center. She gave birth six months ago. She did not receive a vitamin A capsule after the birth of her infant. She lives in a community which has a lot of VAD. *Would you assume Julia is vitamin A deficient? Would you give the mother and baby a capsule? If yes, what is the dosage you would give?*

2. Mariama is 11 months old. She was brought to the health center by her mother because of chronic diarrhea. *How do you prevent the diarrhea from becoming more severe? What would you check for?*

3. Kisanga is 3 years old. She lives in rural northeast Zaire. Her mother brought her to the health center because of malaria. Kisanga was also found to have a white material on the white part of her eye. When asked about the material on the eye, her mother said she noticed it after Kisanga had measles two weeks ago. *What does this indicate? What would you do in order to prevent this type of eye damage from getting worse?*

4. Fatima is 22 years old and pregnant. You suspect she may be deficient in vitamin A because her other two children had Bitot's spots. *Would you assume she is vitamin A deficient? If she is, what would you do?*

5. Julio, 10 months old, was brought to the clinic because he has measles. He shows no ocular manifestations of xerophthalmia. He lives in Guatemala. *How would you prevent him from developing an acute eye problem or complications from measles?*

6. Maria is three years old and was brought to the clinic because of her prolonged diarrhea, which has lasted over two weeks. The doctor diagnosed her as also having acute lower respiratory infection. *What would you do for Maria's diarrhea? Her acute lower respiratory infection? What additional preventive measures would you take?*

Answers for Prevention Case Studies

1. Julia may be vitamin A deficient, so she should be encouraged to eat vitamin A-rich foods. She should have received a dose of 200,000 IU within a month of delivery. By now, she may be pregnant again. Large doses of vitamin A should be avoided by women who might be pregnant, because too much vitamin A may harm the fetus.

   The infant should be given a preventive dose of 100,000 IU of vitamin A orally every 3-6 months as long as he continues to be at risk.

2. Diarrhea can rapidly cause dehydration and death. Oral rehydration therapy should be given to prevent dehydration. Mariama should also continue to be fed, especially breastmilk and staple foods that are part of her normal weaning diet, such as millet porridge. She should be encouraged to eat more often, and solid foods should be softened. The cause of the diarrhea needs to be diagnosed by qualified personnel. After recovery, Mariama should be given more food than usual to regain any weight she has lost. Diarrhea that lasts more than 14 days is a risk condition for VAD, and so Mariama should be given vitamin A in addition to treatment for her diarrhea. Because Mariama is not yet 1 year old, she should be given only 1/2 of a vitamin A capsule (or 100,000 IU). If there are any signs of xerophthalmia (such as Bitot's spots, xerosis, etc.), she should be given vitamin A according to the treatment schedule.

3. First, Kisanga should be treated for malaria by qualified medical personnel. The white material on his eye is most likely a Bitot's spot. This condition can be cured with a high dosage of vitamin A—a 200,000 IU vitamin A capsule given immediately, followed by another dosage the next day, and a third dosage 1-4 weeks later.

4. Fatima may be vitamin A deficient. However, she should not be given a high dose (200,000 IU) of vitamin A because giving a high dose of vitamin A to a pregnant woman carries with it a small risk of harming the fetus. Any vitamin A supplementation to pregnant women, even in modest doses, should be undertaken with caution. Fatima should be counseled to eat foods rich in vitamin A and should receive a vitamin A capsule (200,000 IU) one month after giving birth. If, while pregnant, she develops nightblindness or Bitot's spots, the WHO recommends treating her with a daily oral dose of 10,000 IU of vitamin A for 2 weeks. The risk to the fetus of this lower-dose vitamin A supplementation is outweighed by the benefit to the mother.

5. Julio should be treated for the measles and should receive one 100,000 IU dose of vitamin A. In addition, he should be encouraged to eat vitamin A-rich foods that are available in the community.

6. Give Maria a high dose of vitamin A (200,000 IU) to prevent vitamin A deficiency and worsening of the diarrhea. The cause of the diarrhea should be diagnosed by the doctor and treated. The doctor should recommend treatment for her acute lower respiratory infections. Maria should be given oral rehydration therapy to prevent her from becoming dehydrated. Maria should continue to be fed frequently and foods should be softened for her. After the diarrhea is over, she should be fed more food than normal so that she can regain any weight that she lost. To prevent vitamin A deficiency from recurring, Maria should be encouraged to eat vitamin A-rich foods that are available in the community. Talk with Maria's mother about ways to prevent diarrhea, such as preparing foods with clean water and clean hands, and having all family members wash their hands before eating.

CATARACT

The following activities will instruct health workers to detect, refer, and provide follow-up care to cataract patients. It will also develop skills for counseling and motivating patients to seek cataract surgery.

Activities:

Cataract Detection, Referral and Post-Operative Care (1 hour)

Purpose: To learn to detect cataract, refer patients for surgery, and provide post-operative care.

Motivating and Referring Cataract Patients for Surgery (1 hour 30 minutes)

Purpose: To develop counseling skills for cataract patients and family members so that they seek treatment for cataract; and to explain the referral system for the community.

CATARACT FREE ZONES

In 1986 Helen Keller International, the National Eye Institute, Pan American Association of Ophthalmology, and the Pan American Health Organization launched a program with key Latin American ophthalmologists to demonstrate that cataract, the leading cause of blindness worldwide, could be simply and safely operated in rural areas as well as urban slums of Peru and Brazil. Since then the program has been undertaken in the Philippines, Indonesia, Sri Lanka, Chile, Argentina, Bolivia, Ecuador, Uruguay, Mexico and Venezuela.

Cataract Free Zones are projects that enable all those who need and want cataract surgery to obtain it and return to their own homes to recover. Working with community organizations, teams of ophthalmologists and primary health care workers, HKI has achieved dramatic results in making cataract surgery available to poor people. In Brazil, 60% of those diagnosed as bilaterally blind actually received cataract surgery. As a result of the campaign in Peru, the number of surgeries performed have tripled. Patients can now recover at home instead of in an expensive hospital bed. Patients usually receive free glasses (aphakic) after the surgery. By massive public awareness campaigns and eye screening exams, all persons who come forward with cataracts or visual problems are assisted through surgery or the provision of eye glasses.

A manual describing the objectives and methods of a Cataract Free Zone is available from Helen Keller International. The manual is available in English, Spanish, and Portuguese.

Activity

CATARACT DETECTION, REFERRAL AND POST-OPERATIVE CARE

Proper preparation for this activity requires that you know where to refer the patient, once a cataract is identified.

Purpose: To learn to detect cataract, refer patients for surgery, and provide post-operative care.

Time: 1 hour

Materials:
- Slides 1, 16, 20
- Handout: **"How to Care for A Patient Who Has Had Cataract Surgery'**
- Flipchart and markers

Procedure:

1) Show slide 1 (healthy eye) and review with the participants the signs of a healthy eye.
   - The eyelids should open and close properly

     Eyelashes should point away from the eye

     The white part should be white and smooth

     The pupil should be black (most important in cataract detection)

     The cornea should be clear
   - The vision should be good
2) Show slide 16 (cataract). Ask volunteers to describe what they see in the slide. Ask them to compare the appearance of the eye in the slide with that of a healthy eye. Note the descriptions on the flipchart.
3) Repeat step 2 with slide 20 (corneal scar).
4) Using the Trainer's Guide below, review with the participants the characteristics, signs and symptoms of a cataract.
5) Distribute the handout **"How to Care for A Patient Who Has Had Cataract Surgery'** Review with the group, and demonstrate the procedures on a volunteer.
6) If possible, arrange a visit to a nearby health facility where cataract surgery is performed to see actual cases of cataract and to allow health workers to practice post-operative examinations.

Trainer's Guide for Cataract

Slide 16 (cataract)

Definition: A cataract is the term which describes any loss in transparency of the lens.

Cataract is more common in older persons. It is rarely found in babies and children. The exact cause of cataract is not known. The following factors may contribute to cataract: aging, sunlight, malnutrition, trauma, diarrhea, some medicines such as steroids, and some diseases such as diabetes.

Signs and Symptoms

- patient complains of gradual and painless loss of vision
- patient describes vision as cloudy or misty
- the pupil is not black, but looks white, brown or gray

Cataract can be treated by surgery. Surgical removal of the cloudy (opaque) lens is now a simple procedure. An alternative lens to replace the natural one may be introduced in the space previously occupied by the lens. Thick glasses, known as aphakic spectacles, are used when the lens is not replaced by surgery. If the patient has a lens implant, he/she will not need aphakic glasses.

There is no known method for preventing the development and growth of cataracts. Once the eye develops a cataract, that eye may gradually lose its vision until finally it becomes totally blind. There are no medicines which can remove a cataract.

Action

History	Ask the patient to describe his/her vision.
Examination	Measure the patient's visual acuity. Examine the patient's pupil. If the person can still tell light from dark and notice movement, cataract surgery may allow him/her to see again.
Treatment	Refer for surgery. After surgery, the patient may need aphakic glasses. These are high powered glasses for people who have had their natural lenses removed. If the patient has had a lens implant, he/she will not need aphakic glasses.

DESCRIPTION OF CATARACT SURGERY

After the eye is thoroughly cleaned, an anesthetic is injected into the eye. The patient only feels a needle prick.

The cornea is cut so that the doctor can see the lens. The patient feels no pain.

The lens is removed by using one of the two procedures:

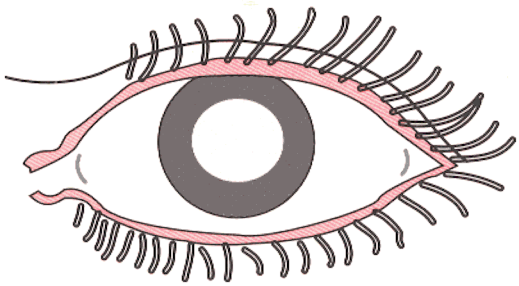
a) Intracapsular cataract extraction (ICCE): The lens and its capsule is removed in one piece, and the corneal wound is sutured. The patient is given aphakic glasses (thick and high-powered) in order to see well afterwards.

b) Extracapsular lens extraction (ECCE): The lens capsule is opened and the lens material is aspirated out. The surgeon puts an intraocular lens into the space where the lens used to be, then sutures the corneal wound. The artificial lens lets the patient see well after surgery.

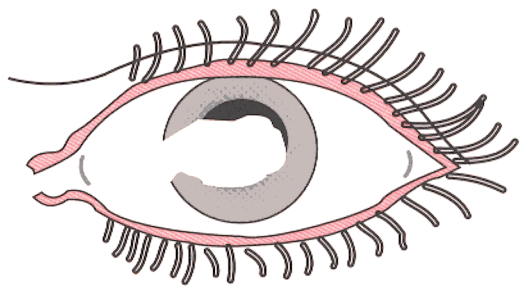
A corneal scar is often mistaken for a cataract.

It is important not to confuse a cataract with a corneal scar. Like cataract, corneal scarring is a major cause of blindness. It is estimated that corneal scarring is the cause of 25% of blindness. It is a condition which is difficult to treat or not treatable at all. However, most of the causes of corneal scarring are preventable. Corneal scars can be caused by: trachoma, xerophthalmia (vitamin A deficiency), neonatal conjunctivitis, onchocerciasis, corneal ulcers, or harmful eye practices which lead to corneal infections. The table below summarizes the differences between a cataract and a corneal scar.

CATARACT	CORNEAL SCAR
Located inside of the eye	Located on the surface of the eye
Centrally located	Is rarely centrally located
Appears in the pupil	Appears on the cornea
Borders are regular, look round	Borders are irregular, do not look round
Changes in size when light is shone on the eye	Does not change in size when light is shone on the eye



Cataract



Corneal Scar

Unlike a cataract, a corneal scar may block the view of the pupil (black part of the eye). When light is shone on the eye, a corneal scar does not change in size, whereas a cataract appears to change size. It appears to change in size because the pupil becomes smaller because of the light, and the lens and cataract appear to become smaller as well.

Handout

HOW TO CARE FOR A PATIENT WHO HAS HAD CATARACT SURGERY

Wash your hands thoroughly before examining the eye.
If the eye is patched, remove the patch gently.
Open the eyes carefully, avoiding pressure on the eye.
As in a typical eye exam, examine the eye with a flashlight or torch or in good daylight.
Instruct the patient to look down, and up. Is there:

any pus or secretions in the conjunctiva or behind the cornea?
a hazy cornea?
swelling of the eyelids?
blood behind the cornea?

If the answer to any of the above questions is yes, the patient should be referred back to the doctor. If this is not possible, proceed as follows:

Pus:	Clean the eye with a sterile, moist piece of cotton and resume antibiotic ointment. If available, you may also give oral antibiotics for 5 days.
Hazy cornea:	This is a dangerous sign! Increase antibiotics and refer to the nearest facility.
Swelling eyelids:	Apply a warm moist compress.
Blood behind the cornea:	Provide a high back rest, and patch both eyes. Remove the patches when the blood has been absorbed completely.

To take the visual acuity, ask the patient to count fingers at a distance of 1 meter or nearer. He/she cannot be expected to read the visual acuity chart, unless he has received an intraocular lens (lens implant) or aphakic glasses.

Give the following instructions to patients who have had cataract surgery:

Avoid bending or stooping.
Avoid taking a shower until the doctor says it is safe to do so.
Avoid rubbing the eye which has been operated.
Wear an eye shield or glasses when going out of the house.
Clean the eye gently, removing excess ointment. Use eye medicines as directed by the doctor.
Return for scheduled checkups, or earlier if there is pain, discharge, and/or the vision is very poor.

Activity

MOTIVATING AND REFERRING CATARACT PATIENTS FOR SURGERY

Purpose: To develop counseling skills for cataract patients and family members so that they seek treatment for cataract; and to explain the referral system for the community.

Time: 1 hour 30 minutes

Materials:
- Flipcharts and markers

Procedure:

1) Ask the group to list as many reasons as possible why persons with cataract may not want to seek treatment. Write the reasons on flipchart. Include information you may have from program evaluations or community interviews.

2) Introduce the following game to the group.

   [a] Cut the list of reasons into separate pieces of paper, with one reason on each. Fold them and put them in a box.

   [b] Ask for at least 3 volunteers who will act as judges, then divide the group into two teams.

   [c] The trainer will draw one of the reasons from the box, and read it aloud. Each team will discuss it. Representatives of Team A will play the role of the person or family who would not want to seek treatment and Team B will be the ones to counsel them.

   [d] Judges rate the counseling team by holding score cards with 1, 2, and 3 stars on them and explain why they gave such a rating.

   [e] Repeat steps [c] & [d] with Team A and B alternating as counselor until most of the common reasons have been dramatized and both have had equal number of times as counselor.

   [f] The team with the highest number of stars at the end of the game wins.

Possible Reasons for Dramatization:

Use the list generated in step 1 of this activity. The following are some additional ideas the group may also want to consider based on other cataract programs:

Patient says he/she is too old to seek treatment.
Patient says he/she does not have money for transportation for going to the health facility.
Patient says he/she needs a companion to go to the center and there's no one in the house to accompany him/her.
Patient is afraid he/she might die during surgery.
Patient says he/she cannot afford the surgery.

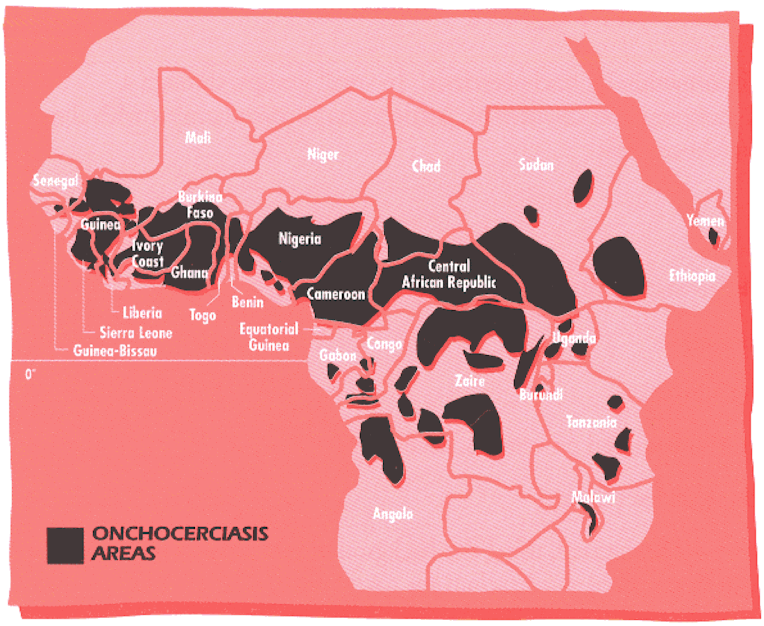
Patient says he/she knows of someone who went blind after surgery.
Patient says he/she may not be able to work after surgery.
Patient says a gray eye — like gray hair — is part of the aging process.
Patient says the surgery is painful.
Patient says he wants medicines instead.

3) After the game, ask the participants to generate a list of the motivation techniques just demonstrated. Write the list on a flipchart. What kind of information seemed to be helpful in convincing patients to seek cataract surgery? Ask the group to summarize what they learned about counseling.

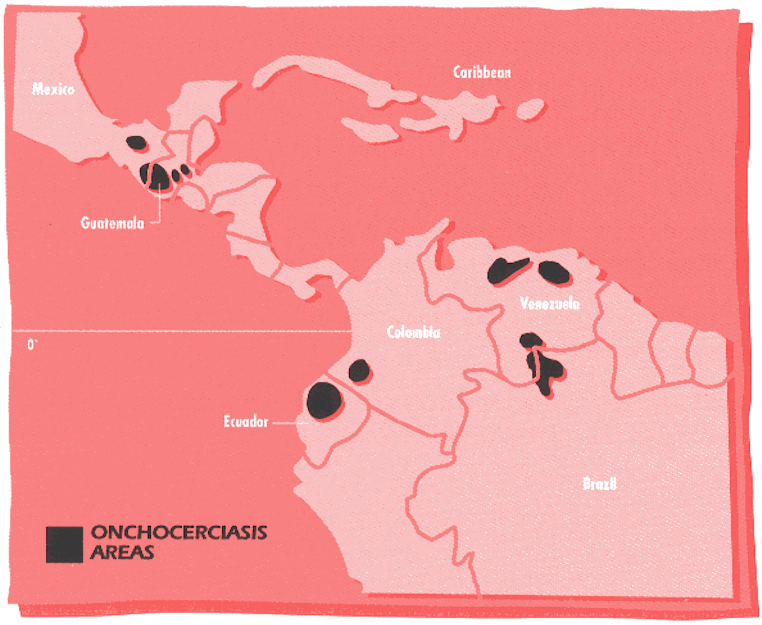
4) To end, explain the referral system for cataract surgery in your area, so that the health workers know where to send patients who may be eligible for surgery, how much it costs, whether lens implants or glasses are available and at what cost.

ONCHOCERCIASIS AND IVERMECTIN

Onchocerciasis Distribution in Africa



Onchocerciasis Distribution in the Americas



The activities included here will enable health workers to understand the causes and symptoms of onchocerciasis, and how it can be treated and prevented with ivermectin. For more training activities, we refer you to HKI's *Onchocerciasis and Mectizan: Training Activities for Community Health Workers.*

Activities:

What is Onchocerciasis and How Does it Affect our Heath? (1 hour 30 minutes)

Purpose: To provide background information on onchocerciasis.

Distribution of Ivermectin for the Prevention and Treatment of Onchocerciasis (1 hour 30 minutes)

Purpose: To learn skills to correctly distribute Mectizan for the prevention and treatment of onchocerciasis.

Activity

WHAT IS ONCHOCERCIASIS AND HOW DOES IT AFFECT OUR HEALTH?

Purpose: To provide background information on onchocerciasis. In small groups, through a True/False exercise with questions and discussions, participants become familiar with the cause and symptoms of onchocerciasis.

Time: 1 hour 30 minutes

Materials:

- Slides 25, 26, 27
- Three sets of True/False Statements:
  - A) Cause of onchocerciasis
  - B) Symptoms of onchocerciasis
  - C) Use of ivermectin to treat and prevent onchocerciasis
- Handout: "Onchocerciasis Fact Sheet"

Procedure:

1) Prepare a lecturette on onchocerciasis, using the background information provided here. This material can also be prepared as a handout for participants.

2) After the lecturette, divide participants into groups of 5-7. Each group should receive a list of True/False statements. For the first round, give each group a set of statements on the cause of onchocerciasis. Ask the groups to consider each one of its statements and determine whether it is true or false.

3) For each statement, ask someone from each group whether his/her group thought the statement was true or false and explain why. With the large group, attempt to reach a consensus on the correct response. If necessary, the trainer should provide the correct answer and explanation. Each team will receive one point for each correct answer.

4) Repeat the above steps for the two remaining lists of True/False statements. The group with the greatest number of points is declared the winner. An appropriate local prize such as a poster or brochure can be given to the winning group.

5) End the activity by distributing a copy of the "Onchocerciasis Fact Sheet" to each of the participants and reviewing it with them.

Option: Cut the questions into strips and have each participant draw one. Ask each participant to tell the group whether his/her statement is true or false. The group agrees or disagrees with the participant and explains why.

ONCHOCERCIASIS:

Background Information

Onchocerciasis is a parasitic disease caused by worms (*Onchocerca volvulus*) which are transmitted by the bite of a black fly (genus Simulium). Onchocerciasis is known as river blindness because the disease occurs near fast flowing rivers where the black fly breeds. The infecting worms are passed from human to human when the female fly ingests the baby worms, or "microfilaria," while taking her blood meal from the skin of an infected person. The worms migrate from the stomach to the head of the fly, where the bite of the female black fly can transmit the microfilaria into the another, uninfected person. The worms mature after 1-3 years into thread-like adult worms which live in nodules under the skin (Slide 25). Adult females can live up to 14 years, and reach a length of 50 centimeters (male adult worms rarely exceed 5 centimeters). After mating, the adult female worm produces millions of microfilaria. The presence of large numbers of these baby worms causes rashes and severe itching. Over time, the skin can become swollen, or depigmented with pinkish white patches called "leopard skin" (Slide 27). With repeated infection over several years, the small worms migrate throughout the skin and eventually to the eyes. The body's immune reactions to the microfilaria often lead to blindness (Slide 26) and severe skin damage. Communities most adversely affected by onchocerciasis are usually found within a few kilometers of the breeding site on the rivers, as the flies usually feed near their breeding sites.

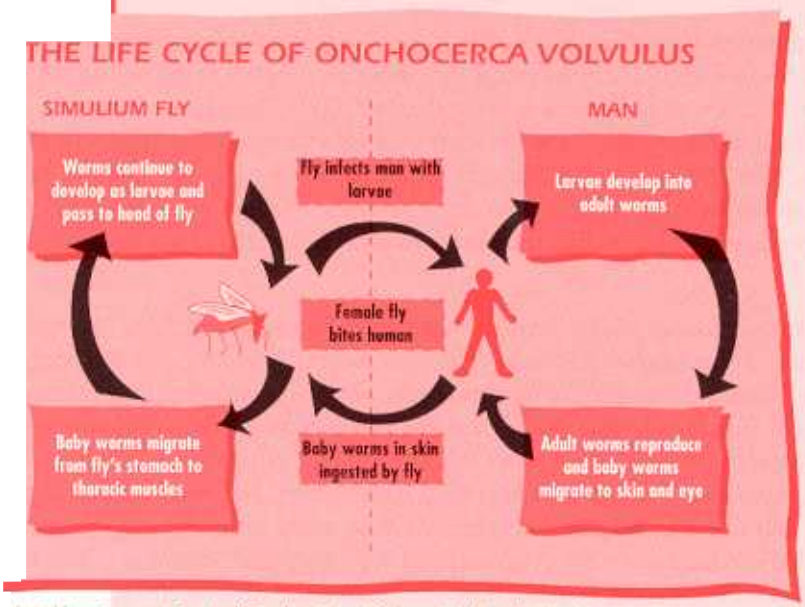
According to the World Health Organization, 85 million people are at risk of onchocerciasis in 27 countries in Africa and 6 countries in Latin America; 18 million are infected with the parasite, leading to visual impairment in 1 million and blindness in more than 400,000. The disease is the fifth most common cause of blindness in the world. Countries most strongly affected are in Africa. *In badly affected communities more than 50% of the inhabitants will become blind before they die.* Because of the disease, some populations are forced to migrate away from fertile river valleys to less productive areas. Therefore, in addition to its impact on health, onchocerciasis also has social and economic consequences.

For over two decades now, worldwide efforts have developed three strategies which are currently being employed to prevent and /or control onchocerciasis. The most recent, widely supported strategy uses ivermectin (trade name Mectizan), an effective microfilaricide which was made available for human use in 1987 by Merck and Co., Inc. Ivermectin has replaced banocide as the drug of choice for treatment of onchocerciasis since it is safer and has fewer side effects. Side effects typically appear 48-72 hours after taking the drug, some of which include itching, nausea, fever, and swelling. Ivermectin treatment also requires only one dose per year. A single oral dose, while not eliminating the adult worm, kills the microfilaria and thus halts the progression of eye lesions and blindness. Treatment must continue every 12 months for up to 15 years, however, because the adult worms survive for up to 14 years and begin to reproduce several months after each round of ivermectin therapy.

Before the availability of ivermectin, insecticides that killed the larvae of the black fly were the chief mechanism used to control onchocerciasis. This strategy, called "vector control", was managed by the Onchocerciasis Control Program (OCP) in 11 countries in West Africa. Vector control has played a significant role in the control of riverblindness. Unfortunately, areas outside of the 11 countries were unable to employ pesticidal means due to its prohibitive costs.

The last strategy involves surgical methods to remove the nodules which house the adult worms. This approach has severe limitations and is not accepted as a control strategy in most countries. Other available medicines are also not accepted because of their severe toxicity. There are new hopes that a safe and effective medicine which would kill the adult worms can be developed.

Since the availability of ivermectin, there has been a dramatic increase in the number of onchocerciasis control programs throughout Africa and Latin America. One such endeavor is The African Programme for Oncho Control (APOC), modeled on the successful Onchocerciasis Control Programme. APOC is a collaboration of national and international agencies, both governmental and non-governmental, that promotes community-based ivermectin distribution in 16 non-OCP African countries. The APOC will be headquartered in Africa, but like OCP, its sponsorship is multi-leveled. Support for APOC derives from prominent entities like The World Bank, which organizes and mobilizes funds, to smaller organizations like the non-profit Carter Center, whose spokesperson for such continental disease control is former U.S. President Jimmy Carter.



dapted from: Community Eye Health Teaching Series, "Onchocerciasis (River Blindness)," onal Centre for Eye Health, Institute of Ophthalmology, London.

Significant progress has been made in the effort to control onchocerciasis. Much of this progress was spearheaded by Merck's decision to donate ivermectin for as long as needed to approved riverblindness programs. The availability of free ivermectin and its clinically-proven effectiveness offered a unique chance to dispense the drug. Although ivermectin is safe enough for community-wide treatment, it has limitations —pregnant women, breastfeeding mothers, children under 5 years old or weighing less than 15 kilograms, and individuals extremely weak or terminally ill are all restricted from the usage of ivermectin. Furthermore, it must be taken once a year for at least 10-15 years. Given the long-term need for ivermectin, distribution programs must train a cadre of local health personnel and community members about onchocerciasis and its treatment with ivermectin.

TRUE/FALSE STATEMENTS ON IVERMECTIN AND THE CAUSES AND SYMPTOMS OF ONCHOCERCIASIS

Causes of onchocerciasis:

1. Onchocerciasis is caused by the bites of mosquitoes.
2. Onchocerciasis is caused by drinking dirty water.
3. Onchocerciasis is caused by the bites of black flies (also called simulium).
4. Onchocerciasis is caused by a poor diet.
5. Any kind of fly can transmit onchocerciasis.
6. Onchocerciasis is caused by contact with certain kinds of vegetation.

   Onchocerciasis can be transmitted from one person to another through sexual intercourse.
8. Onchocerciasis is caused by eating unusual (non-traditional) foods

Symptoms of onchocerciasis:

1. Onchocerciasis can cause depigmentation of the skin. — True
2. Onchocerciasis can cause headaches. — False
3. Onchocerciasis can cause intense itching.
4. Onchocerciasis can cause pain in the joints.
5. Onchocerciasis can cause nodules on the skin.
6. Onchocerciasis can cause decreased vision or blindness. — True

   Onchocerciasis can cause high fever.
8. Onchocerciasis always causes blindness.

Ivermectin:

1. Ivermectin is a drug that combats river blindness.
2. Ivermectin has no side effects. False
3. Ivermectin will restore pigmentation to depigmented skin. False
4. Ivermectin can cause itching, fever, and swelling.
5. Ivermectin can prevent blindness. True
6. Ivermectin can reverse blindness.

   Ivermectin can help stop itching. True
8. Pregnant women and children under 5 years of age cannot take ivermectin. T...
9. Doctors think that ivermectin is the best drug to use against onchocerciasis. True
10. Side effects associated with ivermectin appear within 72 hours of taking the drug. True

Handout

ONCHOCERCIASIS FACT SHEET

What is Onchocerciasis?

Onchocerciasis, also known as river blindness, is a disease caused by small worms that are spread from one person to another by the bite of a small black fly (*simulium*). There is only one genus of fly which can transmit onchocerciasis. The black fly lives and breeds near fast-flowing rivers. Once in the body, the worms, if not treated, can cause severe itching, skin lesions, visual impairment, and blindness. In some places, onchocerciasis is confused with other filarial diseases such as loa loa.

What are the effects of Onchocerciasis (River Blindness)?

Skin:

- Intense itching
- Skin rash
- Nodules (firm, painless lumps often found on the hips, head, or joints)
- Leopard skin (depigmentation of the skin)
- Skin that is extremely dry or wrinkled, or stretched skin in the groin area

Eyes:

- Red eyes
- Irritated eyes and/or tearing
- Light sensitivity
- Night blindness
- Reduced field of vision
- Reduced visual acuity
- Sclerosing keratitis (opacity of the cornea that begins peripherally and moves centrally over time)
- Blindness

How Widespread is the Disease in the World?

Onchocerciasis is considered to be the fifth leading cause of blindness in the world. The World Health Organization estimates that 18 million people are infected. Almost all (99%) of these people live in equatorial Africa. A small number live in Yemen, and the remainder of those infected are found in small regions of Central and South America.

Handout (cont.

Who is Most At Risk of Onchocerciasis?

Priority Risk Groups:

Anyone living in an area where over 60% of the population carries the parasite and/or 10% of the population is blind from the disease.

People who live and work near a black fly breeding site in a fast-flowing river.

Note: Not all fast-flowing rivers are black fly breeding sites.

People who live in villages where over 10% of the population has leopard skin, or over 2% of the population is blind, or over 30% of the population has nodules.

How Do You Prevent and Treat Onchocerciasis?

Prevention:

All eligible people should receive the appropriate dose of ivermectin once every 6 to 12 months according to their body weight or height.

Wear protective clothing and cover as much skin as possible to avoid being bitten when near a river known to be populated by the black fly.

Treatment:

For all eligible people with signs and symptoms of onchocerciasis, give between 1/2 and 2 tablets of ivermectin depending on the patient's weight or height (See page 114 for dosage table).

What are the Benefits of Ivermectin?

People who use ivermectin can expect relief from itching and a general improvement in the appearance of their skin. In addition, if they take the drug at least once a year, their vision will not worsen as a result of the disease.

What Are the Limitations of Ivermectin?

Ivermectin has little or no effect on existing skin nodules and absolutely no effect on depigmented skin and blindness. Ivermectin will NOT cure or reverse blindness, and it will NOT reverse any skin discoloration. It is important that patients understand this in order to avoid disappointment and frustration.

The following people should NOT be given the drug:

Pregnant women

Mothers breastfeeding newborn babies less than 1 week old

Children under 15 kg (generally this applies to children under the age of 5 years old)

Individuals too weak to walk, or who are gravely ill

Activity

DISTRIBUTION OF IVERMECTIN (MECTIZAN) FOR THE PREVENTION AND TREATMENT OF ONCHOCERCIASIS

Purpose: Participants will acquire the skills necessary to correctly distribute Mectizan for the prevention and treatment of onchocerciasis.

Time: 1 hour 30 minutes

Materials:
- Handout: **"Skills Involved in Distributing Mectizan"**
- List of Different Types of Villagers

Procedure: *Part 1:* Distribute the handout, "Skills Involved in Distributing Mectizan", to all the participants, and review it with the group. Key information should also be presented on flip chart during the review, including:

- People who should not take ivermectin
- Mild side effects (and appropriate response)
- Serious side effects (and required response)
- How often ivermectin should be taken

  How to determine the correct dosage

  Be sure to go over the specific forms that the participants will need to fill out in their Mectizan distribution work. Invite questions and discussion from the participants.

Part 2:

a) Ask the participants to take turns playing the role of a health worker who distributes Mectizan. Ask the other participants to draw from a box a strip of paper with a description of a villager written on it. The strips of paper can be cut from a copy of the attached "List of Different Types of Villagers" or new "types" of villagers can be created.

b) One by one, ask the participants to role-play their villager going to one of the health workers to receive Mectizan. Ask the participant role-playing the health worker to read the strip of paper to the group and then interact with the participant/villager accordingly. The health worker must convey the necessary information to the villager, weigh or measure him/her if necessary, give him/her, if necessary, the appropriate dose of Mectizan, and fill out, if necessary, the appropriate form(s).

c) After each health worker-villager exchange, ask the group to comment on the performance of the health worker, referring to Handout: "Skills Involved in Distributing Mectizan". The following questions may serve as a guide:

How well did the patient understand the medicine given to him/her?

Were the patients who did not receive Mectizan given an explanation or told when they could return for a dosage?

Was the proper dosage prescribed? If not, what would be the correct dosage? Why?

d) Attempt to reach a consensus with the group on how, if at all, the health worker's performance could have been improved.

Handout

SKILLS INVOLVED IN DISTRIBUTING MECTIZAN

Communicate the following information to the patient before giving him/her Mectizan:

1. The following groups of people cannot take Mectizan:

   pregnant women

   mothers with children less than 1 week old

   children under 5 years old or weighing less than 15 kilograms

   - gravely ill people (as indicated by any difficulty in walking)

2. A person taking Mectizan should not eat anything 2 hours prior to taking the drug and for the first 2 hours after taking it. He/She should not drink any alcohol the day before treatment, the day of treatment, and the day following treatment. He/She should not work the day of treatment and get plenty of rest.

3. Mild side effects are often observed in people taking Mectizan the first time. These can include:

   itching

   swelling of members or face

   muscle pain

   fever

   skin irruptions

   swelling of lymph glands in the groin

   fatigue

   headaches

   diarrhea

   nausea

   vomiting

   feeling of having grains of sand in the eyes

   - temporary vision problems

   Mild side effects usually disappear 48-72 hours after taking the drug. In the case of these side effects, the patient must lie down and take aspirin. If the patient's condition does not improve, refer to health specialist.

   Serious side effects such as respiratory problems (coughing, wheezing, etc.) and acute dizziness are observed in 1 out of every 1,000 people taking Mectizan the first time. In the case of serious side effects, the patient must be taken to hospital for treatment.

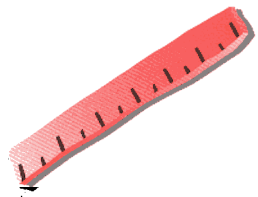
Handout (cont.)

4. People living in a region where onchocerciasis is widespread must take Mectizan at least once a year (sometimes once every six months, depending on the program) for as long as onchocerciasis exists in their region. When giving Mectizan, the health worker must tell the patient when he/she must take the drug again.

   Weigh or measure the patient:

   A health worker who is to distribute Mectizan to a patient must either:

   - have the patient stand on a scale and record his/her weight, or
   - measure the patient (preferably using a stick with four different colors indicating the four height ranges which correspond with the four different doses).



   Give Mectizan to the patient:

   The health worker must give the patient the correct dose of Mectizan according to the patient's weight or height and make sure the patient swallows the drug with clean water in the health worker's presence. In the case of young children, it is advised that the health worker look in their mouth to make sure that the dose has been swallowed.

Weight (kg)	Height (cm)	Number of pills per person
15-25	90-119	1/2
26-44	120-140	1
45-64	141-158	1 1/2
65+	159+	2

   Complete necessary forms:

   The health worker must fill out the Mectizan distribution forms required of him/her by the program coordinators. These forms vary from one program to another, but are an important part of all Mectizan distribution efforts.

LIST OF DIFFERENT TYPES OF VILLAGERS

(to be cut into strips)

1. A 24-year-old breastfeeding mother who gave birth 6 weeks ago and weighs 48 kg.
2. A 73-year-old blind man who measures 153 cm.
3. A 4-year-old girl in excellent health who weighs 25 kg.
4. A 22-year-old man suffering from epilepsy who weighs 68 kg.
5. A 14-year-old girl suffering from malaria who measures 103 cm.
6. A 37-year-old man with depigmented skin on his lower legs who weighs 63 kg.
7. A 53-year-old man suffering from severe itching who weighs 48 kg.
8. A 37-year-old man in excellent health who weighs 73 kg. and drank beer last night.
9. A 25-year-old pregnant woman in excellent health who measures 99 cm.
10. A malnourished 6-year-old boy weighing 14 kg.
11. A 62-year-old woman with nodules around her waist and severe itching who measures 138 cm.
12. A 19-year-old breastfeeding mother who gave birth 5 days ago and weighs 51 kg.
13. A 28-year-old pregnant woman with depigmented skin and nodules on her waist who measures 128 cm.
14. A 12-year-old boy with severe diarrhea who weighs 32 kg.
15. A 36-year-old man who took Mectizan 2 months ago and measures 182 cm.

16. A 4-year-old girl in excellent health who weighs 16 kg.

17. A 47-year-old man bedridden with hepatitis who weighs 63 kg.

18. A 27-year-old woman suffering from severe headaches who measures 160 cm.

19. A 14-year-old blind boy in excellent health who weighs 52 kg.

20. An 8-year-old girl suffering from severe itching who measures 103 cm.

21. A 43-year-old man suffering from intestinal worms who weighs 83 kg.

22. An 11-year-old girl suffering from malaria who measures 122 cm.

23. A 56-year-old man in excellent health, weighing 64 kg. who took Mectizan 2 years ago.

24. A 16-year-old breastfeeding mother who gave birth 10 days ago and measures 149 cm.

25. A 7-year-old boy in excellent health who weighs 28 kg.

26. A 19-year-old man measuring 172 cm. who drank palm wine the day before yesterday.

27. A 23-year-old asthmatic man who hasn't had an asthma attack in a year and who weighs 64 kg.

28. A 53-year-old man suffering from hypertension who weighs 95 kg.

Answer Key

1. Give 1 1/2 pills to the breastfeeding mother.
2. Give 1 1/2 pills to the 73-year-old blind man.
3. Give 1/2 pill to the 4-year-old girl.
4. Give 2 pills to the 22-year-old man suffering from epilepsy.
5. Give 1/2 pill to the 14-year-old girl suffering from malaria.
6. Give 1 1/2 pills to the 37-year-old man with the depigmented legs.
7. Give 1 1/2 pills to the 53-year-old man suffering from severe itching.
8. Do NOT give any pills to the 37-year-old man in excellent health.
9. Do NOT give any pills to the 25-year-old pregnant woman.
10. Do NOT give any pills to the malnourished 6-year-old.
11. Give 1 pill to the 62-year-old woman with nodules.
12. Do NOT give any pills to the breastfeeding mother who gave birth 5 days ago.
13. Do NOT give any pills to the 28-year-old pregnant woman.
14. Give 1 pill to the 12-year-old boy with severe diarrhea.
15. Do NOT give any pills to the 36-year-old man who took Mectizan 2 months ago.
16. Give 1/2 pill to the 4-year-old girl.
17. Do NOT give any pills to the 47-year-old man suffering from hepatitis.
18 Give 2 pills to the 27-year-old woman suffering from severe headaches.
19. Give 1 1/2 pills to the 14-year-old blind boy.
20. Give 1/2 pill to the 8-year-old girl suffering from severe itching.
21. Give 2 pills to the 43-year-old man suffering from intestinal worms.
22. Give 1 pill to the 11-year-old girl suffering from malaria.
23. Give 1 1/2 pills to the 56-year-old man in excellent health.
24. Give 1 1/2 pills to the 16-year-old breastfeeding mother who gave birth 10 days ago.
25. Give 1 pill to the 7-year-old boy in excellent health.
26. Give 2 pills to the 19-year-old man who drank palm wine the day before yesterday.
27. Give 1 1/2 pills to the 23-year-old asthmatic man.
28. Give 2 pills to the 53-year-old man suffering from hypertension.

TRACHOMA

The activities included here will enable health workers to understand the causes, treatment and prevention of trachoma.

Activities:

Learning About Trachoma (1 hour)

Purpose: To learn about the signs and symptoms of trachoma, how it is caused, and how it can be treated and prevented.

Trachoma Signs and Symptoms and Treatment (2 hours)

Purpose: To learn how to recognize trachoma, identify the key signs and symptoms of different stages of trachoma, and provide the appropriate treatment/prevention.

Finding Out if Trachoma is a Problem in the Community (2-4 hours)

Purpose: To provide participants with a practical tool to determine a rough prediction of a community's risk of blindness from trachoma.

Demonstrating How Trachoma is Transmitted and the Importance of Face Washing (1 hour 30 minutes)

Purpose: To show how trachoma spreads from person to person, and the importance of face washing in reducing the transmission of trachoma.

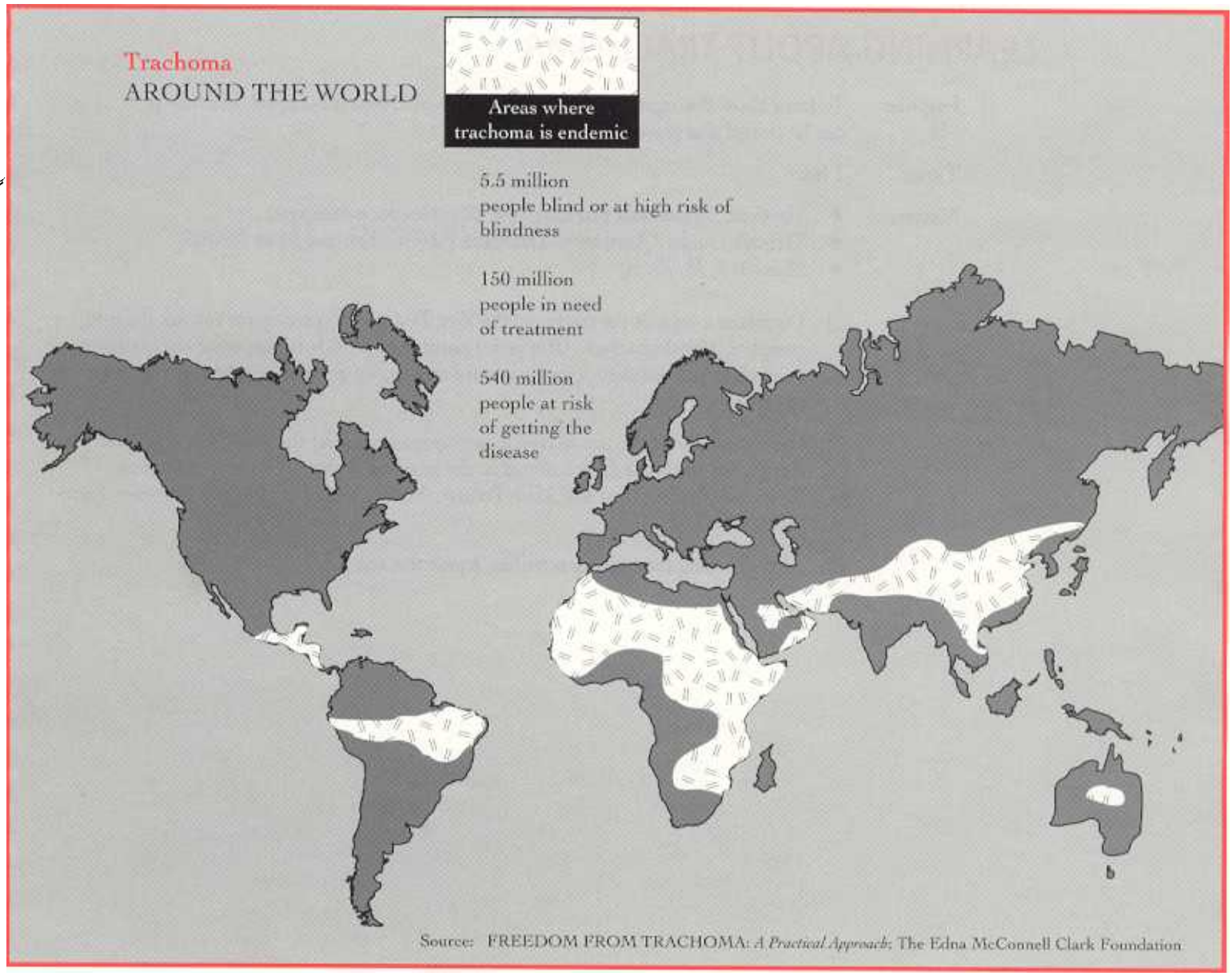
Overcoming Resistance to Trachoma Treatment and Prevention (1 hour - 1 hour 30 minutes)

Purpose: To identify constraints to treatment and prevention activities, and develop potential solutions.

For more information, we recommend the following materials:

Primary Health Care Level Management of Trachoma. WHO/PBL/93.33
Trichiasis Surgery for Trachoma: The Bilamellar Tarsal Rotation Procedure. Reacher, M., Foster, A., and Huber, J.: WHO/PBL/93.29.
Achieving Community Support for Trachoma Control. Francis, V., Turner, V.: WHO/PBL/93.36.

These manuals can be ordered from the WHO Programme for the Prevention of Blindness, CH-1211 Geneva 27, SWITZERLAND.


Trachoma
AROUND THE WORLD
Areas where trachoma is endemic
5.5 million people blind or at high risk of blindness
150 million people in need of treatment
540 million people at risk of getting the disease
Source: FREEDOM FROM TRACHOMA: A Practical Approach; The Edna McConnell Clark Foundation

Activity

LEARNING ABOUT TRACHOMA

Purpose: To learn about the signs and symptoms of trachoma, how it is caused, and how it can be treated and prevented.

Time: 1 hour

Materials:

- Handout: **"Trachoma Pre/Post Test"** (2 copies per participant)
- Trainer's Guide: "Answers to Trachoma Pre/Post Test and Main Points"
- Slides 1, 5, 28, 29, 30

1) Distribute a copy of the trachoma Pre/Post Test to each participant and ask them to complete it by themselves. (If it is not possible to provide copies, write the questions on a flip chart and ask participants to record answers by question number on a separate sheet of paper.)

2) Use the outline of the test to review each question, asking the group for responses. Review the trachoma facts outlined in the attached Trainer's Guide (Answers to Trachoma Pre/Post Test and Main Points). Show slides of trachoma signs when appropriate.

3) After finishing the training activities, repeat this test.

Handout

TRACHOMA PRE/POST TEST

TRUE OR FALSE

1. Trachoma is the second largest cause of world blindness.
2. Common symptoms of active trachoma in the early stage are red, sticky eyes that are painful and itchy
3. Repeated infections of trachoma lead to scarring of the inside of the eyelid.
4. Trachoma is spread from person to person by mosquitoes.
5. Trachoma infection is most likely to occur during the rainy season
6. Trachoma infection is most active in preschool and school age children

   Women are more likely to become blind from trachoma than men
8. Active trachoma infection is diagnosed by examining the inner upper eyelid
9. Blindness from trachoma is preventable.
10. One of the most effective ways to fight trachoma is to promote cleaner faces through increased face washing in children.
11. Individuals with moderate or severe active trachoma should be treated with a single application of tetracycline eye ointment.
12. A simple surgery that reverses inturned eyelashes can prevent pain and further loss of vision in persons who already have eye scarring and trichiasis.

TRAINER'S GUIDE:

ANSWERS TO TRACHOMA PRE/POST TEST AND MAIN POINTS

1. **TRUE** **Trachoma is second only to cataract as a major cause of world blindness. It is found primarily in sub-saharan Africa, the Middle East and some countries in Asia.**

   5.5 million people in the world are blind or at high risk of blindness from trachoma.
   Three out of four of those blind or at risk of becoming blind are women.
   An additional 150 million people have the disease and are in need of treatment, mainly women and children.
   Approximately 540 million people — 10% of the world's population — are at risk of developing the disease if it is not controlled.

2. **TRUE** **Common symptoms of trachoma in the early stages are red, sticky eyes that are painful and itchy.**

Trachoma is an infectious eye disease that causes inflammation, redness, discharge, as well as small white round spots (follicles), and swelling of the inner lining of the eyelid.

3. **TRUE** **Repeated infections of trachoma lead to scarring of the inside of the eyelid.**

When people get trachoma, they do not go blind immediately. After repeated infections of trachoma, usually over several years during childhood, the inflammation causes irritation and scarring in the inside of the upper eyelid. Over time, severe scarring of the inner lining of the eyelids can cause the eyelashes to turn in, a condition which is called *trichiasis.* These inturned eyelashes rub on the cornea at the front of the eye which may become cloudy or scarred. This causes vision loss and eventual blindness, usually when people are 40-50 years old. (If available, show slides of trachoma signs and normal eye.)

Only repeated infections cause blindness, so it is important to treat and prevent the infection even if people have already had trachoma.

4. **FALSE** **Trachoma is spread from person to person by mosquitoes.**

Trachoma is caused by the microorganism *Chlamydia trachomatis* and can be spread easily by flies who carry the germs from person to person. However, children are the main source of the infection. The disease is usually passed from child to child and child to mother, often affecting an entire family. Trachoma is often referred to as a "community disease". It is usually found in rural communities where people live in overcrowded conditions and have very limited access to water and health care. There are several ways the germs move from person to person:

- Children with trachoma usually have red, sticky eyes and sometimes runny noses. If the discharge contains the trachoma germ, it can be easily passed onto fingers and clothes.
- Flies are attracted to the discharge on eyes and carry the trachoma germs to other people's eyes.
- When children sleep close to each other, the germ is easily spread from child-to-child, child-to-clothes, and clothes-to-child.

5. **FALSE** **Trachoma infection is most likely to occur where there is a great deal of rain.**

Trachoma infection is most likely to occur in dry, dusty conditions where there is a severe lack of water and good hygiene is hard to keep up. The dust and dust storms cause further irritation to the eyes. Other conditions which add to the problem of trachoma are:

- Lack of water
- Many flies
- Overcrowding where children sleep
- Poverty
- Eye irritants: smoke from cooking fire, traditional treatments and other irritants or eye infections that cause the eye to be red.

6. **TRUE** **Trachoma is most active in preschool and school-age children.**

The disease usually starts in early childhood, and becomes intense in preschool and school-age children with repeated infections. Inflammation is sometimes seen in a small percentage of adults and scarring is common. If a community has a severe trachoma problem, scarring may also be seen in young children.

7. **TRUE** **Women are more likely to become blind from trachoma than men.**

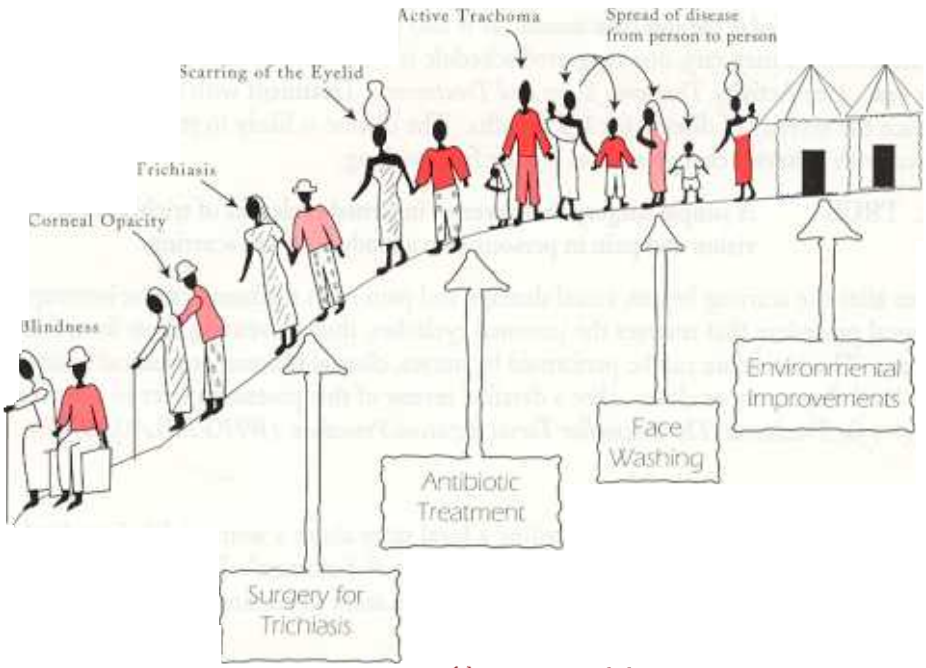
Mothers of young children are particularly at risk because they spend so much time with children who are infected. In fact, three out of every four people blinded by trachoma are women.

8. **TRUE** **Active trachoma infection is diagnosed by examining the inner upper eyelid.**

This will be reviewed in the Activity: *Trachoma Signs and Symptoms and Treatment*

9. **TRUE** **Blindness from trachoma is preventable.**

Blindness from trachoma can be prevented. There are four types of actions which can be taken to treat and prevent trachoma. These actions are referred to as *S.A.F.E.:*



- **S** = *Lid surgery* for trichiasis to turn out eye lashes which are scratching the cornea, thus reducing pain and preventing further damage and blindness.
- **A** = *Antibiotic treatment* for individuals with moderate to severe active trachoma and their families (1% tetracycline ointment applied to the eyes).
- **F** = *Increased face washing* to keep children's faces clean and prevent the disease from spreading from one child to another. A small amount of water can be used to wash many faces.
- **E** = *Environmental improvement* (water and sanitation) to get rid of the disease altogether. Examples include: constructing and using ventilated latrines to reduce flies, rubbish disposal and cow dung removal, constructing water tanks and jars to improve the water supply, and tree planting in desert areas.

10. **TRUE** **One of the most effective ways to fight trachoma is increased face washing in children.**

This simple intervention is one of the best ways to attack trachoma and prevent serious damage from occurring. In trachoma-endemic areas, children rub their red, sticky eyes and then touch the faces of their mothers, brothers and sisters, thus spreading the infection. Flies are attracted to sticky eyes and faces, further spreading the disease from person to person. When the initial trachoma infection is treated with antibiotics, regular face washing can prevent trachoma from returning. Just rinsing the face with water can clear the discharge from eyes and noses and help prevent the germs from being spread from one person to another.

Keeping children's faces clean is not easy!!!! Encourage schools to promote face washing and teach older siblings to increase the face washing of younger brothers and sisters.

11. **FALSE** **Individuals with moderate or severe active trachoma should be treated with a single application of tetracycline eye ointment.**

The recommended treatment of individuals with moderate or active trachoma is tetracycline eye ointment 1% twice a day applied to the eyes for 6 weeks. It is also possible to treat the whole community. Although treatment schedules may vary, one suggested schedule is 5 continuous days per month for 6 continuous months per year. (see Activity *Trachoma Signs and Treatment*). Treatment with tetracycline ointment will only reduce the severity of disease for 1-2 months. The disease is likely to return again unless treatment is combined with behavior change such as regular face washing.

12. **TRUE** **A simple surgery that reverses inturned eyelashes of trichiasis can prevent further loss of vision and pain in persons who already have eye scarring.**

Even after the scarring begins, visual damage and pain from trachoma can be interrupted with a simple surgical procedure that reverses the inturned eyelashes, thus preventing them from further rubbing on the cornea. The procedure can be performed by nurses, clinical officers, or medical assistants, and can be done in a local dispensary or clinic. [For a detailed review of this procedure refer to the manual *Trichiasis Surgery for Trachoma: The Bilamellar Tarsal Rotation Procedure. (WHO/PBL/93.29.)]*

Adaptation: Introduce trachoma by telling a local story about a woman's life from birth to blindness from trachoma as a grandmother. See BOX: "The Story of Kokwana". If possible, develop several pictures showing her at different life stages. (Volunteers can assist in reading story). The story can also be performed as a drama.

The Story of Kokwana

Source: *Hanyane: A Village Struggles for Eye Health.* E. Sutter, A. Foster, and V. Francis. 1989.

When Kokwana was born, living conditions and the climate in Hanyane were much the same as they are now. Cattle were kept near her family's homestead; water was scarce. When she was a toddler, Kokwana was left with the other children to play in the dusty yard. Like most children, she had a runny nose and sometimes sores on her skin. Her hands were dirty with mucus from her nose, which often contained *Chlamydia.* Poorly maintained latrines and fresh cow dung attracted swarms of flies. During the seasons of epidemic conjunctivitis, flies were especially abundant around the children's discharging eyes. This was when Kokwana was infected with trachoma for the first time. She was then one year old. Nobody worried about it. Slightly discharging eyes were considered part of childhood.

Kokwana slept with all the other girls in the girls' hut where they huddled together on one mat and shared one blanket among them. Such close physical contact, day and night, made it easy for the *Chlamydia* (the germ that causes trachoma) to spread amongst the children, causing repeated infections.

By the time she was eight years old, she had had trachoma many times. Like most children, she could see well and had few complaints apart from slight discomfort and an intermittent discharge from her eyes. Kokwana was then old enough to be in charge of her little brothers and sisters. Most of them also had trachoma. Kokwana carried the youngest child on her back. When he cried she wiped his face with the same cloth that she used to dry the sweat from her own face. In this way, she caught the disease again.

When Kokwana became a young woman she worked in the fields where the wind often blew dust and sand into her face and eyes. When she had her own children she wiped their faces with the same cloth she used on her own face, or she used her fingers. In this way she became infected again and again, this time from her own children. The repeated infections with trachoma began to damage her eyes—the eyelashes started to turn in. This made her rub her eyes even more. Kokwana had many children. Each one of them had trachoma and they kept reinfecting each other and Kokwana.

Kokwana is now a grandmother and looks after Ma-Anna's children. She wipes the noses and eyes of her little grandchildren with her own cloth, getting herself infected again. The scarring has now led to trichiasis and the cornea has turned cloudy. Now her vision is failing. If nothing is done, if she does not have surgery for her trichiasis soon, she will be totally blind.

Kokwana's brother also had trachoma as a child, but his eyes are still good. His job was to herd the cattle, so he had little close contact with his younger brothers and sisters. Later he found work in the city and did not see much of his own children who remained in Hanyane. Even if he had stayed at home, it would not have been his business to nurse the children. So he was less at risk of getting repeated infections. Now you can see why far more women than men have trichiasis and are blind with trachoma.

Discussion Questions:

Do you know of a community where the living conditions are similar to Kokwana's village? In what ways?

What are the major health risks in this community?

How would you describe or explain the difference between Kokwana's health and her brother's? What caused the difference(s)?

How could Kokwana's health be improved?

Activity

TRACHOMA SIGNS AND SYMPTOMS AND TREATMENT

Purpose: To learn how to recognize trachoma, identify the key signs and symptoms of different stages of trachoma, and provide the appropriate treatment/prevention.

Time: 2 hours

Materials:

- Handouts: "Trachoma Eye Exam"
  "Strategies for Treatment of Trachoma"
- Slides 1, 5, 28, 29, 30
- Set of three treatment index cards for each group. On each card is written one treatment: eyelid surgery, topical antibiotic ointment, or face washing.
- Set of six patient index cards per group. On each card is written a description of a patient with one or more of the signs of trachoma as described in part 3 of this activity.

Procedure: **PART 1 — Orientation to Trachoma Signs and Treatment**

1) Distribute the handout, "Trachoma Eye Exam".

Note: We have simplified the signs of trachoma for this manual. There is a more accurate way of grading the signs of trachoma which provides more details than are included in this activity. Please refer to the WHO manual *Primary Health Care Level Management Of Trachoma* if you are interested in a more accurate assessment of a community's trachoma situation.

2) Show slide 1 and describe the healthy normal eye.

3) Show slides 28, 29, 5, 30 and describe the major signs of trachoma. After each description, allow participants a few minutes to test their understanding by telling the person next to them in their own words the eye observations for each sign, referring to the handout as needed. Ask some participants to share with the whole group a description in their own words of each of the signs.

Major Signs of Trachoma

Active Trachoma (*slide 28*)

- Trachoma begins with red sticky eyes.
- People, especially children, who complain of sticky eyes and itchy painful eyes could have trachoma.
- More advanced trachoma causes the inside of the upper eyelids to become very inflamed.
- After repeated infections, the inner lining of the eye starts to become scarred.
- Patients in this condition may complain that it feels as though there is sand or insects in their eyes.

The above conditions are known as active trachoma, and should be treated with face washing and topical antibiotic eye ointment.

Eyelid scarring and trichiasis (*slides 5, 29, 30*)

- Scarring on the inner lining of the eye (*slide 29*) eventually causes the shape of the eyelid to change and pulls the eyelashes in towards the eye. When the eyelashes rub on the eyeball, it is very painful. This condition is called trichiasis (*slide 5*) and is well recognized in communities where trachoma is a significant problem. Patients with this condition should be referred for corrective eyelid surgery. The surgery prevents the lashes from turning in on the eye and scratching it. If left untreated, the rubbing eyelashes may damage the cornea (*slide 30*), eventually affecting the patient's sight and causing poor vision or blindness.
- Emphasize that prevention is an important part of the treatment for all cases, especially increased face washing in children.

4) Distribute the handout, "Strategies for Treatment of Trachoma". Describe the treatment options and appropriate treatment for different stages of trachoma.

5) Ask one of the participants to describe and if possible demonstrate the correct procedure for applying the antibiotic to the eye (see Handout: "Strategies for Treatment of Trachoma"). Note that some individuals with intense inflammation may not respond effectively to topical antibiotic and may require systemic antibiotics provided they are available.

6) To summarize, review the trachoma eye slides in order of severity along with treatment. Ask:

For which condition is topical antibiotic treatment warranted?
What are the treatment schedule options for topical antibiotic?
When would you consider treating the whole family? The whole community?
When is systemic treatment with antibiotic indicated?
What trachoma sign may require surgery?
What is an important treatment/prevention for all cases of trachoma?

PART 2 Practicing Diagnosis and Treatment for Trachoma

1) Stage a clinic session to allow participants to practice diagnosing and treating trachoma. Divide into groups of about 6-7 persons each.

2) Give each group a set of patient index cards and a set of treatment index cards. Ask the members of each group to take turns being the health worker. The remaining group members play the patients (children, women, men).

3) The health worker takes the treatment/prevention cards. Divide the patient cards among the remaining group members. Ask the patients to read their patient card and be prepared to describe the symptoms they are suffering from to the health worker.

4) One at a time, the health worker interviews the patient and examines their eye. After examining the eye, the patient should give the health worker the patient card with the description of their signs and symptoms.

5) The health worker in turn makes a diagnosis and suggests a treatment based on the signs and symptoms, handing the patient one or more treatment cards (e.g., antibiotic ointment and face washing). The other group members should confirm whether the diagnosis and treatment are correct.

6) The health worker repeats the diagnosis for all remaining patients.

7) Each group member takes turns being the health worker, diagnosing and recommending treatments to the patients.

8) Summarize the session with the whole group. Review the varying signs of trachoma using the eye picture cards (or slides) and the treatment and prevention approaches. Note that prevention should be a part of all treatments - face washing at a minimum.

PART 3 Patient Index Cards (Signs and Symptoms)

Write each description below on a separate index card. One set of at least 6 cards should be given to each group. Do not write answers (treatment) on card.

1. Young child with red sticky eyes, rubbing eyes and crying in pain;
Inner lining of eyelid has small white dots.
(Treatment: topical antibiotic ointment, face washing. Treat family if possible.)

2. School age child with red sticky eyes, complaining of itching and pain;
Inner lining of eyelid very inflamed and cannot even see blood vessels.
(Treatment: topical antibiotic ointment, face washing. Treat family if possible.)

Elderly man complaining of the feeling of sand in the eyes;
Inner lining of eyelid has scarring, indicated by white streaks;
Eyes are not red and sticky.
(Treatment: topical antibiotic ointment, face washing. Treat family if possible.

4. Woman with young children complaining of discomfort in eyes, like an insect has gotten in eyes, itching, and pain;
   The eyes are red and sticky;
   Inner lining of eyelid shows small white dots and white streaks indicating scarring.
   (Treatment: topical antibiotic ointment, face washing, check children for signs of active infection, treat family if possible)

5. Middle age woman complaining of eye pain but no change in vision;
   Eyelid appears thicker than normal. Eyelashes turn down toward the eyeball;
   Inner lining of eyelid has many white streaks indicating heavy scarring;
   Eyes not red and sticky;
   Vision is normal.
   (Treatment: eyelid surgery)

6. Elderly woman complaining of eye pain and cloudiness in vision;
   Eyelid appears thicker than normal;
   Eyelashes turn down toward the eyeball;
   Inner lining of eyelid has many white streaks indicating heavy scarring.
   (Treatment: eyelid surgery)

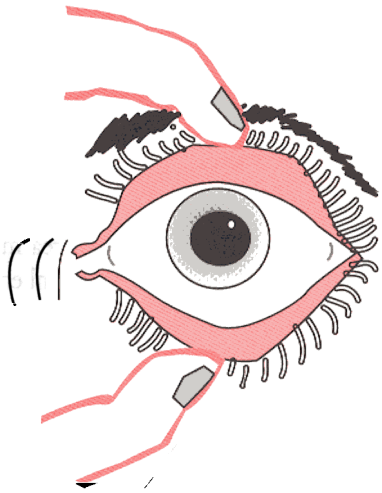
REMEMBER: *Treat the entire family whenever possible. This is a key strategy in the prevention of trachoma.*

Handout

TRACHOMA EYE EXAM

Examining the Eye for Trachoma

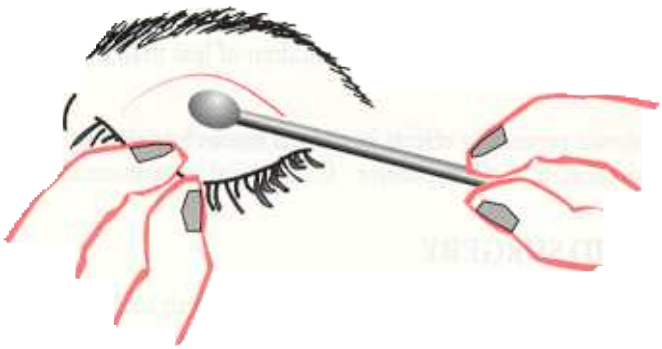
Examine each eye separately using adequate daylight lighting or a torch. First observe the outer eyelid and cornea, then the inner eyelid.

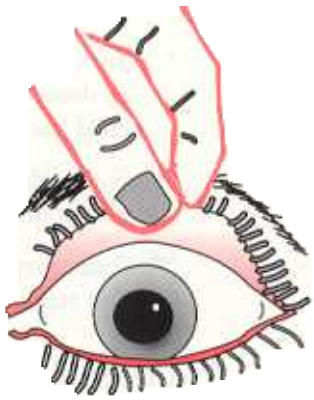


Outer Eyelid: Look for signs of trichiasis, which are indicated by inturned eyelashes actually rubbing on the eye or previously removed lashes. To look for trichiasis (inturned eyelashes), push the upper lid up slightly to expose the lid margins.

2. Cornea: Look carefully at the cornea for opacities (the eye looks white where it should be clear).

3. Inside Eyelid: Examine the inside of the upper eyelid. Ask the patient to look down. Gently hold the eyelashes between your thumb and first finger. Using a glass rod, blunt end of a pen, or cotton swab, evert the upper eyelid. Steady the everted eyelid with your thumb and look for inflammation or scarring. When you have completed the examination, gently return the eyelid to its normal position. Repeat on the other eye.





Handout

STRATEGIES FOR TREATMENT OF TRACHOMA

INDIVIDUAL, FAMILY, OR MASS TOPICAL ANTIBIOTIC TREATMENT

Treat individuals with active infections with tetracycline 1% eye ointment. To apply the ointment: first wash the face with plain, clean water and clean the eyes; then place the ointment in each eye using one of the following regimens:

- Twice per day for six weeks
- Twice per day for 5 consecutive days per month for 6 consecutive months per year
- Once daily for 10 consecutive days each month for at least 6 consecutive months per year

Family treatment: If resources permit, treat all members of the household/family where there are one or more members with active trachoma (red sticky, itchy eyes).

Mass treatment: In areas where more than 5-20% of children under age 10 years have active trachoma, consider treatment of all members of all households/families in the community.

SELECTIVE SYSTEMIC ANTIBIOTIC TREATMENT

Choose one of the following options for individuals with very severe inflammation who are not responding to topical antibiotic treatment.

• Oral tetracycline:	250 mg x 4/day for 3 weeks }	Only to children
• Doxycycline:	100 mg daily for 3 weeks }	over 7 years of age
• Erythromycin:	250 mg x 4/day for 3 weeks*	
• Cotrimethazole:	2 tablets x 2/day for 3 weeks**	
• Azithromycin:	Single dose of 20 mg/kg***	

For children who weigh less than 25 kg, dosage is generally 30 mg/kg body weight daily in four divided doses. Observe children daily for nausea and vomiting; if severe, discontinue treatment. If the child has an apparent skin rash, discontinue treatment.

For children of 6-12 years: use half the dose. Children of less than 6 years: mixture as prescribed by weight of child

Azithromycin has shown promising effects in clinical research trials, but the optimal dose requires further research. In addition, it is still expensive. Check local recommendations.

CORRECTIVE EYELID SURGERY

Refer individuals with trichiasis (the presence of at least one eyelash rubbing on the eye) to a local dispensary or clinic for eyelid surgery. Patients who pull out their eyelashes so that they do not rub should also be referred for surgery. If active trachoma is present, also treat with topical antibiotic as above. Individuals should be seen between 6 months to one year after the operation to make sure the eyelids have not turned in again.

Handout (cont.)

COMMUNITY-WIDE PREVENTION: FACE WASHING, HYGIENE, SANITATION

Prevention is an important part of the treatment for all cases of trachoma. Encourage general improvement in family and personal hygiene, especially keeping children's faces clean through increased face washing. Other general useful hygiene and sanitation measures include: improved water supply; fly control through construction, use of latrines, and rubbish and dung control; separate and ventilated sleeping areas; and distribution of antibiotic ointment for cases of acute conjunctivitis with discharge from the eyes.

Sources: *Primary Health Care Level Management of Trachoma* WHO/PBL/93.33.
Achieving Community Support for Trachoma Control WHO/PBL/93.36.

Activity

FINDING OUT IF TRACHOMA IS A PROBLEM IN THE COMMUNITY

Purpose: To provide participants with a practical tool to determine a rough prediction of a community's risk of blindness from trachoma when a full assessment using trachoma grading is not possible.

Note: A full assessment of a trachoma prevalence requires survey methods. These are described in detail in the publication *Primary Health Care Level Management of Trachoma* WHO/PBL/93.33.

Time: 2-4 hours (not including travel time)

Materials:

- Note pad
- Pencils
- Copies of: **"Interview Guide with Health Workers and Leaders"**
  "Children's Eye Exam Recording Form"

Procedure: Preparation

The following activities require a field visit to a local village. The health worker can arrange this ahead of time with other community leaders.

1) To avoid overwhelming villagers with a large group, conduct the field visits in small groups. This can be done in several ways depending on the number of participants and access to villages:

   Assign separate tasks in each activity to each group and ask them to compile the information at the end of the visit.

   - If logistics permit, arrange a separate village for each group to visit.
   - Alternately, select a small group of interested participants to conduct the field visit.

2) Before the field visits, review the procedures for each activity and distribute copies of the "Interview Guide with Health Workers and Leaders" and "Children's Eye Exam Recording Form." Give the groups time to organize their activities for the field visit.

3) After the field visit, have the groups summarize their findings. Discuss the experiences and observations of each group during the field visit. Ask: *"What steps will you need to take to get a rough idea of the risk of blinding trachoma in your own area?"*

Part 1—Talking with Local Health Workers and Leaders

1. Arrange a visit to a village with a small group of participants, as described above.
2. Using the "Interview Guide with Health Workers and Leaders" as a guide, talk to the local health worker(s) and village authorities to find out if conditions that contribute to blinding trachoma are present: lack of water, many flies, and overcrowding. Also find out if there is evidence of trichiasis in adult women.
3. Summarize the findings. Does the village appear to be at risk for trachoma?

Part 2 —Looking for Evidence of Active Trachoma in Children

Organize an eye exam session in the community with the local health worker and a small group of participants. Before the session, make sure the local health worker and participants have practiced examining and everting the eyelid and are able to recognize active trachoma.

2. Gather children aged 4-7 years in the village, or visit the local primary or pre-primary school.
3. With the local health worker, examine the eyes of 50 children. Record the findings on the Handout: "Children's Eye Exam Recording Form." Are there more than 10 out of 50 children with active trachoma?

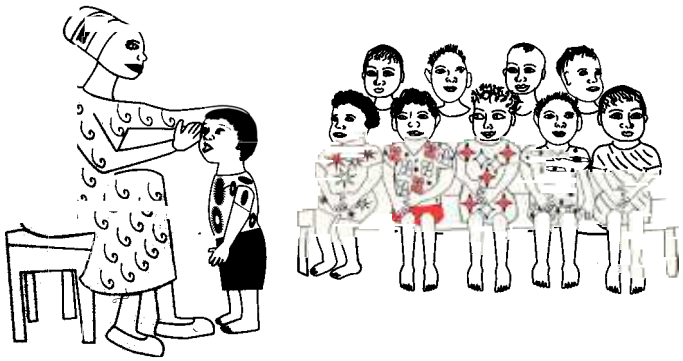
Examine both eyes. If you find trachoma in either eye, record and treat.

5 Remember:

Be sure that you have enough supplies of tetracycline 1% eye ointment to treat active trachoma cases and their families.

Note the names of the children with active trachoma for future follow-up by the health worker.

If more than 10 out of 50 children have active trachoma, the whole village may need treatment.



- Instruct the local health worker how to provide the treatment.

If more that 10 of the 50 children have active trachoma, then the whole village may need treatment. You (or the health worker) will need to discuss what needs to be done to reduce trachoma with the community leaders, parents and teachers.

Source: *Achieving Community Support for Trachoma Control.* WHO/PBL/93.36.

INTERVIEW GUIDE WITH HEALTH WORKERS AND LEADERS

Date:

Name of Village:

Talk to the local health worker and village authorities to find out if conditions that contribute to blinding trachoma are present: lack of water, many flies, and overcrowding. Also find out if there is evidence of trichiasis in adult women. Observe the condition of the village homes and children. Use the Question Guide below to help focus your discussions and observations.

Roles of Individuals Interviewed

1.

2.

3.

4.

5.

6.

Question Guide for Finding Out About Trachoma in Village	YES	NO
Is there lack of water?		
2. Are there a lot of flies, especially around children's faces?		
3. Is there overcrowding in the houses? Do many children sleep in the same bed?		
4. Is there a local word for trichiasis (inturned eyelashes)?		
5. Are there adults (or children) in the village with trichiasis?		
6. If yes, ask if you can meet some of them to confirm the presence of trichiasis.		
7. Did you see someone with trichiasis?		

Note: IF YOU ANSWER YES TO ANY OF THESE QUESTIONS, TRACHOMA MAY BE A PROBLEM IN THE VILLAGE.

Other Comments:

RECORDING FORM

Village or school _____

Name of district health worker conducting the examination _____

Name of local health worker conducting the examination _____

Examine both eyes. Record your findings and treat the child and family with tetracycline eye ointment if you find active trachoma.

Child's name	✔if yes	X if no	Child's name	✔if yes	X if no
1			26		
2			27		
3			28		
4			29		
5			30		
6			31		
7			32		
8			33		
9			34		
10			35		
11			36		
12			37		
13			38		
14			39		
15			40		
16			41		
17			42		
18			43		
19			44		
20			45		
21			46		
22			47		
23			48		
24			49		
25			50		

Are there more than 10 of the 50 children with active trachoma? YES NO

Activity

DEMONSTRATING HOW TRACHOMA IS TRANSMITTED AND THE IMPORTANCE OF FACE WASHING

Purpose: To show how trachoma spreads from person to person, and the importance of face washing in reducing the transmission of trachoma.

Time: 1 hour 30 minutes

Materials:

- Yellow chalk, crushed into fine powder

Procedure:

1) Ask for about six volunteers. Develop a role play that demonstrates the transmission of the active trachoma infection from child-to-mother and child-to-child. (See *Role Play* example below). Put yellow chalk powder under baby's eyes to depict pus with the organism *chlamydia*, which causes trachoma.

2) *Role Play - Part 1:*

Mother is doing household work. Her baby (infected with trachoma indicated by chalk under the eyes) cries. Mother wipes the tears with her hand or clothes and the chalk spreads onto her. Then mother wipes her eyes and the chalk spreads to her eyes.

The baby's 3-year-old brother comes running to the mother as he is being chased by a neighbor boy. The brother grabs the mother's clothes and tries to hide in her skirt, giggling. The chalk spreads to the brother's eyes.

Then the neighbor boy grabs the brother and the two wrestle playfully. The chalk spreads to the neighbor boy. He wipes his eyes.

The mother of the neighbor boy calls her child home for nap time. She sings the boy a song, cuddling and stroking him to calm him. The chalk spreads to the mother's hands. The dust blows and she wipes her eyes to clear the dust. The chalk spreads to the mother's eyes.

The child lies down next to his baby sister. The baby cries and the brother wipes the tears. The chalk spreads to the baby's eyes.

3) Discuss the transmission of trachoma.

How did the chalk travel from the child to the mother? From child to child? Do mothers, grandmothers, and other women you know comfort children in this way?

If a child's eyes are infected with trachoma, how does it spread to the mother?

Why are women more susceptible to infection than men? Are some women more likely to be infected than others? Why?

What are other ways trachoma can spread within the family?

4) *Role Play - Part 2:*

Again put yellow chalk powder under the baby's eyes. Have mother wash the baby's face, washing the chalk off (demonstrate using only a small amount of water to show that very little water is necessary for face washing).

Repeat the role play above with the baby crying and the mother wiping the tears and her own eyes, etc...

5) Discuss how face washing decreases transmission of trachoma.

Why didn't the chalk (trachoma) spread to the mother when she wiped her baby's eyes as before?

What does this tell you about how to decrease the spread of trachoma within the family?

What can be done to increase face washing of children in your area?

ONE HANDFUL OF WATER IS ENOUGH TO WASH THE DISCHARGE FROM THE EYES AND NOSE

Adaptation: Introduce the activity by telling a local story about transmission of trachoma, such as that of "The Best Medicine: Keeping the Snakes Away" adapted from *Hanyane: A Village Struggles for Eye Health.* E. Sutter, A. Foster, and V. Francis. 1989.

The Best Medicine: Keeping the Snakes Away

Adapted from *Hanyane: A Village Struggles for Eye Health,* E. Sutter, A. Foster, and V. Francis. 1989

A group of young women with young babies gathered at Lerisa's home. Some toddlers were playing, and a few grandmothers sat at a distance. Joyce, the nurse, was pleased. Could this be the beginning of better health in Hanyane?

The mothers began by complaining about the lack of eye ointment. They wanted Joyce to examine all the children and tell them who should get ointment. Joyce could not promise that. She was too busy at her clinic. The best method was still to improve hygiene. But how could she convince them? Maybe a better understanding of the disease could make face washing more acceptable. She explained in simple terms the clinical course of trachoma.

"Do you still remember the village meeting when we spoke about the reasons for cutting the grass around the houses?", Joyce asked. "Yes, you told us that trachoma is a snake hiding in the grass."

Joyce was shocked. She had not expected people to take it literally. So she had to find another way. She noticed a mother wiping her baby's face and then her own face with the cloth she was wearing. This is a better illustration, Joyce thought. She asked for a volunteer to help her demonstrate. The lady would act as her "baby". Joyce then crushed a piece of yellow chalk into a fine powder and put some of it below the "baby's" eyes . "Imagine the baby has trachoma," Joyce said. "I've put this chalk below the baby's eyes to show that trachoma is hiding in the pus." Then Joyce asked the women playing baby to pretend to cry. "My baby is crying. What must I do?" "You must comfort it. You must wipe its tears," they all said.

Joyce wiped her "baby's" face with a cloth. Everyone could see the yellow powder on the cloth. Trachoma was now hiding in the cloth. Then she said she had itchy eyes and rubbed them with the stained cloth. The powder was now on her face.

The group agreed that this was exactly what they used to do. Sometimes they didn't use a cloth but used their fingers instead. Would this also carry trachoma from person to person? "Of course it does", said Joyce. "And the flies do the same. They're attracted by all the dust on the children's faces. They sit around the children's eyes and fly, with trachoma sticking to their feet, to the eyes of other children."

The group got quite excited. They all talked at once. "Now we understand what you meant when you said that washing face and hands is a medicine."

"Does it also mean to wash the cloths more often?"
"What about the flies? Cattle and goats near the house bring lots of flies."
"You must cover the stools with soil. We do the same when we go to the bush. Or build a toilet."
"Flies also sit on our children's runny noses and skin sores."
"They are wherever food and rubbish are left uncovered."

Water was the biggest problem for them. A tap in the village would help. Joyce let them talk, providing only an occasional guiding remark. It was hard for her not to interfere and tell them what to do. It would have saved her a lot of time. The group finally decided that they could start with cleanliness in their own homes and washing their children's faces at least once every day using a tiny handful of water. This way there would be no where for trachoma to hide.

Discussion Questions:

What is the story talking about?

Who are the people in the story?

What are they trying to do? How?

Do you think they will be successful? Why? Why not?

Activity

OVERCOMING RESISTANCE TO TRACHOMA TREATMENT AND PREVENTION

Purpose: To identify constraints to treatment and prevention activities, and develop potential solutions.

Time: 1 hour - 1 hour 30 minutes

Materials:

- Teaching Aid: Constraints, or a locally generated list of constraints to each SAFE treatment/prevention (Surgery, topical Antibiotic eye ointment, Face washing, Environmental sanitation) cut into separate strips of paper.
- Additional blank strips of paper
- Markers or pencils

Procedure:

1) Divide into 4 groups. Assign a treatment or prevention activity to each group.
2) Provide groups with strips of paper listing possible constraints to achieving community support for their activity, along with some blank sheets. Ask them to perform steps 3 to 5 below.
3) Review each constraint and select those which are likely problems in your area. Write additional constraints specific to your area on the blank strips.
4) Rank the constraints in order of their importance in contributing to the continued trachoma prevalence in the village.
5) Select the top 5 constraints (or all, if 5 or fewer) and develop a possible way of helping villagers overcome each of these constraints. (To make it more entertaining, these solutions can be developed into a drama to share with the whole group.)
6) Return to the large group. Have each group share their constraints and potential solutions with the whole group. Are there additional ideas?
7) Summarize potential solutions to trachoma control.
8) Reflecting on the reality that change is difficult for people, ask participants to write down two ways they will deal with resistance to change when they return to their site.

TRAINER'S NOTES

Experience with trachoma programs suggests the following points may be useful in overcoming constraints:

- Health services which perform trichiasis (lid) surgery as close to people's homes as possible to enable more to come. If there is no one to perform the surgery, find and train someone.
- The first few patients need to have good results from trichiasis surgery for others to follow. Involve those with successful surgery in motivating others to seek surgery.

  Take time to explain why it is necessary to continue antibiotic treatment for so long. It is better to put up with the temporary discomfort and blurry vision (from the ointment in the eye) than to go blind.

  Demonstrate to mothers how to put the ointment in the eye. Then ask them to do it.

  One of the best times to put the medicine in the child's eye is at night before they sleep.

  In hot climates the antibiotic ointment is very runny. Try to keep it as cool as possible.

  Promote face washing through as many channels as possible: mothers, women's groups, churches, primary schools, adult literacy classes, village health workers.

  An important message to increase face washing in children is, "You don't need a lot of water."

  Environmental change is the slowest and most difficult part of trachoma control. Depending on your participants and audience, you may decide to eliminate environmental improvements from this activity to narrow the focus. If time and resources allow, work with other projects to bring about environmental development (water, sanitation, agriculture, education) and ensure you have support of community leaders and influential people such as religious leaders and school teachers.

TEACHING AID: CONSTRAINTS

Cut each line into separate strips....

Note: These constraints have been identified based on experience from other trachoma programs. You may want to have the group identify their own list of constraints.

<u>Constraints to Surgery</u>

People are afraid of the operation.

People do not know it is a problem which can be solved.

There is a lack of transport to take patients to hospital.

There is a lack of funds to take patients to hospital.

There is a shortage of people who are able to do the surgery.

People are suspicious of the surgery. They do not want their eyes to be cut.

People have heard that the operation does not restore their sight in the way that cataract surgery does.

Appointments are not always kept by the health staff.

There is no one to take care of the children while they are away.

Constraints to Antibiotic Treatment

The schedule for using tetracycline 1% eye ointment is slow. It must be put in the affected eyes twice a day for six weeks. This is often a difficult thing for people.

Children get impatient with having the ointment put in their eyes.

People might find the ointment painful when applied to their eyes.

Some people complain that the ointment makes their vision blurry.

Some people stop using it when they do not feel any immediate improvement.

The ointment is not always available.

It can be expensive to buy.

People often use the ointment as partial treatment. They stop using it once they get relief after a few days.

The ointment is sometimes wrongly applied — for example, to eyelashes or on top of the eye.

If reinfection occurs sometime after using the ointment, people lose faith in the treatment.

People forget to put the cap on the tube.

People use the same tube for all family members, increasing the risk of transmitting the infection.

?

Constraints to Face Washing

There is a shortage of water.

Mothers have a heavy workload and it is difficult to find time to wash children's faces often.

People are not always aware of the benefits of keeping children's faces clean.

Children don't like to have their faces washed.

?

Constraints to Environmental Improvements

Communities may have different priorities.

People are reluctant to change things which have been done in certain ways for many years.

There is sometimes poor communication between communities and development workers.

There may be a shortage of skills for example, on how to construct a latrine.

There may be a shortage of time to devote to improving the environment in the community.

Involves community concensus, responsibility and maintenance, and therefore, good leadership.

Adaptations:

"IDENTIFYING HOW VILLAGERS CAN SUPPORT TRACHOMA CONTROL ACTIVITIES"

If time and conditions allow, prior to conducting Activity: *Overcoming Constraints to Trachoma Treatment and Prevention*, organize an information-gathering session in the community where participants can interview villagers and learn what they are willing and interested to do to control trachoma. A suggested Community Discussion Guide follows.

- Ask them to speak to a variety of people, not just men, or just women, the educated or the wealthy.
- Suggest that they use open-ended questions, such as "What problems do you have washing children's faces daily?", or "What problems would keep a family from using water to wash children's faces," instead of "Do you wash your children's faces often?"
- Ask participants to make notes on what they learned from the villagers. (See Discussion: Summary Form)
- Use this information to develop the list of constraints.

COMMUNITY DISCUSSION GUIDE

S **Will people accept *surgery*?**

- What are people already doing to remove inturned eyelashes?
- Do people think that blindness from inturned eyelashes can be prevented?
- Do people know about lid surgery?
- Would people be willing to have lid surgery if necessary to prevent blindness?
- What place is the most convenient for lid surgery?
- Where else is health care delivered?
- Who in the community can encourage people to go for surgery: traditional healers? community elders? school teachers?

A **Will people use *antibiotic eye treatment?***

- Are there any traditional treatments for trachoma?
- Is tetracycline 1% eye ointment available locally?
- Would they be willing to buy ointment if necessary?
- Where is the most convenient place to keep supplies of tetracycline eye ointment?
- What experiences have people had with using the eye ointment?
- How long do they think they need to apply the ointment in order to treat trachoma?

F **Will people accept *face washing* to keep children's faces clean?**

- What do they think they can do to keep flies away from children's faces?
- What do they do to keep children's faces clean?
- What might help them to keep children's faces more clean?
- How far do people go to fetch water?
- Who decides how water will be used?
- How much water do people think you need to keep children's faces clean?

E **Will people make *environmental improvements?***

- What is the water supply like for this community?
- What are people's ideas about constructing and using latrines?
- Where are animals kept and why?
- Who makes decisions abut changes in the home?
- Who makes decisions about changes in the community?
- Do community members ever join together to improve water supply and rubbish conditions?

WHAT DID YOU FIND OUT FROM DISCUSSION WITH THE COMMUNITY?

S People's knowledge, ideas, and fears about surgery

-
-
-
-
-

A People's knowledge and experience with using antibiotic ointment

-
-
-
-
-
-

F How difficult or easy it is to keep children's faces clean

-
-
-
-
-
-

E How difficult or easy it is to encourage the community to support environmental improvements in this village

-
-
-
-
-
-

Source: *Achieving Community Support for Trachoma Control.* WHO/PBL/93.36.

SLIDES

1. Normal/healthy eye
2. Neonatal conjunctivitis
3. Conjunctivitis
4. Allergic conjunctivitis
5. Trichiasis
6. Corneal ulcer
7. Acute glaucoma
8. Foreign body
9. Corneal abrasion
10. Bruised eye/black eye
11. Subconjunctival hemorrhage
12. Hyphema
13. Cut in the eyelid
14. Penetrating injury
15. Chemical burn
16. Cataract
17. Bump or lump (stye)
18. Squint (cross eye)
19. Pterygium
20. Corneal scar
21. Bitot's spots
22. Bitot's spots
23. Xerosis (dry eye)
24. Keratomalacia
25. Onchocerciasis: Nodule
26. Onchocerciasis: Blindness
27. Onchocerciasis: Leopard skin
28. Trachoma with follicles
29. Trachomatous scarring
30. Corneal opacity (trachoma)

We would like to acknowledge the assistance of partner organizations who graciously agreed to let us reproduce some of their slides as teaching materials:

WHO

All trachoma slides
Cut in the eyelid
Chemical burn
Neonatal conjunctivitis
Bitot's spot

Teaching Aids at Low Cost (TALC)

Corneal ulcer
Infectious conjunctivitis

International Centre for Eye Health (ICEH)

Allergic conjunctivitis/vernal catarrh (Murray McGavin)
Cataract (Professor Gordon Johnson)
Onchocerciasis nodule (Clare Gilbert)
Onchocerciasis blindness and leopard skin (Pak Sang Lee)

The Edna McConnell Clark Foundation

The Russell Berrie Foundation

USAID