90 Minutes

SESSION IV

THE EYE EXAMINATIONS

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Upon successfully completing this session the student will be able to:

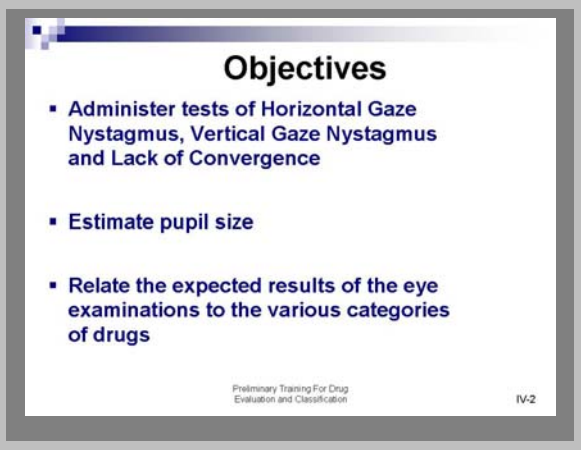
- Administer tests of Horizontal Gaze Nystagmus, Vertical Gaze Nystagmus and Lack of Convergence.
- Estimate pupil size.
- Relate the expected results of the eye examinations to the seven categories of drugs.

CONTENT SEGMENTS	LEARNING ACTIVITIES
A. Purposes of the Eye Examinations	▪ Instructor-Led Presentations
B. Procedures and Clues	▪ Instructor-Led Demonstrations
C. Demonstrations	▪ Hands-on Practice
D. Relationship of Drug Categories to The Eye Examinations	

I. THE EYE EXAMINATIONS

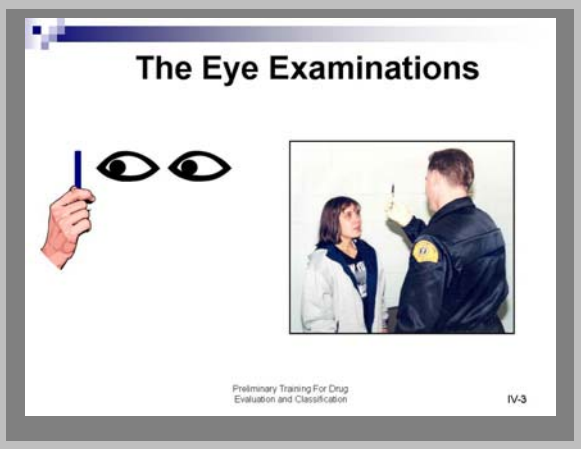
Display Slide IV-1: The Eye Examinations

Display Slide IV-2: Objectives



Briefly review the objectives, content and activities of this session.

Display Slide IV-3: The Eye Examinations



A. Purposes of the Eye Examinations

The principal purpose of all of the eye examinations is to obtain articulable facts indicating the presence or absence of specific categories of drugs.

- Certain drug categories usually cause the eyes to react in specific ways.
- Other drug categories usually do not cause those reactions.

HGN and VGN

The tests of Horizontal Gaze Nystagmus (HGN) and Vertical Gaze Nystagmus (VGN) provide important indicators of the drug categories that may or may not be present.

- Prior to the administration of the HGN, the subject's eyes should be checked for equal pupil size, resting nystagmus and equal tracking.
- The check for equal pupil size is simply done by visibly checking to see if both pupils are equal in size. If they are not, this may be an indicator of a head injury or other medical condition.
- The check for equal tracking is done by moving the stimulus smoothly across the subject's entire field of vision checking to see if the eyes track together or if one lags behind.
- If the subject's pupils are noticeably unequal in size or if resting nystagmus is present or if the eyes do not track together, there may be a chance of a medical condition or pathological disorder.

- This part of the examination may require more than one check to ensure that a medical condition or pathological disorder does not exist.

- If HGN is observed, it is likely that the subject may have taken a CNS Depressant, Dissociative Anesthetic, an Inhalant, or a combination of those.

- If VGN if observed, the implication may be that the subject took Dissociative Anesthetics, or fairly large doses of depressants or inhalants (for that individual).

- Point out that it is very unlikely that a subject would exhibit Vertical Gaze Nystagmus without also exhibiting HGN.

- By comparing the subject's blood alcohol concentration with the angle of onset of HGN, it may be possible to determine that alcohol is or is not the sole cause of the observed nystagmus.

- Clarification: If the angle of onset is significantly inconsistent with BAC, the implication may be that the subject has also taken a Dissociative Anesthetic or an Inhalant, or some CNS Depressant other than alcohol, or that the subject may have a medical condition.

Angle of Onset

The consistency of onset angle and BAC can be compared using the following formula:

Write the formula on the dry erase board of flip-chart.

BAC = 50 – Angle of Onset

- Explanation: BAC = 100 x blood alcohol (e.g., if blood alcohol is 0.10, BAC = 10).

- Example: If onset angle is 35 degrees, then BAC = 50-35 = 15.

- The corresponding blood alcohol concentration would be approximately 0.15.

- Keep in mind that this formula is only a statistical approximation. It is not an exact relationship for all subjects at all times.

- Emphasize this point: The formula can easily be "off" by 0.05 or more, even though the subject has consumed no drug other than alcohol.

- The only purpose of comparing BAC and the angle of onset is to obtain a gross indication of the possible presence of another Depressant, Inhalant, or Dissociative Anesthetic.

- Emphasize that many other facts will also be considered that will help to determine whether Depressants, Inhalants or Dissociative Anesthetics may be present.

A DRE is expected to be able to estimate the angle of onset of nystagmus to the nearest 5 degree increment, over the range from 30 to 45 degrees.

- If the subject's eyes begin to jerk before they have moved to the 30 degree mark, you will not attempt to estimate the angle precisely, but will record that they exhibit "immediate onset."

- From 30 degrees on out, you will record a numeric estimate of onset.

LOC

The check for Lack of Convergence can provide another clue as to the possible presence of Depressants, Inhalants, or Dissociative Anesthetics.

Lack of Convergence is also an indicator of the possible presence of Cannabis.

- Point out that a DRE might begin to suspect the presence of Cannabis if Lack of Convergence was observed but no HGN was observed.

The checks of pupil size, equal tracking and reaction to light provide useful indicators of the possible presence of many drug categories.

- Point out that in addition to signs of drug use, checks of the pupil size and reaction to light may reveal signs of injury or existing medical conditions.

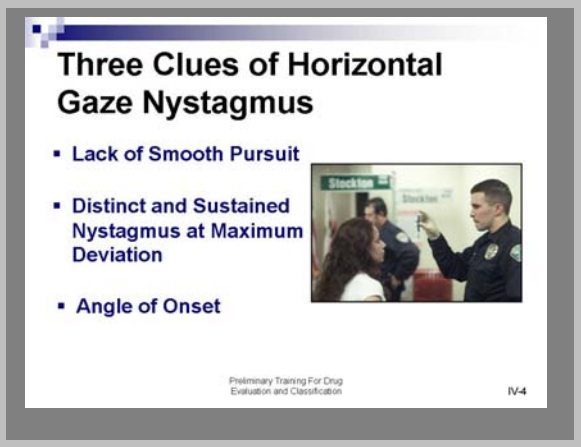
- CNS Depressants, CNS Stimulants and Inhalants will usually cause the pupils to react slowly to light.

- CNS Stimulants, Hallucinogens and Cannabis usually will cause the pupils to dilate.

- Narcotic Analgesics will usually cause the pupils to constrict, with little or no reaction to light.

Solicit students' comments and questions concerning the purposes of the eye examinations.

Display Slide IV-4: Three Clues of Horizontal Gaze Nystagmus



B. Procedures and Clues

Three Clues of Horizontal Gaze Nystagmus

Prior to the administration of the HGN test, the eyes are checked separately for equal pupil size, resting nystagmus and equal tracking.

- Note: As pointed out earlier, if the eyes do not track together, or if the pupils are noticeably unequal in size, the chance of a medical disorder or injuries causing the nystagmus may be present. Resting nystagmus may also be observed at this time.

Horizontal Gaze Nystagmus test consists of three separate checks, administered independently to each eye.

- Remind the students that the HGN test is done exactly the same as in the SFST training and that the DRE start with the "suspect's" left eye first.

Lack of Smooth Pursuit

The first check is for "lack of smooth pursuit."

Select a student, and demonstrate the first check of HGN on that student.

- Position the stimulus approximately 12 to 15 inches in from of the subject's nose.

- Hold the tip of the stimulus slightly above the subject's eye level.

- Point out that this procedure insures that the eyes will be open wide and easy to observe.

- Instruct the subject to hold the head still and follow the stimulus with the eyes only.

- Move the stimulus smoothly, all the way to the subject's left, then all the way to the right, then back again all the way to the left, then once again all the way back to the right.

- Point out that we begin by checking the subject's left eye, then we immediately check the right eye. We make at least two complete passes in front of both eyes.

- Demonstrate two complete passes in front of the eyes, using a student-volunteer as your test subject.

- Emphasize: For standardization, we always begin by checking the left eye.

- Point out that the stimulus should move at a speed that requires approximately two seconds to bring it from the center to side.

- While the eye is moving, examine it for evidence of a lack of smooth pursuit.

Use these or similar analogies:

- A smoothly pursuing eye will move without friction, much the way that a windshield wiper glides across the windshield when it is raining steadily. An eye showing lack of smooth pursuit will move in a fashion similar to a wiper moving across a dry windshield.

- A smoothly pursuing eye will roll in the socket the way that a marble or ball bearing would glide smoothly across a polished pane of glass. An eye exhibiting lack of smooth pursuit would move more like that marble rolling over a sheet of heavy gauge sandpaper.

Excuse the student-volunteer and thank him or her for participating.

Student Practice

Students' initial practice of the check for lack of smooth pursuit.

- Instruct students to work in pairs, taking turns checking each other's eyes for lack of smooth pursuit.

- Monitor, coach and critique the students' practice.

- Allow this practice to continue for only about 2 minutes.

Distinct and Sustained Nystagmus at Maximum Deviation

The second check if for "distinct and sustained nystagmus at maximum deviation."

Select a student and demonstrate the second check of HGN on that student.

- Again position the stimulus as before.
- Note: Remind students that the nystagmus must be both distinct and sustained.
- Move the stimulus all the way to the subject's left side and hold it there so that the subject's eye is turned as far to the side as possible.
- Remind students that we always start by checking the subject's left eye.
- Hold the eye at that position for a minimum of 4 seconds, to check carefully for any jerking that may be present.
- Then, move the stimulus all the way to the subject's right side, and hold it there for a minimum of 4 seconds.
- Remind students that as soon as we have finished checking the left eye, we immediately repeat the check on the right.
- Repeat the procedure.
- With this cue, the examiner looks for distinct and sustained jerking.
- A slightly or barely visible tremor is not sufficient to consider this cue present.
- A definite, strong jerking must be seen.
- Point out that for HGN to be considered present, a distinct and sustained jerking must be present for a minimum of four seconds.

Excuse the student-volunteer and thank him or her for participating.

Student Practice

Students' initial practice of the check for distinct and sustained nystagmus at maximum deviation.

The formula is BAC = 50 – Angle of Onset.

- Instruct students to work in pairs, taking turns checking each other's eyes for distinct and sustained nystagmus at maximum deviation.

- Monitor, coach and critique the students' practice. Allow this practice to continue for only about 2 minutes.

Angle of Onset

The final check is for the "angle of onset." The formula is BAC = 50 – Angle of Onset.

Select a student and demonstrate the third check of HGN on that student.

- Position the stimulus as before.
- Slowly move the stimulus to the subject's left side, carefully watching the eye for the first sign of jerking.
- When you think that you see the eye jerk, stop moving the stimulus and hold it perfectly still.
- Point out: If the eye is not jerking, resume moving the stimulus slowly to the side, again observing for the first sign of jerking.
- Verify that the eye is, in fact, jerking.
- Once you have established that you have located the point of onset, estimate the angle.
- Exhibit a template if available.
- Repeat this procedure on the subject's right eye.
- Point out that angle estimation simply requires practice.

Student Practice

Students' initial practice of angle of onset estimation.

- Point out that the template will be used during practice.

Excuse the student-volunteer and thank him or her for participating.

- Instruct students to work in pairs, taking turns estimating angles of each other's eyes.
- Instruct students that they are to try to draw their partner's eyes to 3 different angles: 30, 35, and 40 degrees.
- Students will check their accuracy using the template.
- Monitor, coach and critique the students' practice.

- Allow this practice to continue for only about 3 minutes.

Instructor's Note

In their previous training in HGN, some students may have been taught to look for all 3 clues in one eye, and then to check the other eye for all 3 clues. There is nothing wrong with that procedure, from either a scientific or legal perspective. As DREs however, we expect them to switch from eye to eye as they "work through" the three clues.

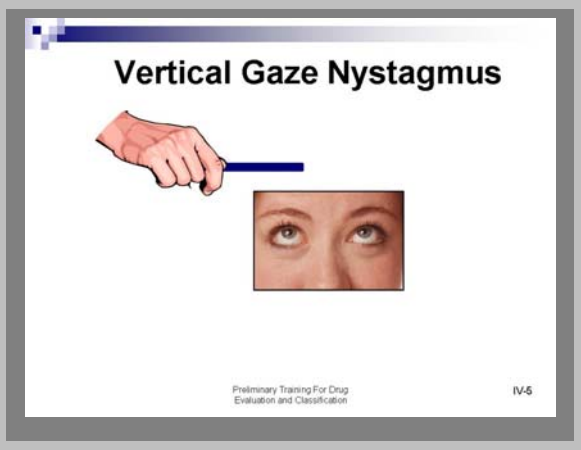
There are two reasons for this:

- Standardization: We want all DREs to work in the same way; the "left eye / right eye" switching procedure is simply the standard approach that we have adopted.

- Medical Complications: DREs must always be alert to the possibility of a medical complication, such as stroke, brain tumor or other injury to the brain. These kinds of injuries often will cause the two eyes to behave quite differently from one another. For example, the left eye might jerk noticeably while the right eye tracks smoothly. By always immediately comparing the performances of the two eyes, the DRE might more quickly spot the possibility of a medical complication.

Note: NHTSA modified its SFST training courses to conform to this "left / right" procedure in 1989.

Display Slide IV-5: Vertical Gaze Nystagmus



Vertical Gaze Nystagmus

The Vertical Gaze Nystagmus test is a very simple test.
Select a student and demonstrate the Vertical Gaze Nystagmus test on the student.

- Position the stimulus horizontally, approximately 12 to 15 inches in front of the subject's nose.

- Point out to the subject that he or she will have to keep their head steady and try to keep their eyes focused on the stimulus as it moves in toward the nose.

- Raise the stimulus until the subject's eyes are elevated as far as possible.

- Watch closely for evidence of jerking.

- Point out that the examiner should keep the subject's eyes elevated for approximately 4 seconds to verify that the jerking is present and continues during the full four seconds.

- Point out that we do not attempt to estimate an angle of onset for Vertical Gaze Nystagmus: we simply record whether a visible up and down jerking is present or not present.

Excuse the student-volunteer and thank him or her for participating.

Student Practice

Students' initial practice of the Vertical Gaze Nystagmus test.

- Instruct students to work in pairs, taking turns administering the Vertical Gaze Nystagmus test to each other.

- Monitor, coach and critique the students' practice.

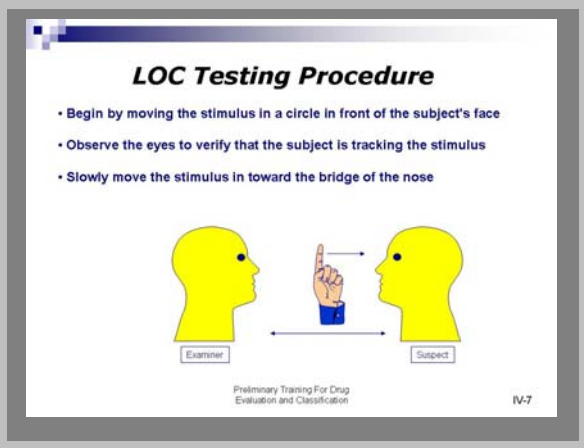
- Allow this practice to continue for only about 2 minutes.

Display Slide IV-6: Lack of Convergence

Lack of Convergence

The test for Lack of Convergence determines whether the subject is able to cross his or her eyes.

Display Slide IV-7: LOC Testing Procedure



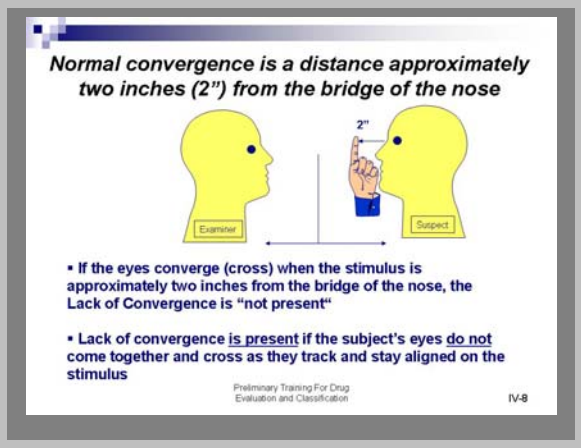
Select a student and demonstrate the test for Lack of Convergence on that student.

- Position the stimulus approximately 12 to 15 inches in front of the subject's nose in the same position we use for the HGN test.
- Point out in the simplest terms – Lack of Convergence means an inability to cross the eyes.
- Inform the subject that you are going to move the stimulus around in a circle in front of his or her face and to follow the stimulus with his or her eyes only.
- Point out that the stimulus can be moved either clockwise or counterclockwise.
- Inform the subject that you will move the tip of the stimulus in toward the bridge of his or her nose.
- Emphasize that it is important that the subject be aware of what will happen so that he or she will not flinch or become frightened when you move the stimulus toward his or her face.
- Point out to the subject that he or she will have to keep their head steady and try to cross the eyes in order to keep their eyes focused on the stimulus as it moves in toward the nose.
- Point out that you will not actually touch the subject's nose.

- Start to move the object slowly in a circle.
- Point out that this initial circular motion helps to verify that the subject has focused on the stimulus and is able to track it.
- Verify the subject is tracking the stimulus.
- Move the stimulus within approximately two inches of the bridge of the nose. Carefully observe the subject's eyes to determine whether both eyes converge on the stimulus.
- Point out not to actually touch the nose and not to go any closer than approximately two inches from the bridge of the nose.

Instructor note: Remind the students that prior to conducting the check for Lack of Convergence the DRE should determine if the subject to be tested routinely wears eyeglasses for reading and near visual tasks and if so, are the reading glasses available for the test. If so, ensure that the eyeglasses are worn for the check for LOC.

Display Slide IV-8: Normal Convergence



- In a normal non-impaired subject, the eyes should come together (converge) and remain converged for one second.
- Point out that convergence response in most people is a distance of approximately 2 inches from the bridge of the nose.
- If the eyes do not converge or remain converged on the stimulus for one second, then Lack of Convergence is present.

- Point out that many normal non-impaired people cannot converge to the bridge of the nose. Moving the stimulus within two inches of the nose provides a better indicator of lack of convergence attributed to drug impairment.

Student Practice

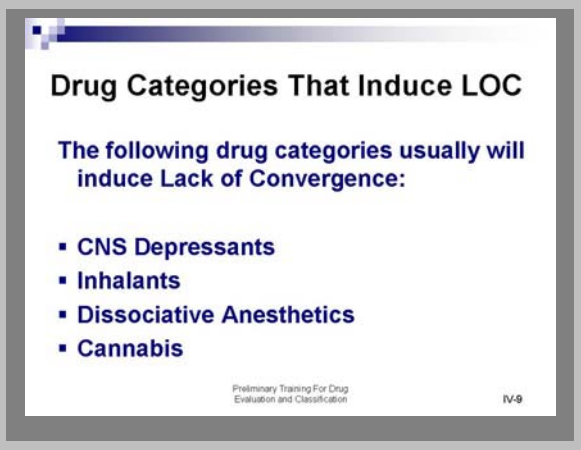
Students' initial practice of the test for Lack of Convergence.

- Point out to keep the stimulus high enough so that eye movement can be observed.

Excuse the student-volunteer and thank him or her for participating.

- Instruct students to work in pairs, taking turns testing each other's eyes for Lack of Convergence.
- Monitor, coach and critique the students' practice.
- Allow this practice to continue for only about 2 minutes.

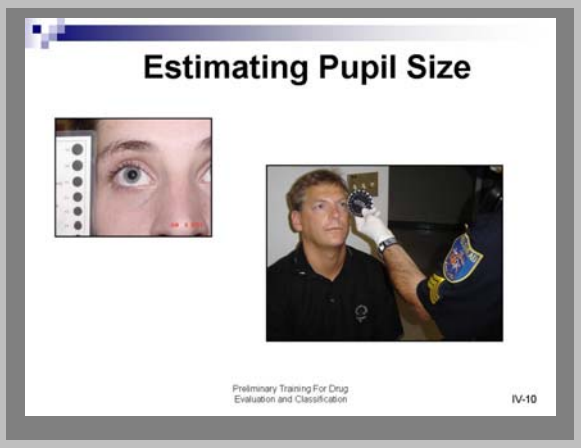
Display Slide IV-9: Drug Categories That Induce LOC



Drug categories which usually cause lack of convergence include:

- CNS Depressants
- Inhalants
- Dissociative Anesthetics
- Cannabis

Display Slide IV-10: Estimating Pupil Size



Estimation of Pupil Size

We use a device called a pupillometer to estimate the size of the subject's pupil.

The DRE pupillometer has a series of circles or semi-circles, with diameters ranging from 1.0 mm to 10.5 mm, in half millimeter increments.

Exhibit a pupillometer.

- Point out that our eyes continually adjust to accommodate different lighting conditions
- Emphasize the measurement is an "estimate."
- Select a student and demonstrate pupil size estimation using the student.
- Point out to begin by testing the subject's left eye first.

The pupillometer is held alongside the subject's eye, and moved up and down until the circle or semi-circle closest in size to the pupil is located.

The pupil size estimations are recorded as the numeric value that corresponds to the diameter of the circle or semi-circle closest in size to the subject's pupil in each lighting condition.

Students' Initial Practice of Pupil Size Estimation

Select a student from the class and demonstrate how the pupil size is estimated.

Upon completion, excuse the student-volunteer and thank him or her for participating.

- Instruct students to work in pairs, taking turns estimating each other's pupils.
- Monitor, coach and critique the students' practice.
- Allow this practice to continue for only about 2 minutes.
- Tell the students to record on paper the pupil sizes of their partners.

Ask the students how many found partners with different sized pupils (i.e., one pupil larger or smaller than the right).

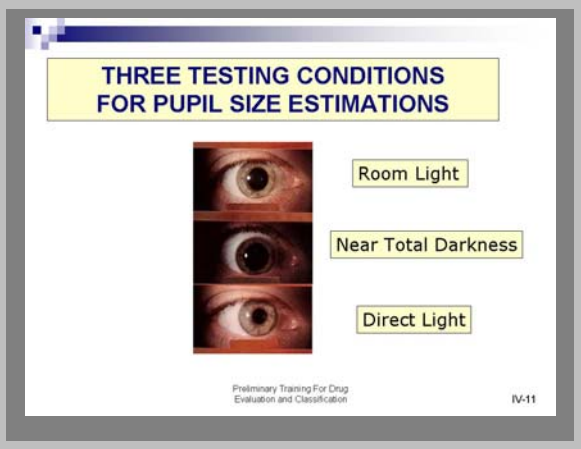
- Point out that it is not too uncommon to find people whose pupils differ by as much as one-half millimeter, but the larger differences are more unusual.

Tabulate the pupil size estimates made by the students on the flip-chart using the following sizes:

8.5 or larger_____
8.0_____
7.5_____
7.0_____
6.5_____
6.0_____
5.5_____
5.0_____
4.5_____
4.0_____
3.5_____
3.0_____
2.5 or smaller_____

- Point out that the "normal" range of pupil size in room light is 2.5 to 5.0 mm.

Display Slide IV-11: Three Testing Conditions for Pupil Size Estimations



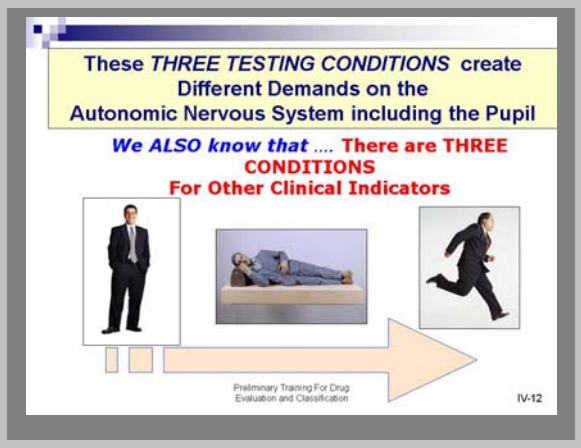
Three Lighting Conditions

We estimate pupil size under three (3) different lighting conditions:

- Room Light
- Near Total Darkness
- Direct Light

Instructor Note: The In-Direct Light estimation was removed from the DRE protocol in 2003 after research determined it had no direct correlation to impairment.

Display Slide IV-12: Three Testing Conditions



- Different testing conditions create different demands on the autonomic nervous system, including the pupil.

- Examining the pupils in three different lighting conditions is similar to examining other clinical indicators, i.e., pulse or blood pressure in different conditions.

- Point out that the human pulse and blood pressure can vary depending on whether the person is standing, resting, or running.

Estimation of Pupil Size under Room Light

Pupils are examined in Room Light prior to darkening the room.

Estimation of Pupil Size under Near Total Darkness and Direct Light

The final two pupil size estimations are made with the use of a penlight in a near totally darkened room.

- Prior to estimating the pupil sizes, we darken the room and wait 90 seconds to allow the subject's eyes and our own to adapt to the dark.

Demonstrate this.

- For the estimation under near total darkness, completely cover the tip of the penlight with your finger or thumb, so that only a reddish glow and no white light emerges.

- Bring the glowing red tip up toward the subject's left eye until you can distinguish the pupil from the colored portion of the eye (iris).

- Position the pupillometer alongside the pupil (left eye first) and locate the circle or semi-circle that is closest in size to the pupil.

- Repeat the procedure for the subject's right eye.

Select a student to participate in demonstrations of darkroom pupil measurements.

- For the estimation under direct light, bring the uncovered light from the side of the subject's face directly into his or her left eye and hold it there for approximately 15 seconds.

Demonstrate this.

- Emphasize that the penlight should be positioned so that the beam just "fits" or approximately fills the eye socket.

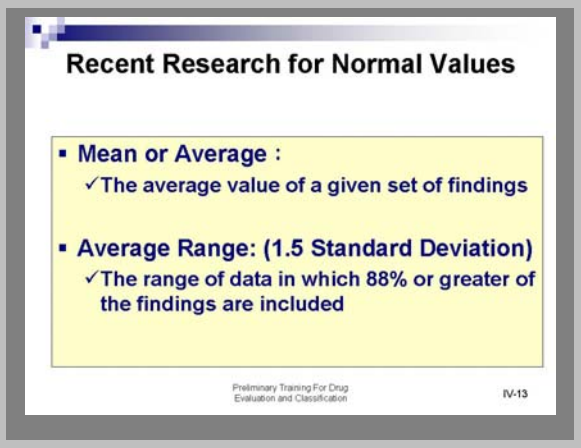
- Bring the pupillometer up alongside the left eye, and find the circle or semi-circle that is closest in size to the pupil.

- Repeat the procedure for the right eye.

Normal Sizes for the Pupil

Since we estimate pupil size under three different lighting conditions (Room Light, Near Total Darkness, and Direct Light) the range of pupil sizes will vary.

Display Slide IV-13: Recent Research for Normal Values



Basic Concepts Relative to Interpreting Pupil Sizes

It is important to understand a few basic concepts relative to interpreting pupil sizes. Understanding these concepts will allow DRE's to better understand the relationship of pupil size to impairment.

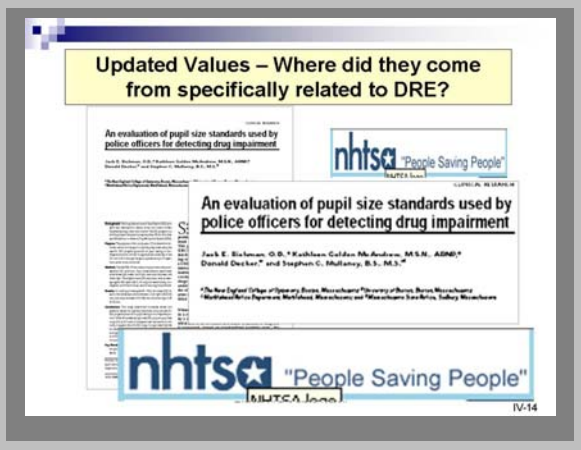
Mean values and average ranges: scientifically validated studies were conducted to determine normative values for pupil size in non-impaired persons. These studies show what one would expect a person to exhibit when their pupil sizes are checked under different lighting conditions. Sometimes average means "in the middle" or sum of all numbers divided by the number in a particular group. What we use for interpretation purposes are "average ranges" of pupil sizes.

- Point out that when all of the study subjects were tested, the majority (approximately 88%) of the "normal" non-impaired people fell within the "average ranges."

- As a DRE, you will be making your decision of impairment based on clinical, psychophysical, and behavioral indicators. This includes using pupil sizes as one of the factors in determining that impairment.

- With many people, even under very bright light, the pupils won't constrict much below a diameter of 2.0 mm, and even under near total dark conditions, the pupils usually only dilate to a diameter of not more than 8.5 mm.

Display Slide IV-14: Updates Values



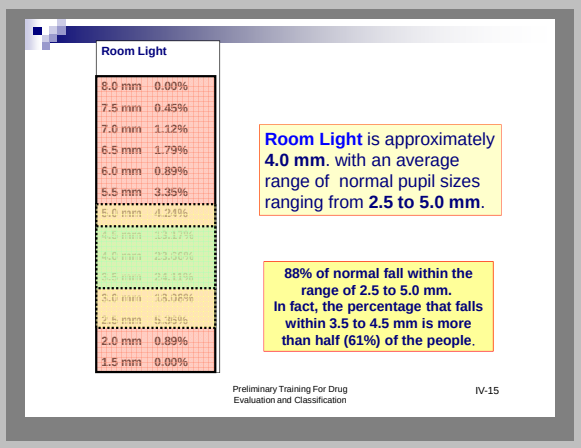
- Studies have indicated there are significant differences between the average pupil size in these three conditions.

- Consequently, the use of three distinct pupil sizes range for each of the different testing conditions may be more useful to determine impairment versus non-impairment.

Point out that although there are several studies that indicate these pupil sizes are "for the majority of normal, non-impaired people," there is one study in particular that specifies the average size and ranges:

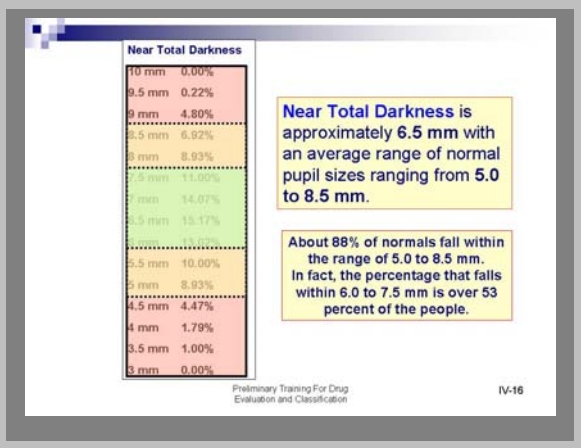
- "An Evaluation of Pupil Size Standards Used By Police Officers for Detecting Drug Impairment" JAOA, March 2004, Richman, McAndrew, Decker & Mullaney.

Display Slide IV-15: Room Light



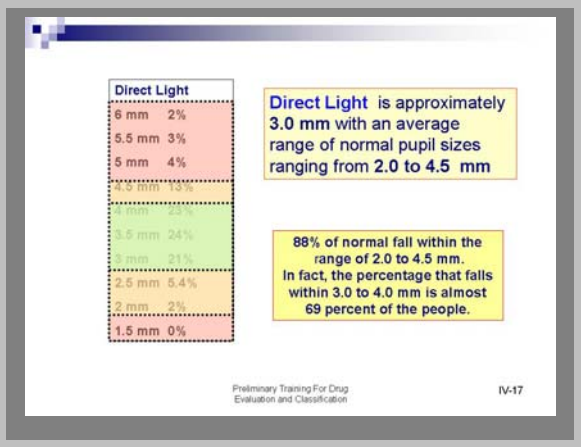
- Room Light is approximately 4.0 mm with an average range of normal sizes ranging from 2.5 to 5.0 mm.

Display Slide IV-16: Near Total Darkness



- Near Total Darkness is approximately 6.5 mm with an average range of normal pupil sizes ranging from 5.0 to 8.5 mm.

Display Slide IV-17: Direct Light



- Direct Light is approximately 3.0 mm with an average range of normal pupil sizes ranging from 2.0 to 4.5 mm.

Many drugs, however, will affect the dilation or constriction of the pupils and many cause the pupil size to go outside these normal ranges.

- Point out that specific drug categories and their relationship to pupil sizes will be covered later.

The check of the pupil's reaction to light takes place at the same time as the test of pupil size under direct light.

- Observe the subject's pupil size as the penlight is aimed at the side of the subject's face.

Demonstrate this using a participant-volunteer.

- As you bring the beam of light directly into the subject's eye, note how the pupil reacts.

Demonstrate this.

- Under ordinary conditions, the pupil should react very quickly, and constrict noticeably when the light beam strikes the eye.
- Point out that pupillary reaction to light should occur within one second.
- Under the influence of certain categories of drugs, the pupil's reaction may be very sluggish, or there may be no constriction at all.

Excuse the student-volunteer and thank him or her for participating.

Student Practice

Students' initial practice in measuring the pupil's reaction to light.

- Instruct the students to work in pairs, taking turns shining the light into each other's eye and observing the pupil's reaction.
- Remind students to position the penlight so that the beam exactly "fits" the eye socket when the beam is brought directly into the eye.
- Monitor, coach and critique the students' practice.
- Allow the practice to continue for only about 2 minutes.

Solicit students' comments and questions concerning the eye examinations.

C. Demonstrations

Select two students to come before the class.

- Demonstrate equal tracking and equal pupil size.
- Demonstration of Horizontal Gaze Nystagmus.

Instruct one student to demonstrate the administration of HGN to the other student.

- Check for lack of smooth pursuit.
- Check for distinct and sustained nystagmus at maximum deviation.
- Coach and critique the student-administrator's performance.

Estimation of the Angle of Onset

Make sure that the student-administrator checks both eyes.

When the participant-administrator has completed the HGN test, instruct the student-administrator to draw the student-subject's eye to an angle of 35 degrees. Check the accuracy of this estimate, using the template.

Excuse the two students and thank them for participating.

Demonstration of Vertical Gaze Nystagmus and Lack of Convergence

Select two other students to come before the class and instruct one student to check the other for Vertical Gaze Nystagmus.

- Coach and critique the student-administrator's performance.

Instruct the second student to check the eyes of the first student for Lack of Convergence.

- Coach and critique the student-administrator's performance.

Excuse the two students and than them for participating.

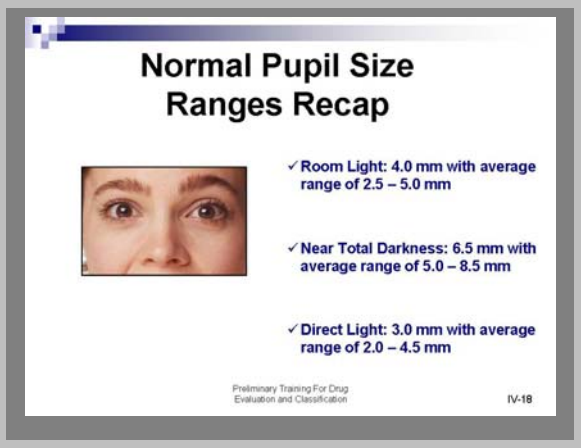
Demonstration of Pupil Size Estimation and Test for Reaction to Light

Select two other students to come before the class and instruct one student to estimate the other's pupils under room light.

- Pupil size estimation under room light.
- Coach and critique the student-administrator's performance.
- Darkroom estimations of pupil size.
- Instruct the second student to demonstrate how to perform the dark room estimations of pupil size.
- Coach and critique the student-administrator's performance.
- Point out that assessment of the pupil's reaction to light takes place in conjunction with the direct-light estimation.

Excuse the two students and thank them for participating.

Display Slide IV-18: Normal Pupil Size Ranges Recap



To review, the normal ranges for non-impaired people are:

- Room Light: 4.0 mm with an average range of 2.5 – 5.0 mm.
- Near Total Darkness: 6.5 mm with an average range of 5.0 – 8.5 mm.
- Direct Light: 3.0 mm with an average range of 2.0 – 4.5 mm.

Solicit students' comments and questions concerning the demonstrations of the eye examinations and the pupil size ranges.

D. Relationship of Drug Categories to the Eye Examinations

- Note: Draw the matrix at the end of this session on the dry erase board or flip-chart at the outset of this segment.

Three of the seven drug categories normally will cause Horizontal Gaze Nystagmus.

Ask the students which drug categories normally induce HGN.

- CNS Depressants, Inhalants and Dissociative Anesthetics normally will cause HGN.

> Along the HGN line on the matrix, write "PRESENT" under the columns for Depressants, Dissociative Anesthetics and for Inhalants.

- The other four categories normally will not cause HGN.

> Write "NONE" on the HGN line under the other columns.

Any drug that will cause HGN also will cause Vertical Gaze Nystagmus, if a high enough dose of the drug is taken.

- Depressants, Inhalants and Dissociative Anesthetics can all cause Vertical Gaze Nystagmus at higher doses for that individual.

> Along the VERT NYST line, write "PRESENT" under the columns for those three categories.

- But if a drug will not cause HGN, then it will not cause Vertical Gaze Nystagmus.

Write “NONE” for VERT NYST under the other four columns.

All drugs that cause nystagmus also will cause the eyes to be unable to converge.

- Therefore, Depressants, Inhalants and Dissociative Anesthetics, including PCP and its analogs, usually will cause Lack of Convergence.

Write “PRESENT” along the LACK CONV line under the columns for those three categories.

- Interestingly, there is one category of drug that does not cause nystagmus but that does usually cause Lack of Convergence.

Ask students which category that is.

- Cannabis usually does cause Lack of Convergence, even though it does not cause nystagmus.

Write “PRESENT” along the LACK CONV line under CANNABIS.

- The other three categories do not cause a Lack of Convergence.

Write “NONE” along the line under the remaining three columns.

An interesting and important fact is that the drugs that cause nystagmus usually don’t affect pupil size, and the drugs that don’t cause nystagmus usually do affect pupil size.

- CNS Stimulants and Hallucinogens usually cause the pupils to become larger or “dilated.”

Write “DILATED” along the PUPIL SIZE line under the columns for CNS Stimulants and Hallucinogens.

- Cannabis may cause the pupils to dilate.

Write “DILATED” under the CANNABIS column; however, explain they may also be “NORMAL” as per Exception #6.

- Narcotic Analgesics usually cause the pupils to become smaller or "constricted."

Write "CONSTRICTED" under the NARCOTICS column.

- Dissociative Anesthetics and most Inhalants tend to leave pupil size in the normal ranges.

Write "NORMAL" under the columns for Dissociative Anesthetics and Inhalants. BUT POINT OUT THAT SOME INHALANTS MAY CAUSE PUPIL DILATION as per Exception #4.

- CNS Depressants also usually leave the pupils near normal.

Write "NORMAL" under the DEPRESSANT column.

- However, there are some exceptions, i.e., depressant drugs that usually dilate the pupils.

Ask students which depressants cause pupil dilation.

- Soma, Quaaludes and some anti-depressants usually dilate pupils.

Put a (1) next to the "NORMAL" in the DEPRESSANT column and explain Exception #1: Soma, Quaaludes and some anti-depressants usually dilate pupils.

Solicit students' questions and comments.

Generally, the pupillary reaction to light is either slowed by the effect of the drug or the pupil reacts normally. The most significant exception is the effect caused by Narcotic Analgesics. Though there is always some reaction to light, in live subjects, the constricted pupil caused by narcotics makes it difficult to perceive a change in the pupil size.

- CNS Depressants and CNS Stimulants usually cause a slowed reaction to light.

Write "SLOW" in the column for inhalants that this is only a general rule.

- With Hallucinogens, Dissociative Anesthetics and Cannabis the pupillary reaction to light is usually normal.

Write “NORMAL” under the columns for Hallucinogens, Dissociative Anesthetics and Cannabis.

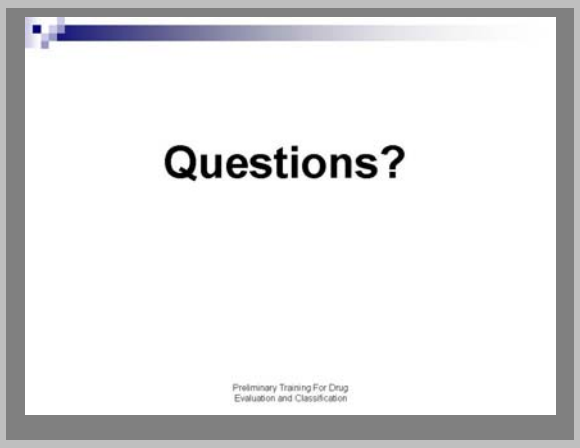
- Point out that certain psychedelic amphetamines cause slowing of the pupils as per Exception #3.
- Due to the constricted nature of the pupils when under the influence of Narcotic Analgesics, it is difficult to perceive a reaction to light. As a result, we list reaction to light for Narcotic Analgesics as “little or none visible.”

Write “LITTLE OR NONE VISIBLE” under Narcotic Analgesics.

- Inhalants will usually slow pupillary reaction.

Write “SLOW” in the column for inhalants and explain that this is only a general rule.

Display Slide IV-19: Questions



REVIEW QUESTIONS

1. Name the three clues of impairment associated with Horizontal Gaze Nystagmus.

   1. Lack of smooth pursuit 2. Distinct and sustained nystagmus at maximum deviation 3. Onset of nystagmus prior to 45 degrees

2. Complete this formula:

   BAC = 50 - ????

   Angle of onset

3. Which categories of drugs will not cause Vertical Gaze Nystagmus?

   CNS Stimulants, Hallucinogens, Narcotic Analgesics, Cannabis

4. Which categories of drugs usually will cause Lack of Convergence?

   CNS Depressants, Inhalants, Dissociative Anesthetics, Cannabis

5. Name the three lighting conditions under which a DRE makes pupil size estimations.

   Room light, Near total darkness, Direct Light

6. What is the normal range of pupil size for room light?

   2.5 – 5.0 mm

7. Which categories of drugs will usually slow down the reaction of the pupils to light?

   CNS Depressants, CNS Stimulants, Inhalants

Attachment A

PARTICIPANT PROFICIENCY EXAMINATION
STANDARDIZED FIELD SOBRIETY TEST BATTERY

Participant Name: _____ Date: _____

I. HORIZONTAL GAZE NYSTAGMUS

_____ 1. Have subject remove glasses if worn.

*_____ 2. Stimulus held in proper position (approximately 12”-15” from nose, just slightly above eye level.

_____ 3. Check for equal pupil size and resting nystagmus.

_____ 4. Check for equal tracking.

*_____ 5. Smooth movement from center of nose to maximum deviation in approximately 2 seconds and then back across subject’s face to maximum deviation in right eye, then back to center. Check left eye, then right eye. (Repeat)

*_____ 6. Eye held at maximum deviation for a minimum of 4 seconds (no white showing). Check left eye, then right eye. (Repeat)

*_____ 7. Eye moved slowly (approximately 4 seconds) from center to 45 angle. Check left eye, then right eye. (Repeat)

_____ 8. Check for Vertical Gaze Nystagmus. (Repeat)

II. WALK-AND-TURN

_____ 1. Instructions given from a safe position.

*_____ 2. Tells subject to place feet on a line in heel-to-toe manner (left foot behind right foot) with arms at sides and gives demonstration.

*_____ 3. Tells subject not to begin test until instructed to do so and asks if subject understands.

*_____ 4. Tells subject to take nine heel-to-toe steps on the line and demonstrates.

*_____ 5. Explains and demonstrates turning procedure.

*_____ 6. Tells subject to return on the line taking nine heel-to-toe steps.

*_____ 7. Tells subject to count steps out loud.

*_____ 8. Tells subject to look at feet while walking.

*_____ 9. Tells subject not to raise arms from sides.

*_____ 10. Tells subject not to stop once they begin.

*_____ 11. Asks subject if all instructions are understood.

III. ONE-LEG STAND

_____ 1. Instructions given from a safe position.

_____ 2. Tells subject to stand straight, place feet together, and hold arms at sides.

_____ 3. Tells subject not to begin test until instructed to do so and asked if subject understands.

*_____ 4. Tells subject to raise one leg, either leg, approximately 6" from the ground, keeping raised foot parallel to the ground, and gives demonstration.

*_____ 5. Tells subject to keep both legs straight and to look at elevated foot.

*_____ 6. Tells subject to count out loud in the following manner: one thousand one, one thousand two, one thousand three, until told to stop, and gives demonstration.

_____ 7. Checks actual time subject holds leg up. (Time for 30 seconds.)

Instructor: _____

Note: In order to pass the proficiency examination, the student must explain and cannot omit the numbers marked with an asterisk (*).