Vision screening procedures for the migrant population

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Vision screening procedures for the migrant population

Abstract
Vision care is neglected in certain populations, one of which is the migrant population. A cost effective means of providing the necessary care could be set up, utilizing the present system of facilities around the nation. Health care providers in such facilities can be trained to perform simple, but effective vision screening techniques and to refer any vision problems observed. To attain this goal the Federal government initially provided the funds to produce a slide presentation and teaching manual. It proved to be quite successful, but to even better communicate the vision screening procedures to the health care workers, a supplemental video presentation was requested and subsequently funded. The format of the video includes a short introduction into each test sequence indicating the reason for the test and possible symptoms that the subjects may present. There will be an opportunity after each sequence to review the video and/or teaching manual and to practice the test with a partner. The manuscript itself consists of the actual script on the right column with a description of the action immediately to the left. The far left column consists of the accompanying pictures from the original story board. A glossary of the abbreviations used follows the script.

Degree Type
Thesis

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VISION SCREENING PROCEDURES
FOR THE
MIGRANT POPULATION

By
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MARISA K. MONTEROLA
BEN H. WONG, JR.

A thesis submitted to the faculty of the
College of Optometry
Pacific University
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Advisor:
WILLARD B. BLEYTHING, O.D., M.S.
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ABOUT THE AUTHORS

Monica J. Trejo Arvizu was born in Valparaiso, Chile in 1961 and later moved to Southern California. She went to UCLA where she acquired research experience in behavior modification with autistic children and received a B.A. in Psychology in 1984. Her immediate plans after graduation include practicing in a HMO setting, but she would eventually like to be in a group practice or partnership. Her areas of interest include general practice, contact lenses, and pediatric vision especially with the Spanish-speaking population.

Marisa K. Monterola was born in the Philippines and emigrated to the United States in 1974. She attended San Francisco State University and obtained a Bachelor's degree in 1984 in Biology with an emphasis in cell and molecular biology. She plans to pursue an optometric practice with emphasis in primary care, contact lenses, and pediatric vision in her home state.

Ben H. Wong, Jr. was born and raised in Roseburg, Oregon. He performed his undergraduate studies at Oregon State University. While there he majored in microbiology, concentrating in the subspecialty of immunology as a research assistant. He received a B.S. in Microbiology with University Honors in 1986. He is presently an active member of the Beta Sigma Kappa Optometric Honorary at Pacific University. Future plans after graduation include a residency position at Northeastern State University, an eventual private practice with specialties in vision therapy and contact lenses, and ultimately, a teaching position at an accredited college of Optometry.
Vision care is neglected in certain populations, one of which is the migrant population. A cost effective means of providing the necessary care could be set up, utilizing the present system of facilities around the nation. Health care providers in such facilities can be trained to perform simple, but effective vision screening techniques and to refer any vision problems observed. To attain this goal the Federal government initially provided the funds to produce a slide presentation and teaching manual. It proved to be quite successful, but to even better communicate the vision screening procedures to the health care workers, a supplemental video presentation was requested and subsequently funded. The format of the video includes a short introduction into each test sequence indicating the reason for the test and possible symptoms that the subjects may present. There will be an opportunity after each sequence to review the video and/or teaching manual and to practice the test with a partner. The manuscript itself consists of the actual script on the right column with a description of the action immediately to the left. The far left column consists of the accompanying pictures from the original story board. A glossary of the abbreviations used follows the script.
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INTRODUCTORY STATEMENT

**Concept**: Vision care is neglected in certain populations, one of which is the migrant population. There are numerous clinics around the nation with health workers providing various types of health care to the this population, but they generally lack any training in testing for visual problems. Vision screenings when done properly are an effective means of determining who is need of vision care, but to bring in vision care professionals would not be cost effective or time efficient. An ideal situation exists whereby health care providers in these facilities can be trained to perform simple, but effective vision screening procedures. Once properly trained, these health care providers can produce a cascading effect, thus leveraging access to vision care for the migrant population. Not only can they make up for the discrepancy in vision care giving those in need an opportunity to receive it, but they will be doing it on a cost effective basis.

A previous optometric thesis project by Dori Carlson, O.D. and Laura Bondy, O.D. was undertaken to address this concern in the migrant population. The project consisted of a slide presentation and teaching manual and its primary purpose was indeed to help train health care providers to perform vision screenings. The Federal government funded the project, and due to its success, they have requested and subsequently funded a supplemental video to accompany the teaching manual to better communicate these vision screening techniques to the health care provider in clinics throughout the country.
Goal: Our intent was to produce a high quality video presentation of comprehensive vision screening techniques to the health care provider. The major advantage of a video is the visual-auditory reinforcement of the written material. To maximize the learning process, the format of the video was decided to be as follows:

1. The video will be approximately 45 minutes in length
2. Emphasis on the fact that these are just screening procedures and they are responsible primarily for good observations and appropriate referrals
3. Short introduction to each test sequence indicating the reason for the test and possible symptomology
4. Opportunity after each test sequence to review video and/or manual and to practice the test with a partner

Status: A story board was originally written based on the slide presentation and teaching manual. Numerous hours of tedious discussions and revisions have taken place since that first manuscript. The following script and accompanying pictures from our story board represent our efforts on this project to this point in time. The actual script is located on the right column with the description of the action to the left. The pictures on the far left accompany each action. A glossary of abbreviations follows the script. Much of our video shooting is done and any additional shot selections have been planned. The painstaking editing process lies ahead. The final product should be available in late April or early May of 1990. The video will be accessible in the Learning Resource Center in Jefferson Hall, College of Optometry.
INTRODUCTION: VISION SCREENING TECHNIQUES

#1 This presentation is designed to teach you how to perform vision screening tests. You’ll learn how to screen your clinic population, identify individuals with possible visual problems, and record anything unusual that you find. You will not be expected to actually diagnose problems, but you should be able to detect individuals in need of care.

At the conclusion of each testing section, you will be given an opportunity to review the procedure, refer to the accompanying manual for more detailed information, and perform the test with a partner. Practice each screening test with this partner until you gain confidence with it. Then, proceed to the next test.
To understand vision it is important to know something about eye structure, its surrounding components, and how the eye works.

Our eyes are not merely cameras that decode information about the world around us. They are actually extensions of the brain.

The eye sits inside a bony socket, called the orbital cavity. Lining this cavity are several layers of fat, which cushion and support the eye. Any blow to the eye can damage the fragile cavity and may cause damage to the eye itself.
Animated illustration to live action...

...eyes looking at clock or similar object.

LA, ECU profile of eye, both left and right directions.
Animation of "dandruff" being stopped by lashes.

LA, CU with CG and/or arrow pointing to sclera.

LA, CU of conjunctiva, with CG and/or arrow indicating area.

#4 Attached to the eye are six muscles which move the eyes to change their position. These muscles also hold the eyes steady when looking at a stationary object.

#5 The eye's upper and lower lids are flaps of skin that function to protect the eye. Along the margin of each lid is a row of lashes that helps prevent particles from entering the eye.

#6 The sclera, commonly known as the "white of the eye," provides a protective covering for the eye.

#7 Closely adherent to the sclera is the conjunctiva. It is a clear mucous membrane that contains blood vessels.
Illustration of eye in profile with CG. Animate in front curvature when mentioned, top to bottom.

#8 The cornea is transparent and covers the colored portion of the eye. Its curvature provides a major optical component in the eye's focusing system.

LA with CG on iris, which opens and closes in response to light.

#9 The colored portion of the eye is the iris. It changes the size of the central opening called the pupil to control the amount of light entering the eye.

Illustration, change focus of light with animation.

#10 Behind the iris is the lens, a transparent, but pliable, disc that changes shape to focus the incoming light.
Illustration and animated zoom to ECU of rods and cones. CG outlining receptors.

Animation of light ray over illustration, as far as "nerve impulse."
Illustration of top view of the brain. Animation of light ray continues to optic chiasm.

#11 The retina makes up the back of the eye. In it are receptors that receive the light.

When a ray of light enters the eye, it is focused onto the retina...which generates a nerve impulse, sending visual information to the optic nerves...to the middle portion of the brain, where the fibers cross at an area known as the optic chiasm.
EXTERNAL EXAMINATION OF THE EYE
Animation of light ray continues to "combined".

LA shot of human activity.

(music fades up slowly)

Illustration of cross section of eye with CG names.

CG: review manual
review videotape

From there, the information travels to its final destination... the visual cortex. Here at the back of the brain, the inputs from the two eyes are combined to create perceptions of depth, color, movement, and shape.

This concludes a basic review of ocular anatomy. If you have any questions, take this time to review the manual and this section of the videotape. When you're ready, we'll continue on to the screening test series.

EXTERNAL EXAMINATION
OF THE EYE

TITLE: External Examination of the Eye. Over the examiner's procedures, begin by assessing the general health of the eye by its external appearance. Be sure to note anything unusual that you find.
LA CU head on, then cut to CU profile.

Show both eyes being examined when checking lashes.

Slides or LA of entropian...

...and ectropian.

Here is a healthy set of eyes. Begin the examination by looking at the eyelids. Notice that the upper and lower lids both lie against the eye. Check the lids for swelling and in-turned or out-turned lashes. In-turned lashes scrape and irritate the cornea, while out-turned lashes cause the lid margin to roll away from the eye exposing the eye to dryness.

ECU of lashes. Cut to slide of flakes on lashes.

#14 Check the base of the lashes for dandruff-like flakes. These flakes can get into the eye and cause irritation.

ECU normal sclera.

#15 Next, look at the sclera. It should be bluish-white in color.

CU jaundiced eyes, LA or slide.

Yellowing of the sclera indicates jaundice, and the patient should be referred for further care.
CU normal conjunctiva. #16 Check the conjunctiva for clarity. If it’s irritated the blood vessels will dilate and give it...

CU of person with red eye, LA, or slide. ...

CU shot, LA, or slide of condition. #17 The abnormality seen here is called a pinguecula. It is the yellow, raised portion of the conjunctiva shaped like a triangle, commonly seen on the side next to the nose.

CG outline of pinguecula.

ECU, LA or slide. Because it may grow onto the cornea, it can pose a serious threat to vision. It often affects people who work outdoors in a dry climate and are exposed to the constant irritation of dust and wind. For these reasons, agricultural workers are frequently affected.

MS and CU of field workers (during local grape harvest).
ECU of cornea, with some eye movement.

#18 The cornea should be examined next. Because the light essential for vision enters through the cornea, it is important that the cornea be clear.

ECU of defective cornea from LA or slide.

Any haziness or clouding will interfere with the person's vision.

This subject should be referred.
#19 Finally, look at the iris.

When the iris is swollen or irritated it may have a muddied appearance.

The pupil should be round and regular in shape.

Note if its shape is irregular, which may be secondary to a swollen iris.

In bright light, the pupil should constrict, decreasing the amount of light that enters the eye. In the dark, the pupil should dilate, increasing the amount of light that enters the eye.
MS then CU of examiner making notes on the form. CU of other spaces on the form.

#20 Be sure to note any abnormalities. Diagrams have been inserted on the screening form so that anything unusual can be drawn. Also, there are blank spaces where a written description of the abnormality may be included.

(music fades up)
Graphic page which lists the steps to follow.
(perhaps with the exam title as a quick background)

This concludes the external examination of the eye. Stop the videotape now and refer to the manual if you require more detailed explanations of terms or procedures used in the exam. You may also want to replay this section of the program. Practice the exam on a partner before proceeding to the screening test that follows.
VISUAL ACUITIES

Scene of person watching an activity then from person’s POV.

The scene washes out and takes on a yellow tint.


CU He/she looks up and attempts to focus on clock on distant wall. Facial gestures, squints, etc.
POV camera tries to focus unsuccessfully on the clock.

#21 A number of factors influence the eye’s ability to gather and transmit visual information. One of these factors is the sharpness of our vision. A cataract, caused by a clouding in the lens of the eye, affects the clarity of vision and may make the world appear washed out and yellow.

#22 A nearsighted person may be able to see things that are close,... but be unable to see objects that are farther away.

12
Person walking on street carrying piece of paper with an address written on it. Cannot focus clearly on writing, but can read street sign in distance. Looks back and forth from paper to sign, squints as he/she tries to read address on paper.

#23 A farsighted person may have just the opposite problem. Things which are near may appear blurry, while objects in the distance are clear. He may be able to see clearly both at far and near, but to do this he will have to work hard to focus. This may cause the person to have eyestrain and headaches, especially if he is reading or doing close work.

TITLE: Visual Acuities fades in, then out, over shot of eye chart.

Super of Graphics Tool Box with images of an occluder and a wall chart.

TITLE: Far Visual Acuities MS establishing shot, with wall chart on right wall.

CU of chart, full frame.

CU head on of subject's face.

#24 Visual acuities are taken to determine how clearly we see. It is necessary to test at both far and near distances. To test for visual acuities you will need an occluder and an acuity wall chart.

#25 To take far acuities, have the subject stand 20 feet from the chart. There should be sufficient lighting on the chart so that the letters can easily be seen. Visual acuities are taken for the right eye, left eye, and both eyes.
MS of Examiner with subject to her left. Raises occluder.

CU of occluder over right eye.
CU, (change angle slightly) of occluder tilting away from face.

#26 Begin by covering one eye and then the other. When an eye is covered, it is important to have the occluder flat against the subject's face. If the occluder is tilted, the subject may be able to see past it with the eye that should be covered. This can result in an incorrect acuity being recorded.
EXAMINER: Do the letters on the chart appear clearer with your right eye or left eye?

SUBJECT: Uh, my right.

EXAMINER: Let's start with your left eye. Call out the letters on the smallest line that you can see.

SUBJECT: F, E, L, O, P, Z, D.

NARRATOR: Always start the test with the poorer eye. Encourage the subject to go as far down the chart as possible.

EXAMINER: Can you see the next line down?

SUBJECT: (hesitates) Not really.

EXAMINER: Go ahead and guess.
VISUAL ACUITY  FAR
RIGHT  2/15  2/20  2/25  2/30 OTHER
LEFT  2/15  2/20  2/25  2/30 OTHER
BOTH  5/15  2/20  5/25  5/30 OTHER
MS SUBJECT attempts to read the next line, slowly, trying for each letter.  

CU of wall chart. 

#28 A subject earns the line when more than half of the letters on the line are called out correctly. For example, if the subject called out “P, E, C,” the response would be recorded as 20/40.  

MS over SUBJECT shoulder. 

EXAMINER: Now let’s test your other eye. Call out the lowest line of letters that you can see. 

CU 3/4 side view. SUBJECT continues to read line as NARR voice comes in. 

SUBJECT: D, E, F, P, etc. 

NARRATOR: Remember to test each eye separately and together. 

MS of exam as he makes recording on chart, then CU of notes on chart. 

#30 Record the lowest line the subject could see. Circle the acuity for the right, left, and both eyes on the portion of the form designated for far visual acuity.
TITLE: Near Visual Acuities

#31 To test near visual acuities, you will need a near letter card and an occluder.

LA--MS, CG/CU16” with arrow, coming from recording far V.A. subject.

#32 Hold the card 16 inches from the subject.

MS shot angle from SUBJ shoulder-see SUBJ and EXAM doing routine VA.

The near visual acuities is performed the same way as the far visual acuities.

CU near point card with dialogue.

EXAMINER: Do the letters on the card appear clearer with your right eye or left eye?

SUBJECT: Uh, my right.

EXAMINER: Let’s start with your left eye. Call out the letters on the smallest line that you can see.

CU of form.

#33 Circle the acuity for the right eye, left eye, and both eyes on the portion of the form for near visual acuity.

Shot of the Far and Near “E” charts.
Shot of kid using hand to point the same direction as the “E’s.”
Fade out.

#34 For subjects who do not know their alphabet, a tumbling “E” chart can be used. Have the subject use his hand to show which way the “E” is pointing.

Graphics page, or freeze frame (or LA) from preceding test with CG super, listing:
Stop Videotape Review Practice Test With Partner

This concludes the visual acuities test. Stop the videotape now and review the material in the program and in the manual. Practice the procedure with a partner before continuing on to the next test.


COVER TESTS

CU Threading a needle, person's eyes and thread going through eye of needle.
LA, CU Ben's eye turning in and out.
CU Jack's eyes.

MS of person suffering eye strain, reaches for aspirin in medicine cabinet.

#35 In addition to sharpness of vision, the two eyes must work together as a team. Some individuals have an eye that turns in or out. Others just have a tendency for an eye turn that is not obvious without testing. An individual with an eye coordination problem may complain of headaches or a pulling sensation particularly towards the end of the day.

Animation, illustration: top view of eyes coordinating on a subject (as in #26-27), then to double vision image created with two cameras on table setting, via switcher.

#36 Both eyes must point to the same place in space to see an object as one. If they don't, the individual may see double or the brain may suppress, or ignore one of the images.
TITLE: Cover Test
Profile MS test warm up with EXAM and SUBJ.
CG: unilateral tests for actual eye turn
CG: alternating tests for the tendency for eye turn
Graphics Tool Box: occluder and wall chart.

#37 The cover test is used to test for eye coordination problems, and it consists of two parts. The unilateral cover test detects problems with eyes that do not point to the same place in space. The alternating cover test reveals any tendencies for an eye to turn. To perform these tests you need an occluder and a wall chart.

UNILATERAL COVER TEST

TITLE: Unilateral Cover Test
super over EXAM and SUBJ sitting down beginning test.

#38 Face the subject while he looks at the chart. You both may be sitting or standing.

Graphic showing far VA (20/20). #39 Select a letter from the line above the lowest line the subject was able to see and instruct him to look at it.

Move up one line and show/circle letter “O.”
Cover one eye with the occluder. Watch the opposite eye as you remove the occluder. Wait one or two seconds to allow the eye to refixate. You shouldn’t see any movement. If movement is detected, make sure the patient is still looking at the target letter. Repeat two more times. Now cover the other eye and repeat the procedure.

If all instructions were followed, and movement is still seen, then the subject should be referred.
#42 To perform the alternating cover test, have the subject continue to look at the letter.

Cover one eye for two to three seconds, and rapidly shift and cover the other eye. This time watch the eye that is being uncovered for any movement. Allow time for the eyes to refixate before shifting the cover back. Repeat two more times.

As you perform this test, the subject may report that the letter seems to jump from side to side or up and down. This is a normal response.
Lower Test
T A L
unilateral no movement
Alternating no movement
#43 Circle the responses for both the unilateral and alternating cover tests.

This concludes the cover tests. Stop the videotape now and review the material in the video and in the manual. Practice the procedure with a partner before continuing on to the next test.

EYE MOVEMENT TESTS

Smooth and accurate eye movements are important. Poor eye movements may cause difficulty in reading or doing fine, detailed, near tasks.

There are three tests for eye movements: near point of convergence, pursuits, and saccades.
Title: Near Point of Convergence

Top view animation and cut into the bead doubling.

Graphic Tool Box: white fixation bead.

Profile: two shots over shoulder.

#45 The near point of convergence shows how well an individual can turn his eyes in while keeping a target single close up.

To perform this test you need a fixation bead.

#46 Begin by holding the bead 20 inches from the subject, making sure that it is centered and slightly downward.
EXAMINER: How many beads do you see?

SUBJECT: One.

NARRATOR: In this test expect the subject to say “one”. If the subject reports seeing two beads make sure that he is looking at the bead. If he still sees two, move the bead further away.

EXAMINER: Good. Keep your eyes on the bead as I move it towards your nose. Tell me when it breaks into two.

SUBJECT: Two.
CU CH arrow from bead to nose. 

#48 Measure the distance in inches from the bridge of the nose to the bead. This is called the break.

Subject #2

You may observe one or both eyes deviate from the bead instead of the subject seeing two. When this happens, measure the distance from this point. Some individuals may be able to follow the bead all the way to the nose.

Subject #3

LA

#49 Now have the subject close his eyes, and hold the bead close to the bridge of the nose.

EXAMINER: Open your eyes. How many beads do you see?

SUBJECT: Two.

EXAMINER: Keep watching the beads and tell me when you see one as I move it away from your nose.

SUBJECT: One.
CG arrow from bead to nose. 

Again measure this distance. This is called the recovery. You may see the eyes come together before the subject reports seeing one. Measure the distance from this point.

Top view animation with cutaways to real patient eyes

The two eyes should converge by equal amounts. If only one eye turns in as the bead is moved, or if one turns in more than the other, make sure that you are bringing the bead in along the center of the patient, and not from a point slightly off to the side. If you are performing the test correctly and the discrepancy is still noted, refer the subject for further care.

Use the close up of subject with bead coming in.
Near Point of Convergence

Break nose 1" 2" 3" other

Recovery nose 1" 2" 3" other
LA have SUBJ #2 say "two" PURPOSELY after they actually break.

CU of form.

#52 Your observation and the subject's response on the break and recovery points should agree. If they don't, record your observation and make a note of it on the form. Circle the measurements for the break and recovery.

Graphic page.

This concludes the near point of convergence test. Stop the videotape now and review the material in the video and in the manual. Practice the procedure with a partner before continuing on to the next eye movement test.

Title: Pursuits

ball rolling across the floor followed by a pair of eyes.

Graphic Tool Box: white fixation bead.

PURSUITS

#53 Unlike the near point of convergence, pursuits evaluate eye movements for following objects moving across our field of view.

To perform the test, you need a fixation bead.
MS profile of EXAM and SUBJ.

MS over EXAM shoulder

SUBJ with head movement and eye movement.

CU SUBJ eyes following bead movement. see bead move across (EXAM #54 Hold the bead 16 inches from the subject.

EXAMINER: Follow the bead and keep it clear. Tell me if it ever doubles or if you feel any discomfort. Just use your eyes.

NARRATOR: Watch the subject's eyes as you move the bead horizontally, vertically, diagonally, and then in a circular motion. Move the bead in each direction as far as the subject can follow.

CU over SUBJ shoulder.

#55 The eye movements should be smooth and accurate. "Accuracy" refers to how well the subject can keep his eyes on the bead without losing it and making a secondary jump movement to find it again. Watch the eyes for jerky movement.

CU of SUBJ eyes.
Preliminary

Smooth and accurate

Yes

Restricted

Other
LA or animation emphasis: lag, lead, and limitation of movement.

#56 The two eyes should work together. One eye should not lag behind or shoot out in front of the other. Look for any limitations of movement as well, since this may indicate trauma or some neurological problem.

MS EXAM recording on form and CU of form.

#57 Circle the eye movements that you observed.

Graphic page.

This concludes the pursuits tests. Stop the videotape now and review the material in the video and in the manual. Practice the procedure with a partner before continuing on to the next eye movement test.
SACCADIES

TITLE: Saccades

#58 Saccades are jump eye movements. They are used when we look rapidly from one object to another, as when we read.

Graphic Tool Box: red and white fixation beads.

#59 To evaluate the saccades you need one red bead and one white bead. Hold one in each hand so that they are 8 inches apart and 16 inches from the subject. During the test the beads will be separated in different directions; horizontally, vertically, and diagonally.

Over shoulder of EXAM with CG 8" and arrows, then from side, with CG 16" and arrows. Illustrate directions.

EXAMINER: Look at the red bead when I say "red" and look at the white bead when I say "white."

MS of examiner with beads in front of eyes.
CU of eyes as test proceeds.

SUBJ moves head to follow targets.

CU EXAM from SUBJ POV

EXAMINER: Try not to move your head and use only your eyes to look at the beads.

If he cannot hold his head relatively still, make a note of it.

CU SUBJ eye movements

#61 Watch the subject's eyes. Movements should be smooth and accurate consisting of one quick motion.

Other eyes (blue, etc.) which over and under shoot or animation.

Watch for over shooting and under shooting, where more than one movement has been made to successfully fixate the target.

NARRATOR: Do not initially instruct the subject to hold his head still. If head movements are made to fixate from one target to the other, then ask the subject to try to hold his head steady for the rest of the test.
#62

Ballades

Smooth & accurate
Jerkily
Restricted
Other
Notes on charts, per usual.

#62 Circle the movements that you observed.

Graphic page.

This concludes the saccades test. Stop the videotape now and review the material in the video and in the manual. Practice the procedure with a partner before continuing on to the next test.
WORTH FOUR DOT TEST

Graphic rendering of an object in 3-D.

Top view (as in #36) of neural pathway, with interruption.
Same object as #63, this time in 2-D.

Pad and pencil on desk, (use 2 offset cameras and SEG)
Graphic top view with both eyes not on same target.

Title: Worth Four Dot Test

Suppression is when an individual is looking with both eyes at an object, but the information from one eye is ignored.

Double vision results when both eyes are not pointed to the same place in space.

The Worth Four Dot Test is used to determine if an individual is suppressing or seeing double.

#63 Combining the information from each eye simultaneously gives us the ability to perceive depth.
Graphic Tool Box: flashlight and glasses.

#64 You need a Worth 4-Dot flashlight and a pair of red-green glasses. Have the subject put on the glasses. Turn the flashlight on, hold it 16 inches away and point it towards the subject.

EXAMINER: How many dots do you see?

SUBJECT: Four.

EXAMINER: What colors are they?

SUBJECT: Two red, one green and one that is a combination of both.

Animation of flashlight head or actual still shots of two green dots, three red dots or five dots.

#65 If the subject is suppressing the information from one eye, either two green dots or three red dots will be seen. If the subject reports seeing five dots, he is seeing double.
Worth 1-Dot

4 dots
5 dots
3 dots
2 dots
CU of form. #66 Circle the number of dots the patient sees.

Graphic page. This concludes the Worth Four Dot Test. Stop the videotape now and review the material in the video and in the manual. Practice the procedure with a partner before continuing on to the next test.

STEREO FLY TEST

Montage of scenes: bumping into chairs in a classroom, knocking over cup of coffee, key into lock. #67 Individuals who lack good depth perception tend to bump into things, knock things over, and stumble a lot.

TITLE: Stereo Fly Test, super over test preparations. The stereofly test evaluates depth perception.
Graphic Tool Box: Stereo Fly and Polaroid glasses.

#68 To perform this test, you need a stereofly and a pair of Polaroid glasses. Have the patient put on the glasses, and hold the stereofly 16 inches away.

EXAMINER: Do you see the fly?

SUBJECT: Uh.....huh.

EXAMINER: Can you pinch the fly's wing?

#69 The expected response is for the subject to pinch the fly's wing as if it's floating off the card. If the subject touches the actual picture of the fly, make sure he understands the instructions. If he touches it again, this is a "no depth" response.
Stereofly

depth response

no depth response
This concludes the Stereo Fly test. Stop the videotape now and review the material in the video and in the manual. Practice the procedure with a partner before continuing on to the next test.

AMSLER GRID TEST

Our clearest vision comes from a small area in the retina. Any disturbance to this area will have a damaging effect on our central vision. For example, alcohol abuse, as well as normal aging processes, may compromise this area.

The Amsler grid evaluates the central vision.
To perform this test, you need an Amsler grid chart and the occluder. If the subject wears glasses for near work, he should put them on. If it is a bifocal, make sure he is looking through the bottom portion.

Have the subject cover one eye and hold the grid 12 inches away. Make sure there is sufficient lighting on the card so the lines are easy to see.

EXAMINER: Do you see a dot in the center?

SUBJECT: Yes

EXAMINER: When you look at the dot, are you aware of the four sides and the four corners of the grid at the sametime?

SUBJECT: Yes

EXAMINER: Keep looking at the dot. Are there areas where the pattern is missing, disrupted, or blurred?

SUBJECT: No, it is all clear.
Amster Grid

distortion

no distortion
LA or distort grid pattern with trial lenses.  

#74 If any distortions are seen in the grid pattern, or if the patient reports that any lines are missing, the subject should be referred for further care.

Proceed to test the other eye.

CU of form.  

#75 Circle either "distortion" or "no distortion."

Graphic page.  

This concludes the Amsler Grid test. Stop the videotape now and review the material in the video and in the manual. Practice the procedure with a partner before continuing on to the next test.
CONFRONTATION FIELDS

Graphic top view of neural pathway (good old #36), with tumor (displayed with color cycling) located between chiasm and visual cortex.

Bulging artery on side of brain.

Pedestrian in crosswalk almost hit by car.

TITLE: Confrontation Fields

Confrontation fields testing helps determine the limits of a person's side vision.

Graphic Tool Box: white bead and occluder.

#76 Any problem along the visual pathway may compromise an individual's field of vision. For example, tumors may grow and interrupt the pathway.

Strokes will restrict the blood flow that supplies the brain with nutrients... and may diminish side vision.

#77 You need the while fixation bead and the occluder. If the subject wears glasses, he should remove them.
#78 Face the subject about two feet away. Have the subject cover his left eye with the occluder. Cover your right eye so each of you have an eye covered. It is important that you and the subject look at each other's eyes during the test or it will be invalid. Hold the bead out of view above the patient and look straight ahead into his eye.
#79
EXAMINER: Look at my open eye. As I bring the bead into view, tell me when you first see the bead out of the corner of your eye. Say "now" when you first see it.

SUBJECT: Now.

NARRATOR: The subject should see the bead at about the same time as you. Repeat with the bead from below the eye, then next to the subject's nose. Finally, bring the bead into view from behind the subject's head next to the ear. You will see the bead the entire time. However, the subject should see the bead only when it's lined up with the corner of his eye. If the bead passes the corner of the subject's eye before he sees it, then it is considered as a failing response.

#80 Repeat with the other eye.
#81 For the first three positions, circle whether the patient saw the bead at the same time, before, or after you saw it. For the side towards the ear, circle whether the bead was in line, behind or in front of the eye when the subject first saw it.

This concludes the confrontation fields test. Stop the videotape now and review the material in the video and in the manual. Practice the procedure with a partner before continuing on to the next test.
#82 Glaucoma is a slow, progressive disease that may lead to blindness. Increased pressure within the eye decreases the blood flow to the retina. Without a proper blood supply, it cannot function and blind areas result within the field of vision.

#83 Tonometry is the measurement of the pressure inside the eye using an instrument called a tonometer. A tonometer measures the pressure by blowing a puff of air onto the front of the eye. An eye with increased pressure returns the puff of air faster than one with normal pressure.
MS of tonometer and then cutaway CUs of joystick, elevation control knob, trigger button.

#84 The tonometer has only a few controls and is simple to use. The joystick aligns and focuses the tonometer by moving it forward, backward, and side to side. In front of it is the elevation control knob which changes the instrument's height. In the center is the trigger button which is pressed to take the measurement.

CU of digital display, eyepiece.

#85 Above it is the digital display. It gives you the pressure reading. This is the eyepiece you will look through to focus and align the tonometer.
CU of safety lock knob, power and mode switches.

#86 On the base is a safety lock knob. It locks the instrument to prevent accidental contact with the subject's eye. These are the power and mode switches. When each one is pressed, the light comes on. This is the power switch used to turn the instrument on. This is the demonstrate switch used as a demonstration to the subject and for calibration. This is the override switch, which allows you to fire the tonometer when it is not in focus.

Reverse angle

CU of chin rest, elevation ring.

#87 The subject sits on this side. This is the chin rest and this is the elevation ring, which adjusts the height of the chin rest so that the subject's eye is lined with the instrument.
CU of forehead rest, override knob.  

#88 This is the forehead rest and this is the head rest override knob. When the subject's forehead is pressed firmly against the rest, a light turns on inside the instrument. Use this knob when the subject is unable to activate the light.

CU of prescription knob.  

#89 This is the prescription knob. Use this knob when the subject is unable to see the red dot in the instrument. The red and black dots indicate that a prescription has been added. When the knob is in this position, there is no prescription in place.
To operate the tonometer it must first be calibrated. Turn it on and let it warm up for 30 seconds. Then press the trigger. The display should read 65. Next, depress the demonstrate switch. Press the trigger again. The display should read 49, 50, or 51. Press the trigger several more times, waiting at least 8 seconds between each one. The reading should not vary by more than 1 and it should not flash. If it does, the calibration is incorrect. Make sure you follow these guidelines precisely. If the tonometer fails any of these tests, it is in need of service. Once the tonometer is calibrated, it does not need to be recalibrated unless it is turned off.
Next, hold a white index card in front of the tonometer and look through the eyepiece. You will see a black ring. Turn the eyepiece until the ring is in focus for your eye. Remove the card.

This concludes the tonometer orientation and setup. Stop the videotape now and review the material in the video and in the manual. Thoroughly familiarize yourself with the instrument, its controls and setup before continuing on to the test.

**Tonometry procedure**

Before seating your subject at the instrument, clean the chin rest and the forehead rest with alcohol. You should follow this procedure before each subject.
LA MS of SUBJ and then CU of hand. #93 To alleviate any apprehension, have the subject sit down and place his hand half an inch away. Push the demonstrate button, and then press the trigger. The subject feels the puff of air and gets an idea of what to expect.

CU of examiner pushing button and pressing trigger. Take the tonometer out of the demonstrate mode.

LA MS with mixed CU. #94 Next, have the subject place his chin here and his forehead here. Adjust the height of the instrument table of the subject's chair so that the patient is comfortable.

CU of SUBJ. #95 Turn the elevation ring to align the outer corner of the subject's eye with the black mark on the support piece to the left of his face.
CU of light and override knob. 

#96 As the subject presses his forehead against the rest, a light will turn on inside. If he cannot keep his forehead against the rest, use the override knob.

LA various MS and CUs.

#97 Have the subject close his eyes. Raise the safety lock knob and align the tonometer so that the light is centered on the eyelid. Move the tonometer towards the subject until it is no closer than 1/4 inch from his eyelid. Set the safety knob.

LA EXAM directs SUBJ with hand. 

#98 Have the subject open his eyes and look into the instrument. Make final adjustments by aligning the light in the center of his pupil. He should be able to see a red dot inside.
Animation: representation of eyepiece target mixed with manual movements of joystick and elevation control.

#99 Look through the eyepiece. You should see the red dot as well. Get it focused and centered in the black ring. Like with a video game, move the joystick to focus and align the dot. Use the elevation control knob to change the height of the dot.

CU of switch with audio.

#100 When the red dot is in focus and centered, press the trigger. The tonometer will fire only when it is properly aligned. If it does not fire after several attempts, use the override switch.
#101

#102

15 16 17 18 19 20
21 22 23 24
#101 Record the number that appears in the display. A flashing number indicates an invalid reading. A reading of 99 means that the subject blinked. In both cases, repeat the procedure until a valid reading is obtained. If the reading is greater than 22, take a second reading and record both numbers. Subjects with readings greater than 22 should be referred for further care. Repeat this procedure with the other eye.

#102 Circle the reading that you measured.

This concludes the tonometry test. Stop the videotape now and review the material in the video and in the manual. Practice the procedure with a partner before continuing on to the next test.
Nurse taking blood pressure and patient taking insulin and then photos of hypertensive and diabetic retinopathy.

#103 Diseases that affect the entire body as well as those concentrated in the eye can have very damaging effects on vision. Vascular diseases such as hypertension and diabetes, which occur frequently in migrant populations, may affect the health of the retina. Early detection and treatment of many diseases can prevent an individual from losing his vision.

LA MS of EXAM performing retinal photography.
TITLE: Retinal Photography orientation and setup

#104 Retinal photography is used to assess the health of the retina and detect any diseases that may be present. It is the only place in the human body where blood vessels can be viewed without actually making an incision.
CU shot of polaroid picture.  #105 The retinal camera takes a picture of the subject's retina, which can then be evaluated by an eye doctor.

CU shot of different parts of camera.  #106 Here's how retinal camera works: The joystick is similar to the one on the tonometer. It's used for fine adjustments. On top is the shutter release button that takes the photograph.

CU shot of screen and other parts of camera.  #107 This is the screen on which you will line up and focus the camera. To the left is the focusing knob. To the right are four knobs. They work just like the ones on your television at home: the brightness control, the horizontal control, the contrast control, and the vertical control. These controls do not affect the outcome of the photos, however, just the image on the video screen.
CU of different parts of camera.  #108 On the base are three switches: the power switch is used to turn the camera on. The illumination intensity control varies the amount of light that is being projected into the subject's eye. The internal fixation switch provide a target for the subject to look at. It helps hold his eyes steady while the camera is aligned and the photo is taken.

CU of external fixation light.  #109 For a subject who has limited vision and cannot see the target, there is an external fixation light. It is attached on top of the camera and can be placed at any desired fixation point.

CU shot of flash intensity knob.  #110 On the right side of the camera is the flash intensity knob. The three settings allow you to select either a low, medium or high intensity flash.
CU of chin rest and forehead rest. This is the chin rest and the forehead rest. This is the elevation control knob.

CU of compensation slider. On top is a compensation slider that can be used much like the prescription knob on the tonometer. It helps the subject who is very near-sighted or very far-sighted see the fixation target more clearly.

Graphic page. This concludes the retinal camera orientation and setup. Stop the videotape now and review the material in the video and in the manual. Thoroughly familiarize yourself with the instrument and its controls before continuing on to its actual operation with a subject.
TITLE: Retinal Photography procedure

MS of darkened room with exam and subj in position.

LA of routine.

#113 Retinal photography should be performed in a darkened room so that the subject's pupil will open up as much as possible. There should only be as much light as is necessary to see the controls.

#114 Before seating the subject, clean the chin and forehead rests with alcohol. This procedure should be followed with each subject. Seat the subject and place his chin on the chin rest and his head against the forehead rest. Turn the elevation control knob to adjust the height of the chin rest. Adjust the height of the table so that the subject is comfortable. Ask the subject to look at the lens of the camera.
#115 To align the camera, hold the joystick up while you slide it across the table. An image of the subject's eye will appear on the screen. Use the joystick for fine alignment.

#116 Turn the focusing knob to focus the image. Use the joystick to place the circle on the screen into the center of the pupil. The "I" in the center of the circle is a scale used to make sure that the subject's pupil is large enough to get the proper amount of light into the eye to take the photo.

#117 This pupil is large enough to take a photo.

#118 This pupil is barely large enough to take the photo, but you must be careful to line the camera up precisely.
CU of a pupil that is too small. #119 This pupil is definitely too small and this eye cannot be photographed.

Show alignment with animation. #120 Once the circle target is aligned with the pupil, move the camera closer to the subject until an image of the back of the eye appears on the screen. The subject should be able to see a flashing red dot. Tell him to look at this dot.

MS of camera moving closer to SUBJ.

CU shot of flashing red dot.

LA focusing camera, cut to animated focus. #121 Focus the camera so that two dots appear towards the edge of the image on the screen. Adjust the joystick to bring them into view.

Animation #122 Position the two dots with the horizontal line on the screen by turning the joystick. Then move it from side to side so that one dot appears on either side of the pupil. When the camera is aligned, it should look like this.
Animation

#123 You should also see two rectangular images on the screen. Turn the focusing knob so that the two rectangles are lined up horizontally.

LA picture being taken.

Take the picture *immediately* by pressing the trigger. Any other positions of the rectangles will produce a blurry photo.

LA

#124 Repeat the procedure with the other eye.
#125 Staple the photographs in appropriate square.

Montage of screening procedures as in introduction

This concludes the vision screening test series. We hope this presentation has been helpful to your understanding of vision screening procedures. Frequent review of this videotape will assist you in applying consistent techniques in screening your patient population. Your accurate detection of vision problems and abnormalities in subjects needing referral to an eye doctor will greatly enhance their chances for better vision in the future.
GLOSSARY OF ABBREVIATIONS

CG  character generation
CU  close up
ECU  extreme close up
EXAM  examiner
LA  live action
MS  medium shot
POV  point of view
SUBJ  subject