



**ACCREDITED TRAINING FOR THE NATIONAL
REGISTRY OF CERTIFIED MEDICAL
EXAMINERS**

VISION & HEARING

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**THE VISION
STANDARD**



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Driver Vision History

Driver History: Eye disorders or impaired vision (without corrective lenses)

- Ask if any changes, diagnosis, glare, any near crashes (indications of beginning eye conditions)
- Any symptoms related to or cause by eye disease, tolerance to contacts
 - burning, irritation, itching, blurring, night vision
- Any history of Macular Degeneration, Aphakia, Glaucoma, Cataracts, Retinopathy

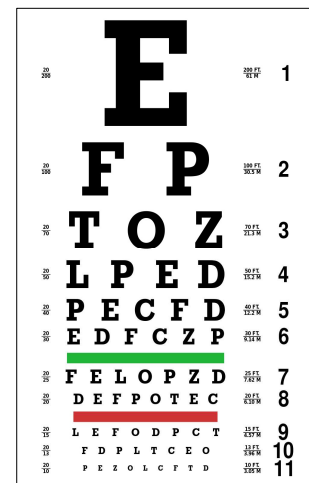


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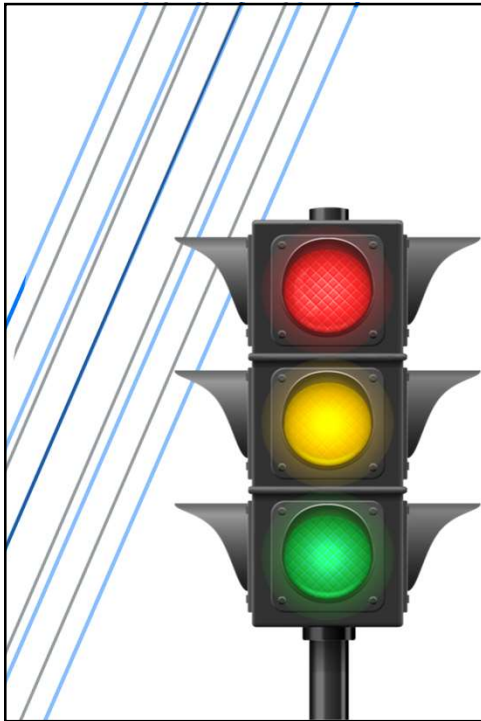
FMCSA VISION STANDARD

Drivers must meet the standard in each eye and when using both eyes. (with or without corrective lenses)

- Distant visual acuity of at least 20/40
- Field of vision of at least 70 degrees in the horizontal meridian
- Be able to recognize the colors of traffic signals and devices showing standard green, red and amber
- No double vision
- When corrective lenses are used to meet the requirements, corrective lenses must be used while driving
- Drivers with insulin-treated diabetes mellitus that have either severe non-proliferative diabetic retinopathy or proliferative diabetic retinopathy cannot be certified



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Color Perception Guideline

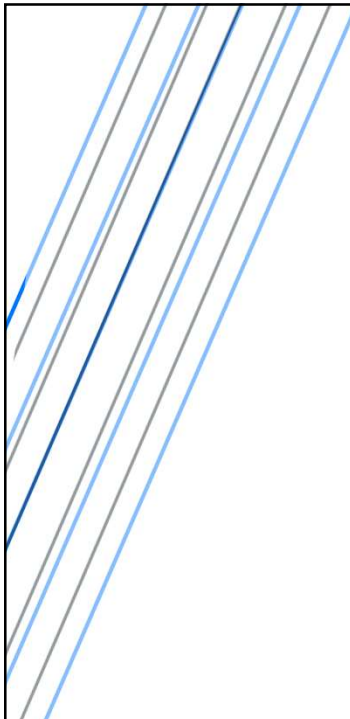
Drivers must be able to recognize the colors of the traffic signal

“The term ‘*ability to recognize the colors of*’ is interpreted to mean if the driver can recognize standard red, green and amber, the driver meets the minimum standard, even though they may have some type of color perception deficiency.”

Color perception may be evaluated using a controlled test using standard **Red, Green and Amber**

True color perception is not required!

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When asked to differentiate traffic signal green, red, and amber using colored cards, the driver can differentiate which color is which, but reports that the red card appears “greenish grey” and green card appears “gray-ish”. What is the next step?

- A. Disqualify the driver
- B. Certify the driver for 2 years
- C. Refer the driver to a vision specialist for color deficiency evaluation
- D. Take the driver to a traffic signal to verify passage of the vision standard

The correct answer is **B**. To pass the color vision standard, drivers are only required to differentiate traffic signal green, red, and amber. It does not matter what color they actually report seeing.

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TESTING VISUAL ACUITY

- A trained office assistive may perform the vision screening test and record results
- Use the Snellen chart at 20 feet, illuminated with white light, or use a Titmus Vision Tester
- Ask the driver which line has the smallest lettering they can read. Note smallest line that driver can read while missing only one letter. (Could be reported at 20/40-1)
- Driver should keep both eyes open when using an eye occluder to test each eye individually
- Some drivers who wear corrective lenses may pass without their lenses
- Drivers wearing contacts must carry a spare set of glasses while driving

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FIELD OF VISION TEST

Sit approximately two feet in front of the driver

Instructions for testing the left eye:

- Driver uses the palm of the right hand to cover the right eye
- Ask the driver to fixate on your left eye
- Extend your arms forward and position your hands halfway between yourself and the driver
- Position your right hand one foot to the right of the straight-ahead axis and six inches above the horizontal plane
- Position your left hand one-and-a-half feet to the left of the straight-ahead axis and six inches above the horizontal plane
- Ask the driver to confirm when a moving finger is detected
- Repeat the procedure with your hands positioned six inches below the horizontal meridian

Reverse the process for the right eye

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OCCULAR MOTILITY, ACCOMMODATION, CONVERGENCE



Driver's eye follows the examiner's penlight movement thru the "H" pattern, then focuses on the penlight when moved close and distant.

Motility: Evaluates the extraocular muscles and their impact on eye movement

Accommodation: The ability of the eye to change its focus from distant to near objects

Convergence: Turning inwards of the eyes in order to fixate an object or image that is closer than the previous fixation point

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MONOVISION VS MONOCULAR VISION

Monovision:

- Disqualifying
- Issues with depth perception
- One eye nearsighted, the other farsighted
- Lasik surgery or corrective lenses for distance acuity in one eye and near acuity in the other

Can be resolved by having corrective lenses that create distance acuity in both eyes.

Monocular Vision:

- One eye does not meet the vision requirements

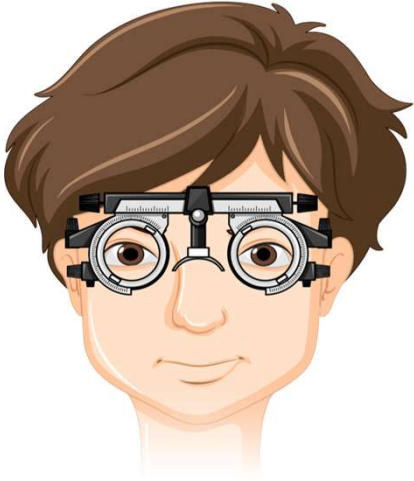


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TELESCOPIC LENSES

Telescopic lenses:

- Disqualifying
- Significantly decreased field of vision
- Used for uncorrectable low for macular degeneration, tunnel vision from glaucoma, retinal detachment, diabetic retinopathy



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EYE PROFESSIONAL DOCUMENTATION

Vision
Standard is at least 20/40 acuity (Snellen) in each eye with or without correction. At least 70° field of vision in horizontal meridian measured in each eye. The use of corrective lenses should be noted on the Medical Examiner's Certificate.

Acuity	Uncorrected	Corrected	Horizontal Field of Vision
Right Eye:	20/ <input type="text"/>	20/ <input type="text"/>	Right Eye: <input type="text"/> degrees
Left Eye:	20/ <input type="text"/>	20/ <input type="text"/>	Left Eye: <input type="text"/> degrees
Both Eyes:	20/ <input type="text"/>	20/ <input type="text"/>	

Applicant can recognize and distinguish among traffic control signals and devices showing red, green, and amber colors Yes No

Monocular vision Yes No

Referred to ophthalmologist or optometrist? Yes No

Received documentation from ophthalmologist or optometrist? Yes No

Vision evaluation can be performed by an ophthalmologist or optometrist

When receiving a report from an eye specialist, check the box for the referral and copy results onto the form or attach received reports.

Professional vision exams often report the findings using Latin abbreviations:

- OD = Right Eye
- OS = Left Eye
- OU = Both Eyes

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FAILURE TO MEET VISION STANDARD

If an individual fails the screening examination, they must be disqualified. The individual has the option of seeing a specialist, and then can undergo a new physical qualification examination.

The ME should instruct the individual to have the specialist complete the Vision Evaluation Report, Form MCSA-5871, if it appears likely that the individual will be physically qualified under the alternative vision standard.

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ALTERNATIVE VISION STANDARD: STEPS TO TAKE FOR MONOCULAR VISION

The same vision standards still apply... but only for one eye

- The vision deficiency must be stable
- Once a medical professional has deemed the vision deficiency to be stable, there must be a period for the individual to adapt to and compensate for the change in vision

First Step

- A **Vision Evaluation Report (Form MCSA-5871)** must be completed by an **ophthalmologist or optometrist** PRIOR to being certified
 - The report is only valid for 45 days

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ALTERNATIVE VISION STANDARD: STEPS TO TAKE FOR MONOCULAR VISION

Second Step

The medical examiner:

- Considers the information in the Vision Evaluation Report
- Performs the **physical qualification examination**
- Determines whether the individual meets the **vision standard** and all other physical qualification standards
- Checks “yes” to monocular vision on the report form
- Attaches the report to the medical exam form, and either writes “see the attached documentation” or write the information in the vision test results section
- Keeps the completed document with their records

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ALTERNATIVE VISION STANDARD: STEPS TO TAKE FOR MONOCULAR VISION

The Final Step: Road Test

- The first time an individual is qualified under this alternate standard, they must satisfactorily **complete a road test** administered by the employing motor carrier
 - Can also be performed by a CDL driving school

The test is conducted in accordance with the road test already required by §391.31

This does not apply to individuals who:

- Have 3 years of intrastate or specific excepted interstate CMV driving experience with the vision deficiency

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A driver has the following visual measurements during re-certification:

Distant Visual Acuity:	OD: 20/40	OS: 20/60
Horizontal Lateral Vision:	OD: 50	OS: 90

What is the next best step?

- A. Disqualify the driver
- B. Qualify the driver for two years
- C. Complete the exam and refer the driver to an eye specialist for a Vision Evaluation Report
- D. Place the driver in Determination Pending status and refer to a vision specialist


The correct answer is **A**. The driver is disqualified because they do not meet the vision standard in either eye, and therefore is not eligible to have a Vision Evaluation Report completed for monocular vision. The ME should know the vision requirements for intrastate only drivers in case their state has lower standards or their own State vision waiver/exemption program that would allow the driver to drive only within their state.

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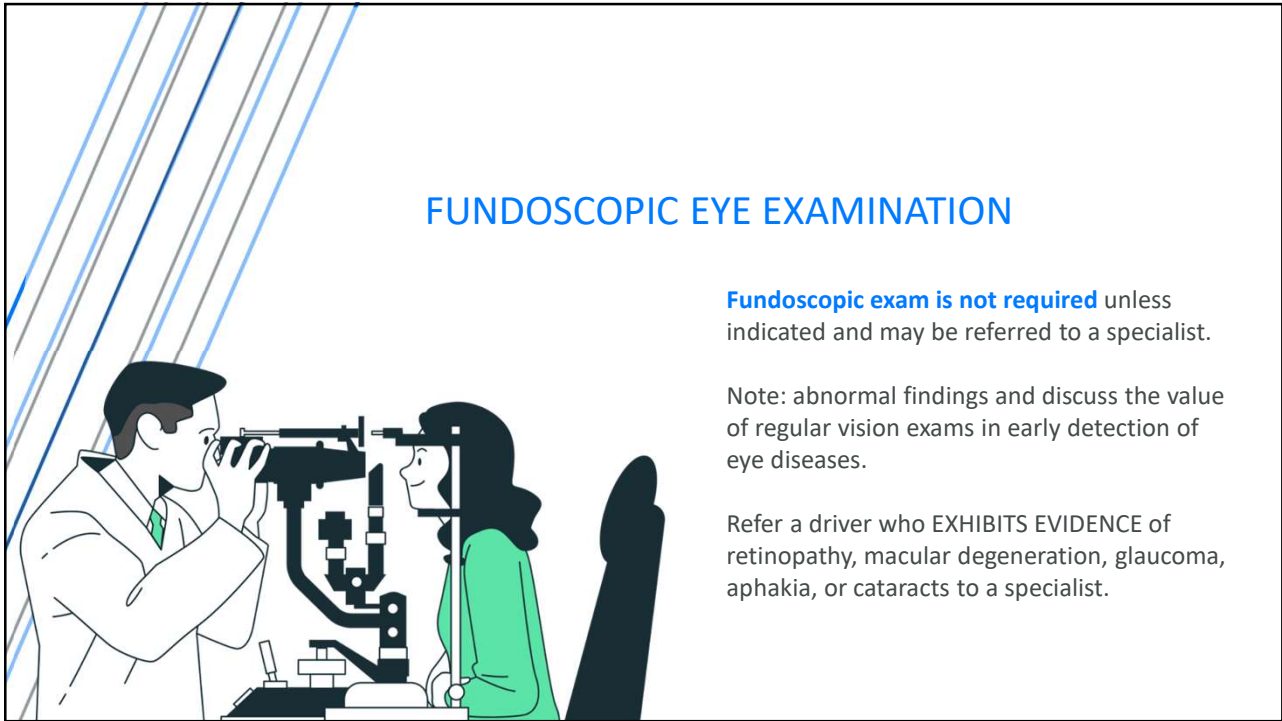
WHEN TO REFER FOR OCCULAR CONDITIONS

Should a driver with macular degeneration, glaucoma, cataracts or retinopathy be disqualified from driving?

- Having one of these visual conditions does not in itself disqualify a driver
- Due to the progressive nature of some of these conditions, the medical examiner may consider issuing a medical certificate for less than two years
- The medical examiner may decide to refer the driver to a vision specialist



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FUNDOSCOPIC EYE EXAMINATION

Fundoscopy exam is not required unless indicated and may be referred to a specialist.

Note: abnormal findings and discuss the value of regular vision exams in early detection of eye diseases.

Refer a driver who EXHIBITS EVIDENCE of retinopathy, macular degeneration, glaucoma, aphakia, or cataracts to a specialist.

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ANISOCORIA, HORNER'S SYNDROME, & CRANIAL NERVE III (CN3) PALSY

Anisocoria: Pupils that are different sizes at the same time. Can be normal (physiologic) or a sign of an underlying medical condition.

- Physiologic anisocoria: Pupil size difference does not exceed 1mm and **does not change under bright or dim light**
- Underlying medical condition:
 - Injured iris
 - Eyedrops, nasal sprays, other meds cause dilation of pupil
 - Inflammation and Horner's syndrome can result in small pupil

Horner's Syndrome: Caused by injury to the sympathetic nerves responsible for dilating the pupil and raising the eyelid on the same side of the face.

- **The pupil in the involved eye is smaller and does not get bigger (dilate) as well as the other eye.**
- The difference in pupil size between the two eyes is more noticeable under dim light.
- May have mild droopiness (ptosis) of the upper eyelid

CN3 Palsy:

- A complete palsy causes a closed eyelid and deviation of the eye outward and downward and usually have double vision (diplopia). **The pupil is typically enlarged and does not react normally to light.**
- Ptosis of the eyelid or an enlarged pupil may be the first sign of a third nerve palsy

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Checking for pupillary equality is a required part of the examination. On a driver's exam, you notice that the pupils are of different diameters, and neither pupil reacts to light. This is consistent with:


- A. Horner's syndrome
- B. Anisocoria
- C. 3rd Cranial Nerve Palsy (CN3 palsy)
- D. Glaucoma

The correct answer is **B**. This scenario describes anisocoria. With both Horner's syndrome and CN3 palsy, the affected pupil does not react normally to light but there is still some reaction. With glaucoma, the pupils are not of different diameters.

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CATARACTS

- Blurry vision at any distance in all fields
- Glare, particularly at night from oncoming headlights
- Decreased contrast and color resolution
- Accelerated by smoking, diabetes, gout, injury, radiation, and steroid medications
- Surgery involves replacement of the lens (aphakia)
- "Cat Eye" reflection from otoscope
- Close vision may be improved temporarily
- Appear as white obstruction in pupil area



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GLAUCOMA



- Decreased peripheral vision
- Decreased night vision and color vision
- Lost vision cannot be restored
- Painless and progressive
- Acuity may not be affected and will probably not be detected by vision acuity testing
- Advise strict compliance with medications is required for effective treatment

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MACULAR DEGENERATION

- Loss of detailed central vision
- Slowly progressive
- Peripheral vision usually spared
- Decreased central visual acuity
- Increased time required for recovery from bright lights
- 30% prevalence in population after age of 70
- Telescopic lenses redirect central images to areas of the eye for peripheral vision but is not acceptable for commercial driving



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RETINOPATHY



- Micro-aneurisms or hemorrhages causing **vision loss in any part of the field of vision**
- Can obscure vision, cause retinal detachment and blindness
- Fluid leakage can lead to blind spots in central vision
- Diabetes is the most common cause (Diabetic Retinopathy)
 - Contrast sensitivity
 - Flicker fusion frequency
 - Decreased color discrimination
- *For insulin-treated diabetics, Proliferative Diabetic Retinopathy and Severe Non-proliferative Diabetic Retinopathy are permanently disqualifying*
 - At risk of sudden loss of vision from a detached retina or bleeding
 - Treatment adversely impacts night and peripheral vision

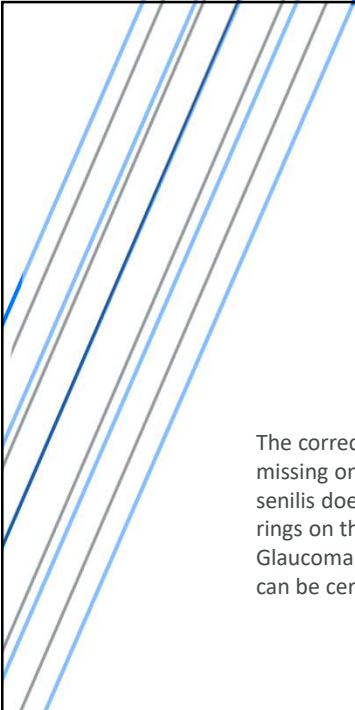
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XANTHOPSIA

A dominantly yellow bias in vision due to a yellowing of the optical media of the eye

- Predominantly caused by digoxin (derived from digitalis) which is used to treat arrhythmias

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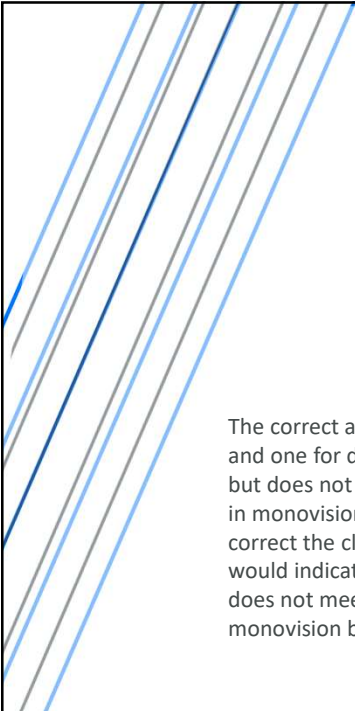


Which of the following eye conditions is of most concern?

- A. The driver is missing one eye
- B. Arcus Senilis
- C. Diabetic proliferative retinopathy
- D. Glaucoma

The correct answer is **C**. Diabetic proliferative retinopathy is a disqualifying condition. A driver missing one eye may meet the alternate vision standard if they pass in the eye they have. Arcus senilis doesn't affect vision, nor does it require treatment. It is lipid deposits that appear as rings on the outer region of the cornea. They are usually gray or white and are usually opaque. Glaucoma affects peripheral vision which may require more frequent monitoring, but drivers can be certified if they meet the vision standard.

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All the following eye conditions may require the medical examiner to seek specialist evaluation except?

- A. Glaucoma
- B. Monovision
- C. Cataracts
- D. Macular Degeneration

The correct answer is **B**. Monovision is not an eye condition. It is the use of one contact for near vision and one for distance vision or was purposely done during Lasik surgery. Monovision is disqualifying but does not require a specialist evaluation. Drivers that had Lasik or other eye procedures resulting in monovision in distance vision correction in one eye could be certified if they can use lenses to correct the close vision eye to 20/40 distance vision. If this were the case, the MEC for these drivers would indicate that they must wear lenses. Monocular vision is the term used to indicate that one eye does not meet the vision standard. If the monovision is corrected, the ME would not mark the monovision box.

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THE HEARING STANDARD

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Hearing: 49 CFR391.41(b)(11) Non-Discretionary

Medical Examiners must follow the hearing standards!

Drivers must meet the hearing requirements in at least one ear
(with or without hearing aides) to pass the hearing standard.

Whisper Test and/or Audiometric test - Either One is Accepted

- If the driver fails the initial test, conduct the other test!
 - Record both test results on exam report form
- If the driver failed the whisper test, and audiometric testing is not available, the driver must be disqualified until results of the audiometric test are presented
 - A new physical exam must be completed
- If the driver fails both tests, a federal hearing exemption is available that will allow even completely deaf individuals to drive a CMV across state lines

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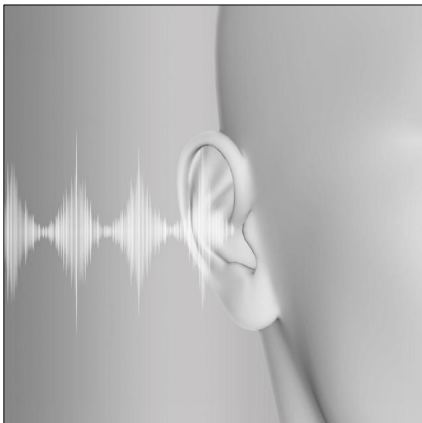
WHISPER TEST

- 5-15 feet away
- The examiner stands behind or to the side of the driver to avoid visual cues
- The driver covers the opposite ear
- Using breath remaining following normal expiration, whisper words or random numbers
 - Avoid nasal and “S” sounds such as nines and sixes
- Record the distance in feet at which the whispered voice can first be repeated by the driver



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AUDIOMETRIC TESTING



- Values to consider: **500Hz, 1000Hz, and 2000Hz**
- Calculate the sum of the readings, then divide by 3
- The average hearing loss must be **≤40dB in the better ear**
- If the driver must use hearing aids, an “Open Field” audiometric test must be administered
- Device should be calibrated to **American National Standard Institute (ANSI)** units

Example:

Right Ear

500Hz	1000Hz	2000Hz
35dB	40dB	50dB

$$125\text{dB} / 3 = 41.66\text{dB}$$

This Ear Fails

Left Ear

500Hz	1000Hz	2000Hz
35dB	40dB	45dB

$$120\text{dB} / 3 = 40\text{dB}$$

This Ear Passes

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INTERNATIONAL ORGANIZATION for STANDARDIZATION (ISO)

Medical Examiners must know how to convert ISO units into ANSI units

- Subtract 14 from the 500Hz reading
- Subtract 10 from the 1000Hz reading
- Subtract 8.5 from the 2000Hz reading
- Replace any negative number resulting from the subtraction with 0
- Calculate the sum of the readings from the three categories, then divide this number by 3

	RIGHT EAR			LEFT EAR		
	500Hz	1000Hz	2000Hz	500Hz	1000Hz	2000Hz
ISO:	10dB	20dB	50dB	45dB	50dB	45dB
	<u>-14</u>	<u>-10</u>	<u>-8.5</u>	<u>-14</u>	<u>-10</u>	<u>-8.5</u>
ANSI:	(-4) 0	10	41.5	31	40	36.5
	$51.5\text{dB} / 3 = 17.2\text{dB}$			$107.5\text{dB} / 3 = 35.8\text{dB}$		

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HEARING AIDS

Regardless of the specific function or cost of a hearing device, if the driver passes the whisper test or audiometric testing while using the device, it is acceptable.



- The device must not interfere with safe driving, such as loss of peripheral vision
- The driver must wear the device while driving
- The driver must carry a spare battery or spare hearing aid while driving



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COCHLEAR IMPLANTS



Cochlear implants are an acceptable option for meeting the hearing standard

- Bypasses damaged portions of the ear to deliver sound signals to the auditory nerve
 - It takes time and training to learn to interpret the signals received from a cochlear implant
 - Within a year of use, most people with cochlear implants make considerable gains in understanding speech

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FEDERAL HEARING EXEMPTION

When the driver fails the hearing standard:

- Ask the driver if they want to apply for a Federal or State Hearing Exemption
 - If not, they are disqualified from driving
 - If they do:
 - Check “Meets Standards but periodic monitoring required” and write in “**Hearing**”
 - Check the “other” box and write in “**2 years**” (if they are otherwise qualified for 2 years) on the exam report form
 - On both the exam form and medical Certificate, check the box “Accompanied by waiver/exemption” and write “**Federal Hearing**” in the blank space
 - The box for “wearing hearing aid” should **NOT** be marked on the form or the certificate

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THE EAR EXAM

Changes, balance, ringing, dizziness?

Visualization of the Tympanic membrane

Examine and Discuss:

- Tympanic Scarring
- Occlusion of ear canal
- Perforated membrane
- Any abnormalities

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PRACTICE SCENARIO

A 54-year-old male with “Yes” response to “Loss of hearing”. No other significant medical history

- Hearing Exam (No hearing aide):
 - Whisper test:
 - Right = 5 feet
 - Left = 3 feet

Should this driver be certified or disqualified Why?

If he is to be certified, for how long?

What if the whisper test results were 4 feet on the right and 3 feet on the left?

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PRACTICE SCENARIO ANSWER

The driver meets the hearing standard in one ear which is all that is required. The best outcome is to certify the driver for a period of **two years**.

If whisper test results were 4 feet on the right and 3 feet on the left, the driver would require audiometry.

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