

2- DD: Decrease vision

Five main categories of causes

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1. visual focus abnormalities
2. Media /Visual axis opacities
3. Macula/ Retina
4. Optic nerve
5. Functional (Malingering/ Hysteria)

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How to diagnose: 7 steps

1- Check vision	6/6, 6/24, CF, HM, PL
2- Pinhole	Improvement means can be corrected
3- Refraction	If corrects refractive error
4- Pupil	Reacting (nerve OK) Fixed oval, fixed irregular
5- Media opacity	Can see pathology
6- Macula	Can see pathology
7- Optic nerve function tests	Reacting pupil PLUS Color & contrast vision

7 step diagnosis plan

Five main categories of causes

For normal vision we need to have light focused on macula, clear media so light can reach macula, functional macula and functional optic nerve. Causes of decrease vision are numerous but to make it easy for you I have divided causes in five main categories.

1- Visual axis abnormalities

This means that there is clear media, normal macula and normal optic nerve but light is not focused on macula.

2- Media opacities

This means light can focus but there is obstruction in light pathway.

3- Macula / Retina

Light can focus on macula but macula not working properly to send picture to optic nerve.

4- Optic nerve

Light is focused and macula is making picture but optic nerve can not pass message to brain.

5- Functional

Everything is fine but patient claims decrease vision. This can be either deliberately or because of hysteria.

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1. Visual focus abnormalities
 1. ref errors: vision improves with pin hole & refraction
 2. Ectasia: vision improves with pin hole BUT not with refraction
 3. Amblyopia: vision improves partially with PH & refraction
2. Media / visual axis opacities
 1. Corneal opacity: keratitis scar, degenerations
 2. AC: Glaucoma, uveitis, hyphema (trauma)
 3. Lens: cataract, PCO (posterior capsular opacity)
 4. Vitreous: hemorrhage
3. Macula
 1. Hemorrhage: Diabetic retinopathy, CRVO,
 2. Scar: Exudates (diabetes), ARMD, scar from edema
 3. Macula: Retinal detachment hole, CSCR
4. Optic nerve
 1. Optic neuropathies leading to optic atrophy
 2. Glaucoma
5. Functional (Malingering/ Hysteria)
 1. Patient can't see anything; doctor can't see signs

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How to diagnose: Seven step plan

Seven key examinations plus others like IOP		
Test	Result	Meaning
1- Vision	6/6, 6/9, 6/12, 6/24, 6/36, 6/60, CF, HM, PL+, PL-	6/6 full vision 6/60 top line CF counting fingers HM Hand movement PL can see light
2- Pinhole	Improvement means can be corrected	Refractive error OR keratoconus
3- Refraction	If corrects	Refractive error
	Partially corrects	Keratoconus
4- Pupil	Reacting	Optic nerve OK
	Fixed oval	Angle closure glaucoma
	Fixed irregular	Uveitis
5- Media opacity Check media with ophthalmoscope or slit lamp and media opacity will be visible	Corneal opacity	Corneal ulcer or corneal scar from ulcer or trauma
	Anterior chamber (AC)	Hypopyon, Hyphema, Glaucoma (IOP)
	Lens opacity	Cataract
	Vitreous opacity	Vitreous haemorrhage
6- Macula/Retina If you can see macula/retina, it means media is clear So look for macular pathology	Macular pathology	Haemorrhage: Diabetic retinopathy, CRVO Scar: exudate (diabetes) ARMD, scar from oedema Macula: Retinal detachment, Macular hole, Epiretinal membrane
	Retinal pathology	Vascular: Vein occlusion Detachment: Retinal detachment Degeneration: Retinal degenerations
7- Optic nerve functions 1-Decrease vision & 2- pupil already checked. Check 3- visual fields 4- colour vision and 5- contrast sensitivity	Optic nerve pathology	Disc swelling: optic neuritis, papilledema, AION Primary optic atrophy: with clear disc margins Secondary optic atrophy: with irregular & blurred disc margins Consecutive optic atrophy: clear disc margins with retinal lesions Glaucomatous optic atrophy: clear margins with enlarged cup Optic neuritis or atrophy

History taking: Decrease vision

History taking points for decrease vision

Chief complaint: Main complaint may decrease vision or loss of vision. Severe and sudden loss of vision is usually retinal or optic nerve disease.

History of present illness:

One eye or both eyes:

Refractive errors and anterior segment pathologies like keratoconus, glaucoma, uveitis and cataract are usually bilateral though one eye may affect after other. Retinal conditions like central retinal artery and central retinal vein occlusion and retinal detachment usually affect one eye at a time.

Onset: Gradual or sudden / Duration

Refractive errors and anterior segment conditions present with gradual onset while retinal and optic nerve diseases usually present with sudden onset.

Associated floaters:

Associated floaters may point out toward retinal detachment or vitreous haemorrhage.

Associated pain in eye:

corneal ulcers, uveitis and angle closure glaucoma cause associated pain along which is usually presenting symptom

Associated photophobia:

Posterior sub-capsular cataract and uveitis cause associated photophobia

Trauma / injury:

History of blunt or penetrating trauma is important

Past ocular history:

Patient may have been treated for same condition before so it makes diagnosis easy. History of past eye operations or treatment should be taken.

General systemic history:

Certain systemic diseases are particularly associated with eye diseases. History of severity and duration of diabetes and hypertension are of prime importance.

Family history:

Certain diseases like congenital cataract, refractive errors and macular diseases are inherited.

OPD cases and possible MCQs

Case 1: patient with 6/60 vision improving to 6/12 with pin hole & 6/9 with refraction. Normal anterior and posterior segments with normal nerve function test including reacting pupil. Diagnosis please

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- visual focus- ref errors, ectasia
- Visual axis opacities
- Macula
- Optic nerve
- Malingering/Hysteria

Patient 1		Interpretation
1. Vision	6/60	
2. Pinhole	6/12	Means refractive error or keratoconus
3. Refraction	6/9	Refractive error
4. Pupil	Reacting	Optic nerve OK
5. Media opacity	NIL	Media OK
6. Macula	Normal	Macula OK
7. Nerve function tests	OK	Optic nerve OK

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Refractive error

Vision normal with glasses



Case 2: patient with 6/60 vision improving to 6/12 with pin hole & 6/24 with refraction. Normal anterior and posterior segments with normal nerve function test including reacting pupil. Diagnosis please.

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- visual focus- ref errors, ectasia
- Visual axis opacities
- Macula
- Optic nerve
- Malingering/Hysteria

Patient 2		Interpretation
Vision	6/60	
Pinhole	6/12	Means refractive error or keratoconus
Refraction	6/24	Partial correction
Pupil	Reacting	Optic nerve OK
Media opacity	NIL	Media OK
Macula	Normal	Macula OK
Nerve function tests	OK	Optic nerve OK

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Ectasia: Keratoconus

Limited improvement



Case 3: Sixty year old with pain in eye. On examination CF vision with no improvement with pinhole or refraction (visual focus out) and red eye. There is corneal opacity. Macula not visible and nerve functions not possible. What is diagnosis?

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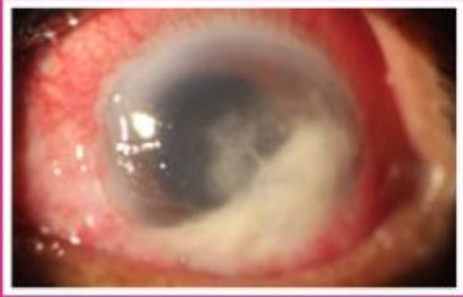
- visual focus- ref errors, ectasia
- Visual axis opacities
- Macula
- Optic nerve
- Malingering/Hysteria

Patient 3		Interpretation
Vision	CF	
Pinhole	No improvement	Means NO refractive error or keratoconus
Refraction	Not possible	
Pupil	Reacting	Optic nerve OK
Media opacity	Corneal lesion	Corneal opacity or ulcer
Macula	Normal	Macula OK
Nerve function tests	Not possible	Optic nerve OK

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Media opacity: Corneal ulcer

Red & painful eye



Case 4: Forty year old with severe pain in eye. On examination CF vision with no improvement with pinhole or refraction (visual focus out) and red eye. Cornea is not clear with fixed dilated pupil. Pressure is high in eye. Macula not visible and nerve functions not possible.

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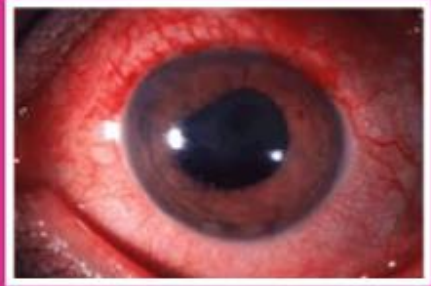
- visual focus- ref errors, ectasia
- Visual axis opacities
- Macula
- Optic nerve
- Malingering/Hysteria

Patient 4		Interpretation
Vision	HM	
Pinhole	No improvement	Means NO refractive error or keratoconus
Refraction	Not possible	
Pupil	Fixed dilated	
Media opacity	Cloudy cornea	Hard eye, Anterior chamber pathology
Macula	Not visible	Assumed OK
Nerve function tests	Not possible	Assumed OK

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Media opacity: Glaucoma

Very painful
Red eye
Hard eye



Case 5: A young boy with photophobia, pain in eye and decrease vision. On examination CF vision with no improvement with pinhole or refraction (visual focus out) and red eye. There hypopyon in anterior chamber. Macula not visible and nerve functions not possible except irregular fixed pupil.

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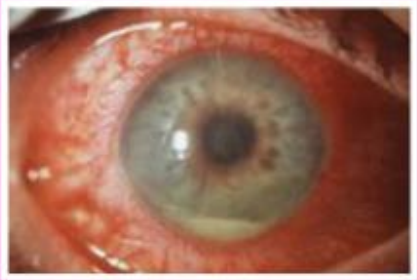
- visual focus- ref errors, ectasia
- Visual axis opacities
- Macula
- Optic nerve
- Malingering/Hysteria

Patient 5		Interpretation
Vision	CF	
Pinhole	No better	Means NO refractive error or keratoconus
Refraction	Not possible	
Pupil	Fixed irregular	
Media opacity	Cloudy AC	Hypopyon in anterior chamber pathology
Macula	Not visible	Assumed OK
Nerve function tests	Not possible	Assumed OK

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Media opacity: Uveitis

Red eye
Photophobia



Case 6: A child complaining of decrease vision after cricket ball injury. On examination CF vision with no improvement with pinhole or refraction and red eye. There is blood in anterior chamber. Macula not visible and nerve functions not possible.

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- visual focus- ref errors, ectasia
- Visual axis opacities
- Macula
- Optic nerve
- Malingering/Hysteria

Patient 6		Interpretation
Vision	HM	
Pinhole	No improvement	Means NO refractive error or keratoconus
Refraction	Not possible	
Pupil	Reacting	Optic nerve OK
Media opacity	Blood in AC	Anterior chamber blood
Macula	Not visible	
Nerve function tests	Not possible	

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Media opacity: Hyphema

History of trauma



Case 7: Seventy year old with decrease vision. On examination CF vision with no improvement with pinhole or refraction (visual focus out) and red eye. There is whitish opacity behind pupil. Macula not visible and pupil is reacting.

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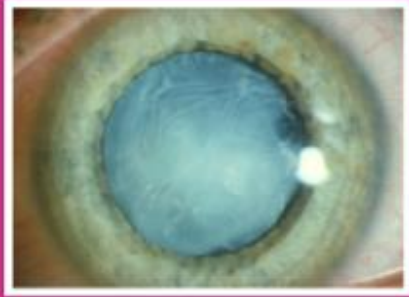
- visual focus- ref errors, ectasia
- Visual axis opacities
- Macula
- Optic nerve
- Malingering/Hysteria

Patient 7		Interpretation
Vision	HM	
Pinhole	No improvement	Means NO refractive error or keratoconus
Refraction	Not possible	
Pupil	Reacting	Optic nerve OK
Media opacity	Behind iris	Cataract
Macula	Not visible	
Nerve function tests	Not possible	

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Media opacity: Cataract

Gradual onset



Case 8: Fifty year man with diabetes is complaining of decrease vision. On examination CF vision with no improvement with pinhole or refraction. Anterior segment is clear. Macula poorly visible because of red vitreous opacities. Optic nerve functions are normal with reacting pupils.

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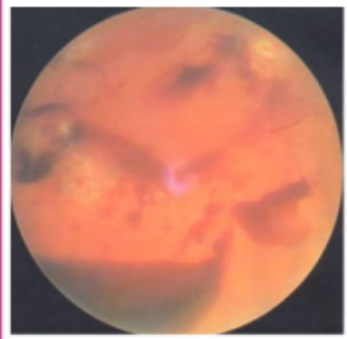
- visual focus- ref errors, ectasia
- Visual axis opacities
- Macula
- Optic nerve
- Malingering/Hysteria

Patient 8		Interpretation
Vision	CF	
Pinhole	No improvement	Means NO refractive error or keratoconus
Refraction	Not better	
Pupil	Reacting	Optic nerve OK
Media opacity	Blood in vitreous	Vitreous hemorrhage (Diabetic retinopathy)
Macula	Not visible	
Nerve function tests	Not possible	

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Media opacity: Vitreous hemorrhage

Usually diabetics



Case 9: Sixty year diabetic complaining of decrease vision. On examination CF vision with no improvement with pinhole or refraction. Anterior segment is clear with reacting pupil. Vitreous is clear. Macula show haemorrhage with normal optic nerve functions.


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- visual focus- ref errors, ectasia
- Visual axis opacities
- Macula
- Optic nerve
- Malingering/Hysteria

Patient 9		Interpretation
Vision	CF	
Pinhole	No improvement	Means NO refractive error or keratoconus
Refraction	Not better	
Pupil	Reacting	Optic nerve OK
Media opacity	Blood in front of macula	Pre retinal hemorrhage (Diabetic)
Macula	Not visible	
Nerve function tests	Not possible	

Macula: Hemorrhage

Usually Diabetes OR ARMD



Case 10: Forty year old with decrease vision. On examination CF vision with no improvement with pinhole or refraction. Anterior and posterior segments are clear. Macula shows hole in retina and nerve functions are normal with reacting pupils.

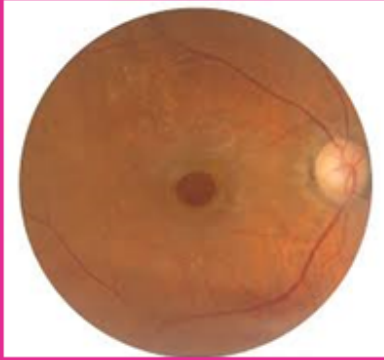
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- visual focus- ref errors, ectasia
- Visual axis opacities
- Macula
- Optic nerve
- Malingering/Hysteria

Patient 10		Interpretation
Vision	6/36	
Pinhole	No improvement	Means NO refractive error or keratoconus
Refraction	Not better	
Pupil	Reacting	Optic nerve OK
Media opacity	NIL	Media clear
Macula	Hole	Macular hole
Nerve function tests	Normal	

Macula: Hole

Broken lines



Case 11: Fifty years myopic with decrease vision. On examination CF vision with no improvement with pinhole or refraction. There are no opacities in media. On retinal examination macula appears detached. Optic nerve functions are normal with reacting pupils. What is diagnosis?

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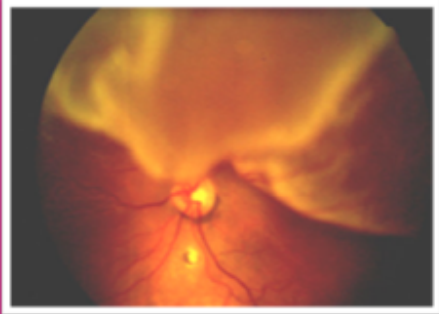
- visual focus- ref errors, ectasia
- Visual axis opacities
- **Macula**
- Optic nerve
- Malingering/Hysteria

Patient 11		Interpretation
Vision	CF	
Pinhole	No better	Means NO refractive error or keratoconus
Refraction	Not better	
Pupil	Reacting	Optic nerve OK
Media opacity	Clear	
Macula	Detached	Retinal detachment
Nerve function tests	Not possible	

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Macula: Retinal detachment

Curtain on vision



Case 12: Seventy year old with gradual loss of vision in eye. On examination CF vision with no improvement with pinhole or refraction. There are normal anterior segments with clear media. Macula shows scarring and optic nerve functions normal. What is diagnosis please?

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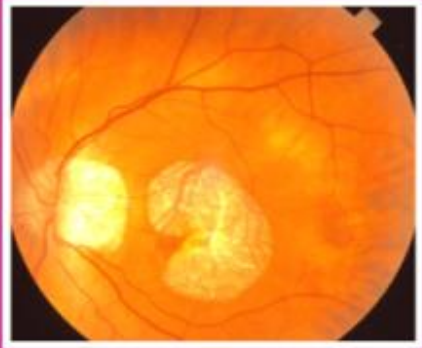
- visual focus- ref errors, ectasia
- Visual axis opacities
- **Macula**
- Optic nerve
- Malingering/Hysteria

Patient 12		Interpretation
Vision	6/60	
Pinhole	No better	Means NO refractive error or keratoconus
Refraction	Not better	
Pupil	Reacting	Optic nerve OK
Media opacity	Clear	
Macula	scar	ARMD and others
Nerve function tests	Normal	

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Macula: Scar

Long history



Case 13: Thirty year old with sudden loss of vision. On examination CF vision with no improvement with pinhole or refraction. Normal anterior segments with clear media. Pupil is not reacting. Macula is normal looking. Optic disc is swollen with no colour vision and defective contrast. What is diagnosis?

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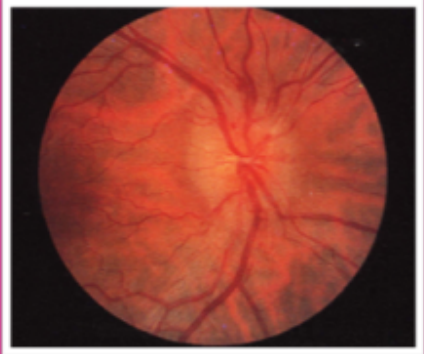
- visual focus- ref errors, ectasia
- Visual axis opacities
- Macula
- Optic nerve
- Malingering/Hysteria

Patient 13		Interpretation
Vision	6/36	
Pinhole	No better	Means NO refractive error or keratoconus
Refraction	Not better	
Pupil	Not Reacting	Optic nerve pathology
Media opacity	Clear	
Macula	Normal	
Nerve function tests	Compromised	Reduced color vision Reduced contrast

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Optic nerve: Neuritis

Sudden history
Central field loss



Case 14: Forty year old with history of increased intracranial pressure treatment. On examination CF vision with no improvement with pinhole or refraction. Normal anterior segments with non-reacting pupil. Macula is normal but optic disc is white. He has field defects and poor colour vision. Diagnosis?

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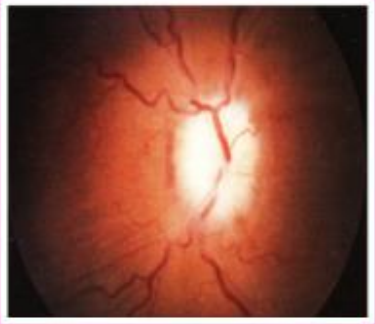
- visual focus- ref errors, ectasia
- Visual axis opacities
- Macula
- Optic nerve
- Malingering/Hysteria

Patient 14		Interpretation
Vision	CF	
Pinhole	No better	Means NO refractive error or keratoconus
Refraction	Not better	
Pupil	poorly Reacting	White optic nerve
Media opacity	Clear	
Macula	Normal	
Nerve function tests	Compromised	Reduced color vision Reduced contrast

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Optic nerve: Atrophy

Central field loss



Case 15: sixty year old with gradual loss of vision because of increased IOP. On examination CF vision with no improvement with pinhole or refraction. Anterior segment looks normal. Macula is normal but disc increased cup disc ratio. Pupil is poorly reacting. What is diagnosis?

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- visual focus- ref errors, ectasia
- Visual axis opacities
- Macula
- Optic nerve
- Malingering/Hysteria

Patient 15		Interpretation
Vision	6/36	
Pinhole	No better	Means NO refractive error or keratoconus
Refraction	Not better	
Pupil	Not Reacting	Increased cupping
Media opacity	Clear	
Macula	Normal	
Nerve function tests	Compromised	Reduced color vision Reduced contrast

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Optic nerve: Glaucoma

Peripheral field loss



Case16: A young student complaining of sudden decrease in vision in both eyes. On examination vision in PL in both eyes. Both anterior and posterior segments are normal with normal nerve function test. All ophthalmic investigations are normal with normal physician and neurosurgeon reports. Diagnosis?

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- visual focus- ref errors, ectasia
- Visual axis opacities
- Macula
- Optic nerve
- Malingering/Hysteria

Patient 16		Interpretation
Vision	decreased	
Pinhole	No better	Means NO refractive error or keratoconus
Refraction	Not better	
Pupil	Reacting	NO optic nerve pathology
Media opacity	Clear	No media pathology
Macula	Normal	No macular pathology
Nerve function tests	Normal	No optic nerve pathology

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Malingering/Hysteria

Reduced vision with no pathology

WHAT IS MALINGERING ?

- French malingering- 'to suffer' or 'pretend to be ill'
- "Malingering is intentional production of false or grossly exaggerated physical or psychologic symptoms motivated by external incentives"

Patient can not see anything
Doctor can not see anything