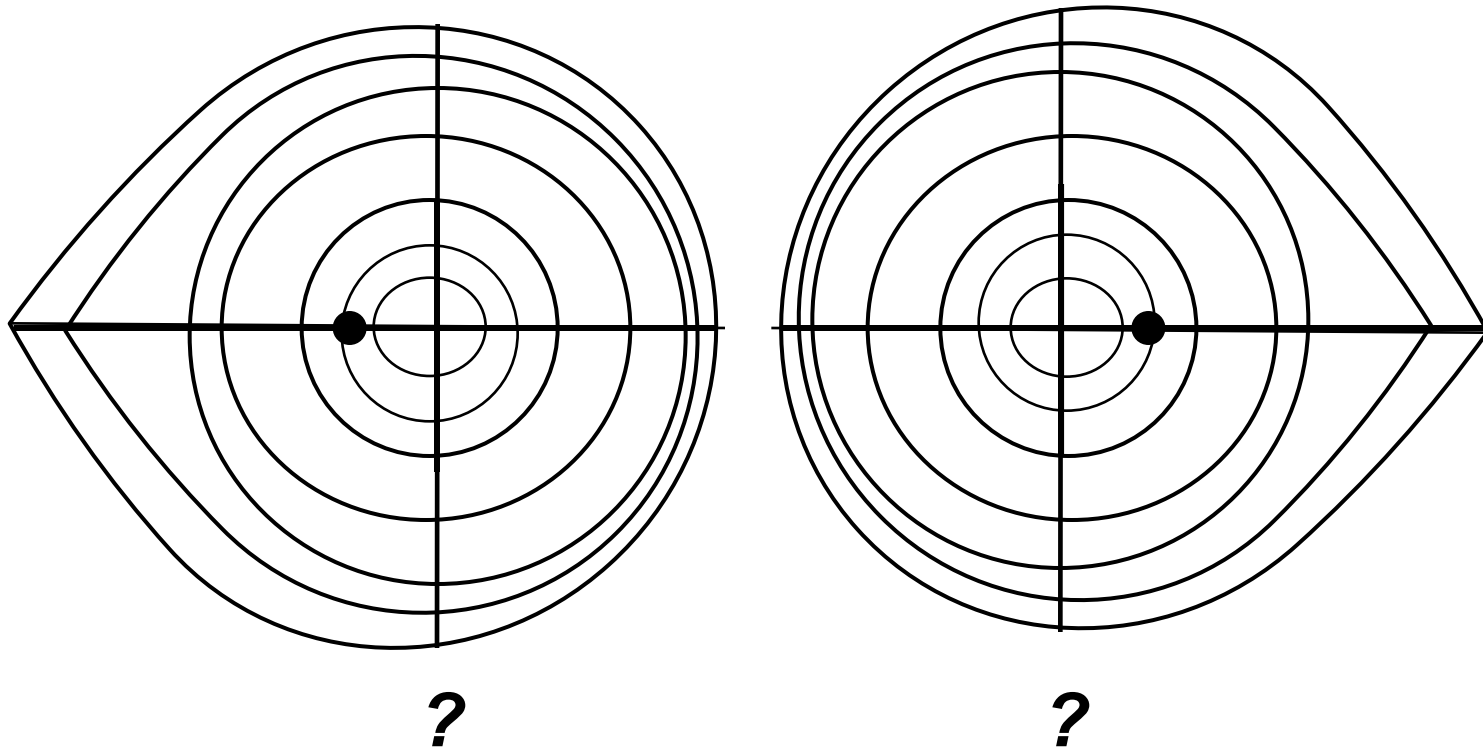
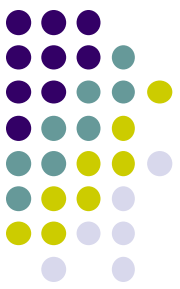


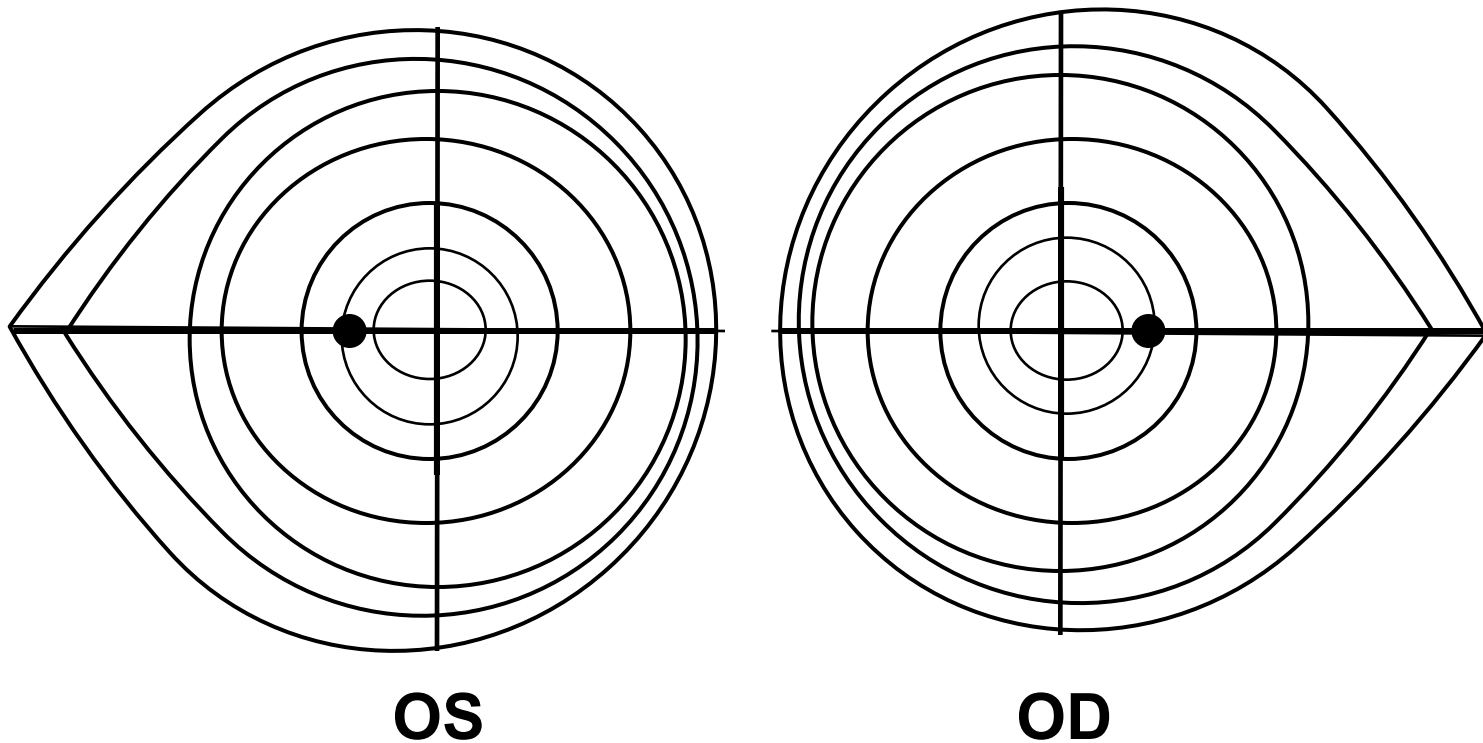
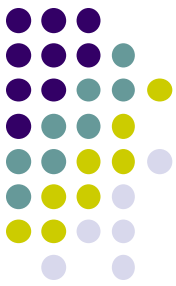
# Visual Field Defects



*Here is a representation of the VF for each eye. Which is OD, and which OS?*

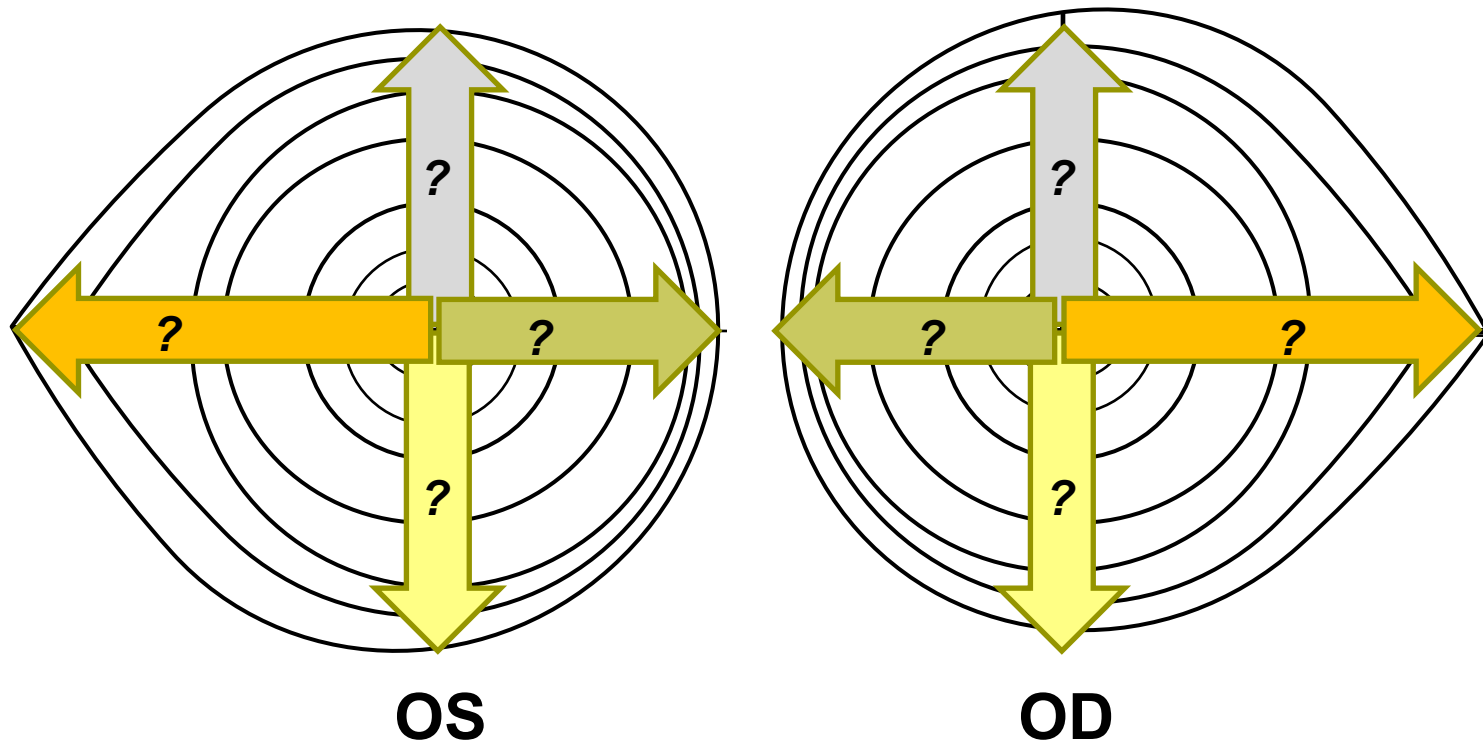
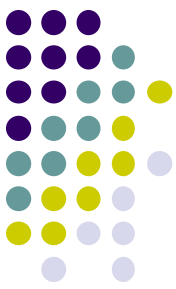
# Visual Field Defects

2



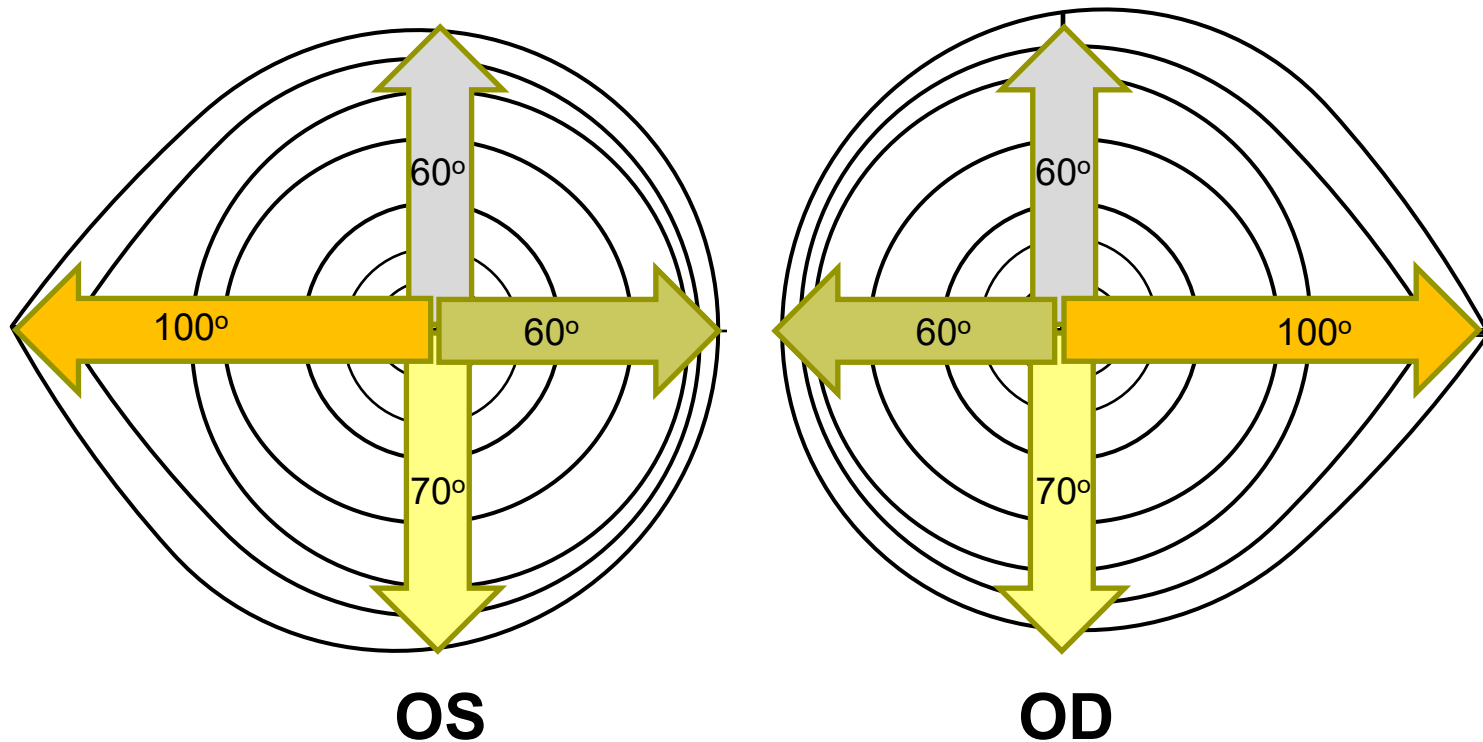
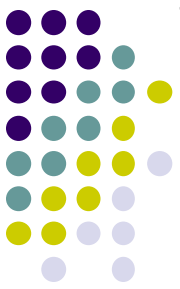
*Here is a representation of the VF for each eye. Which is OD, and which OS? Remember, VFs are **not** drawn as if the pt is looking at you; they're drawn as if **you** are the pt!*

# Visual Field Defects



*Measured in degrees from fixation, how far does the normal VF extend superiorly, inferiorly, nasally and temporally?*

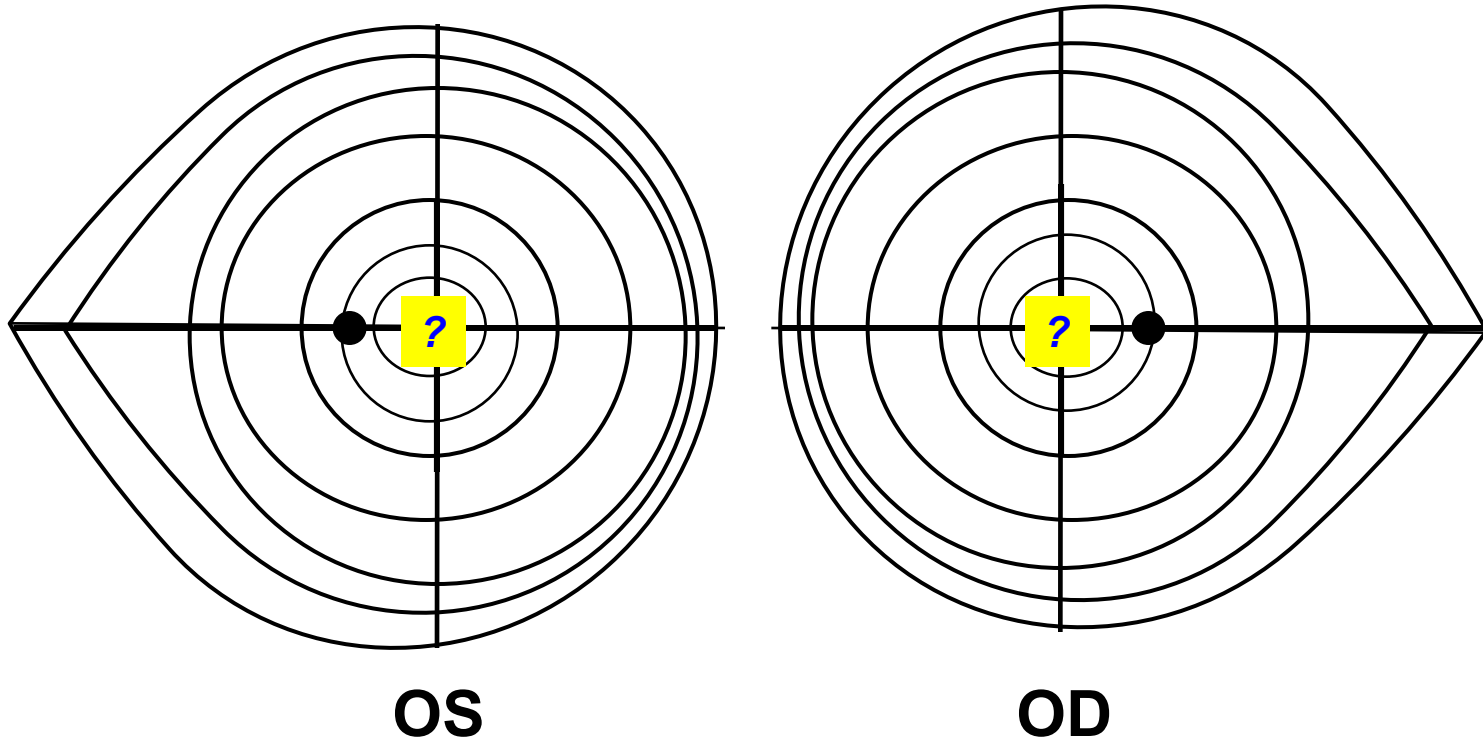
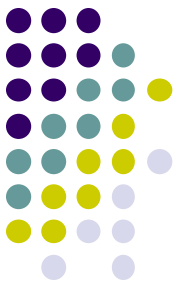
# Visual Field Defects



*Measured in degrees from fixation, how far does the normal VF extend superiorly, inferiorly, nasally and temporally?*

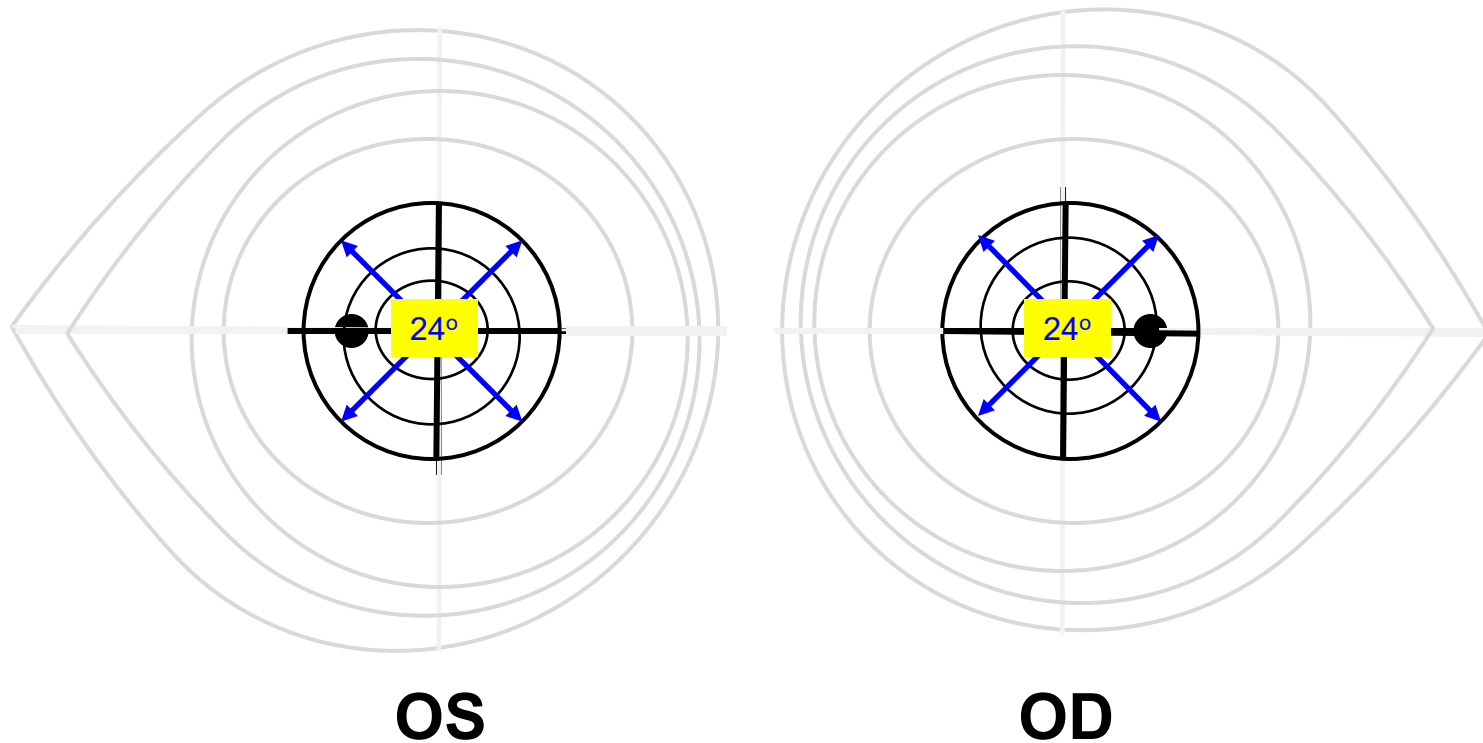
(Don't get too fixated on these specific numbers--different sources will give slightly different values.)

# Visual Field Defects



*Measured in degrees from fixation, how much of the VF is assessed via the automated perimetry machines found in most ophthalmology practices?*

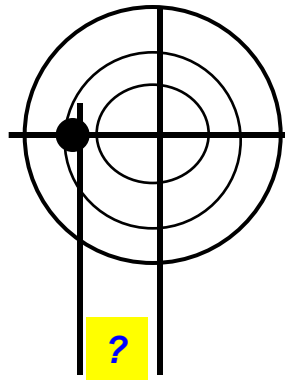
# Visual Field Defects



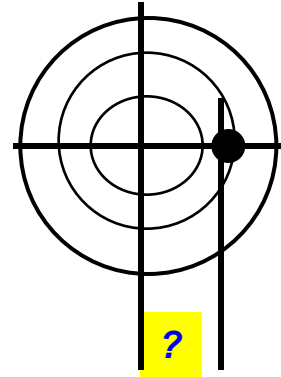
*Measured in degrees from fixation, how much of the VF is assessed via the automated perimetry machines found in most ophthalmology practices?*

**The central 24 degrees**

# Visual Field Defects



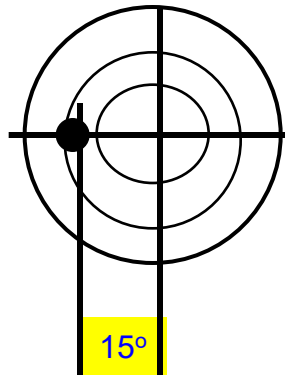
**OS**



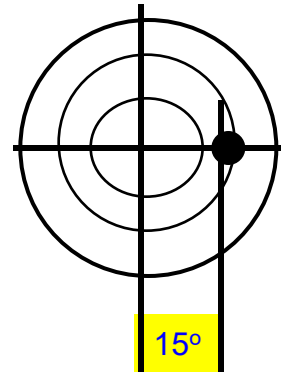
**OD**

*How far in degrees from fixation is the blind spot?*

# Visual Field Defects



**OS**

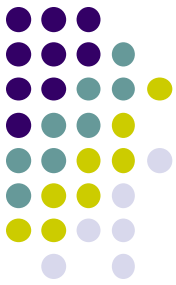


**OD**

*How far in degrees from fixation is the blind spot?*  
About 15 (again, don't get too hung up on that specific number.)



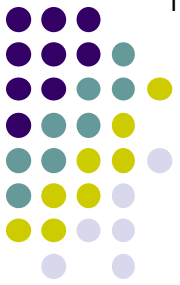
# Visual Field Defects



*most anterior  
location*

*Anatomic locations for  
lesions producing VF defects*

# Visual Field Defects

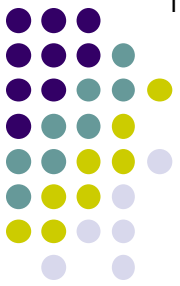


Retina

*next location*

*Anatomic locations for  
lesions producing VF defects*

# Visual Field Defects



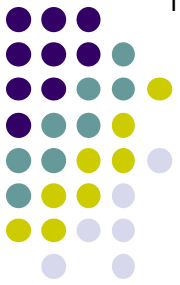
Retina

Optic nerve

*Anatomic locations for  
lesions producing VF defects*

*next location*

# Visual Field Defects



Retina

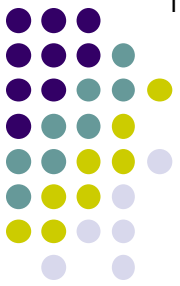
Optic nerve

Optic chiasm

*general term for all locations  
posterior to the previous one*

*Anatomic locations for  
lesions producing VF defects*

# Visual Field Defects



Retina

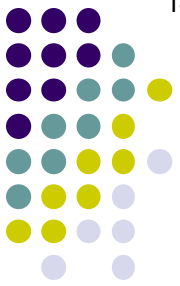
Optic nerve

Optic chiasm

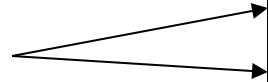
Retrochiasmal

*Anatomic locations for  
lesions producing VF defects*

# Visual Field Defects



**Retina**



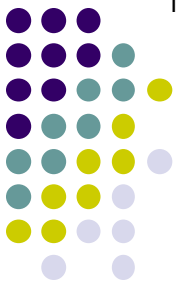
*two very general  
categories of retinal dz*

Optic nerve

Optic chiasm

Retrochiasmal

# Visual Field Defects



**Retina**

Clinically obvious dz

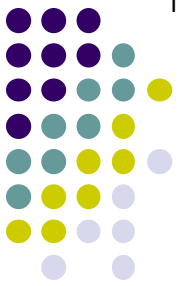
Clinically subtle dz

Optic nerve

Optic chiasm

Retrochiasmal

# Visual Field Defects



**Retina**

**Clinically obvious dz**

**Clinically subtle dz**

*What is meant by clinically obvious vs clinically subtle retinal dz?*

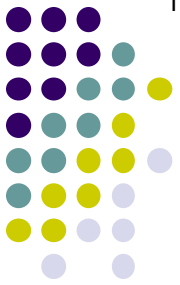
Optic nerve

Optic chiasm

Retrochiasmal



# Visual Field Defects



**Retina**

**Clinically obvious dz**

**Clinically subtle dz**

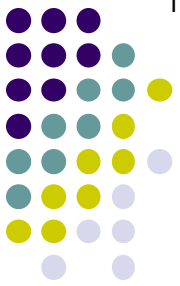
Optic nerve

*What is meant by clinically obvious vs clinically subtle retinal dz?*  
In clinically obvious disease, the retina will appear abnormal on DFE, whereas in clinically subtle disease it will look normal

Optic chiasm

Retrochiasmal

# Visual Field Defects



**Retina**

**Clinically obvious dz (eg...?)**

**Clinically subtle dz**

Optic nerve

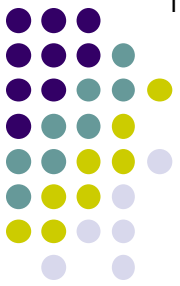
*What is meant by clinically obvious vs clinically subtle retinal dz?*  
In clinically obvious disease, the retina will appear abnormal on DFE, whereas in clinically subtle disease it will look normal

*What is an example of...*  
*...clinically obvious disease?*

Optic chiasm

Retrochiasmal

# Visual Field Defects



**Retina**

**Clinically obvious dz (eg...RP)**

**Clinically subtle dz**

Optic nerve

*What is meant by clinically obvious vs clinically subtle retinal dz?*

In clinically obvious disease, the retina will appear abnormal on DFE, whereas in clinically subtle disease it will look normal

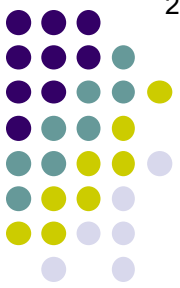
*What is an example of...*

*...clinically obvious disease? 'Typical' retinitis pigmentosa*

Optic chiasm

Retrochiasmal

# Visual Field Defects



**Retina**

**Clinically obvious dz (eg...RP)**

**Clinically subtle dz (eg...?)**

Optic nerve

*What is meant by clinically obvious vs clinically subtle retinal dz?*

In clinically obvious disease, the retina will appear abnormal on DFE, whereas in clinically subtle disease it will look normal

*What is an example of...*

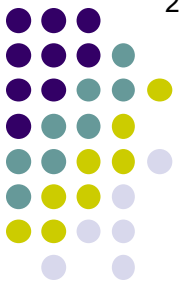
*...clinically obvious disease? 'Typical' retinitis pigmentosa*

*---clinically subtle disease?*

Optic chiasm

Retrochiasmal

# Visual Field Defects



**Retina**

**Clinically obvious dz (eg...RP)**

**Clinically subtle dz (eg...CAR)**

Optic nerve

*What is meant by clinically obvious vs clinically subtle retinal dz?*

In clinically obvious disease, the retina will appear abnormal on DFE, whereas in clinically subtle disease it will look normal

*What is an example of...*

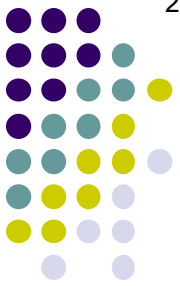
*...clinically obvious disease?* 'Typical' retinitis pigmentosa

*---clinically subtle disease?* Cancer-associated retinopathy

Optic chiasm

Retrochiasmal

# Visual Field Defects



**Retina**

Clinically obvious dz  
**Clinically subtle dz**

**Optic nerve**

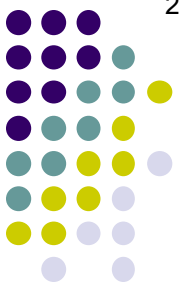
Before we dive into VF defects associated with optic nerve dz... It can be challenging to distinguish between subtle retinal dz (specifically, a maculopathy) and optic nerve dz. Let's review some non-VF clues that can help in this regard.

*(No question yet—keep going)*

Optic chiasm

Retrochiasmal

# Visual Field Defects



**Retina**

Clinically obvious dz

Clinically subtle dz

**Optic nerve**

Before we dive into VF defects associated with optic nerve dz... It can be challenging to distinguish between subtle retinal dz (specifically, a maculopathy) and optic nerve dz. Let's review some non-VF clues that can help in this regard. *For each finding, indicate whether optic neuropathy or maculopathy is more likely.*

Optic chiasm

***If the pt has...***

***...it's almost certainly:***

Metamorphopsia

?

Retrochiasm

<b><i>If the pt has...</i></b>	<b><i>...it's almost certainly:</i></b>
Metamorphopsia	?

# Visual Field Defects



**Retina**

Clinically obvious dz

Clinically subtle dz

**Optic nerve**

Before we dive into VF defects associated with optic nerve dz... It can be challenging to distinguish between subtle retinal dz (specifically, a maculopathy) and optic nerve dz. Let's review some non-VF clues that can help in this regard. *For each finding, indicate whether optic neuropathy or maculopathy is more likely.*

Optic chiasm

***If the pt has...***

***...it's almost certainly:***

Metamorphopsia

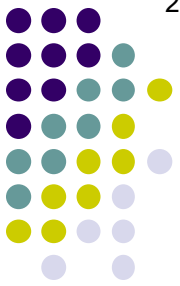
Maculopathy

Retrochiasm

<b><i>If the pt has...</i></b>	<b><i>...it's almost certainly:</i></b>
Metamorphopsia	Maculopathy



# Visual Field Defects



**Retina**

Clinically obvious dz

Clinically subtle dz

**Optic nerve**

Before we dive into VF defects associated with optic nerve dz... It can be challenging to distinguish between subtle retinal dz (specifically, a maculopathy) and optic nerve dz. Let's review some non-VF clues that can help in this regard. *For each finding, indicate whether optic neuropathy or maculopathy is more likely.*

Optic chiasm

***If the pt has...***

***...it's almost certainly:***

Metamorphopsia

Maculopathy

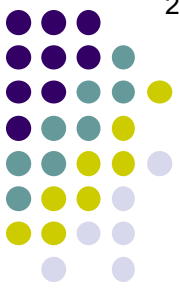
Dyschromatopsia

?

Retrochiasm

<b><i>If the pt has...</i></b>	<b><i>...it's almost certainly:</i></b>
Metamorphopsia	Maculopathy
Dyschromatopsia	?

# Visual Field Defects



**Retina**

Clinically obvious dz

Clinically subtle dz

**Optic nerve**

Before we dive into VF defects associated with optic nerve dz... It can be challenging to distinguish between subtle retinal dz (specifically, a maculopathy) and optic nerve dz. Let's review some non-VF clues that can help in this regard. *For each finding, indicate whether optic neuropathy or maculopathy is more likely.*

Optic chiasm

***If the pt has...***

***...it's almost certainly:***

Metamorphopsia

Maculopathy

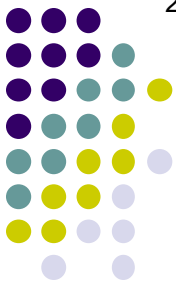
Dyschromatopsia

Optic neuropathy

Retrochiasm

<b><i>If the pt has...</i></b>	<b><i>...it's almost certainly:</i></b>
Metamorphopsia	Maculopathy
Dyschromatopsia	Optic neuropathy

# Visual Field Defects



Retina

Clinically obvious dz

Clinically subtle dz

Optic nerve

Before we dive into VF defects associated with optic nerve dz... It can be challenging to distinguish between subtle retinal dz (specifically, a maculopathy) and optic nerve dz. Let's review some non-VF clues that can help in this regard. *For each finding, indicate whether optic neuropathy or maculopathy is more likely.*

Optic chiasm

***If the pt has...***

***...it's almost certainly:***

Metamorphopsia

Maculopathy

Dyschromatopsia

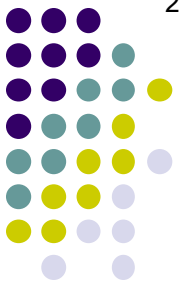
Optic neuropathy

Pain

?

Retrochiasm

# Visual Field Defects



**Retina**

Clinically obvious dz

Clinically subtle dz

**Optic nerve**

Before we dive into VF defects associated with optic nerve dz... It can be challenging to distinguish between subtle retinal dz (specifically, a maculopathy) and optic nerve dz. Let's review some non-VF clues that can help in this regard. *For each finding, indicate whether optic neuropathy or maculopathy is more likely.*

Optic chiasm

***If the pt has...***

***...it's almost certainly:***

Metamorphopsia

Maculopathy

Dyschromatopsia

Optic neuropathy

Pain

Optic neuropathy (neuritis)

Retrochiasm

# Visual Field Defects



**Retina**

Clinically obvious dz

Clinically subtle dz

**Optic nerve**

Before we dive into VF defects associated with optic nerve dz... It can be challenging to distinguish between subtle retinal dz (specifically, a maculopathy) and optic nerve dz. Let's review some non-VF clues that can help in this regard. *For each finding, indicate whether optic neuropathy or maculopathy is more likely.*

Optic chiasm

***If the pt has...***

***...it's almost certainly:***

Metamorphopsia

Maculopathy

Dyschromatopsia

Optic neuropathy

Pain

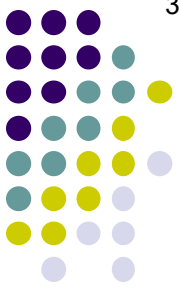
Optic neuropathy (neuritis)

Retrochiasm

Photopsia

?

# Visual Field Defects



**Retina**

Clinically obvious dz  
Clinically subtle dz

**Optic nerve**

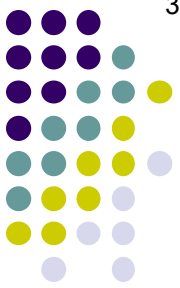
Before we dive into VF defects associated with optic nerve dz... It can be challenging to distinguish between subtle retinal dz (specifically, a maculopathy) and optic nerve dz. Let's review some non-VF clues that can help in this regard. *For each finding, indicate whether optic neuropathy or maculopathy is more likely.*

Optic chiasm

Retrochiasm

<i>If the pt has...</i>	<i>...it's almost certainly:</i>
Metamorphopsia	Maculopathy
Dyschromatopsia	Optic neuropathy
Pain	Optic neuropathy (neuritis)
Photopsia	Maculopathy

# Visual Field Defects



**Retina**

Clinically obvious dz

Clinically subtle dz

**Optic nerve**

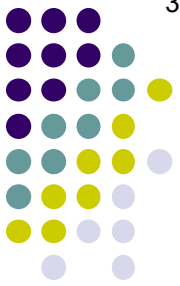
Before we dive into VF defects associated with optic nerve dz... It can be challenging to distinguish between subtle retinal dz (specifically, a maculopathy) and optic nerve dz. Let's review some non-VF clues that can help in this regard. *For each finding, indicate whether optic neuropathy or maculopathy is more likely.*

Optic chiasm

Retrochiasm

<i>If the pt has...</i>	<i>...it's almost certainly:</i>
Metamorphopsia	Maculopathy
Dyschromatopsia	Optic neuropathy
Pain	Optic neuropathy (neuritis)
Photopsia	Maculopathy
RAPD	?

# Visual Field Defects



Retina

Clinically obvious dz

Clinically subtle dz

Optic nerve

Before we dive into VF defects associated with optic nerve dz... It can be challenging to distinguish between subtle retinal dz (specifically, a maculopathy) and optic nerve dz. Let's review some non-VF clues that can help in this regard. *For each finding, indicate whether optic neuropathy or maculopathy is more likely.*

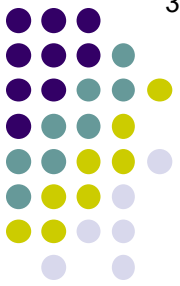
Optic chiasm

Retrochiasm

<i>If the pt has...</i>	<i>...it's almost certainly:</i>
Metamorphopsia	Maculopathy
Dyschromatopsia	Optic neuropathy
Pain	Optic neuropathy (neuritis)
Photopsia	Maculopathy
RAPD	Optic neuropathy



# Visual Field Defects



Retina

Clinically obvious dz

Clinically subtle dz

**Optic nerve**

*Let's take a brief aside to cover optic nerve fundamentals before we address optic nerve VF defects*

Optic chiasm

Retrochiasmal

# Visual Field Defects

*The optic nerves are composed of what?*

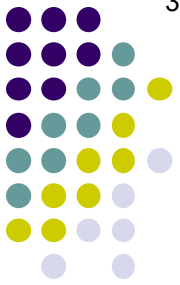


# Visual Field Defects

*The optic nerves are composed of what?*  
The axons of retinal ganglion cells



# Visual Field Defects

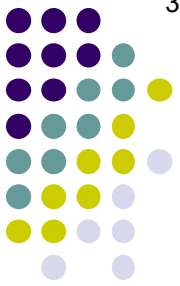


*The optic nerves are composed of what?*

**The axons of retinal ganglion cells**

*How many fibers (axons) comprise an optic nerve?*

# Visual Field Defects



*The optic nerves are composed of what?*

**The axons of retinal ganglion cells**

*How many fibers (axons) comprise an optic nerve?*

Depends upon which book you ask, but the answer **1.2M** works

*Glaucoma book:* 1.2-1.5M

*Neuro:* 1-1.2M

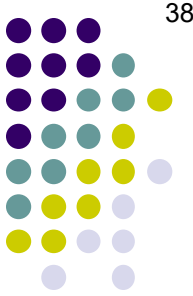
*Fundamentals:* “more than a million”

# Visual Field Defects

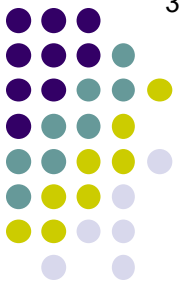
*The optic nerves are composed of what?*

The axons of retinal ganglion cells

*Do they synapse in the region of the optic nerve head?*



# Visual Field Defects



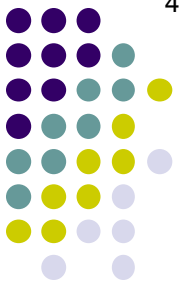
*The optic nerves are composed of what?*

The axons of retinal ganglion cells

*Do they synapse in the region of the optic nerve head?*

No

# Visual Field Defects



*The optic nerves are composed of what?*

The axons of retinal ganglion cells

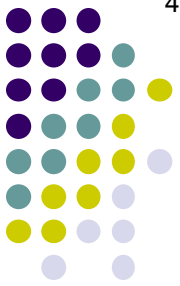
*Do they synapse in the region of the optic nerve head?*

No

*Where will they synapse?*



# Visual Field Defects



*The optic nerves are composed of what?*

The axons of retinal ganglion cells

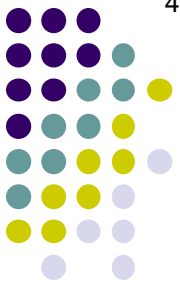
*Do they synapse in the region of the optic nerve head?*

No

*Where will they synapse?*

Most will synapse in the lateral geniculate nucleus (LGN)

# Visual Field Defects



*The optic nerves are composed of what?*

The axons of retinal ganglion cells

*Do they synapse in the region of the optic nerve head?*

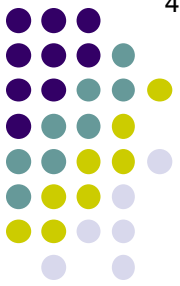
No

*Where will they synapse?*

**Most** will synapse in the lateral geniculate nucleus (LGN)

*Most? Where will the others synapse, and what are they responsible for?*

# Visual Field Defects



*The optic nerves are composed of what?*

The axons of retinal ganglion cells

*Do they synapse in the region of the optic nerve head?*

No

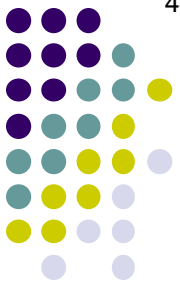
*Where will they synapse?*

**Most** will synapse in the lateral geniculate nucleus (LGN)

*Most? Where will the others synapse, and what are they responsible for?*

Most of the others are involved in the pupillary light reflex; they peel off just prior to reaching the LGN, heading instead to the pretectum of the dorsal midbrain to synapse in the pretectal nuclei

# Visual Field Defects



*The optic nerves are composed of what?*

The axons of retinal ganglion cells

*Do they synapse in the region of the optic nerve head?*

No

*Where will they synapse?*

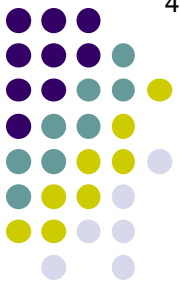
Most will synapse in the lateral geniculate nucleus (LGN)

*Most? Where will the others synapse, and what are they responsible for?*

**Most** of the others are involved in the pupillary light reflex; they peel off just prior to reaching the LGN, heading instead to the pretectum of the dorsal midbrain to synapse in the pretectal nuclei

*'Most'? Where will the others synapse, and what are they responsible for?*

# Visual Field Defects



*The optic nerves are composed of what?*

The axons of retinal ganglion cells

*Do they synapse in the region of the optic nerve head?*

No

*Where will they synapse?*

Most will synapse in the lateral geniculate nucleus (LGN)

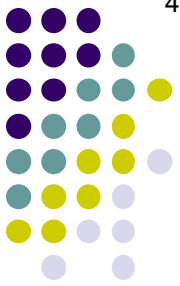
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The hypothalamus, where they are involved in modulating circadian responses

# Visual Field Defects



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The axons of retinal ganglion cells

*Do they synapse in the region of the optic nerve head?*

No

*Where will they synapse?*

Most will synapse in the lateral geniculate nucleus (LGN)

***For a more in-depth look at the optic nerve, see slide-set FELT6***

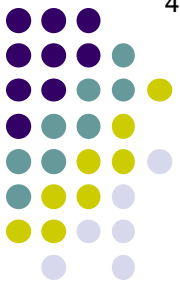
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The hypothalamus, where they are involved in modulating circadian responses

# Visual Field Defects



Retina

Clinically obvious dz

Clinically subtle dz

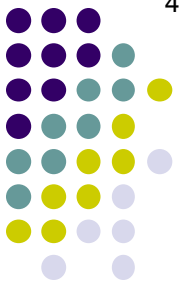
Optic nerve

*two general  
categories of ON  
VF defects*

Optic chiasm

Retrochiasmal

# Visual Field Defects



Retina

Clinically obvious dz

Clinically subtle dz

Optic nerve

Depressions

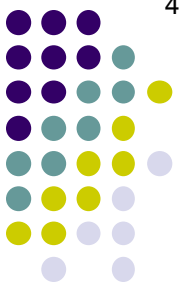
Scotomas

Optic chiasm

Retrochiasmal



# Visual Field Defects



Retina

Clinically obvious dz

Clinically subtle dz

Optic nerve

**Depressions**

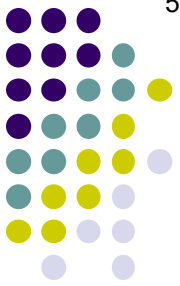
**Scotomas**

*What's the difference between a depression and a scotoma?*

Optic chiasm

Retrochiasmal

# Visual Field Defects



Retina

Clinically obvious dz

Clinically subtle dz

Optic nerve

**Depressions**

**Scotomas**

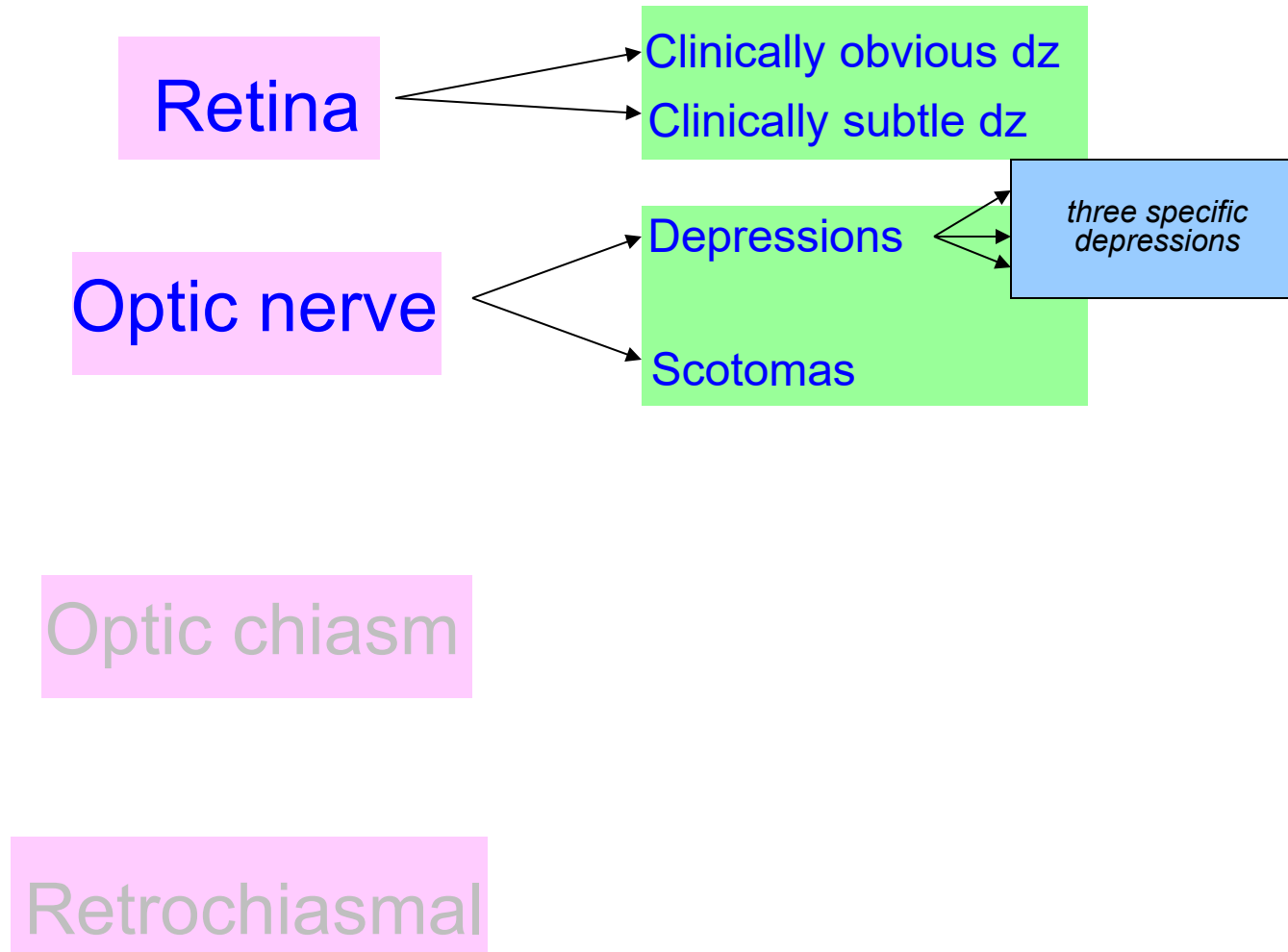
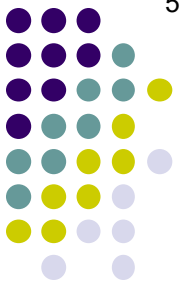
*What's the difference between a depression and a scotoma?*

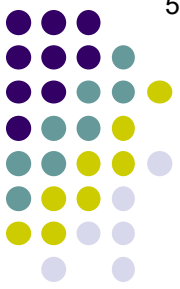
A **depression** is an inward shifting of the outer limit of the visual field, whereas a **scotoma** is an area of field loss surrounded on all sides by areas of normal sensitivity.

Optic chiasm

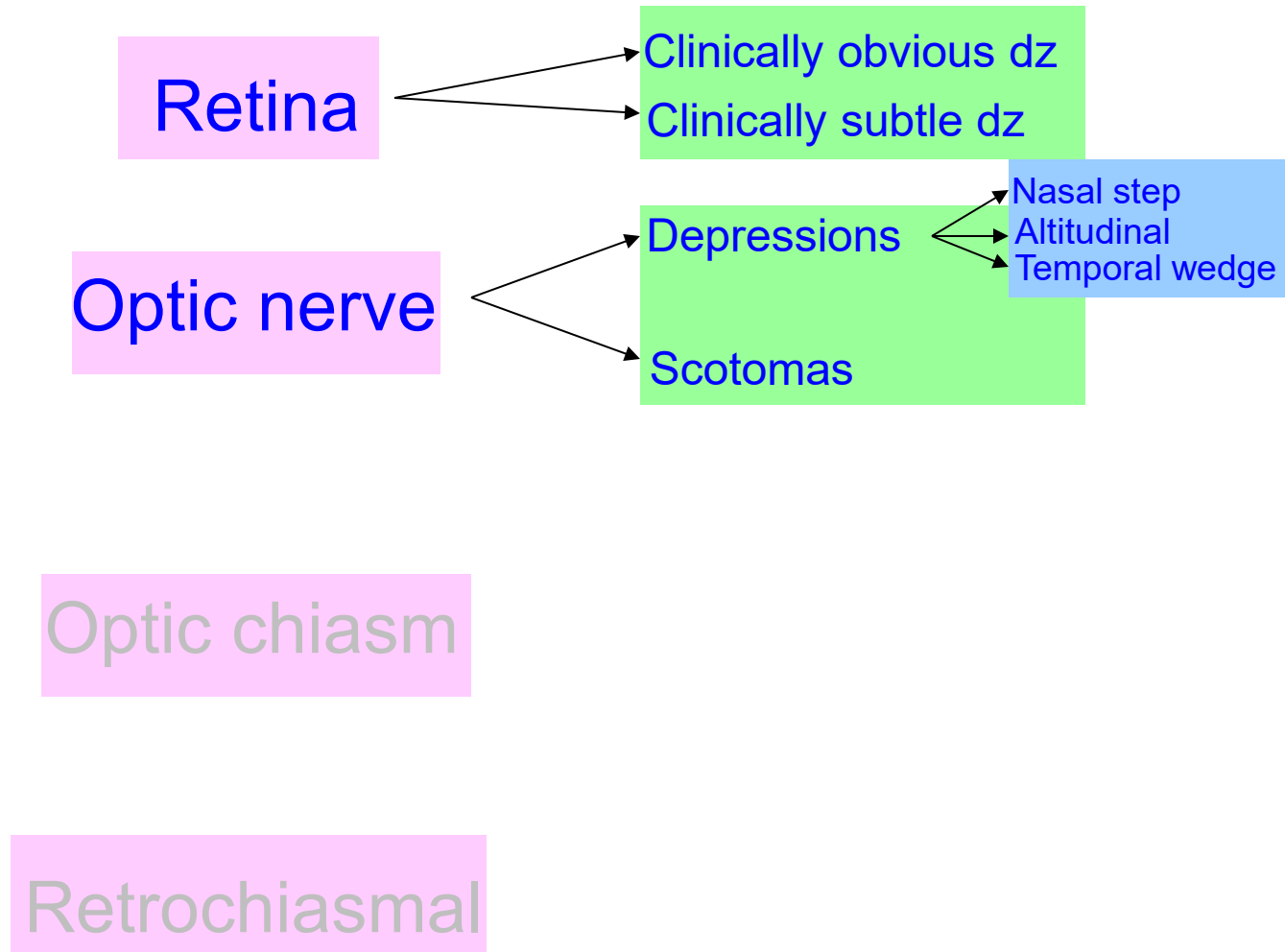
Retrochiasmal

# Visual Field Defects

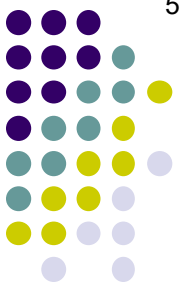




# Visual Field Defects



# Visual Field Defects



Retina

Clinically obvious dz

Clinically subtle dz

Optic nerve

Depressions

Nasal step

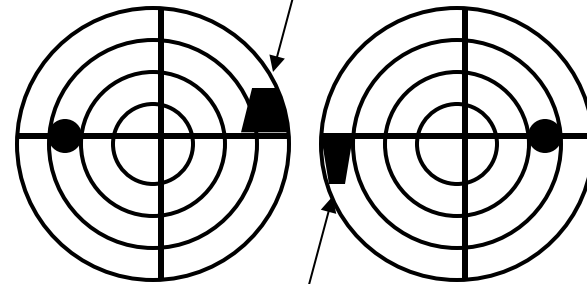
Altitudinal

Temporal wedge

Scotomas

Optic chiasm

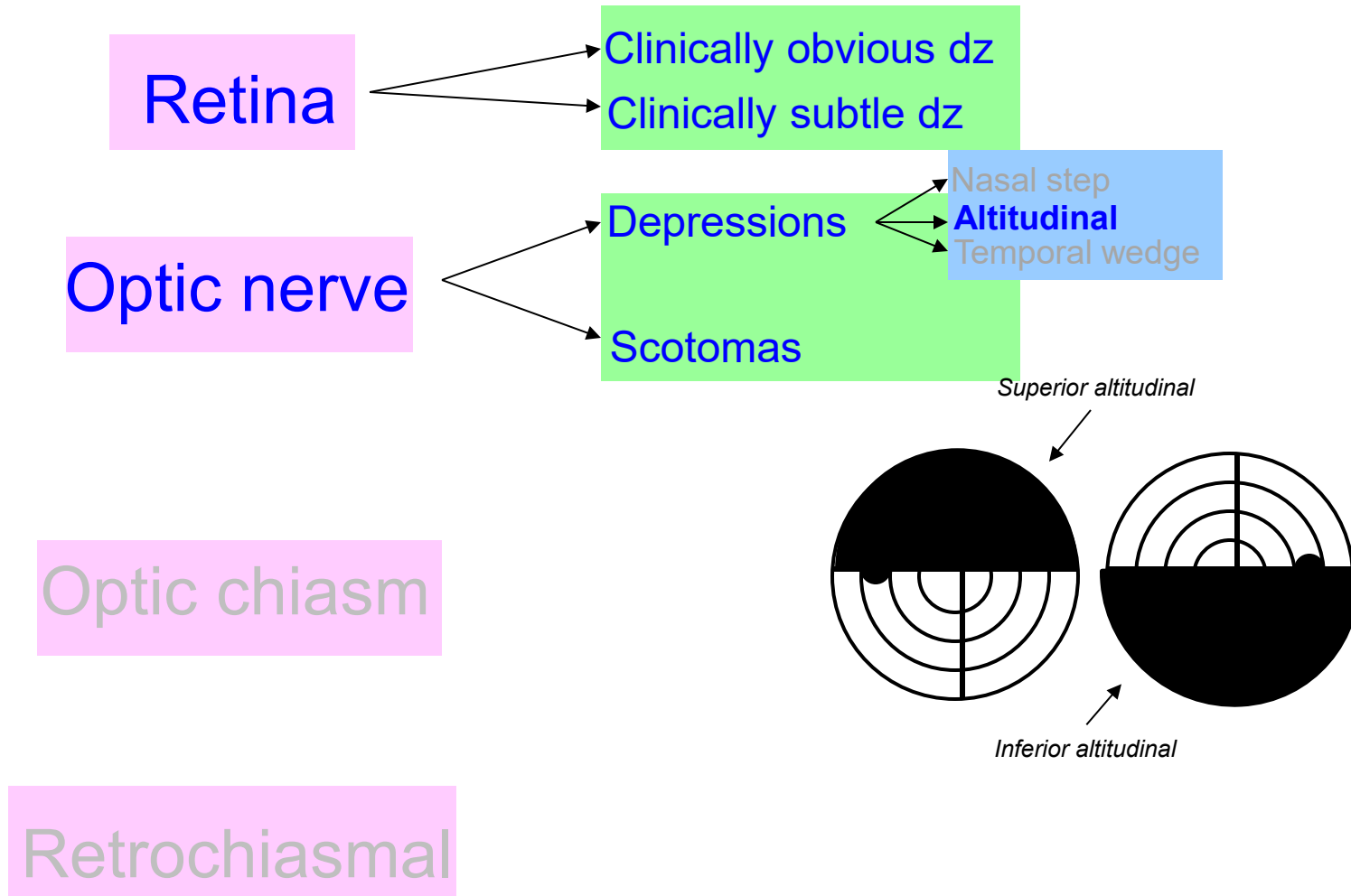
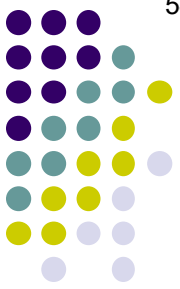
Superior nasal step



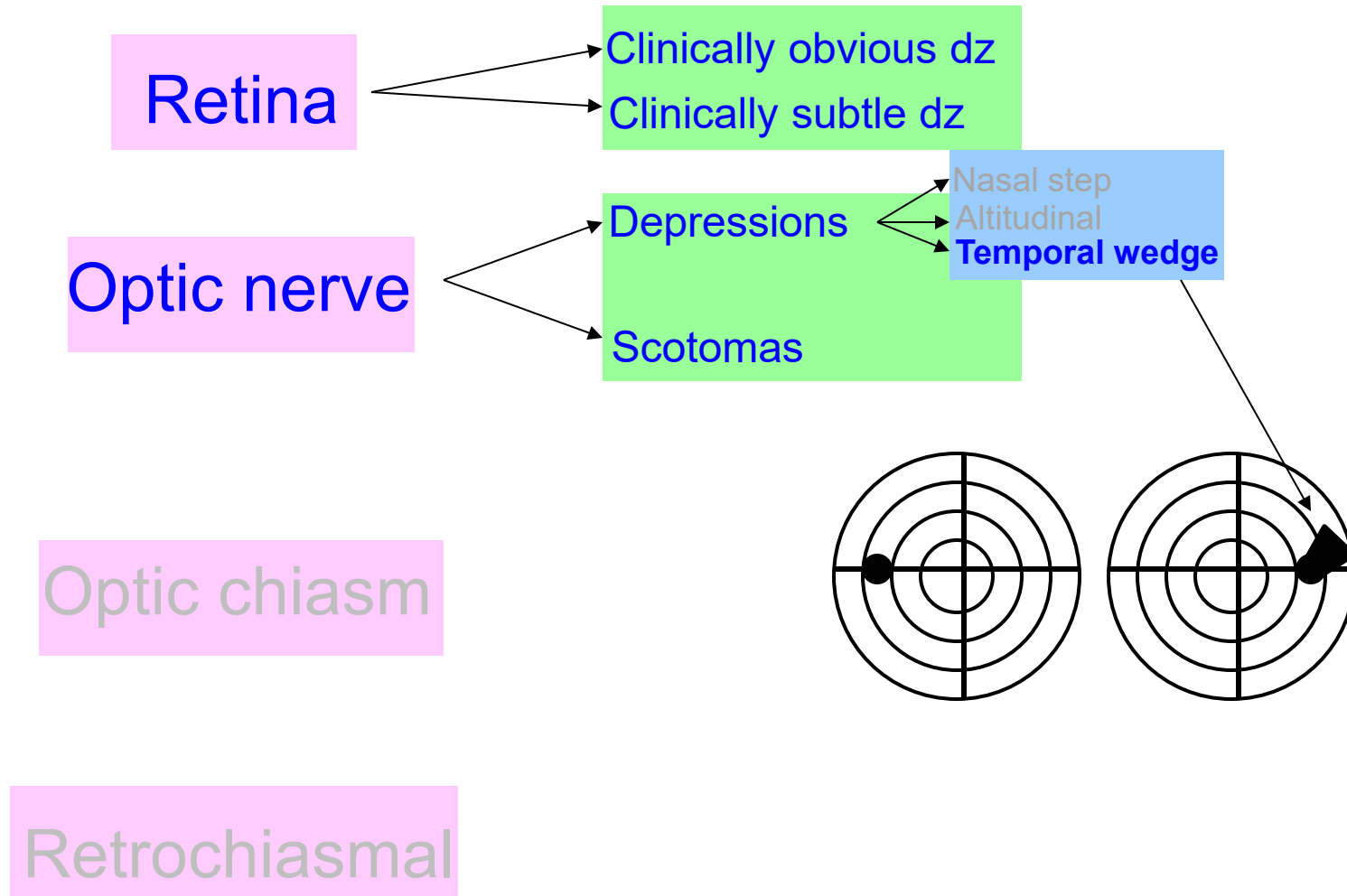
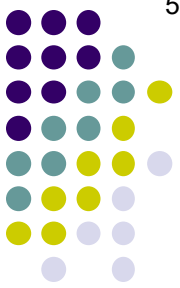
Inferior nasal step

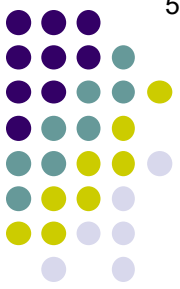
Retrochiasmal

# Visual Field Defects

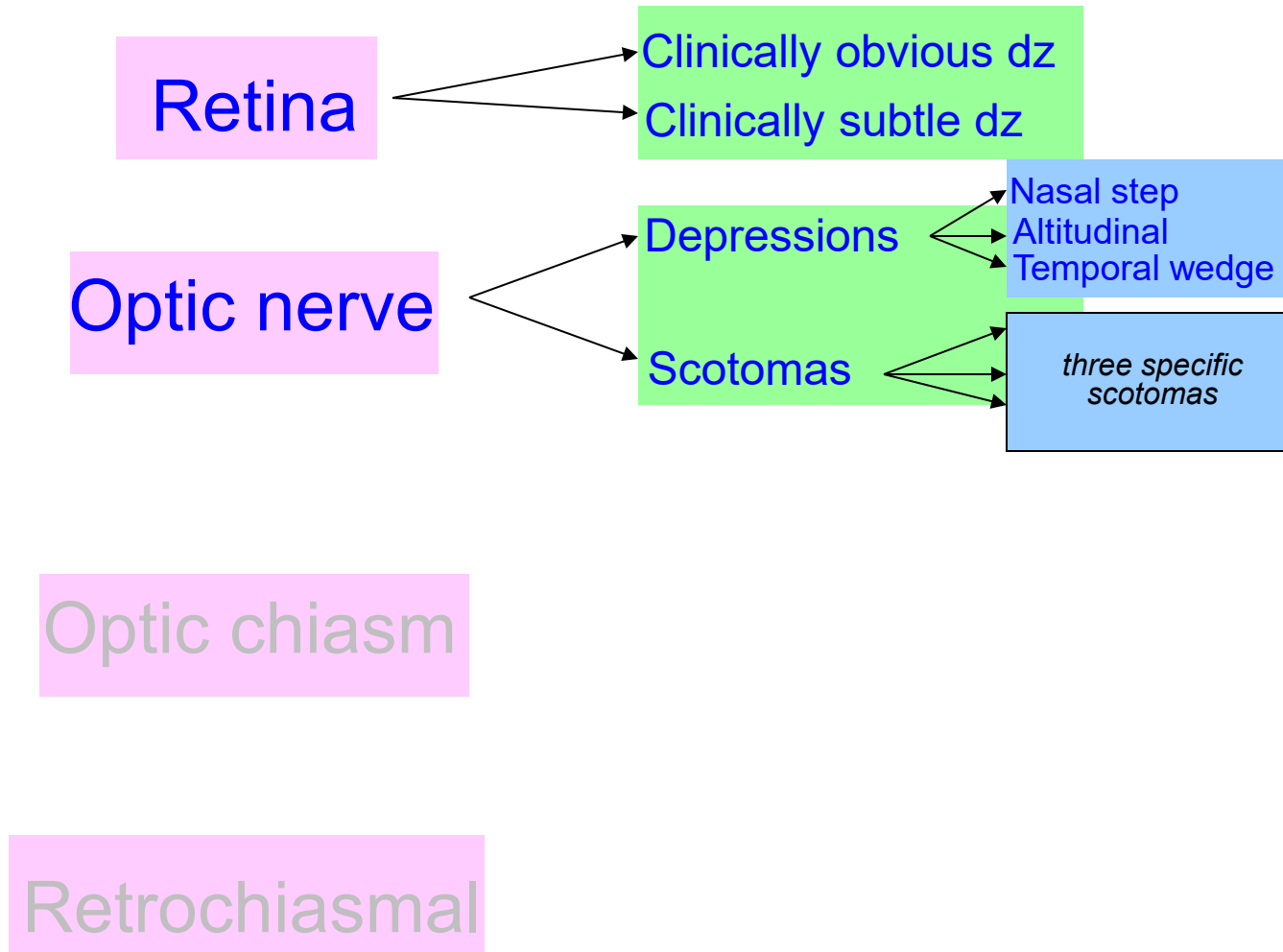


# Visual Field Defects



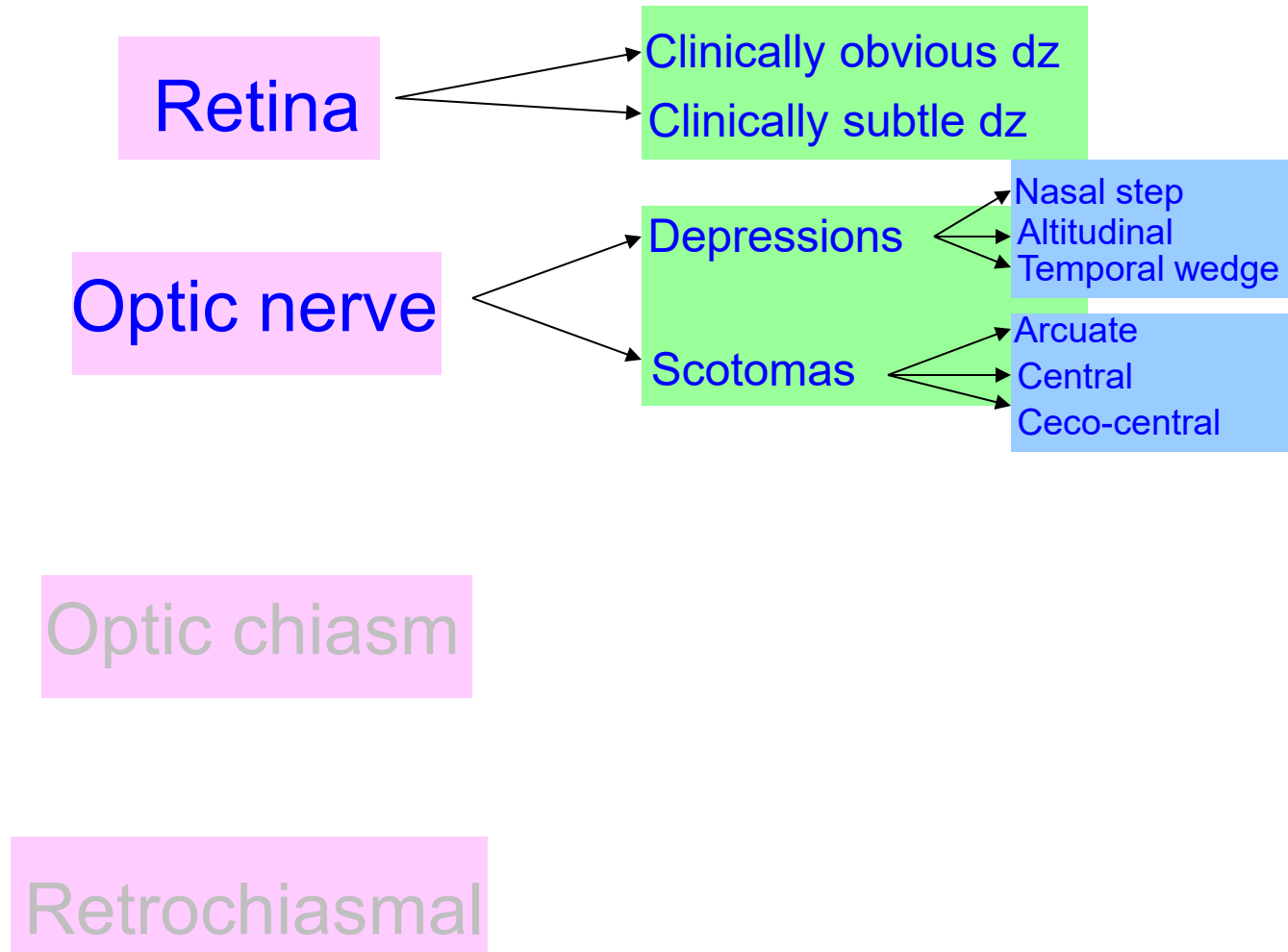
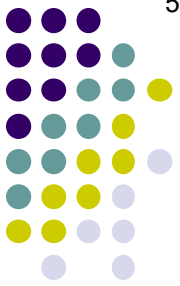


# Visual Field Defects

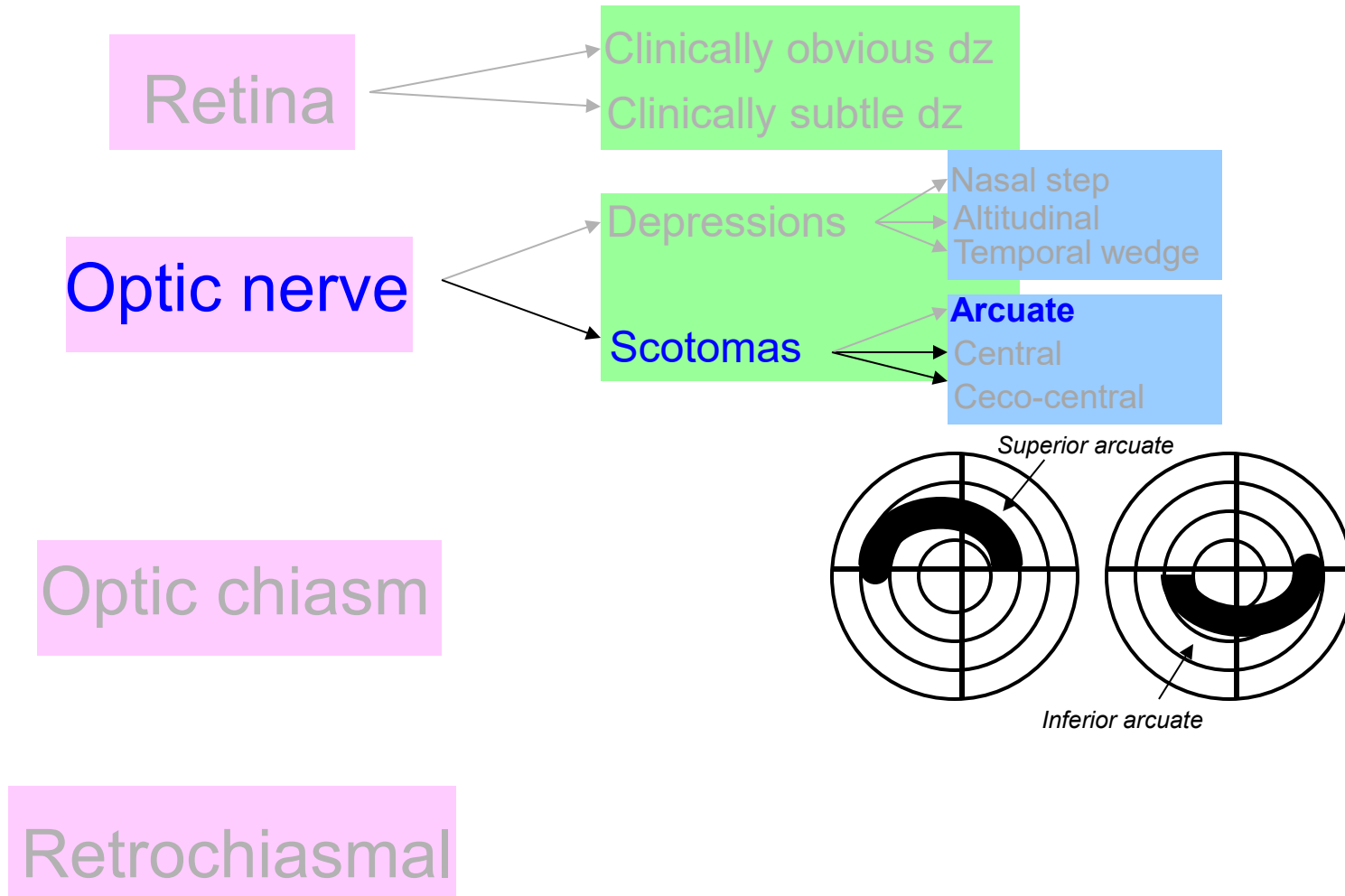
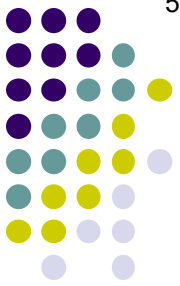




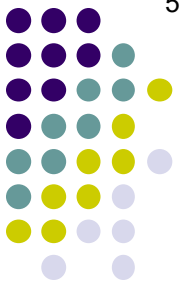
# Visual Field Defects



# Visual Field Defects



# Visual Field Defects



Retina

Optic nerve

Optic chiasm

Retrochiasmal

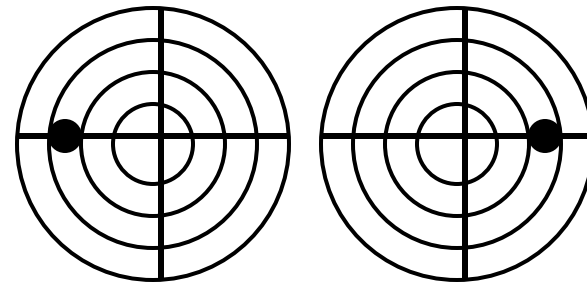
*What's the difference between a central and a ceco-central scotoma?*

Scotomas

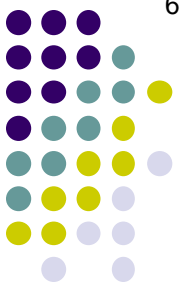
Arcuate

Central

Ceco-central



# Visual Field Defects



Retina

Optic nerve

Optic chiasm

Retrochiasmal

Clinically obvious defects

*What's the difference between a central and a ceco-central scotoma?*

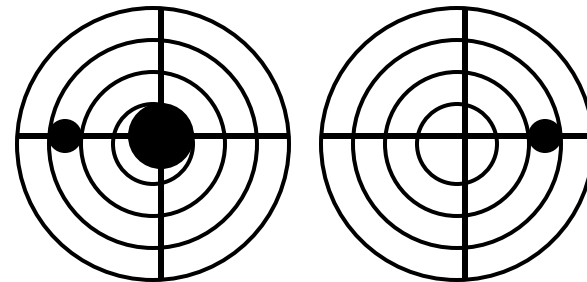
A **central scotoma** involves only fixation, whereas...

Scotomas

Arcuate

Central

Ceco-central





# Visual Field Defects

Retina

Optic nerve

Optic chiasm

Retrochiasmal

*What's the difference between a central and a ceco-central scotoma?*

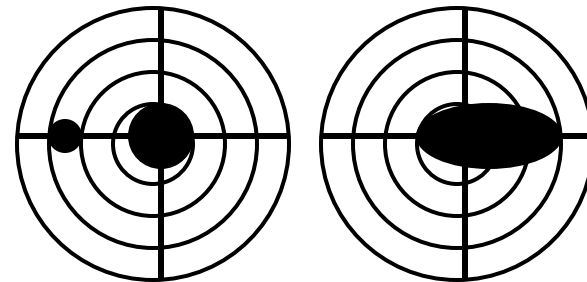
A **central scotoma** involves only fixation, whereas... a **cecocentral scotoma** involves fixation *and* extends all the way to the blind spot

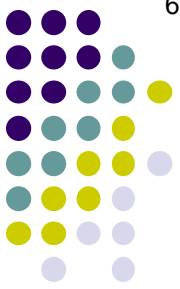
Scotomas

Arcuate

Central

Ceco-central





# Visual Field Defects

Retina

Optic nerve

Optic chiasm

Retrochiasmal

Clinically obvious defects

What's the difference between a central and a ceco-central scotoma?

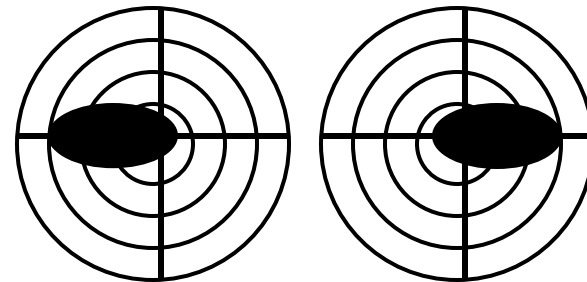
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Scotomas

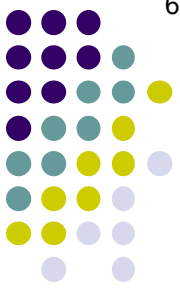
Arcuate

Central

Ceco-central



*(Take note: Bilateral ceco-central scotomas could be mistaken for bitemporal VF loss!)*



# Visual Field Defects

Retina

Optic nerve

Optic chiasm

Retrochiasmal

Clinically obvious defects

What's the difference between a central and a ceco-central scotoma?

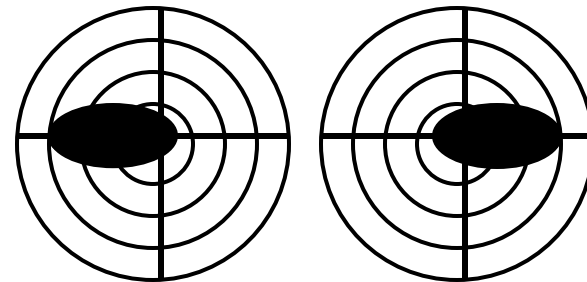
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Scotomas

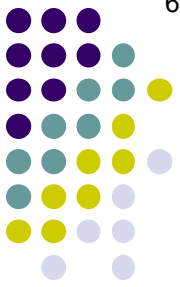
Arcuate

Central

Ceco-central



*(Or put another way: Bitemporal VF loss could be mistaken for bilateral ceco-central scotomas)*



# Visual Field Defects

Retina

Optic nerve

Optic chiasm

Retrochiasmal

Clinically obvious defects

What's the difference between a central and a ceco-central scotoma?

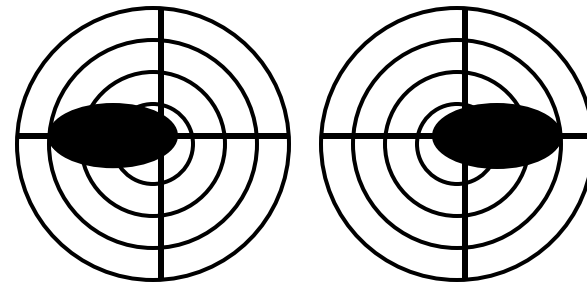
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Scotomas

Arcuate

Central

Ceco-central

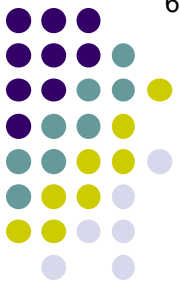


(Or put another way: Bitemporal VF loss could be mistaken for bilateral ceco-central scotomas)



*This seems like an obvious and trivial point to make. Why make it?*





# Visual Field Defects

Retina

Optic nerve

Optic chiasm

Retrochiasmal

Clinically obvious defects

What's the difference between a central and a ceco-central scotoma?

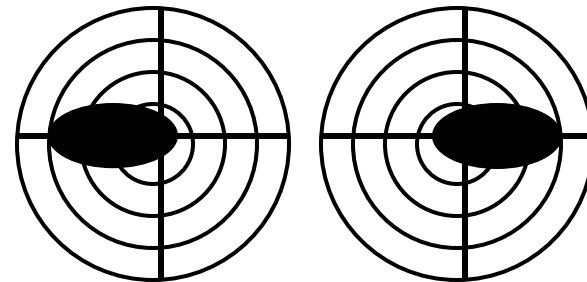
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Ceco-central



(Or put another way: Bitemporal VF loss could be mistaken for bilateral ceco-central scotomas)

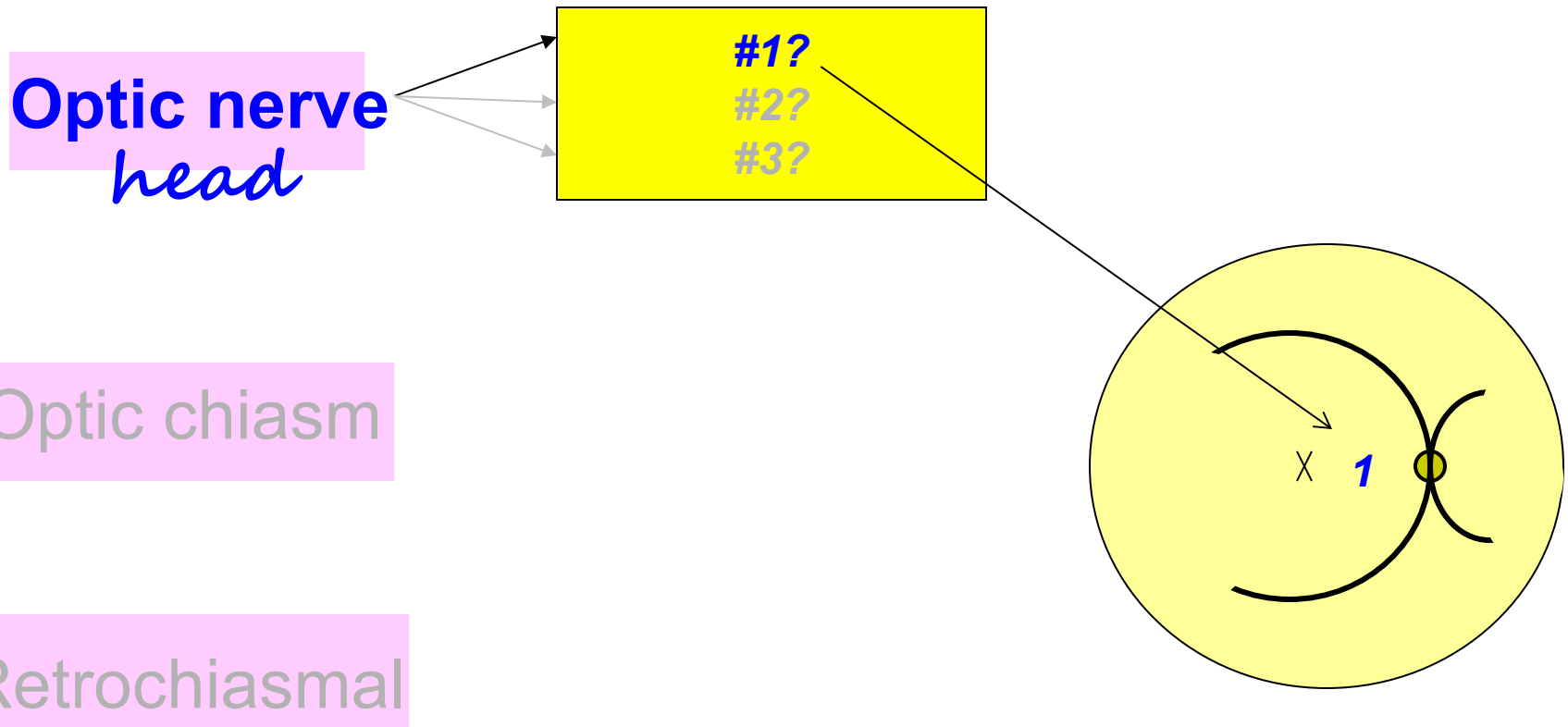


*This seems like an obvious and trivial point to make. Why make it?*  
Because (as we'll see when we talk about chiasmal VF defects),  
it's vital to maintain an index of suspicion regarding the possibility that a VF has a vertical cut

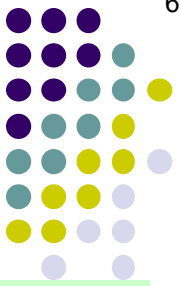
# Visual Field Defects



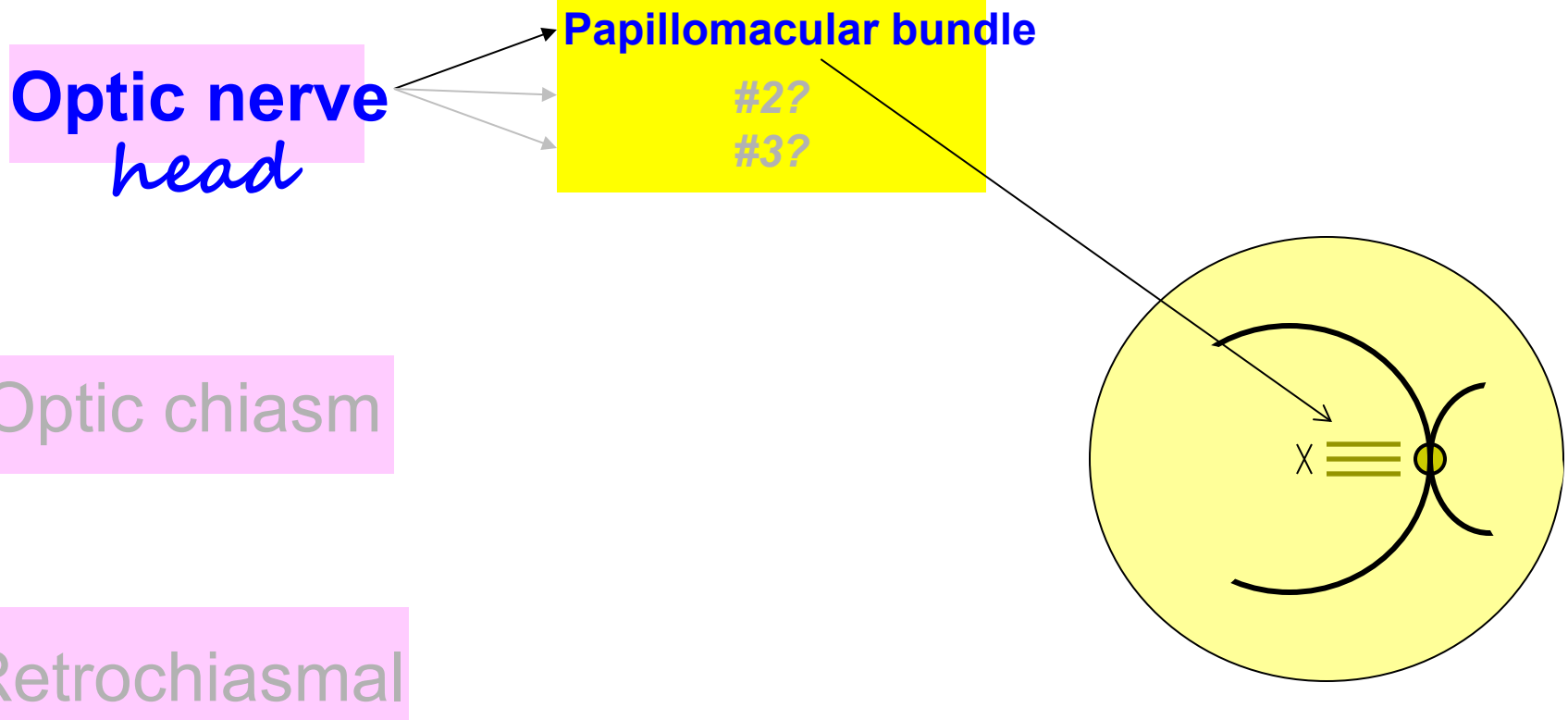
*Another way to think about the optic nerve is with respect to its topography at the optic nerve head. Specifically, the retinal nerve fibers composing the optic nerve can be divided into three groups:*



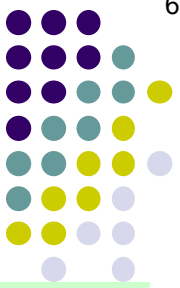
# Visual Field Defects



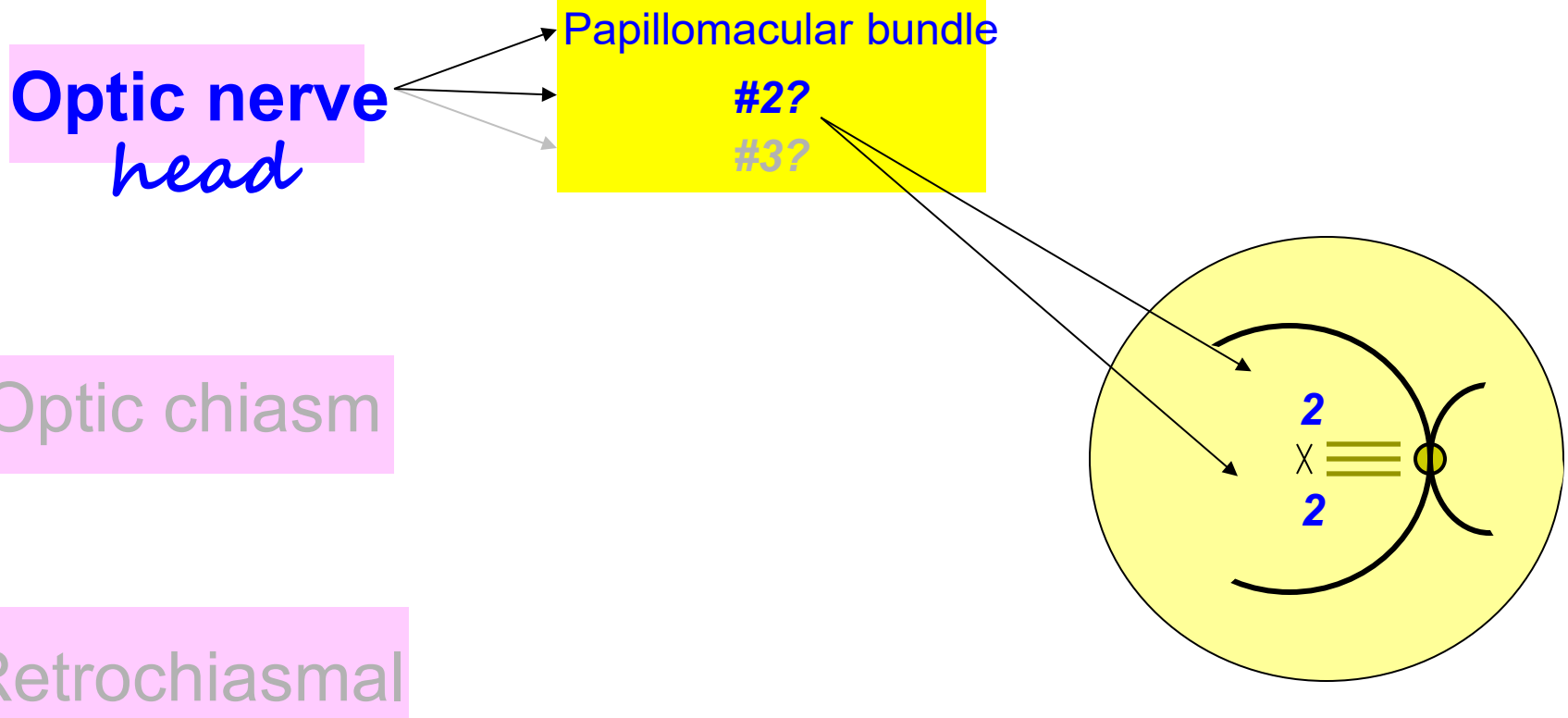
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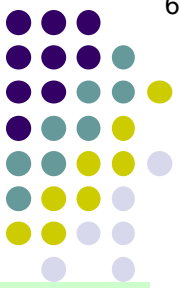
# Visual Field Defects



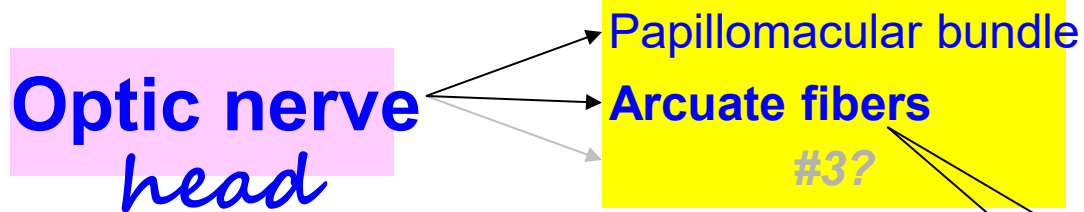
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# Visual Field Defects

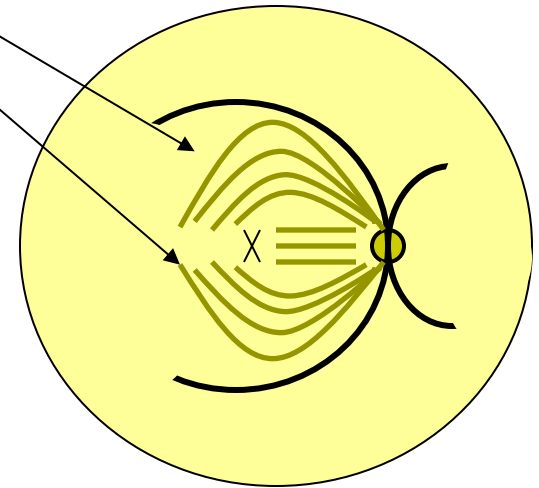


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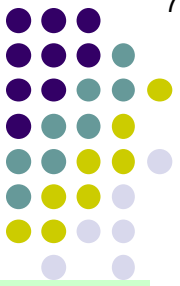


Optic chiasm

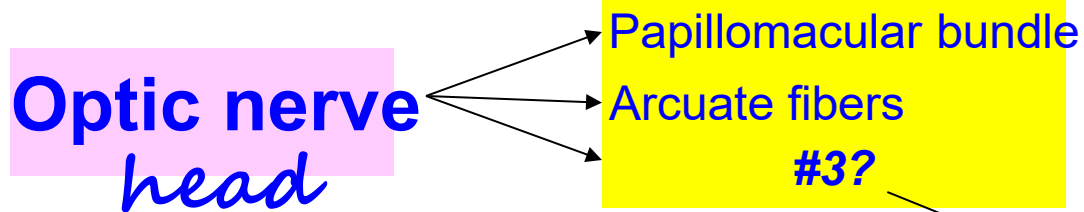
Retrochiasmal



# Visual Field Defects

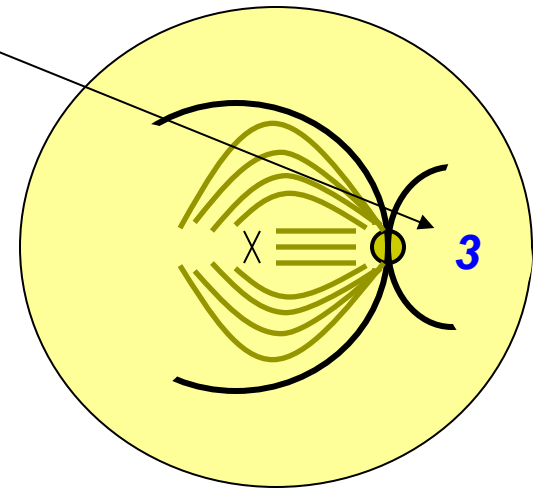


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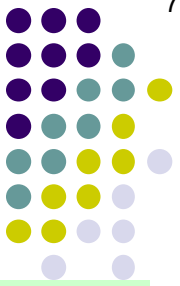


Optic chiasm

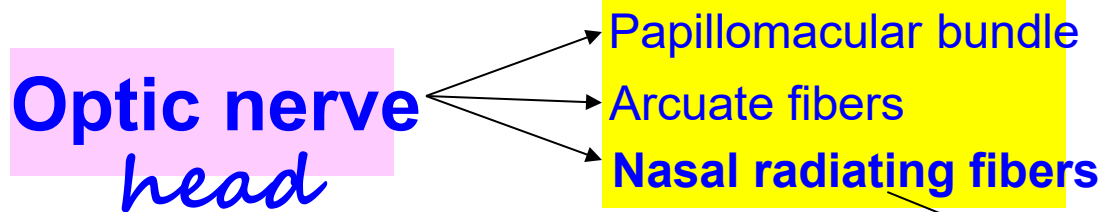
Retrochiasmal



# Visual Field Defects

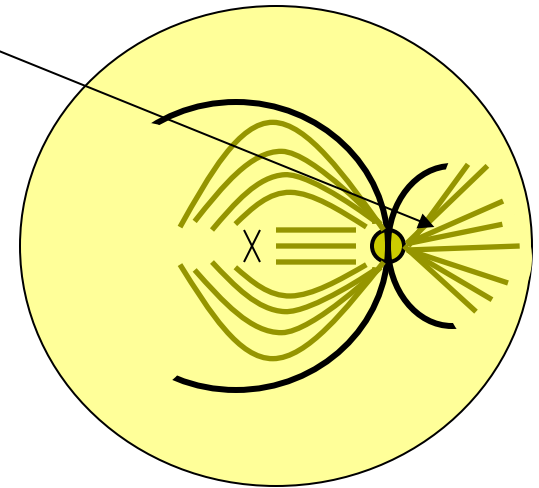


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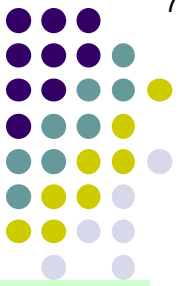


Optic chiasm

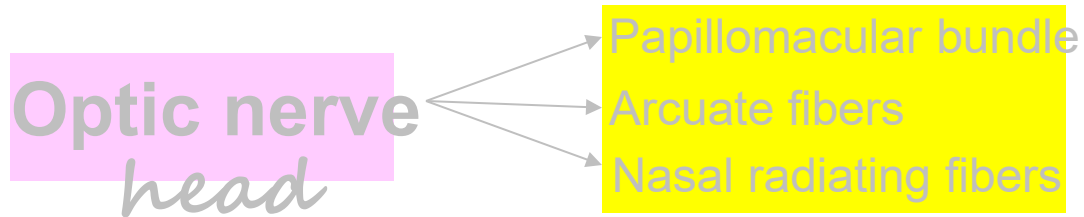
Retrochiasmal



# Visual Field Defects

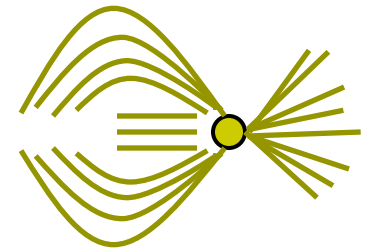


*Another way to think about the optic nerve is with respect to its topography at the optic nerve head. Specifically, the retinal nerve fibers composing the optic nerve can be divided into three groups:*



Optic chiasm

*The basic topography of the RNFL looks a lot like a fish!*



Retrochiasmal



## Re Which of

**R** Which of these VF defects are associated with damage to each group?

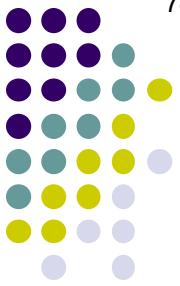
## Papillomacular bundle

## Nasal radiating fibers



# Retrochiasmal

# Visual Field Defects



R Which of these VF defects are associated with damage to each group?

Optic nerve  
head

Papillomacular bundle

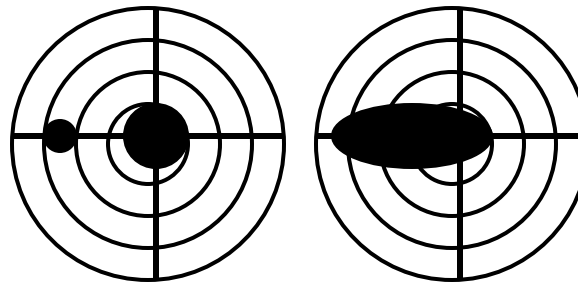
Arcuate fibers

Nasal radiating fibers

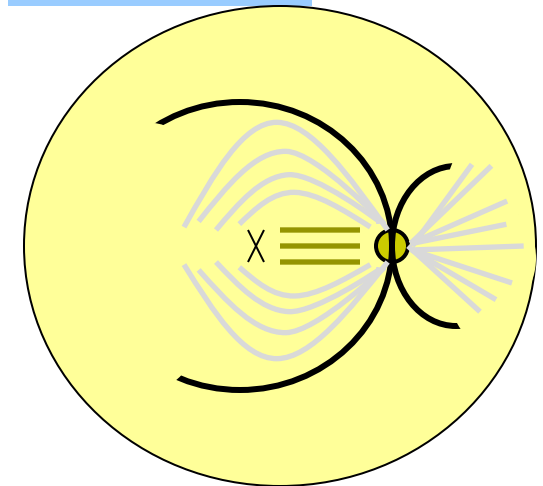
Nasal step  
Altitudinal  
Temporal wedge

Arcuate  
Central  
Ceco-central

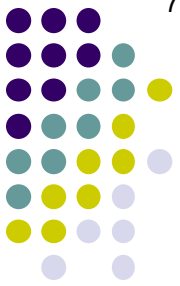
Optic chiasm



Retrochiasmal



# Visual Field Defects



R Which of these VF defects are associated with damage to each group?

Optic nerve  
head

Papillomacular bundle

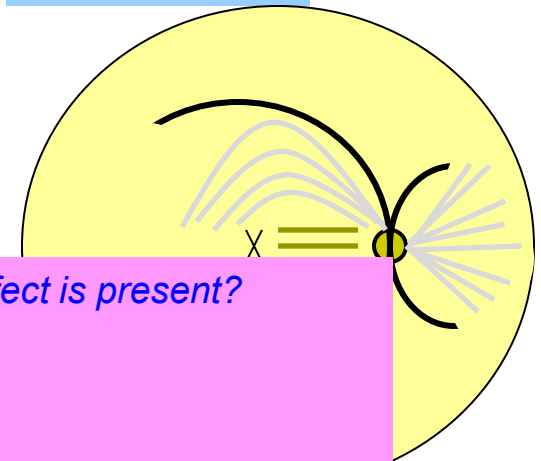
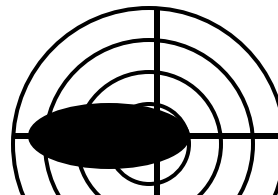
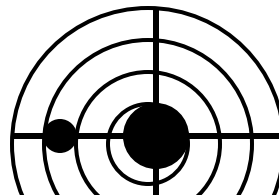
Arcuate fibers

Nasal radiating fibers

Nasal step  
Altitudinal  
Temporal wedge

Arcuate  
Central  
Ceco-central

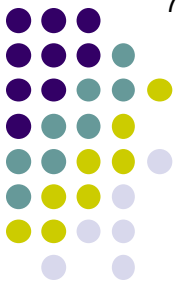
Optic chiasm



Which sorts of optic neuropathy are implicated if a PMB VF defect is present?

Retr

# Visual Field Defects



R Which of these VF defects are associated with damage to each group?

Optic nerve  
head

Papillomacular bundle

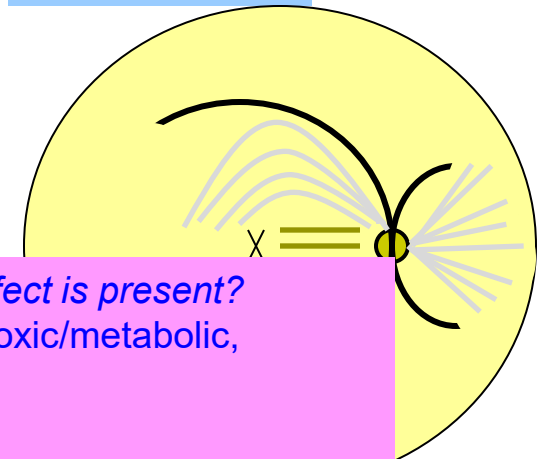
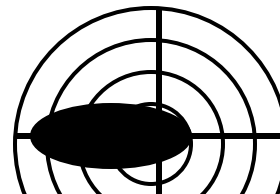
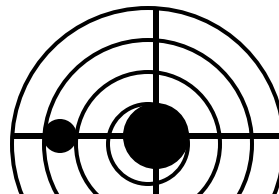
Arcuate fibers

Nasal radiating fibers

Nasal step  
Altitudinal  
Temporal wedge

Arcuate  
Central  
Ceco-central

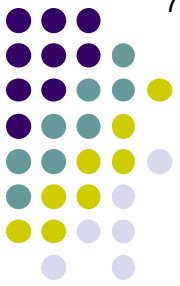
Optic chiasm



Which sorts of optic neuropathy are implicated if a PMB VF defect is present?  
Conditions involving compromised cellular metabolism: Think toxic/metabolic, nutritional deficiencies, inherited mitochondrial dz, etc

Retr

# Visual Field Defects



**R** Which of these VF defects are associated with damage to each group?

**Optic nerve**  
*head*

**Papillomacular bundle**

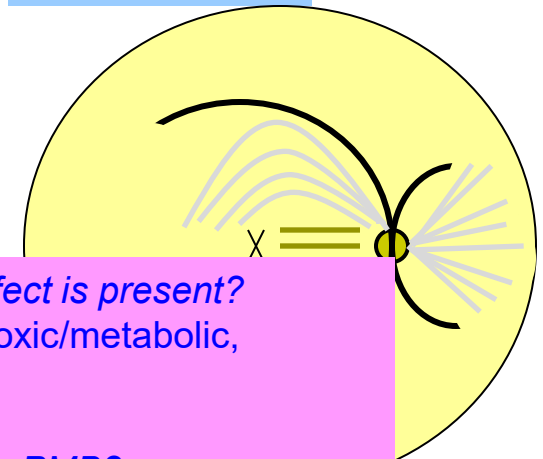
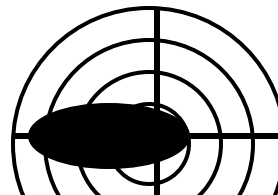
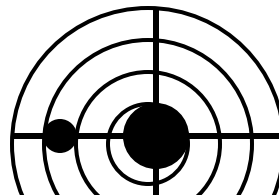
Arcuate fibers

Nasal radiating fibers

Nasal step  
Altitudinal  
Temporal wedge

Arcuate  
**Central**  
**Ceco-central**

**Optic chiasm**

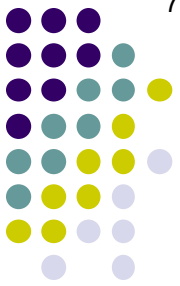


*Which sorts of optic neuropathy are implicated if a PMB VF defect is present?*  
Conditions involving compromised cellular metabolism: Think toxic/metabolic, nutritional deficiencies, inherited mitochondrial dz, etc

**Retr**

*Why do conditions affecting metabolism preferentially affect the PMB?*

# Visual Field Defects



R Which of these VF defects are associated with damage to each group?

Optic nerve  
head

Papillomacular bundle

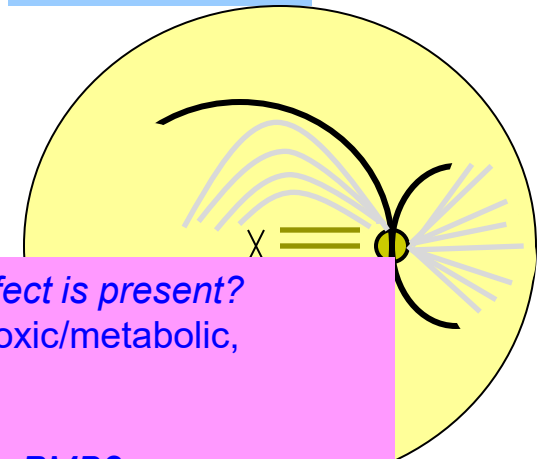
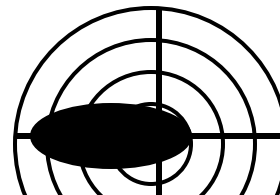
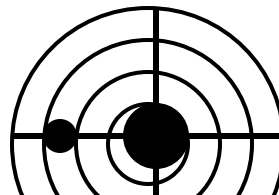
Arcuate fibers

Nasal radiating fibers

Nasal step  
Altitudinal  
Temporal wedge

Arcuate  
Central  
Ceco-central

Optic chiasm

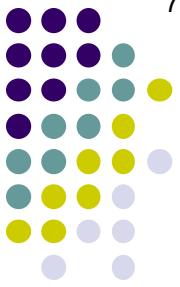


Which sorts of optic neuropathy are implicated if a PMB VF defect is present?  
Conditions involving compromised cellular metabolism: Think toxic/metabolic, nutritional deficiencies, inherited mitochondrial dz, etc

Retr

Why do conditions affecting metabolism preferentially affect the PMB?  
Because the PMB fibers are small, unmyelinated, and extremely active metabolically. Taken together, these characteristics make them more vulnerable than the rest of the optic nerve to factors that adversely impact metabolism.

# Visual Field Defects



*Toxins that shouldn't be ingested at all:*

--?

--?

--?

--(many others)

*Toxins that shouldn't be ingested in large quantities for prolonged periods:*

--

--

*Toxins you were told to ingest by a doc:*

--

--

--

--

--

*Nutrients that weren't ingested in sufficient quantity:*

--

--

--

*Inherited mitochondrial diseases:*

--

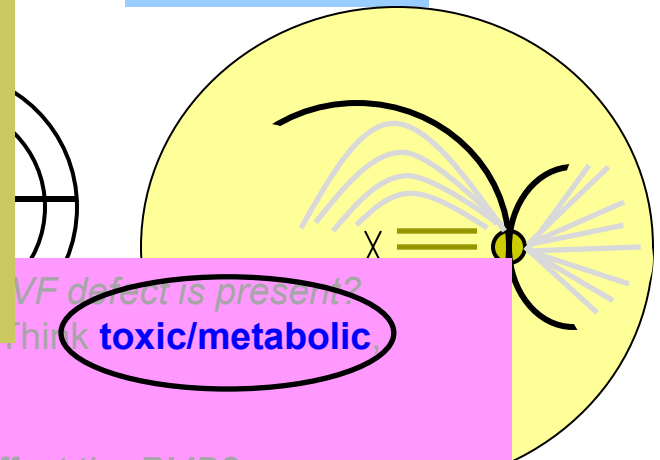
--

What if a VF defect is present?  
Conditions involving compromised cellular metabolism. Think of  
nutritional deficiencies, inherited mitochondrial dz, etc

with damage to each group?

Nasal step  
Altitudinal  
Temporal wedge

Arcuate  
**Central**  
**Ceco-central**

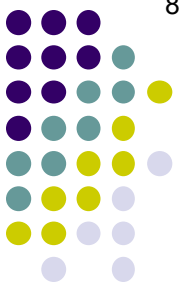


**toxic/metabolic**

*Why do conditions affecting metabolism preferentially affect the PMB?*

Because the PMB fibers are small, unmyelinated, and extremely active metabolically. Taken together, these characteristics make them more vulnerable than the rest of the optic nerve to factors that adversely impact metabolism.

# Visual Field Defects



*Toxins that shouldn't be ingested at all:*

- Methanol
- Ethylene glycol
- Lead (in children)
- (many others)

*Toxins that shouldn't be ingested in large quantities for prolonged periods:*

- 
- 

*Toxins you were told to ingest by a doc:*

- 
- 
- 
- 
- 
- 

*Nutrients that weren't ingested in sufficient quantity:*

- 
- 
- 

*Inherited mitochondrial diseases:*

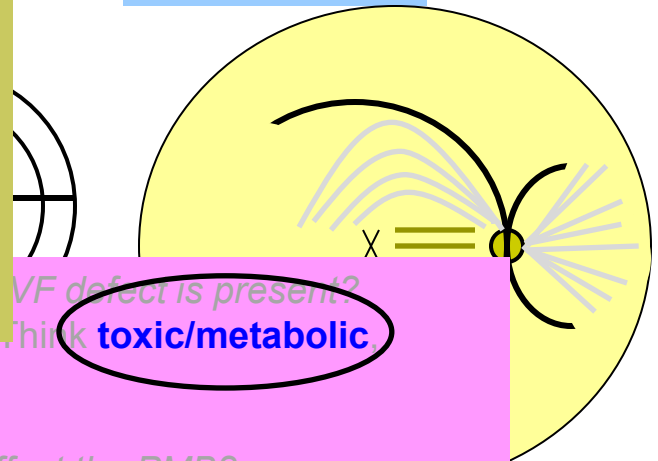
- 
- 

What if a VF defect is present?  
Conditions involving compromised cellular metabolism. Think of  
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with damage to each group?

Nasal step  
Altitudinal  
Temporal wedge

Arcuate  
**Central**  
**Ceco-central**



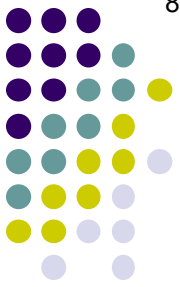
**toxic/metabolic**

*Why do conditions affecting metabolism preferentially affect the PMB?*

Because the PMB fibers are small, unmyelinated, and extremely active metabolically. Taken together, these characteristics make them more vulnerable than the rest of the optic nerve to factors that adversely impact metabolism.



# Visual Field Defects



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- ?
- ?

*Toxins you were told to ingest by a doc:*

- 
- 
- 
- 
- 

*Nutrients that weren't ingested in sufficient quantity:*

- 
- 
- 

*Inherited mitochondrial diseases:*

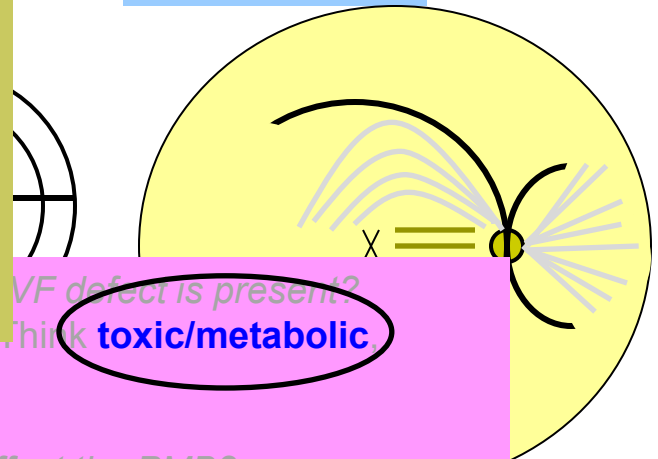
- 
- 

What if a VF defect is present?  
 Conditions involving compromised central metabolism. Think of  
 nutritional deficiencies, inherited mitochondrial dz, etc

with damage to each group?

Nasal step  
 Altitudinal  
 Temporal wedge

Arcuate  
**Central**  
**Ceco-central**

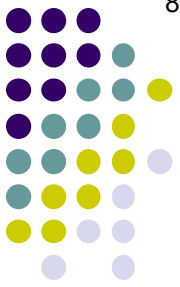


**toxic/metabolic**

*Why do conditions affecting metabolism preferentially affect the PMB?*

Because the PMB fibers are small, unmyelinated, and extremely active metabolically. Taken together, these characteristics make them more vulnerable than the rest of the optic nerve to factors that adversely impact metabolism.

# Visual Field Defects



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*Toxins that shouldn't be ingested in large quantities for prolonged periods:*

- Ethanol
- Tobacco

*Toxins you were told to ingest by a doc:*

- 
- 
- 
- 
- 

*Nutrients that weren't ingested in sufficient quantity:*

- 
- 
- 

*Inherited mitochondrial diseases:*

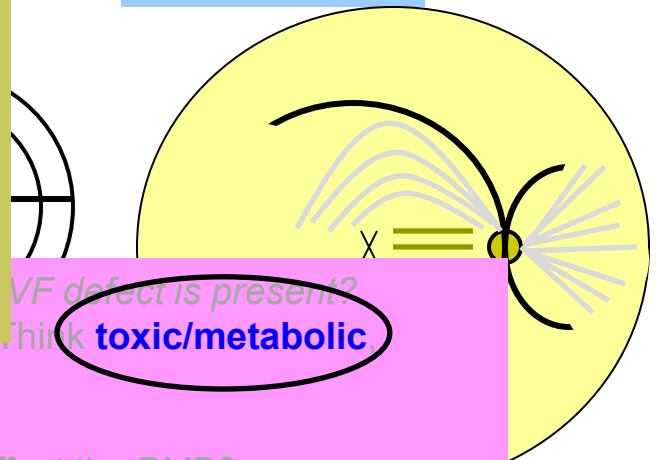
- 
- 

What if a VF defect is present?  
 Conditions involving compromised central metabolism. Think  
 nutritional deficiencies, inherited mitochondrial dz, etc

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Nasal step  
 Altitudinal  
 Temporal wedge

Arcuate  
**Central**  
**Ceco-central**



**toxic/metabolic**

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- ?
- ?
- ?
- (many others)

*Nutrients that weren't ingested in sufficient quantity:*

- 
- 
- 

*Inherited mitochondrial diseases:*

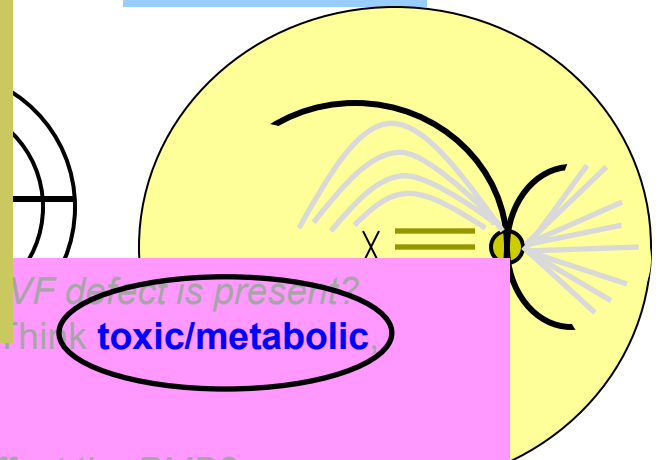
- 
- 

What if a VF defect is present?  
 Conditions involving compromised central metabolism. Think  
 nutritional deficiencies, inherited mitochondrial dz, etc

with damage to each group?

Nasal step  
 Altitudinal  
 Temporal wedge

Arcuate  
**Central**  
**Ceco-central**

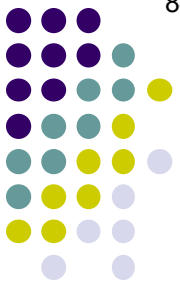


Retr

*Why do conditions affecting metabolism preferentially affect the PMB?*

Because the PMB fibers are small, unmyelinated, and extremely active metabolically. Taken together, these characteristics make them more vulnerable than the rest of the optic nerve to factors that adversely impact metabolism.

# Visual Field Defects



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*Toxins you were told to ingest by a doc:*

- Amiodarone
- Ethambutol
- Isoniazid
- Linezolid
- (many others)

*Nutrients that weren't ingested in sufficient quantity:*

- 
- 
- 

*Inherited mitochondrial diseases:*

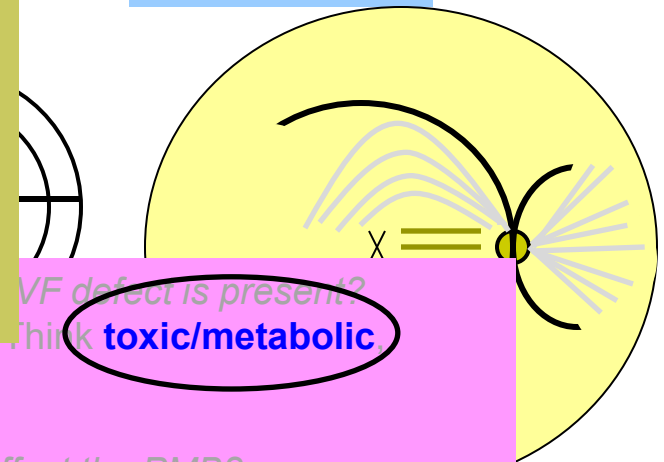
- 
- 

What if a VF defect is present?  
Conditions involving compromised central metabolism. Think  
nutritional deficiencies, inherited mitochondrial dz, etc

with damage to each group?

Nasal step  
Altitudinal  
Temporal wedge

Arcuate  
**Central**  
**Ceco-central**

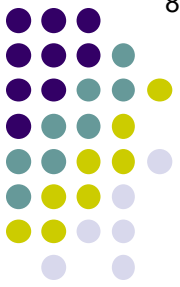


**toxic/metabolic**

*Why do conditions affecting metabolism preferentially affect the PMB?*

Because the PMB fibers are small, unmyelinated, and extremely active metabolically. Taken together, these characteristics make them more vulnerable than the rest of the optic nerve to factors that adversely impact metabolism.

# Visual Field Defects



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*Toxins you were told to ingest by a doc:*

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- Ethambutol
- Isoniazid
- Linezolid
- (many others)

*Nutrients that weren't ingested in sufficient quantity:*

- ?
- ?
- ?

*Inherited mitochondrial diseases:*

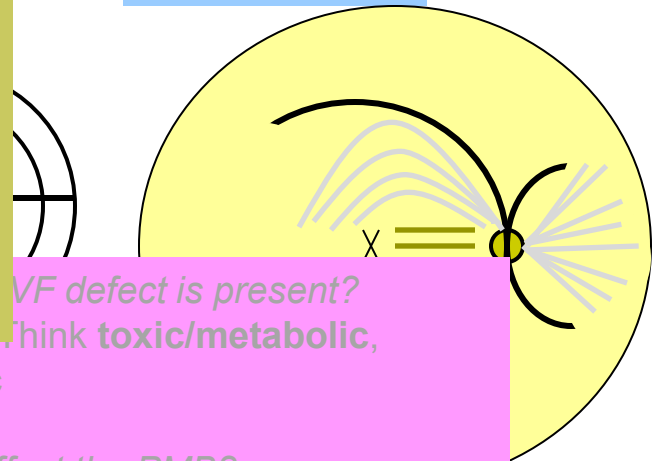
- 
- 

Conditions involving compromised central metabolism. Think **toxic/metabolic**, **nutritional deficiencies**, inherited mitochondrial dz, etc

with damage to each group?

Nasal step  
Altitudinal  
Temporal wedge

Arcuate  
**Central**  
**Ceco-central**



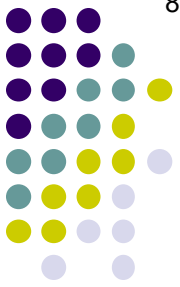
VF defect is present?

Retr

*Why do conditions affecting metabolism preferentially affect the PMB?*

Because the PMB fibers are small, unmyelinated, and extremely active metabolically. Taken together, these characteristics make them more vulnerable than the rest of the optic nerve to factors that adversely impact metabolism.

# Visual Field Defects



*Toxins that shouldn't be ingested at all:*

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- Ethylene glycol
- Lead (in children)
- (many others)

*Toxins that shouldn't be ingested in large quantities for prolonged periods:*

- Ethanol
- Tobacco

*Toxins you were told to ingest by a doc:*

- Amiodarone
- Ethambutol
- Isoniazid
- Linezolid
- (many others)

*Nutrients that weren't ingested in sufficient quantity:*

- Vitamin B<sub>12</sub>
- Folate
- Thiamine

*Inherited mitochondrial diseases:*

- 
- 

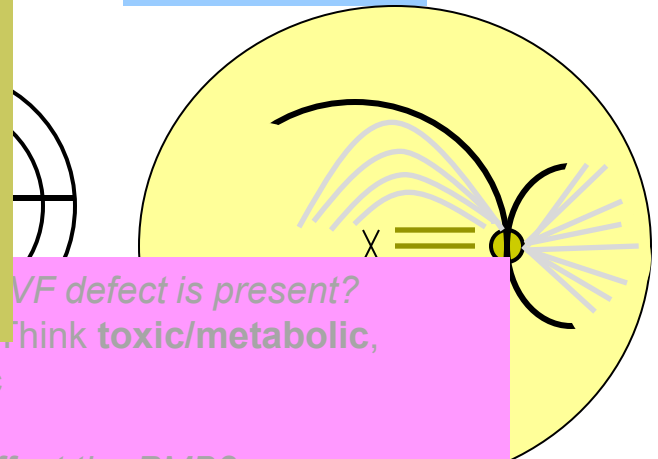
Conditions involving compromised central metabolism. Think **toxic/metabolic**, inherited mitochondrial dz, etc

**nutritional deficiencies**

with damage to each group?

Nasal step  
Altitudinal  
Temporal wedge

Arcuate  
**Central**  
**Ceco-central**

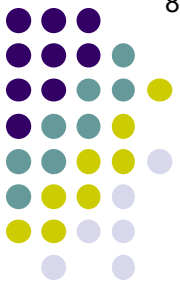


VF defect is present?

*Why do conditions affecting metabolism preferentially affect the PMB?*

Because the PMB fibers are small, unmyelinated, and extremely active metabolically. Taken together, these characteristics make them more vulnerable than the rest of the optic nerve to factors that adversely impact metabolism.

# Visual Field Defects



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- Ethylene glycol
- Lead (in children)
- (many others)

*Toxins that shouldn't be ingested in large quantities for prolonged periods:*

- Ethanol
- Tobacco

*Toxins you were told to ingest by a doc:*

- Amiodarone
- Ethambutol
- Isoniazid
- Linezolid
- (many others)

*Nutrients that weren't ingested in sufficient quantity:*

- Vitamin B<sub>12</sub>
- Folate
- Thiamine

*Inherited mitochondrial diseases:*

- ?
- ?

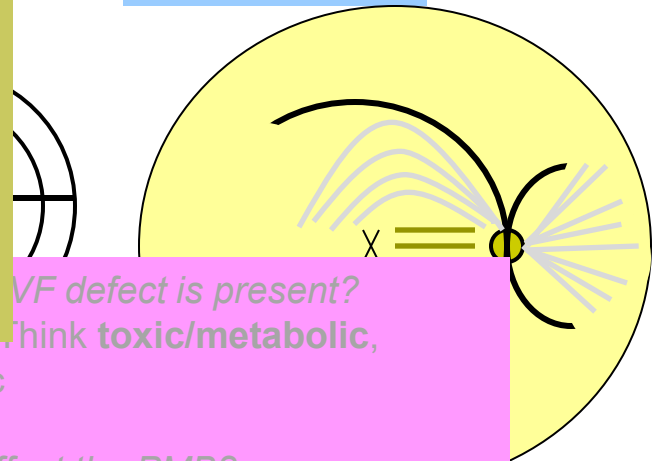
When a VF defect is present?  
Conditions involving compromised central metabolism. Think **toxic/metabolic**, nutritional deficiencies, etc

**inherited mitochondrial dz**

with damage to each group?

Nasal step  
Altitudinal  
Temporal wedge

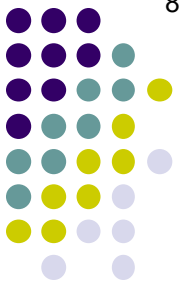
Arcuate  
**Central**  
**Ceco-central**



*Why do conditions affecting metabolism preferentially affect the PMB?*

Because the PMB fibers are small, unmyelinated, and extremely active metabolically. Taken together, these characteristics make them more vulnerable than the rest of the optic nerve to factors that adversely impact metabolism.

# Visual Field Defects



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- Ethylene glycol
- Lead (in children)
- (many others)

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- Tobacco

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- Amiodarone
- Ethambutol
- Isoniazid
- Linezolid
- (many others)

*Nutrients that weren't ingested in sufficient quantity:*

- Vitamin B<sub>12</sub>
- Folate
- Thiamine

*Inherited mitochondrial diseases:*

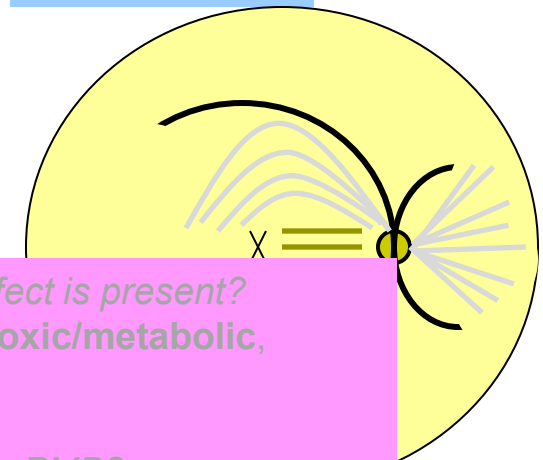
- Leber's hereditary optic neuropathy
- Autosomal dominant optic atrophy

**inherited mitochondrial dz**

*with damage to each group?*

Nasal step  
Altitudinal  
Temporal wedge

Arcuate  
**Central**  
**Ceco-central**



*VF defect is present?*

Conditions involving compromised central metabolism. Think **toxic/metabolic**, nutritional deficiencies, etc

*Why do conditions affecting metabolism preferentially affect the PMB?*

Because the PMB fibers are small, unmyelinated, and extremely active metabolically. Taken together, these characteristics make them more vulnerable than the rest of the optic nerve to factors that adversely impact metabolism.



# Visual Field Defects



R Which of these VF defects are associated with damage to each group?

Optic nerve  
head

Papillomacular bundle

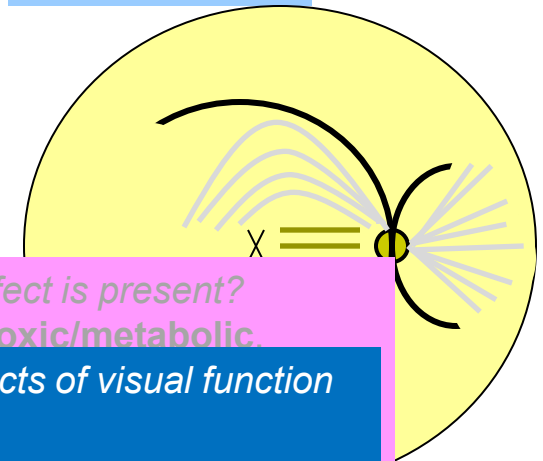
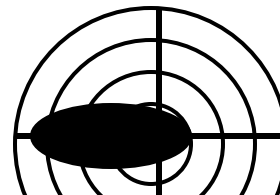
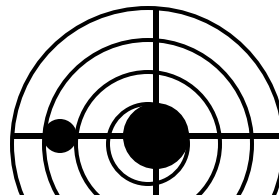
Arcuate fibers

Nasal radiating fibers

Nasal step  
Altitudinal  
Temporal wedge

Arcuate  
Central  
Ceco-central

Optic chiasm



Which sorts of optic neuropathy are implicated if a PMB VF defect is present?

Conditions involving compromised cellular metabolism: Think **toxic/metabolic**.

In addition to central/cecocentral VF defects, what other aspects of visual function are invariably degraded by pathology affecting the PMB?

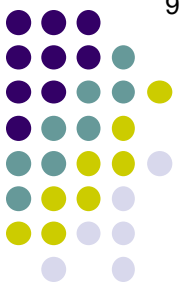
--?

--?

Retr

Taken together, these characteristics make them more vulnerable than the rest of the optic nerve to factors that adversely impact metabolism.

# Visual Field Defects



R Which of these VF defects are associated with damage to each group?

Optic nerve  
head

Papillomacular bundle

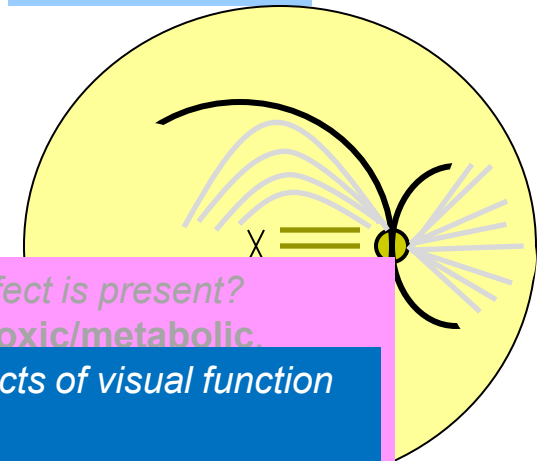
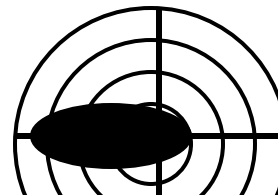
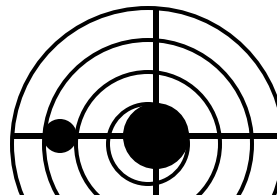
Arcuate fibers

Nasal radiating fibers

Nasal step  
Altitudinal  
Temporal wedge

Arcuate  
Central  
Ceco-central

Optic chiasm



Which sorts of optic neuropathy are implicated if a PMB VF defect is present?

Conditions involving compromised cellular metabolism: Think **toxic/metabolic**.

In addition to central/ceco-central VF defects, what other aspects of visual function are invariably degraded by pathology affecting the PMB?

--Visual acuity\*

--Color vision

\*Which makes sense—after all, a central VF defect is present

Taken together, these characteristics make them more vulnerable than the rest of the optic nerve to factors that adversely impact metabolism.

Retr

# Visual Field Defects



**R** Which of these VF defects are associated with damage to each group?

**Optic nerve**  
*head*

**Papillomacular bundle**

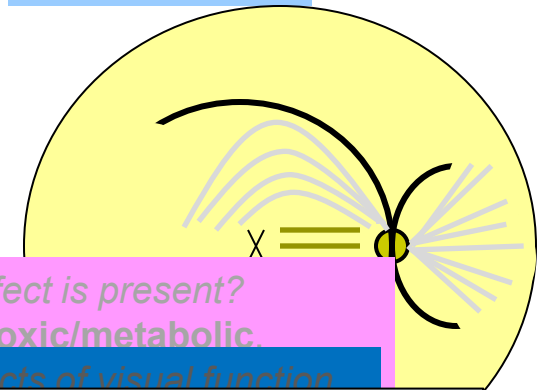
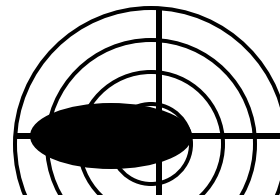
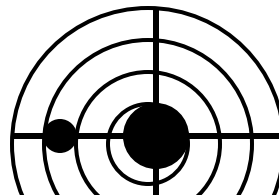
Arcuate fibers

Nasal radiating fibers

Nasal step  
Altitudinal  
Temporal wedge

Arcuate  
**Central**  
**Ceco-central**

**Optic chiasm**



Which sorts of optic neuropathy are implicated if a PMB VF defect is present?

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In addition to central/cecocentral VF defects, what other aspects of visual function

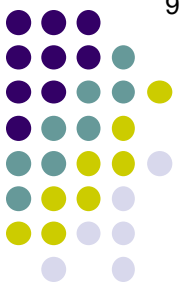
**For more on PMB-related optic neuropathy, see slide-set N9**

—Color vision

\*Which makes sense—after all, a central VF defect is present

taken together, these characteristics make them more vulnerable than the rest of the optic nerve to factors that adversely impact metabolism.

# Visual Field Defects



R Which of these VF defects are associated with damage to each group?

Optic nerve  
head

Papillomacular bundle  
**Arcuate fibers**  
Nasal radiating fibers

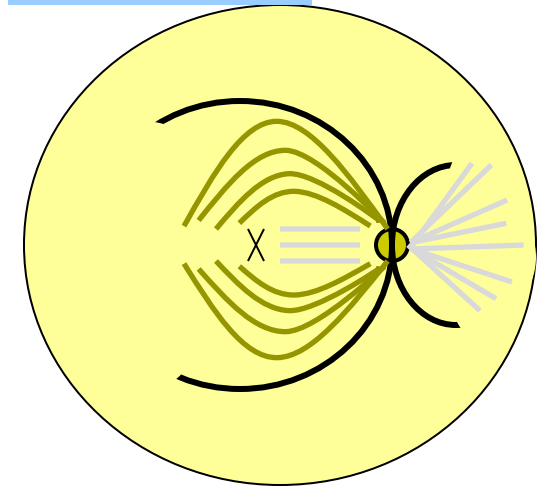
Nasal step  
Altitudinal  
Temporal wedge

?

Arcuate  
Central  
Ceco-central

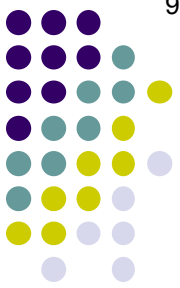
?

Note: We're now shifting to  
VF defects associated with  
the **arcuate fibers**



Retrochiasmal

# Visual Field Defects



R Which of these VF defects are associated with damage to each group?

Optic nerve  
head

Clinically obvious dz

Papillomacular bundle  
Arcuate fibers  
Nasal radiating fibers

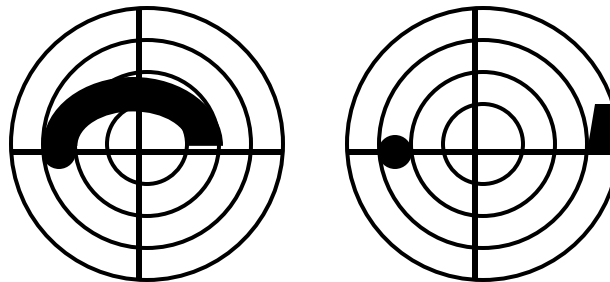
Nasal step

Altitudinal  
Temporal wedge

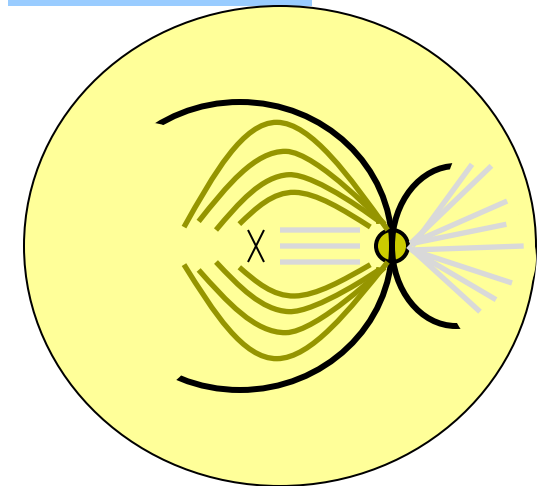
Arcuate

Central  
Ceco-central

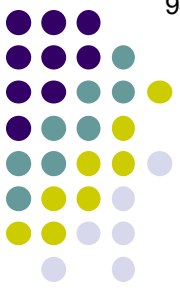
Optic chiasm



Retrochiasmal



# Visual Field Defects



R Which of these VF defects are associated with damage to each group?

Optic nerve  
head

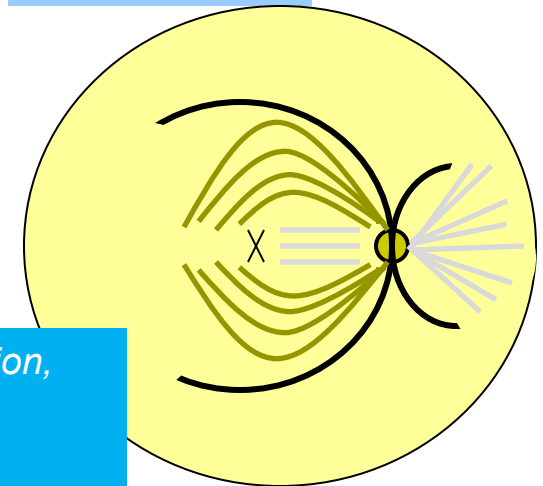
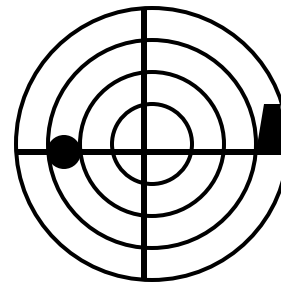
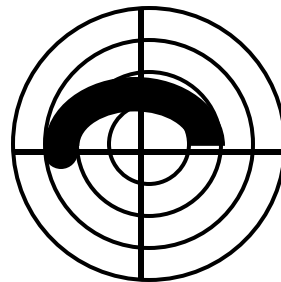
Clinically obvious dz

Papillomacular bundle  
Arcuate fibers  
Nasal radiating fibers

Nasal step  
Altitudinal  
Temporal wedge

Arcuate  
Central  
Ceco-central

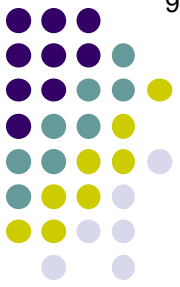
Optic chiasm



If a pt presents with a VF defect c/w an arcuate fiber lesion, what condition should you consider first?

Retrochiasm

# Visual Field Defects



R Which of these VF defects are associated with damage to each group?

Optic nerve  
head

Clinically obvious dz

Papillomacular bundle

**Arcuate fibers**

Nasal radiating fibers

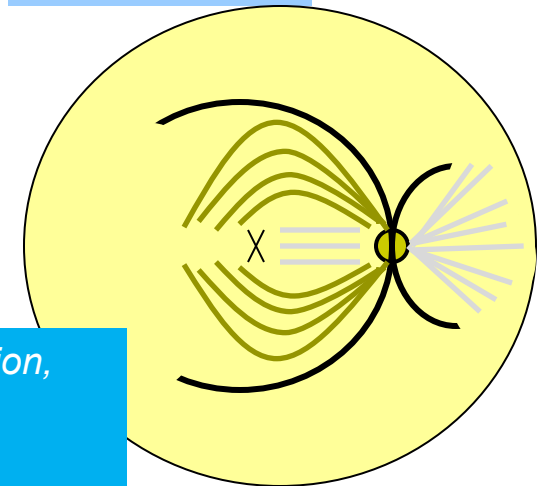
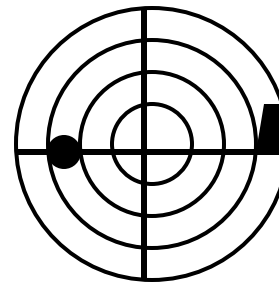
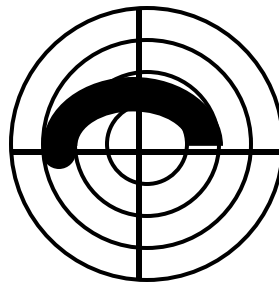
**Nasal step**

Altitudinal  
Temporal wedge

**Arcuate**

Central  
Ceco-central

Optic chiasm

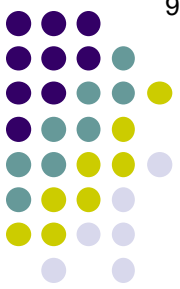


If a pt presents with a VF defect c/w an arcuate fiber lesion,  
what condition should you consider first?

Glaucoma

Retroch

# Visual Field Defects



**R** Which of these VF defects are associated with damage to each group?

**Optic nerve**  
*head*

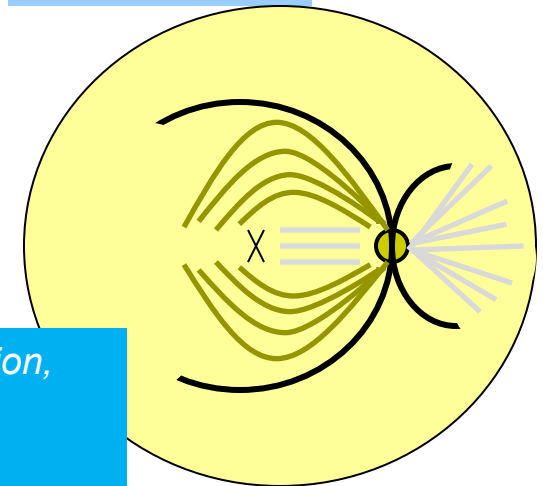
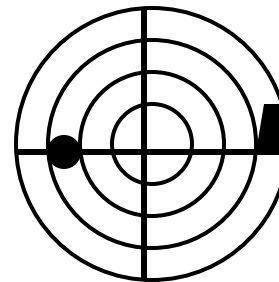
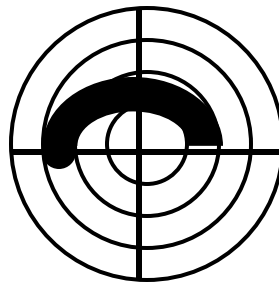
Clinically obvious dz

Papillomacular bundle  
**Arcuate fibers**  
Nasal radiating fibers

**Nasal step**  
Altitudinal  
Temporal wedge

**Arcuate**  
Central  
Ceco-central

Optic chiasm



Retrochiasm

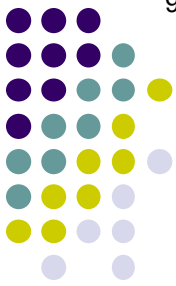
*If a pt presents with a VF defect c/w an arcuate fiber lesion, what condition should you consider first?*

Glaucoma

*Why does glaucoma preferentially damage arcuate fibers?*



# Visual Field Defects



**R** Which of these VF defects are associated with damage to each group?

**Optic nerve**  
*head*

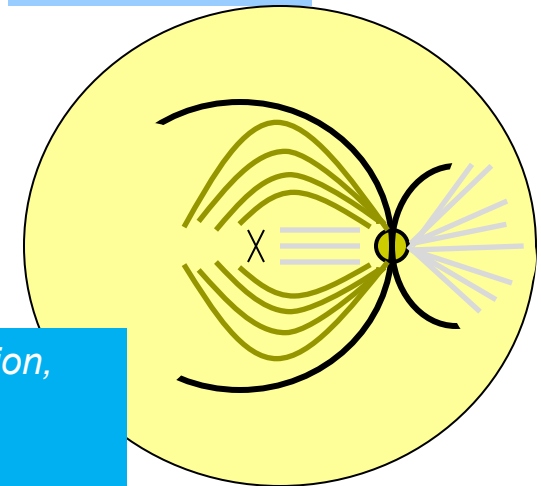
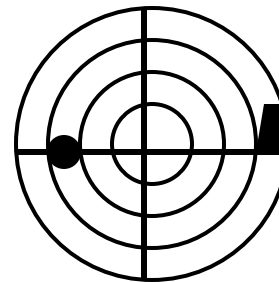
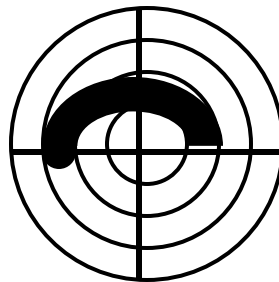
Clinically obvious dz

Papillomacular bundle  
**Arcuate fibers**  
Nasal radiating fibers

**Nasal step**  
Altitudinal  
Temporal wedge

**Arcuate**  
Central  
Ceco-central

Optic chiasm



Retrochiasm

*If a pt presents with a VF defect c/w an arcuate fiber lesion, what condition should you consider first?*

Glaucoma

*Why does glaucoma preferentially damage arcuate fibers?*

It's unclear at this time

Compare the distribution of arcuate-fiber defects with those associated with PMB dysfunction.  
What important difference do you see?

**Optic nerve**  
*head*

**Arcuate fibers**

Nasal radiating fibers

Temporal wedge

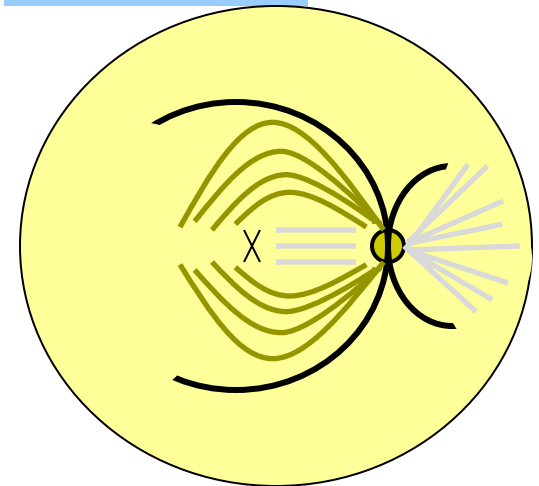
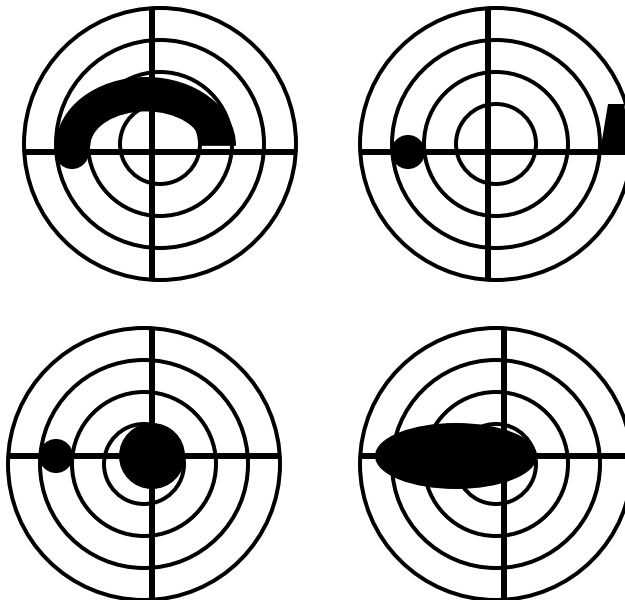
**Arcuate**

Central

Ceco-central

Optic chiasm

Retrochiasmal



Compare the distribution of arcuate-fiber defects with those associated with PMB dysfunction.

What important difference do you see?

Unlike PMB defects, arcuate fiber bundle defects do not cross (ie, they 'respect') the horizontal midline

**Optic nerve**  
*head*

**Arcuate fibers**

Nasal radiating fibers

Temporal wedge

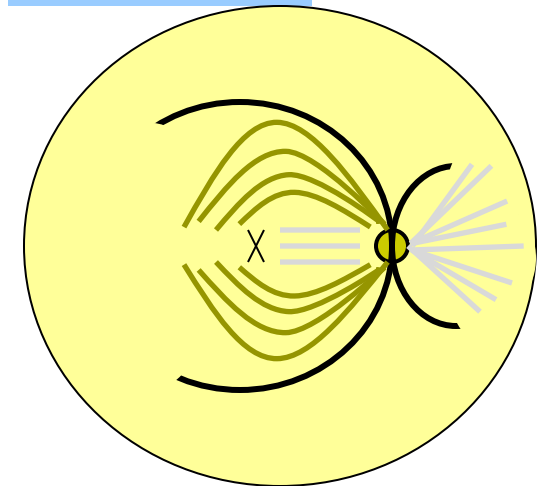
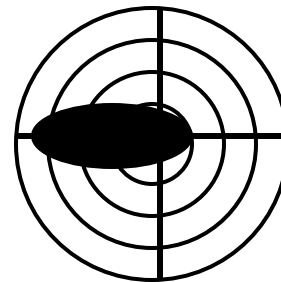
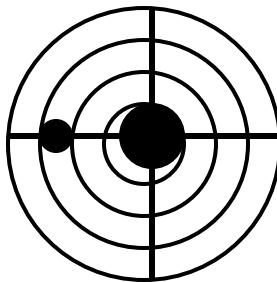
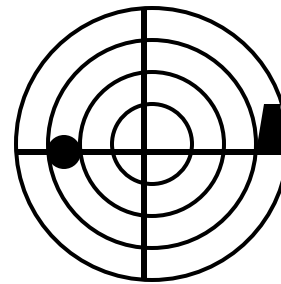
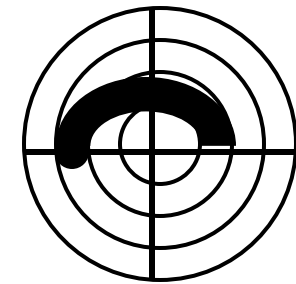
**Arcuate**

Central

Ceco-central

Optic chiasm

Retrochiasmal



Compare the distribution of arcuate-fiber defects with those associated with PMB dysfunction.

What important difference do you see?

Unlike PMB defects, arcuate fiber bundle defects do not cross (ie, they 'respect') the horizontal midline

Why not?

**Optic nerve**  
*head*

**Arcuate fibers**

Nasal radiating fibers

Temporal wedge

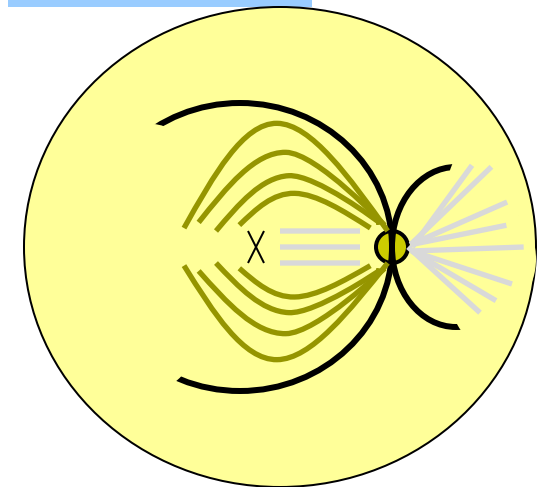
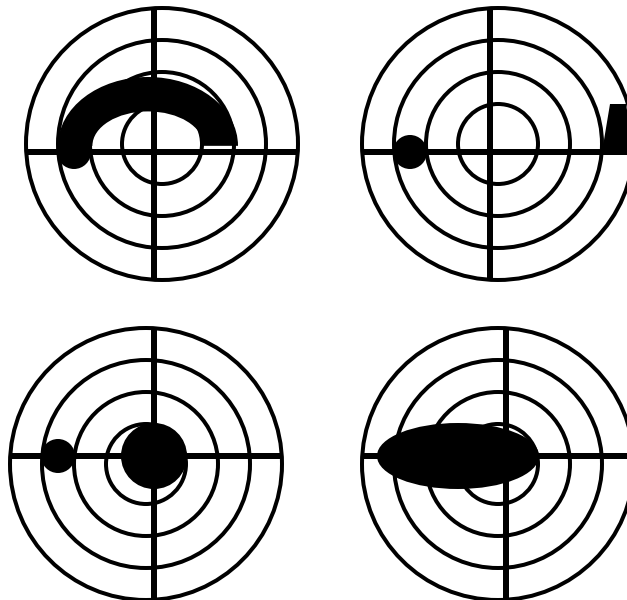
**Arcuate**

Central

Ceco-central

Optic chiasm

Retrochiasmal



Compare the distribution of arcuate-fiber defects with those associated with PMB dysfunction.

What important difference do you see?

Unlike PMB defects, arcuate fiber bundle defects do not cross (ie, they 'respect') the horizontal midline

Why not?

Because fibers on the temporal side of the ONH approach, but do **not** cross, the horizontal midline.

The arcuate fibers arc around the PMB, and meet along a horizontal demarcation line.

Optic nerve  
head

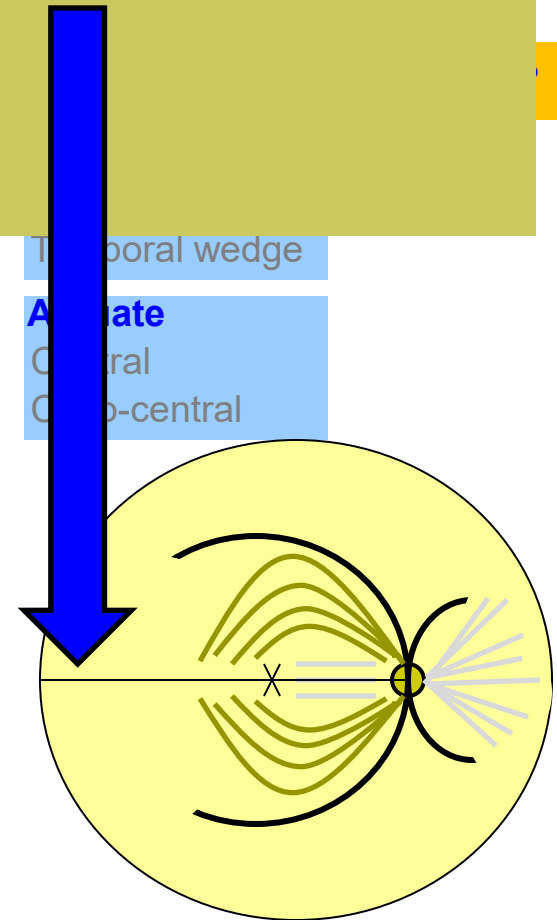
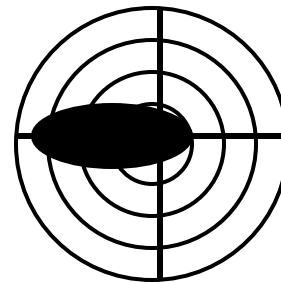
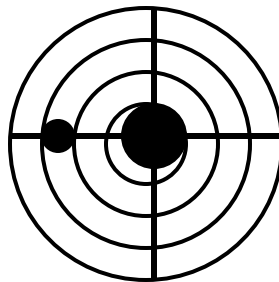
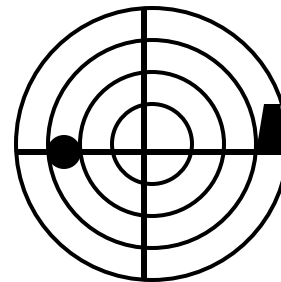
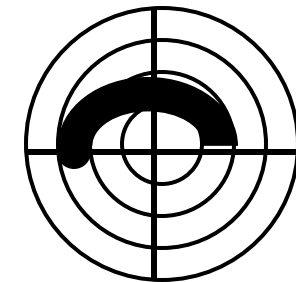
Arcuate fibers

Nasal radiating fibers

Temporal wedge  
Arcuate  
Central  
Circulo-central

Optic chiasm

Retrochiasmal



Compare the distribution of arcuate-fiber defects with those associated with PMB dysfunction.

What important difference do you see?

Unlike PMB defects, arcuate fiber bundle defects do not cross (ie, they 'respect') the horizontal midline

Why not?

Because fibers on the temporal side of the ONH approach, but do **not** cross, the horizontal midline.

The arcuate fibers arc around the PMB, and meet along a horizontal demarcation line. Thus, damage to these fibers always result in VF defects that are limited to either the superior or the inferior portion of the field.

Optic nerve  
head

Arcuate fibers

Nasal radiating fibers

Temporal wedge

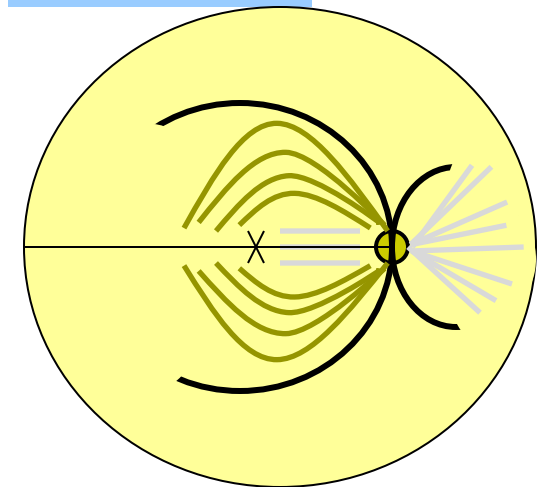
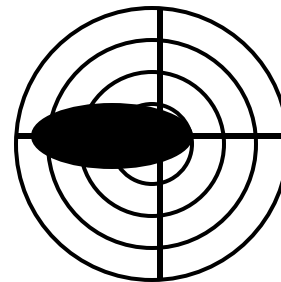
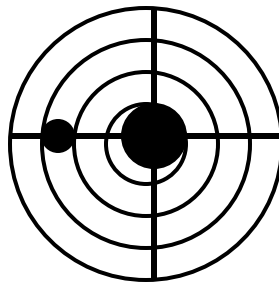
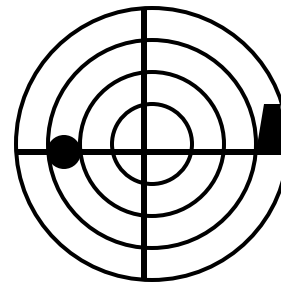
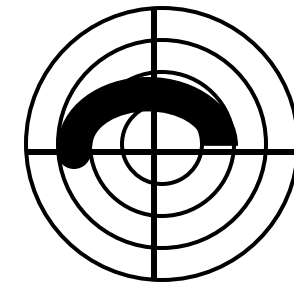
Arcuate

Central

Ceco-central

Optic chiasm

Retrochiasmal



Compare the distribution of arcuate-fiber defects with those associated with PMB dysfunction.

What important difference do you see?

Unlike PMB defects, arcuate fiber bundle defects do not cross (ie, they 'respect') the horizontal midline

Why not?

Because fibers on the temporal side of the ONH approach, but do **not** cross, the horizontal midline.

The arcuate fibers arc around the PMB, and meet along a horizontal demarcation line. Thus, damage to these fibers always result in VF defects that are limited to either the superior or the inferior portion of the field.

What is this horizontal demarcation line called?

Optic nerve  
head

Arcuate fibers

Nasal radiating fibers

Temporal wedge

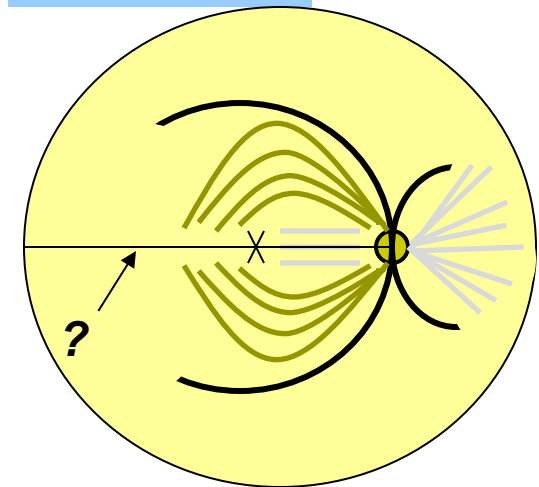
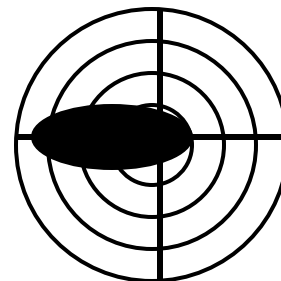
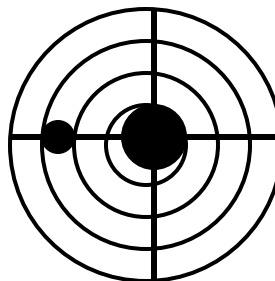
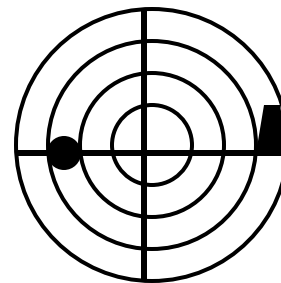
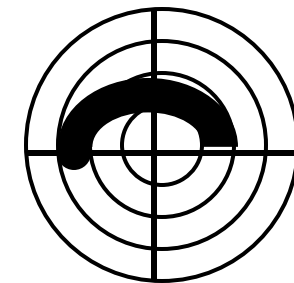
Arcuate

Central

Ceco-central

Optic chiasm

Retrochiasmal



Compare the distribution of arcuate-fiber defects with those associated with PMB dysfunction.

What important difference do you see?

Unlike PMB defects, arcuate fiber bundle defects do not cross (ie, they 'respect') the horizontal midline

Why not?

Because fibers on the temporal side of the ONH approach, but do **not** cross, the horizontal midline.

The arcuate fibers arc around the PMB, and meet along a horizontal demarcation line. Thus, damage to these fibers always result in VF defects that are limited to either the superior or the inferior portion of the field.

What is this horizontal demarcation line called?

The **horizontal raphe**

Optic nerve  
head

Arcuate fibers

Nasal radiating fibers

Temporal wedge

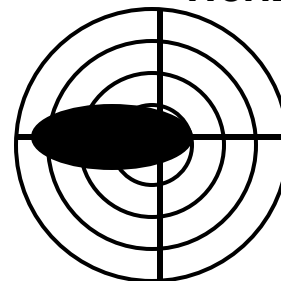
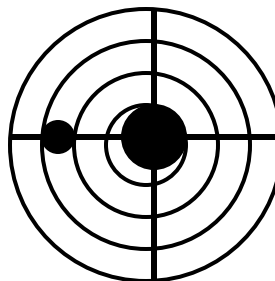
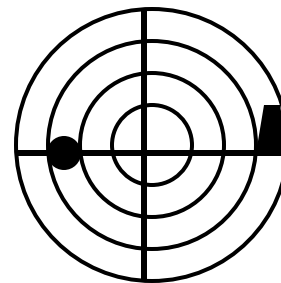
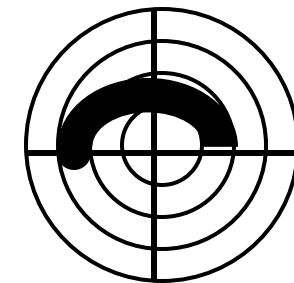
Arcuate

Central

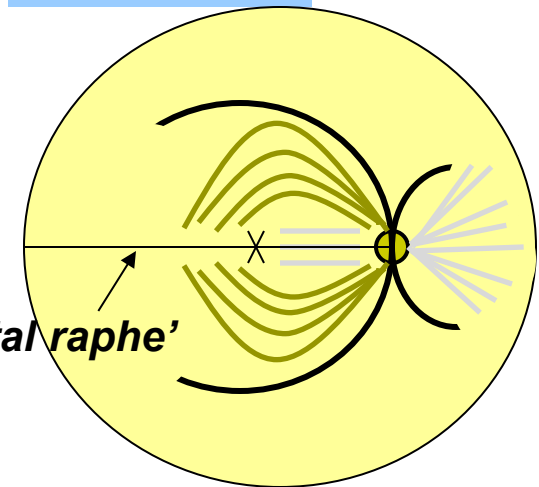
Ceco-central

Optic chiasm

Retrochiasmal



'Horizontal raphe'





# Visual Field Defects



R Which of these VF defects are associated with damage to each group?

Optic nerve  
head

Papillomacular bundle  
Arcuate fibers  
**Nasal radiating fibers**

Nasal step  
Altitudinal  
Temporal wedge

?

Arcuate  
Central  
Ceco-central

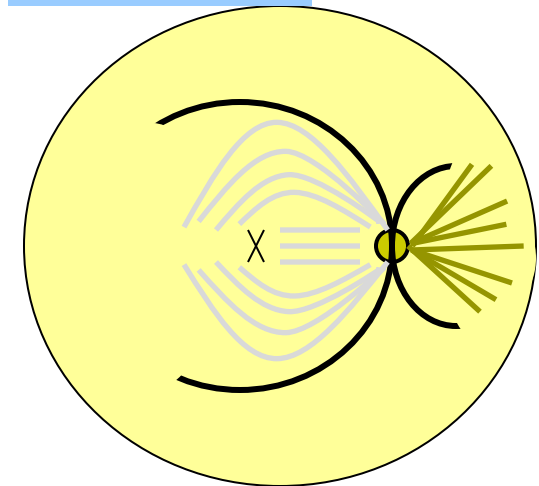
?

Optic chiasm

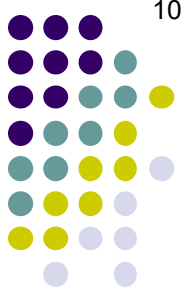


Retrochiasmal

Note: We're now shifting to  
VF defects associated with  
the **nasal radiating fibers**



# Visual Field Defects



R Which of these VF defects are associated with damage to each group?

Optic nerve  
head

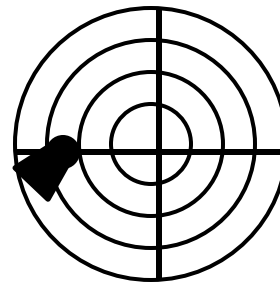
Clinically obvious dz

Papillomacular bundle  
Arcuate fibers  
Nasal radiating fibers

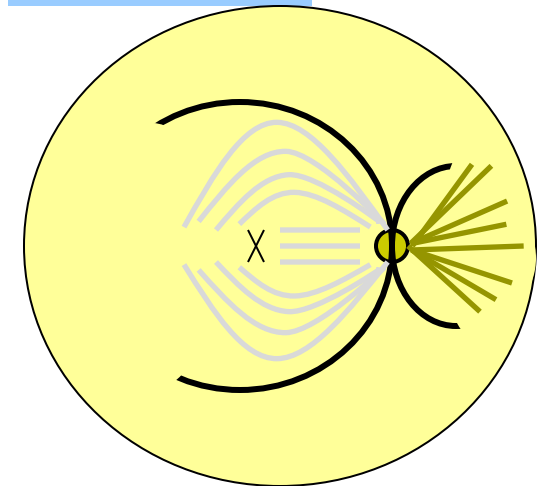
Nasal step  
Altitudinal  
Temporal wedge

Arcuate  
Central  
Ceco-central

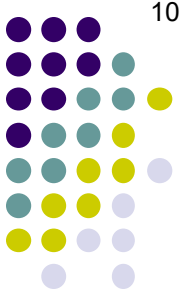
Optic chiasm



Retrochiasmal



# Visual Field Defects



R Which of these VF defects are associated with damage to each group?

Optic nerve  
head

Papillomacular bundle  
Arcuate fibers  
Nasal radiating fibers

Nasal step  
**Altitudinal**  
Temporal wedge

?

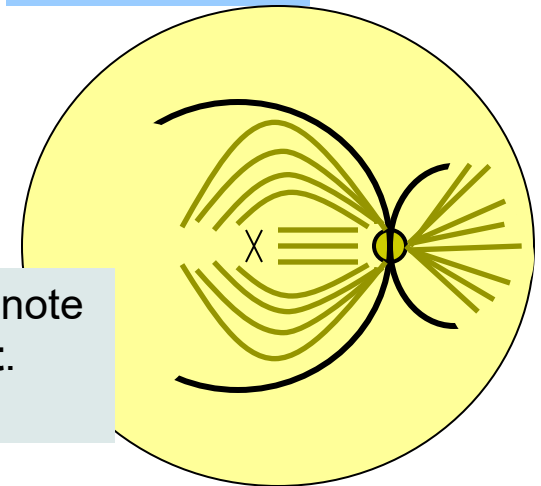
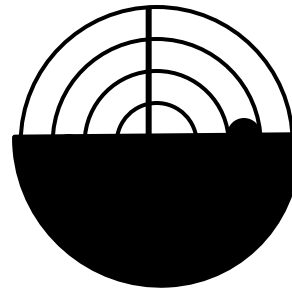
Arcuate  
Central  
Ceco-central

Optic chiasm



Retrochiasmal

We've covered each of the fiber bundles, but note that none accounted for an **altitudinal defect**. Let's talk about this finding now.



# Visual Field Defects



**R** Which of these VF defects are associated with damage to each group?

**Optic nerve**  
*head*

Clinically obvious dz

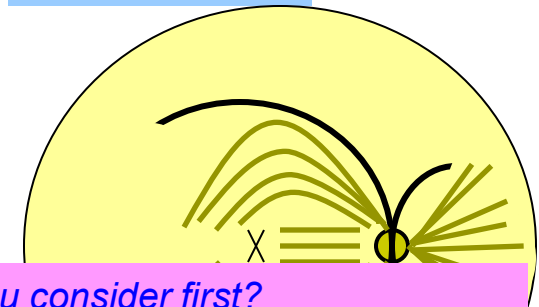
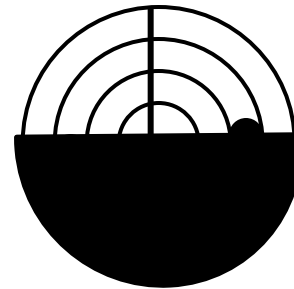
Papillomacular bundle  
Arcuate fibers  
Nasal radiating fibers

Nasal step  
**Altitudinal**  
Temporal wedge

?

Arcuate  
Central  
Ceco-central

Optic chiasm



*If a pt presents with an altitudinal VF defect, what condition should you consider first?*

F

# Visual Field Defects



**R** Which of these VF defects are associated with damage to each group?

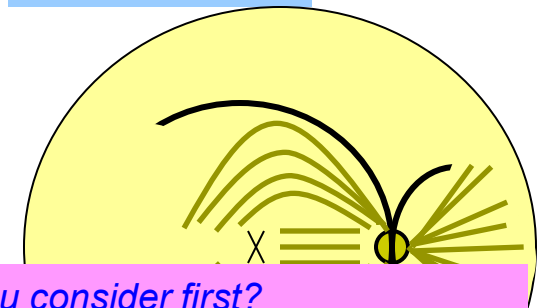
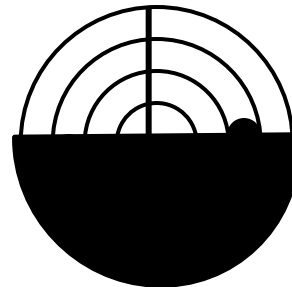
**Optic nerve**  
*head*

Papillomacular bundle  
Arcuate fibers  
Nasal radiating fibers

Nasal step  
**Altitudinal**  
Temporal wedge

?

Arcuate  
Central  
Ceco-central



Optic chiasm

*If a pt presents with an altitudinal VF defect, what condition should you consider first?*

Two conditions should come to mind:

--?

(hints forthcoming)

--?

F

# Visual Field Defects



**R** Which of these VF defects are associated with damage to each group?

**Optic nerve**  
*head*

Clinically obvious dz

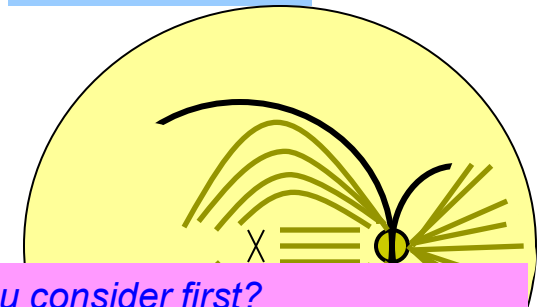
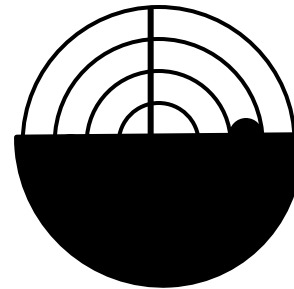
Papillomacular bundle  
Arcuate fibers  
Nasal radiating fibers

Nasal step  
**Altitudinal**  
Temporal wedge

?

Arcuate  
Central  
Ceco-central

Optic chiasm



*If a pt presents with an altitudinal VF defect, what condition should you consider first?*

Two conditions should come to mind:

--If the pt is a 50+ vasculopath, it's likely... (classic cause of altitudinal VF loss in this group)

--?

F

# Visual Field Defects



**R** Which of these VF defects are associated with damage to each group?

**Optic nerve**  
*head*

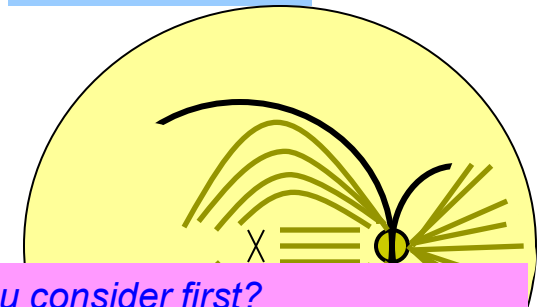
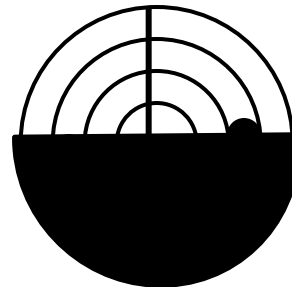
Papillomacular bundle  
Arcuate fibers  
Nasal radiating fibers

Nasal step  
**Altitudinal**  
Temporal wedge

?

Arcuate  
Central  
Ceco-central

Optic chiasm



*If a pt presents with an altitudinal VF defect, what condition should you consider first?*

Two conditions should come to mind:

--If the pt is a 50+ vasculopath, it's likely...nonarteritic anterior ischemic optic neuropathy (NAION)

--?

F

# Visual Field Defects



**R** Which of these VF defects are associated with damage to each group?

**Optic nerve**  
*head*

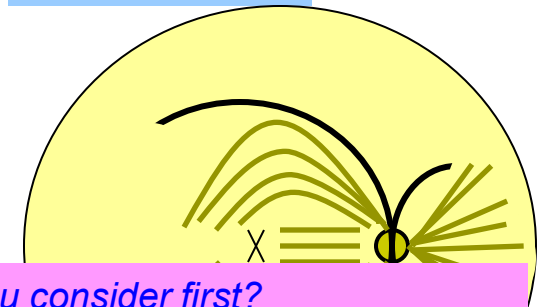
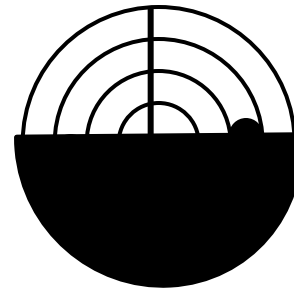
Papillomacular bundle  
Arcuate fibers  
Nasal radiating fibers

Nasal step  
**Altitudinal**  
Temporal wedge

?

Arcuate  
Central  
Ceco-central

Optic chiasm



*If a pt presents with an altitudinal VF defect, what condition should you consider first?*

Two conditions should come to mind:

- If the pt is a 50+ vasculopath, it's likely...nonarteritic anterior ischemic optic neuropathy (NAION)
- If the pt has glaucoma, it likely represents...

**F**



# Visual Field Defects



**R** Which of these VF defects are associated with damage to each group?

**Optic nerve**  
*head*

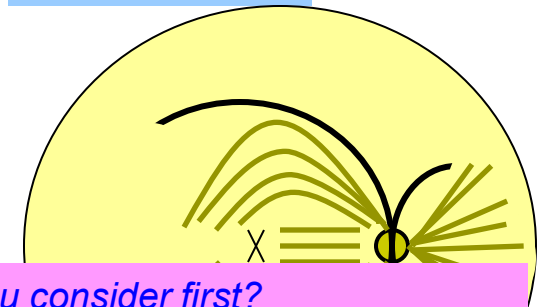
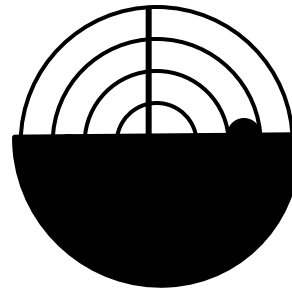
Papillomacular bundle  
Arcuate fibers  
Nasal radiating fibers

Nasal step  
**Altitudinal**  
Temporal wedge

?

Arcuate  
Central  
Ceco-central

Optic chiasm



*If a pt presents with an altitudinal VF defect, what condition should you consider first?*

Two conditions should come to mind:

- If the pt is a 50+ vasculopath, it's likely...nonarteritic anterior ischemic optic neuropathy (NAION)
- If the pt has glaucoma, it likely represents...advanced glaucomatous optic neuropathy

**F**

# Visual Field Defects



**R** Which of these VF defects are associated with damage to each group?

**Optic nerve**  
*head*

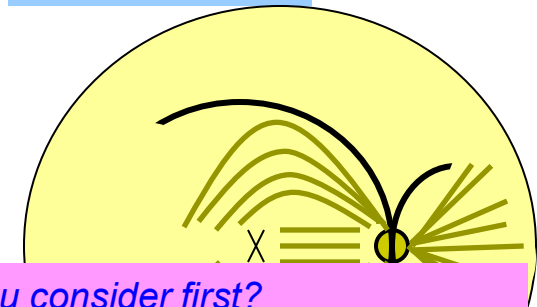
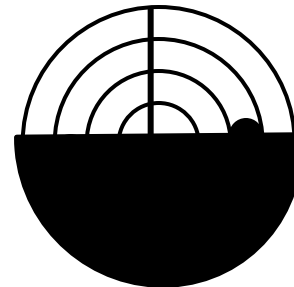
Papillomacular bundle  
Arcuate fibers  
Nasal radiating fibers

Nasal step  
**Altitudinal**  
Temporal wedge

?

Arcuate  
Central  
Ceco-central

Optic chiasm



*If a pt presents with an altitudinal VF defect, what condition should you consider first?*

Two conditions should come to mind:

- If the pt is a 50+ vasculopath, it's likely...nonarteritic anterior ischemic optic neuropathy (NAION)
- If the pt has glaucoma, it likely represents...advanced glaucomatous optic neuropathy

**F**

*How can you differentiate between these two conditions?*

# Visual Field Defects



**R** Which of these VF defects are associated with damage to each group?

**Optic nerve**  
*head*

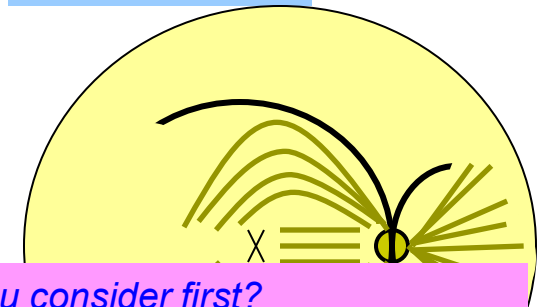
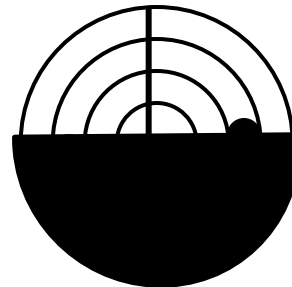
Papillomacular bundle  
Arcuate fibers  
Nasal radiating fibers

Nasal step  
**Altitudinal**  
Temporal wedge

?

Arcuate  
Central  
Ceco-central

Optic chiasm



*If a pt presents with an altitudinal VF defect, what condition should you consider first?*

Two conditions should come to mind:

- If the pt is a 50+ vasculopath, it's likely...nonarteritic anterior ischemic optic neuropathy (NAION)
- If the pt has glaucoma, it likely represents...advanced glaucomatous optic neuropathy

**F**

*How can you differentiate between these two conditions?*

There are a number of ways, but the most straightforward would be to inspect the ONH, which will be one word in NAION, and two words in advanced glaucoma

# Visual Field Defects



**R** Which of these VF defects are associated with damage to each group?

**Optic nerve**  
*head*

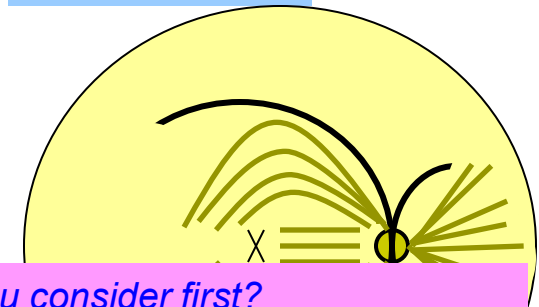
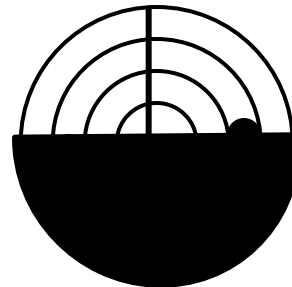
Papillomacular bundle  
Arcuate fibers  
Nasal radiating fibers

Nasal step  
**Altitudinal**  
Temporal wedge

?

Arcuate  
Central  
Ceco-central

Optic chiasm



*If a pt presents with an altitudinal VF defect, what condition should you consider first?*

Two conditions should come to mind:

- If the pt is a 50+ vasculopath, it's likely...nonarteritic anterior ischemic optic neuropathy (NAION)
- If the pt has glaucoma, it likely represents...advanced glaucomatous optic neuropathy

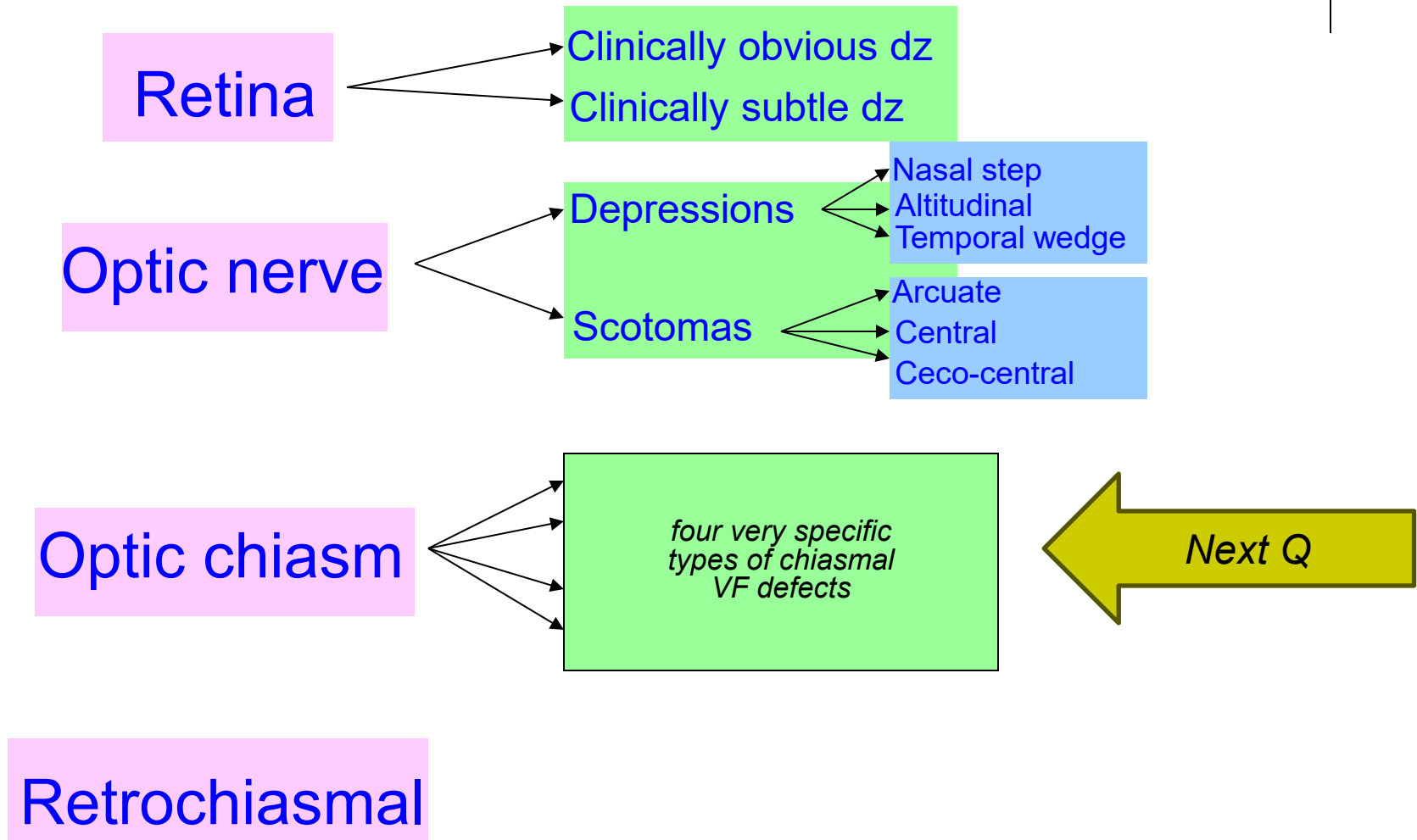
**F**

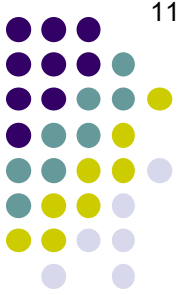
*How can you differentiate between these two conditions?*

There are a number of ways, but the most straightforward would be to inspect the ONH, which will be edematous in NAION, and severely cupped in advanced glaucoma

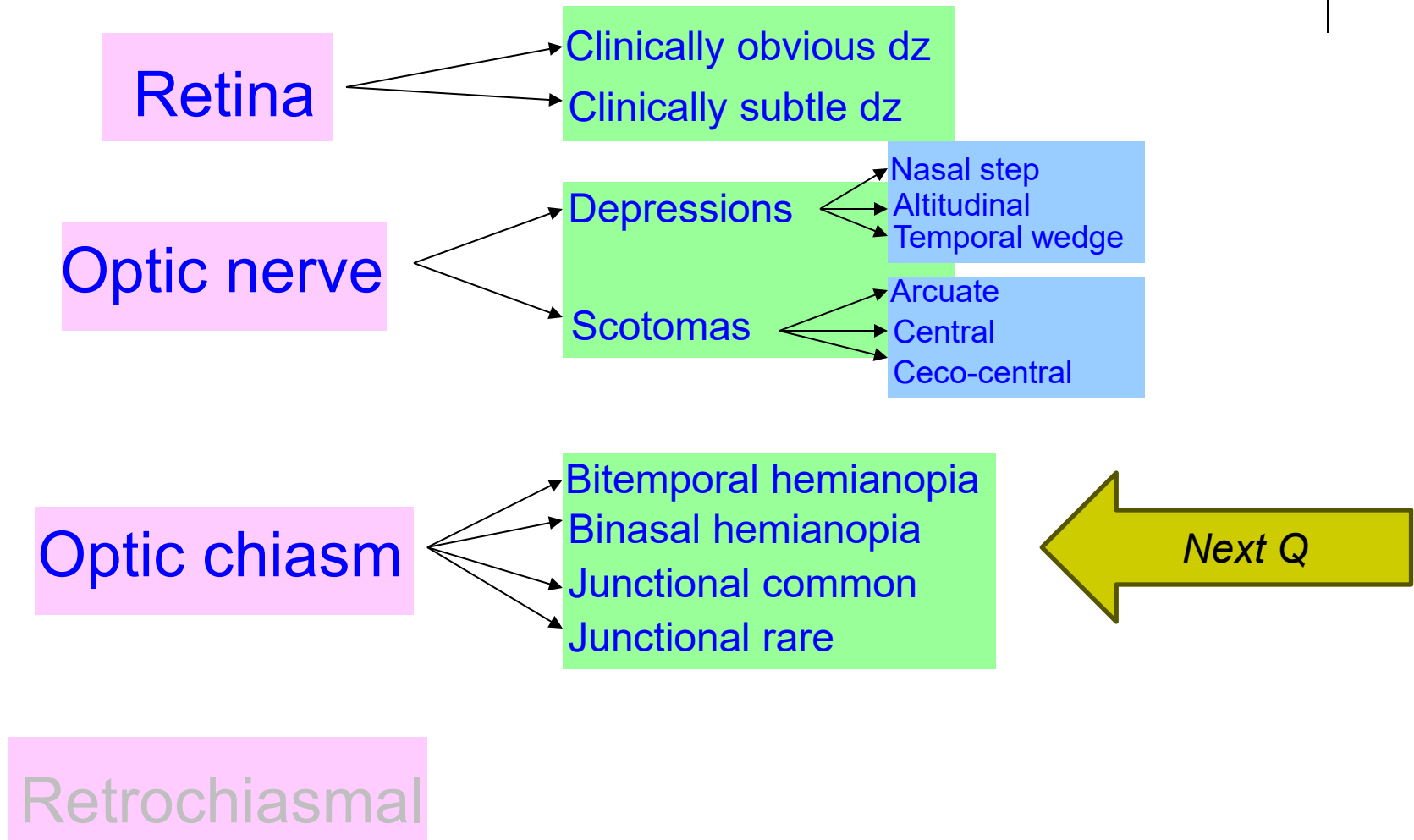


# Visual Field Defects

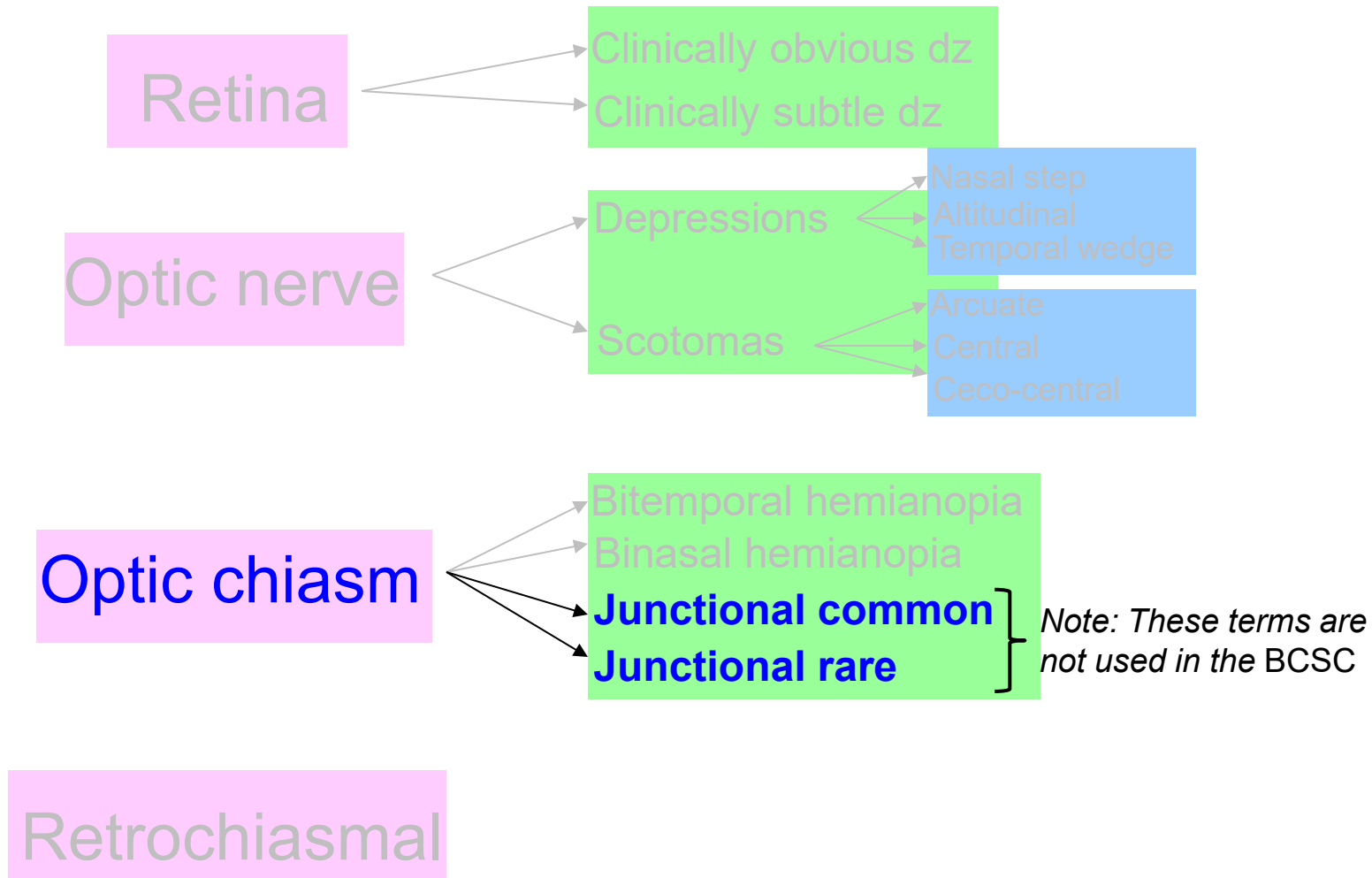


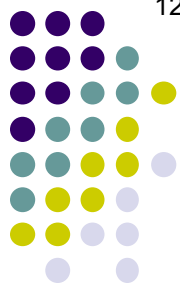


# Visual Field Defects

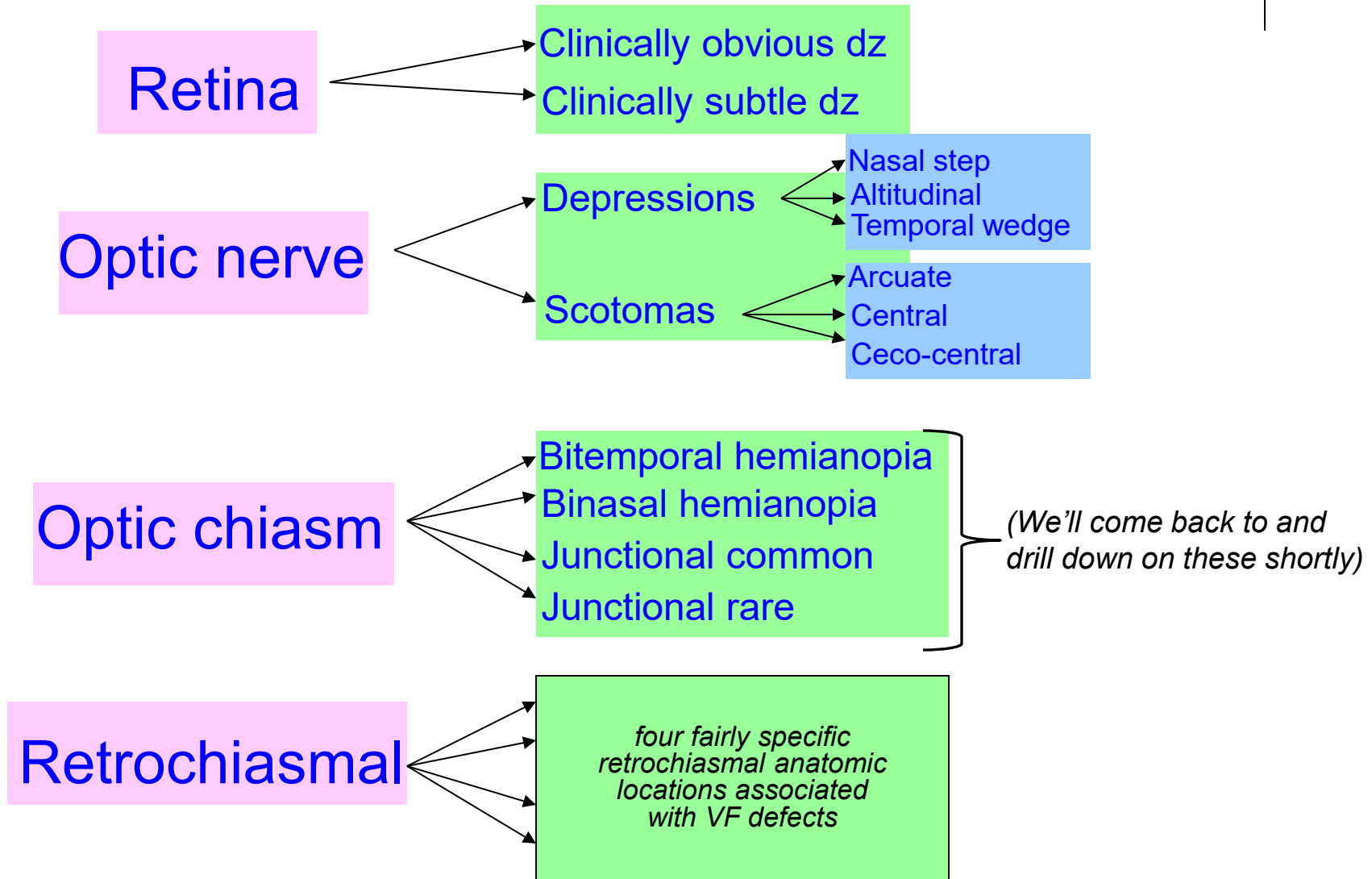


# Visual Field Defects

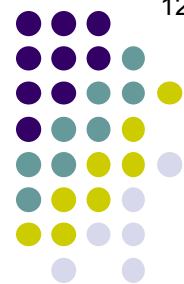




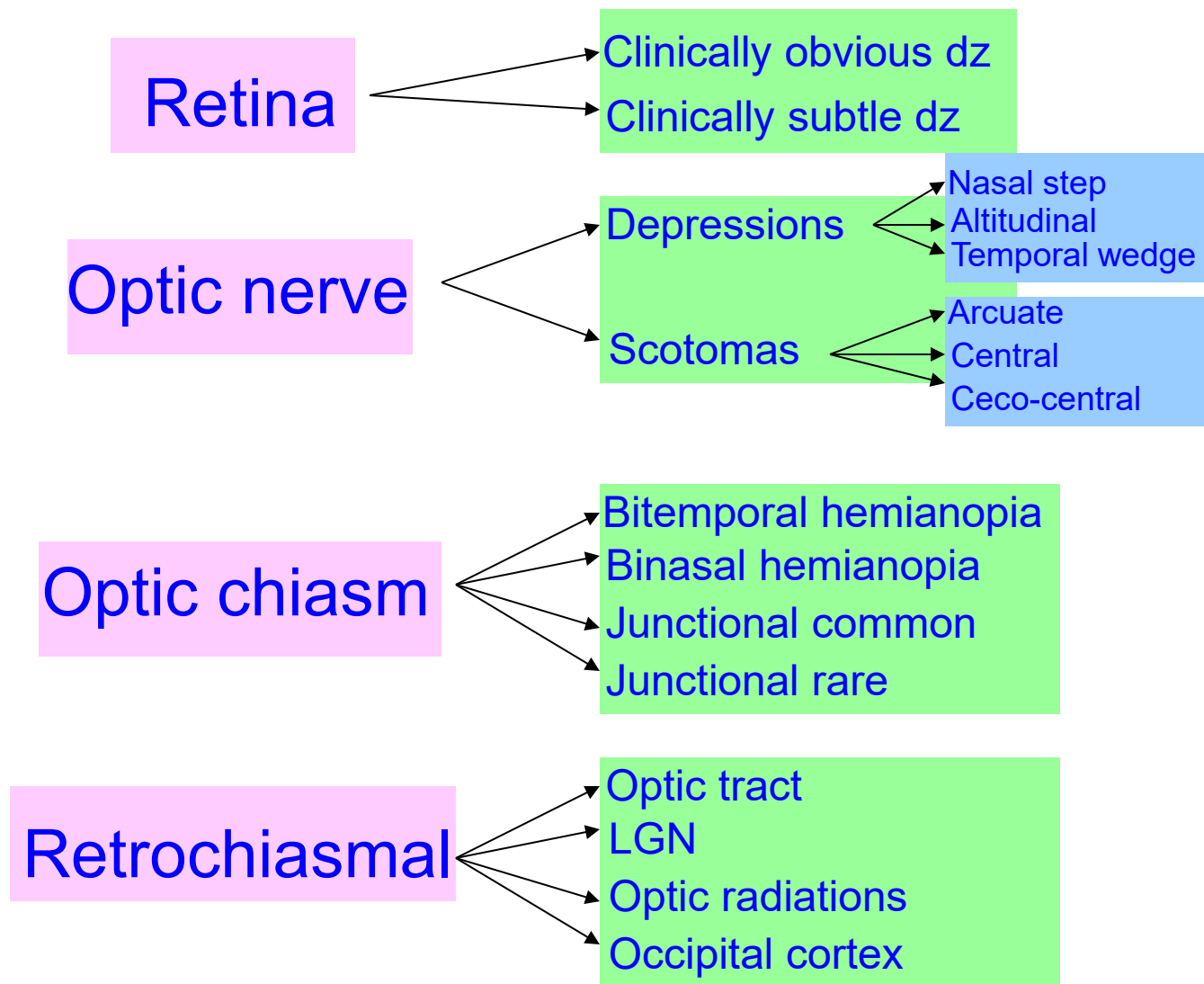
# Visual Field Defects





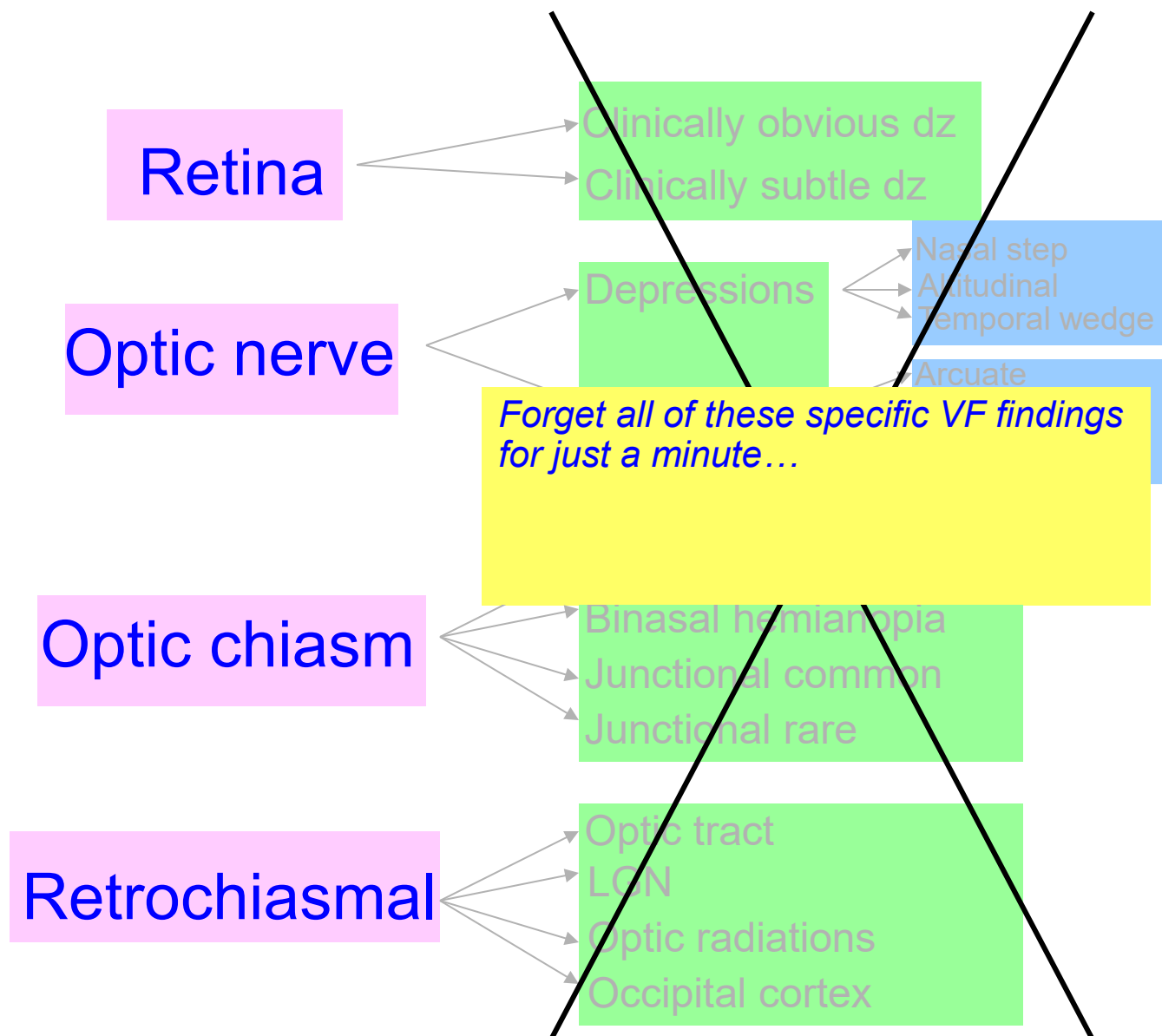


# Visual Field Defects

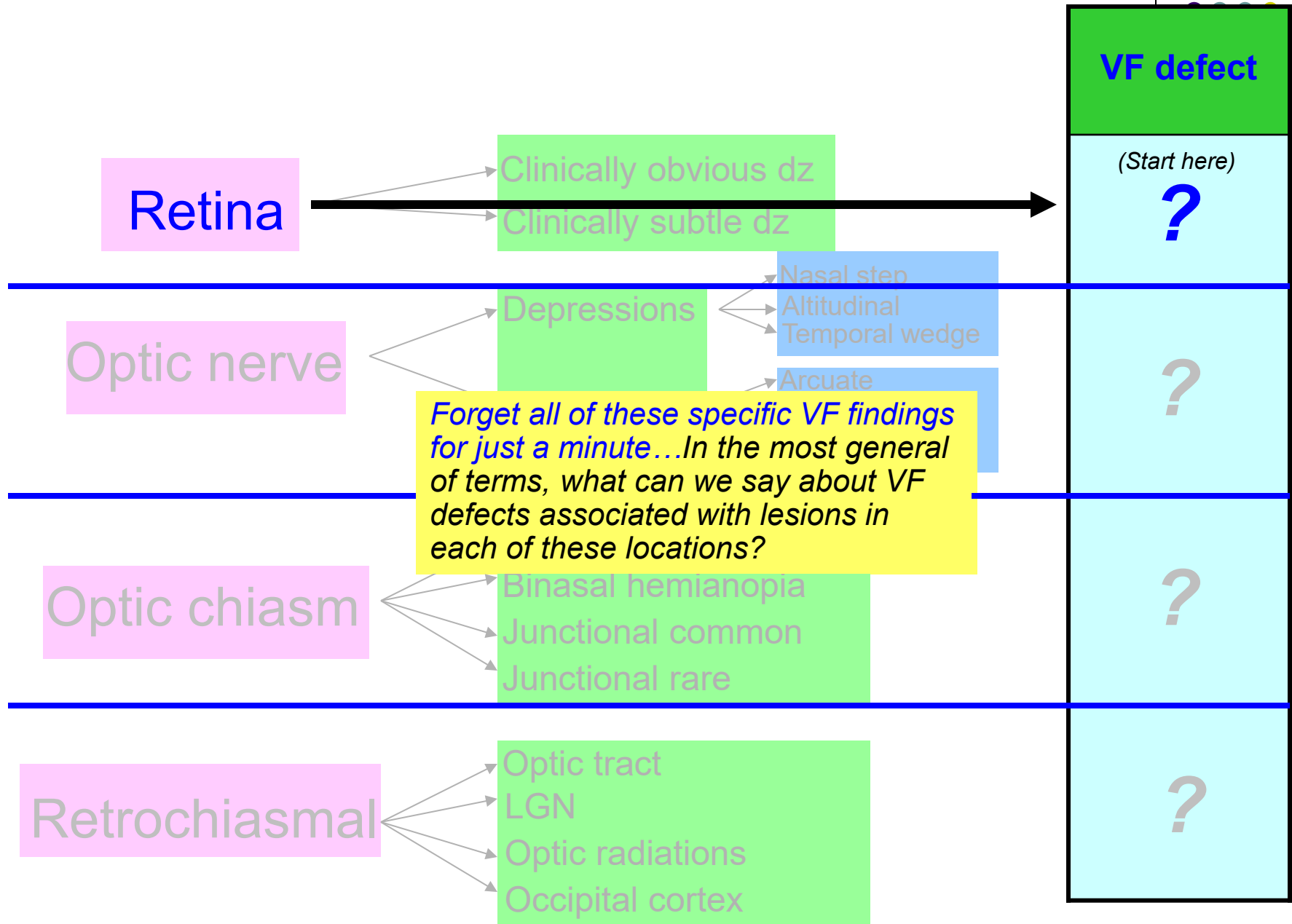




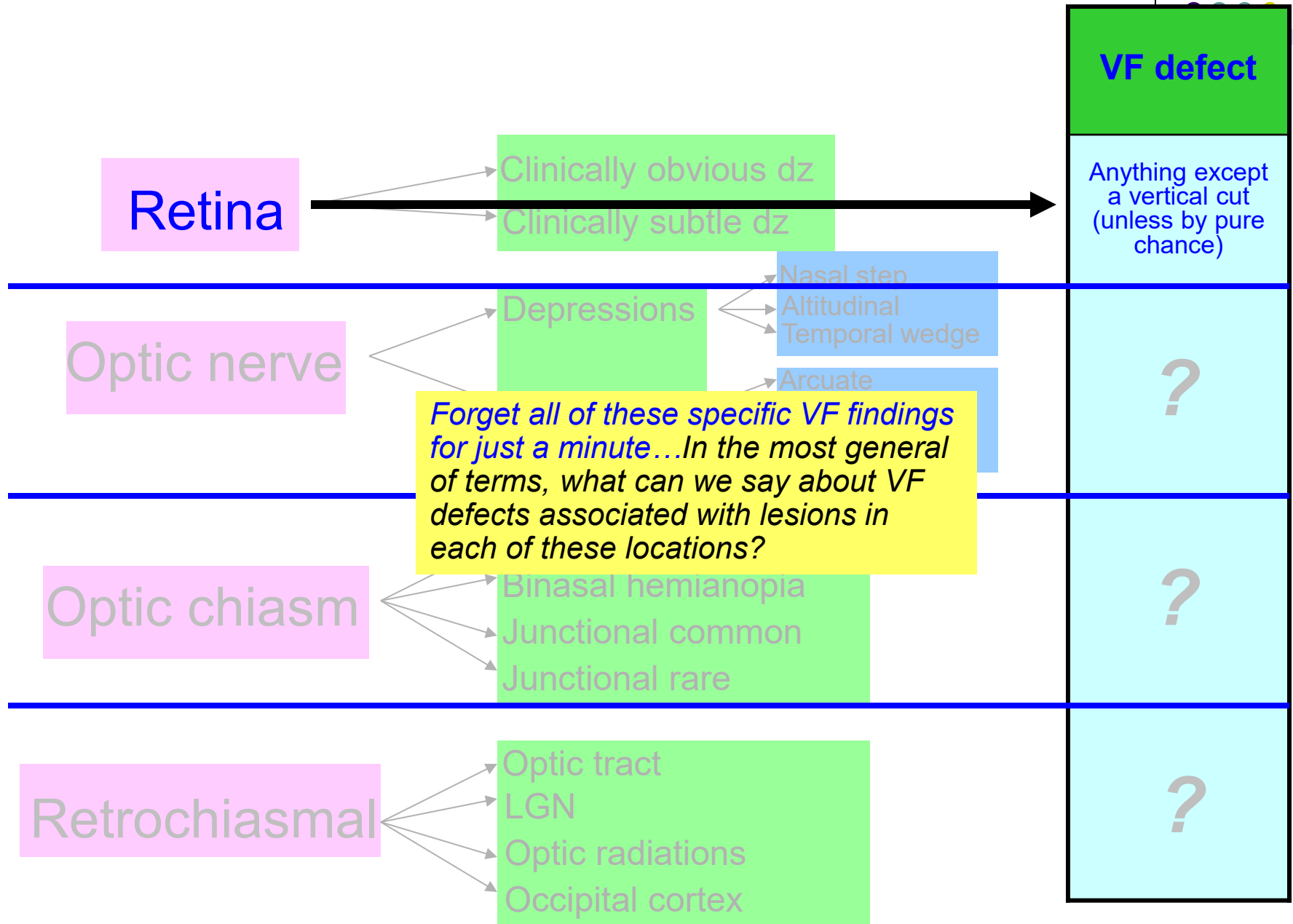
# Visual Field Defects



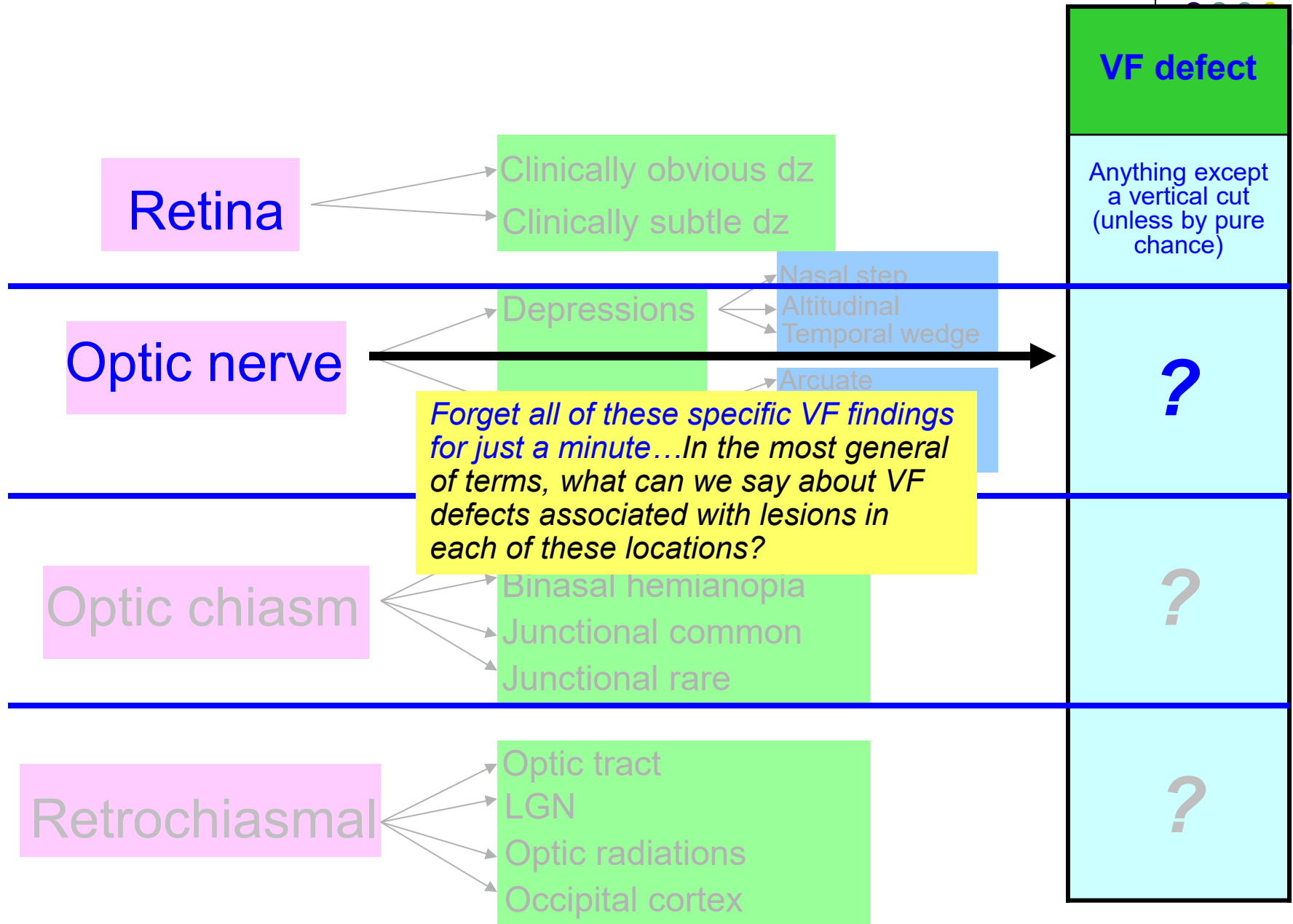
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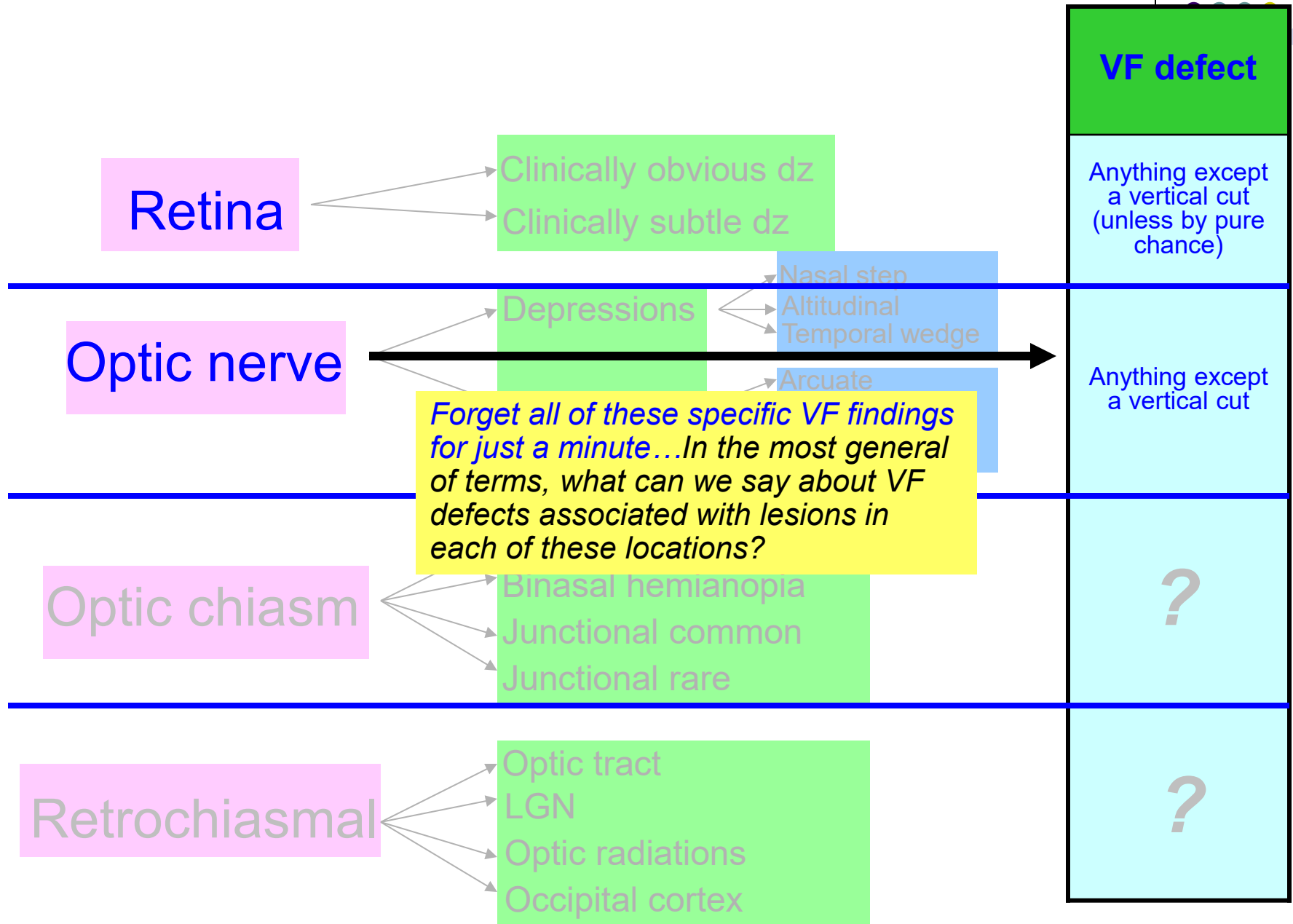
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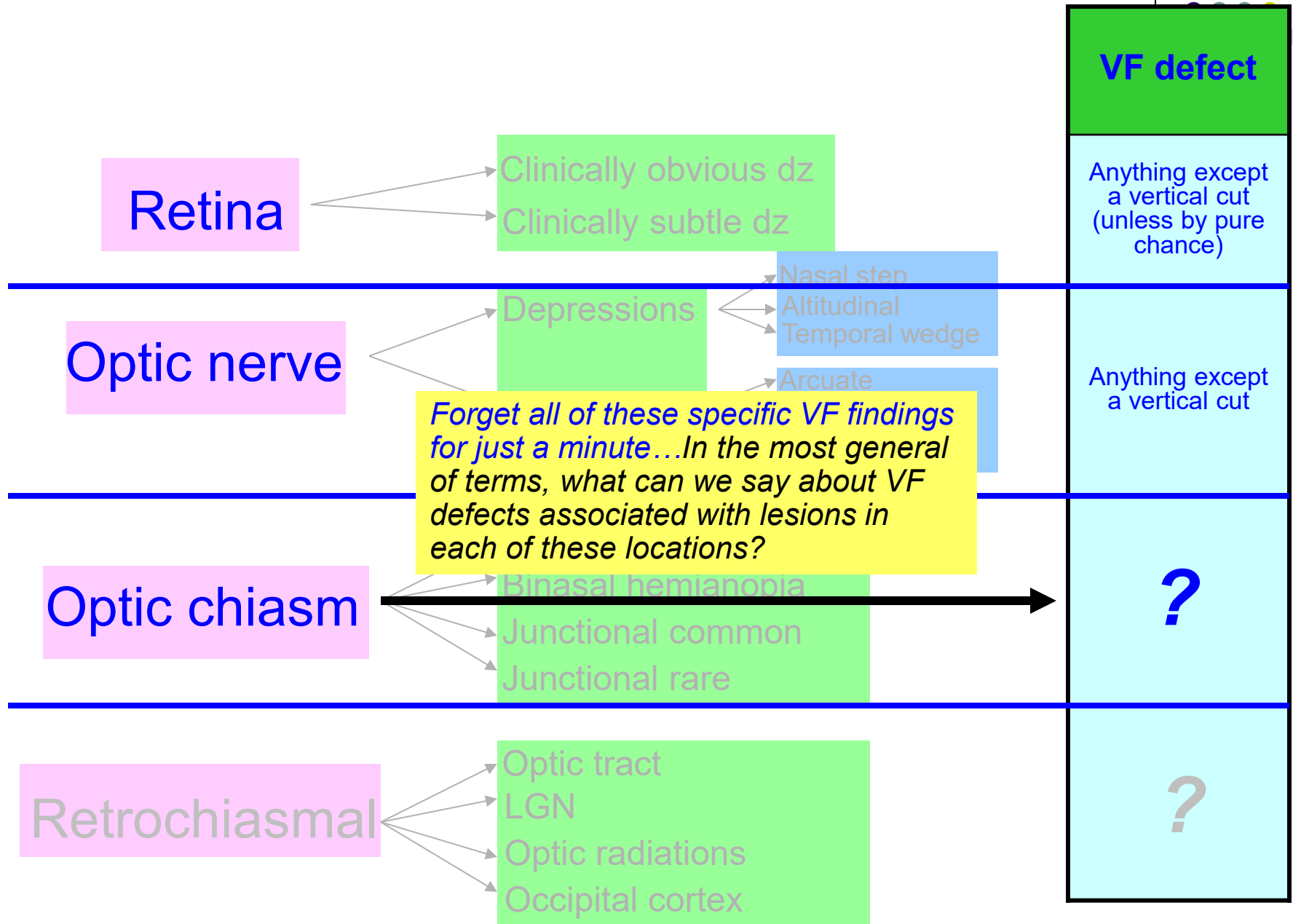
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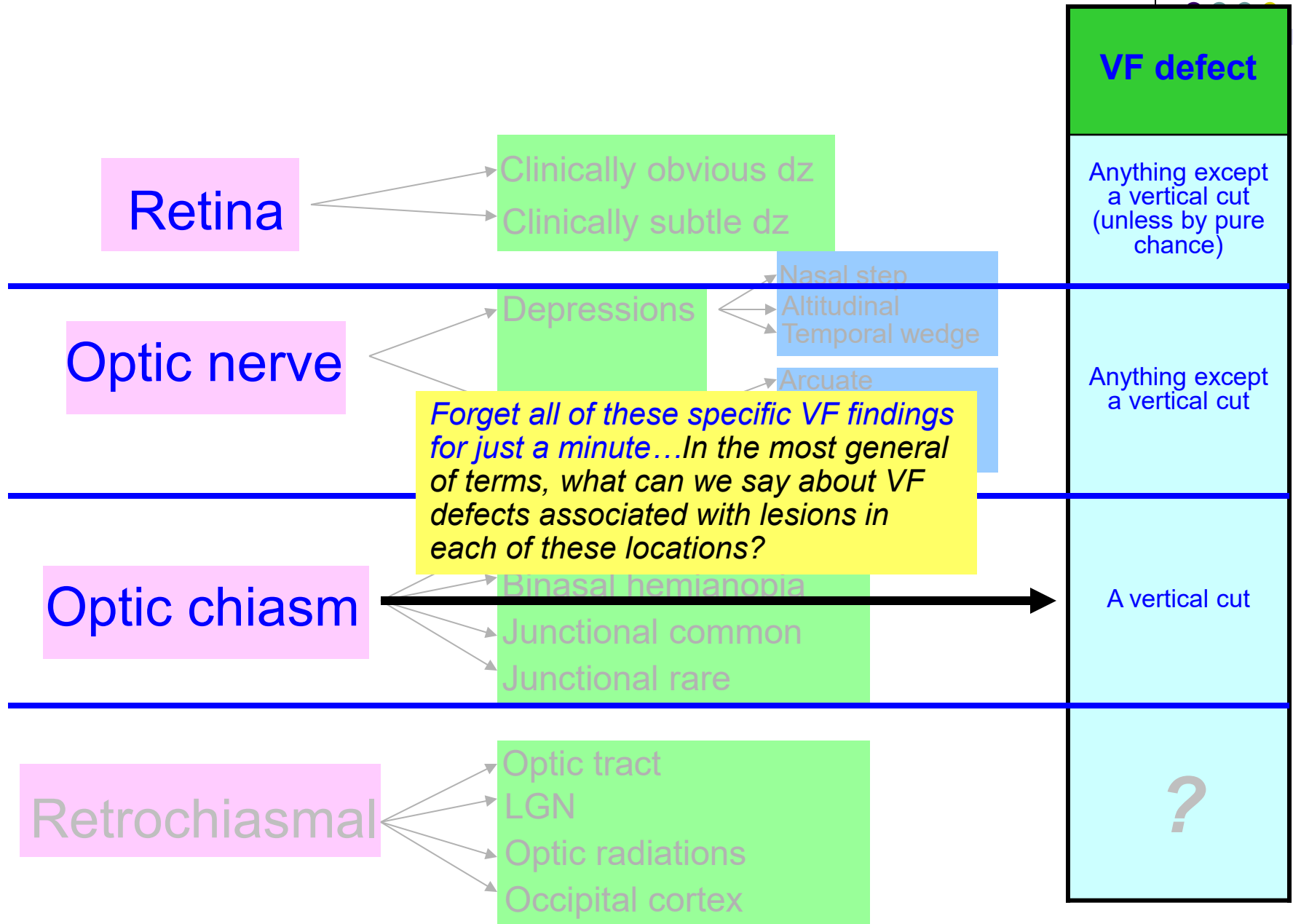
# Visual Field Defects



# Visual Field Defects

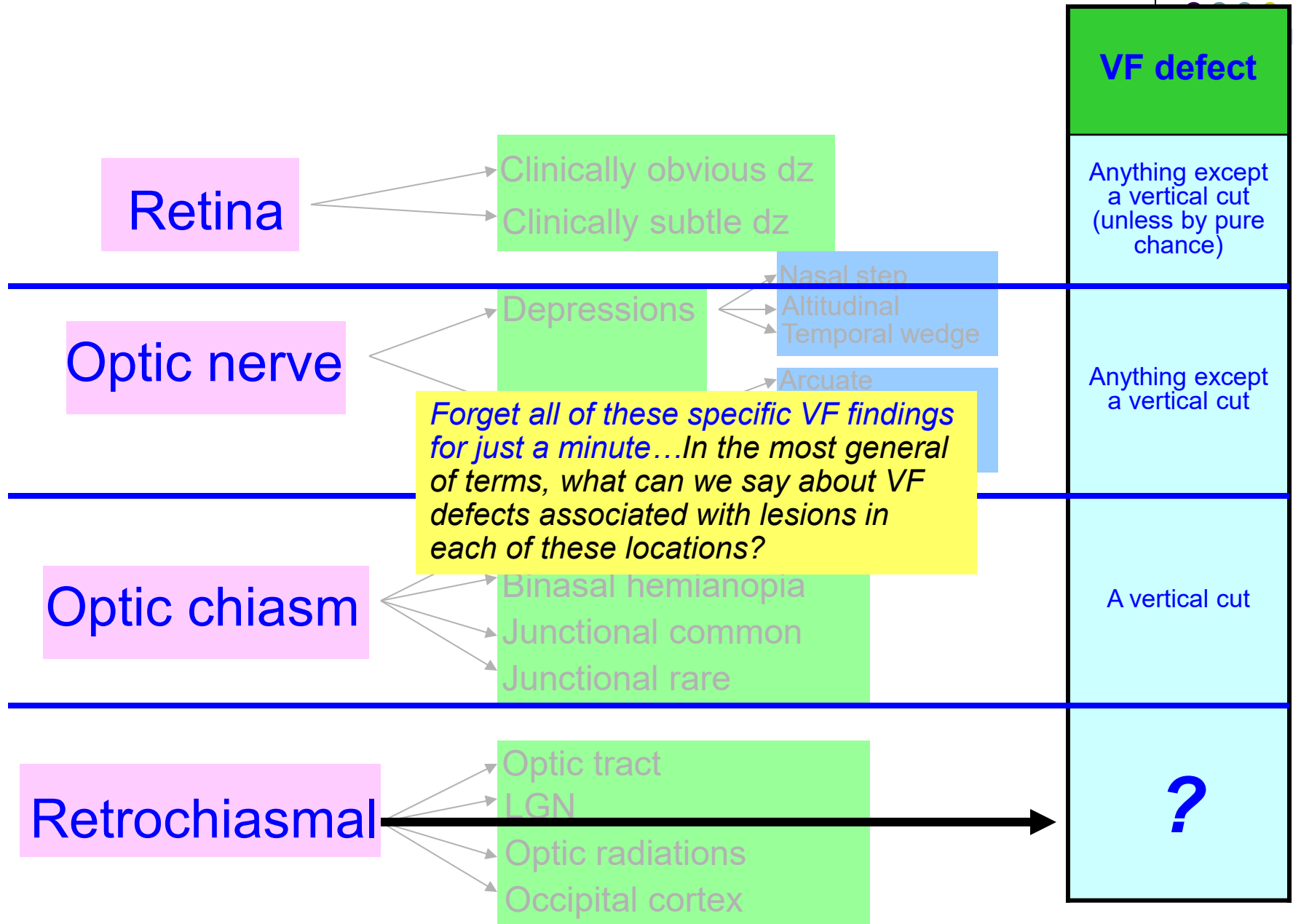


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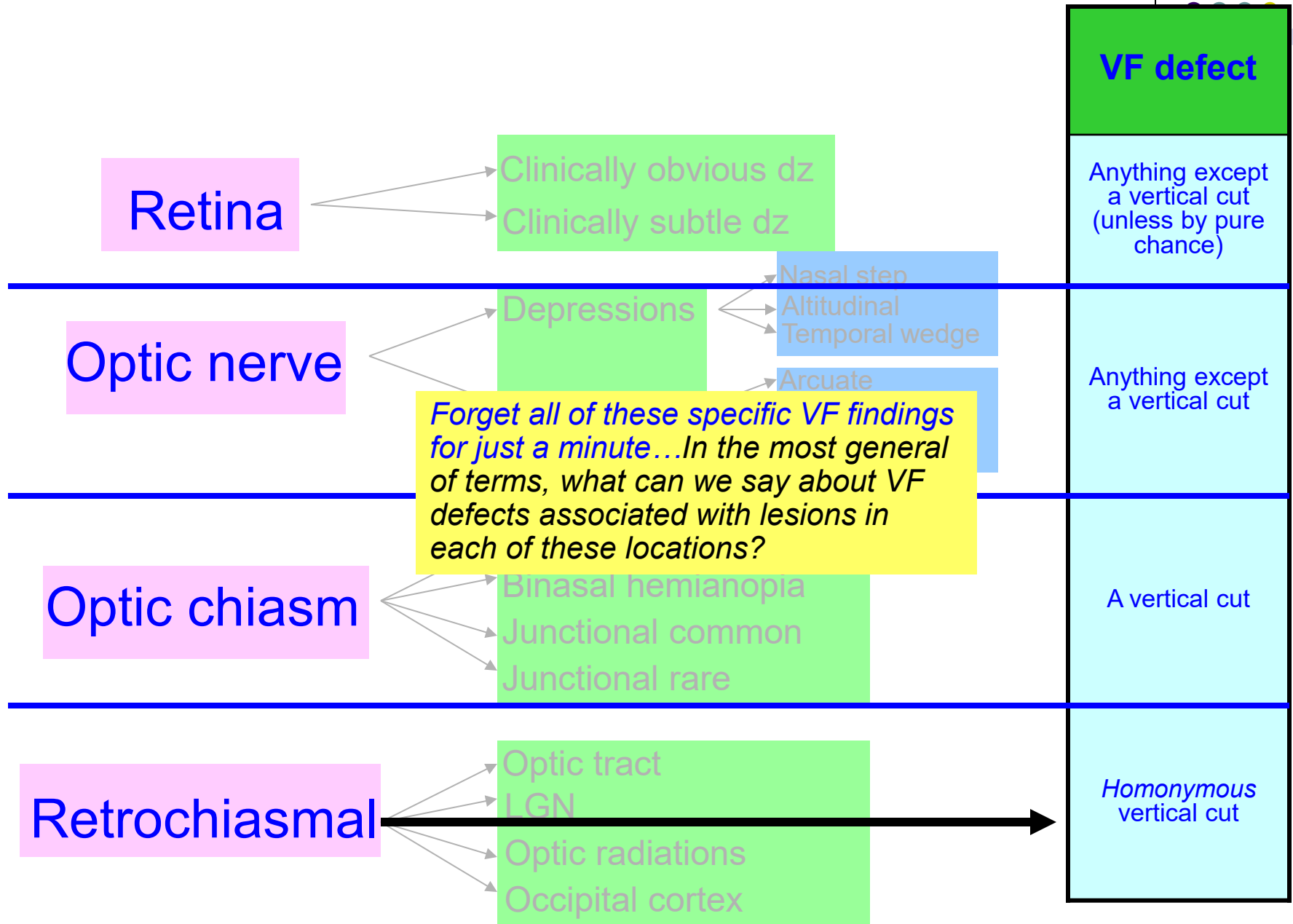




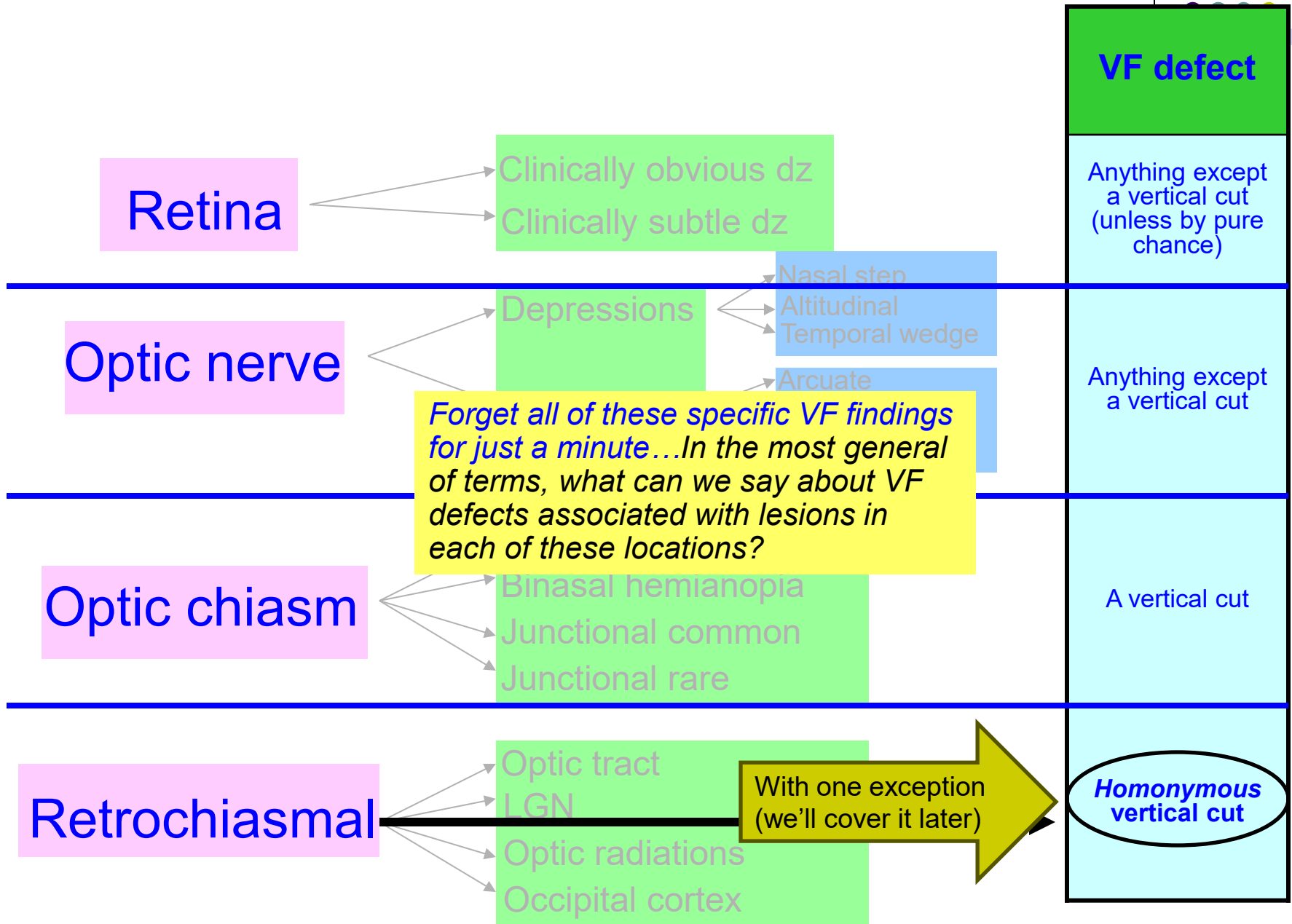
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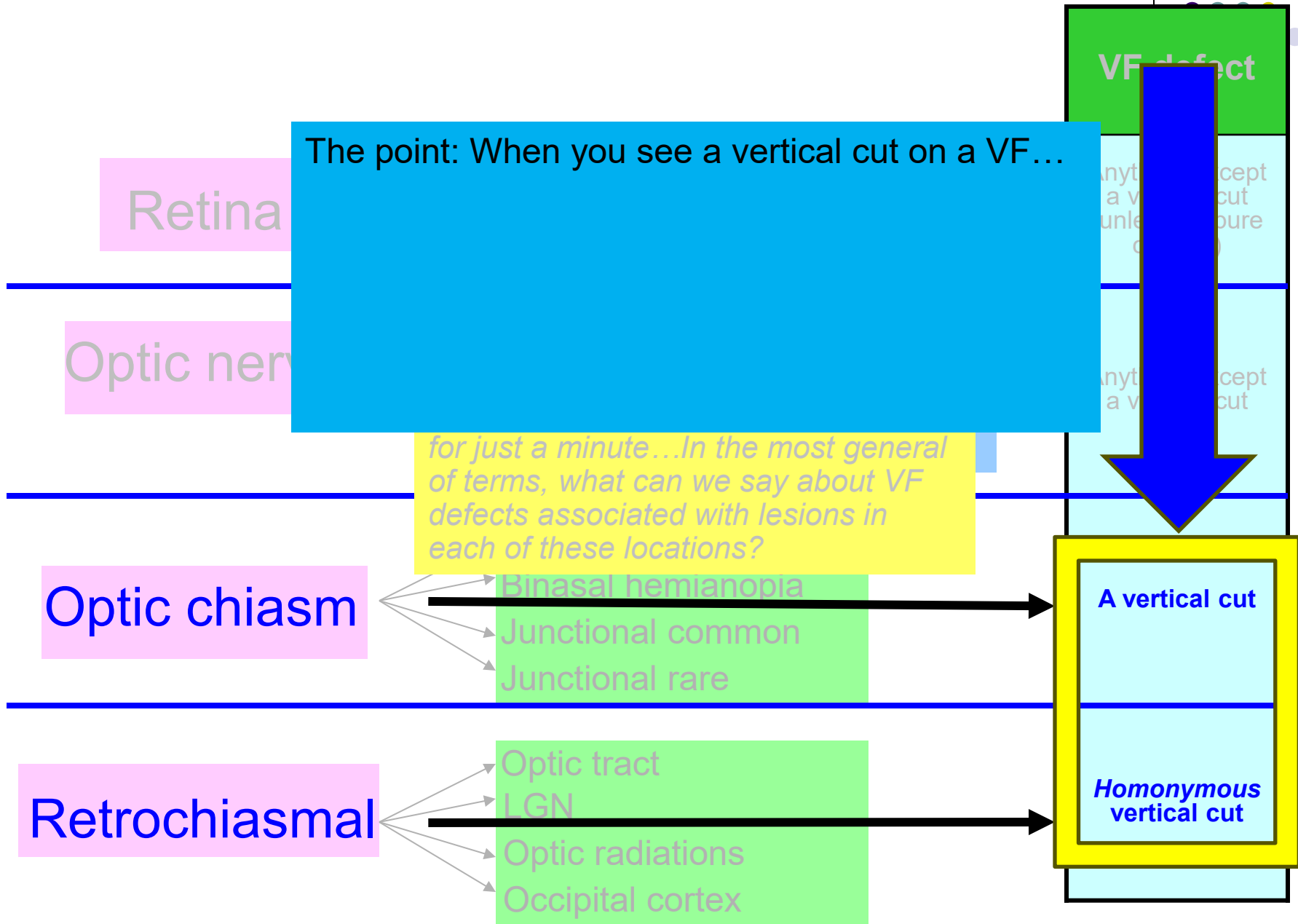
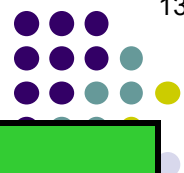
# Visual Field Defects



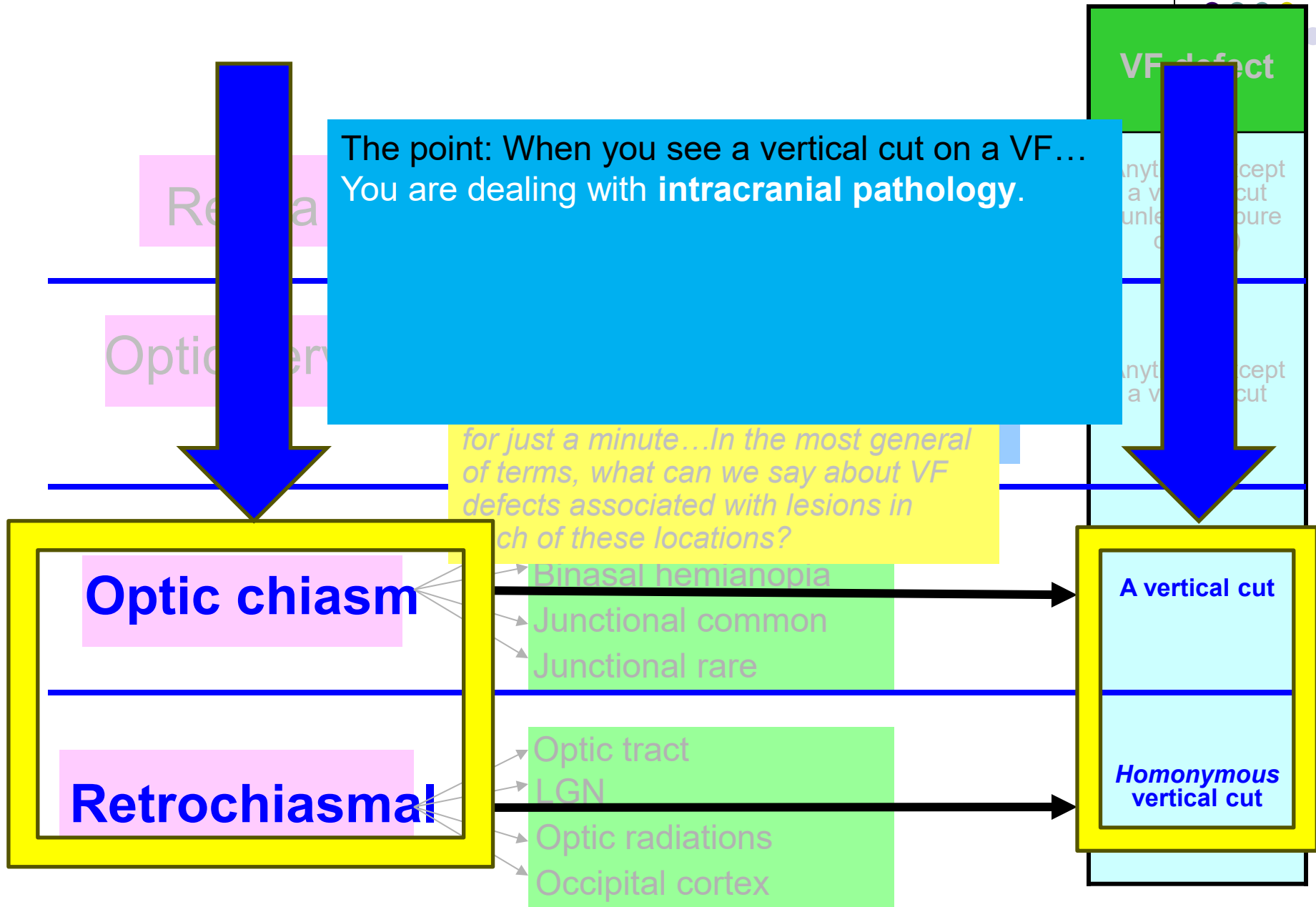
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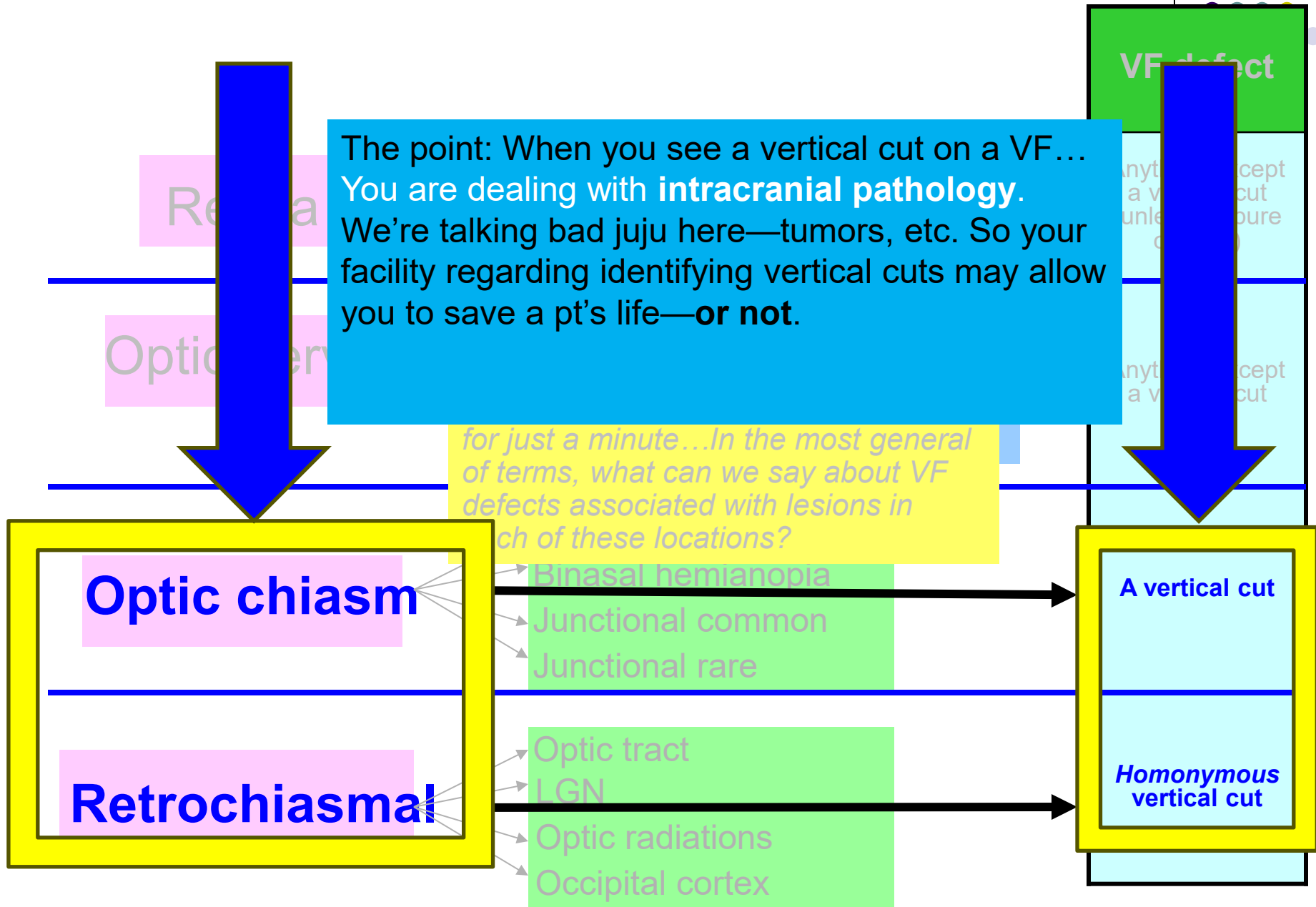
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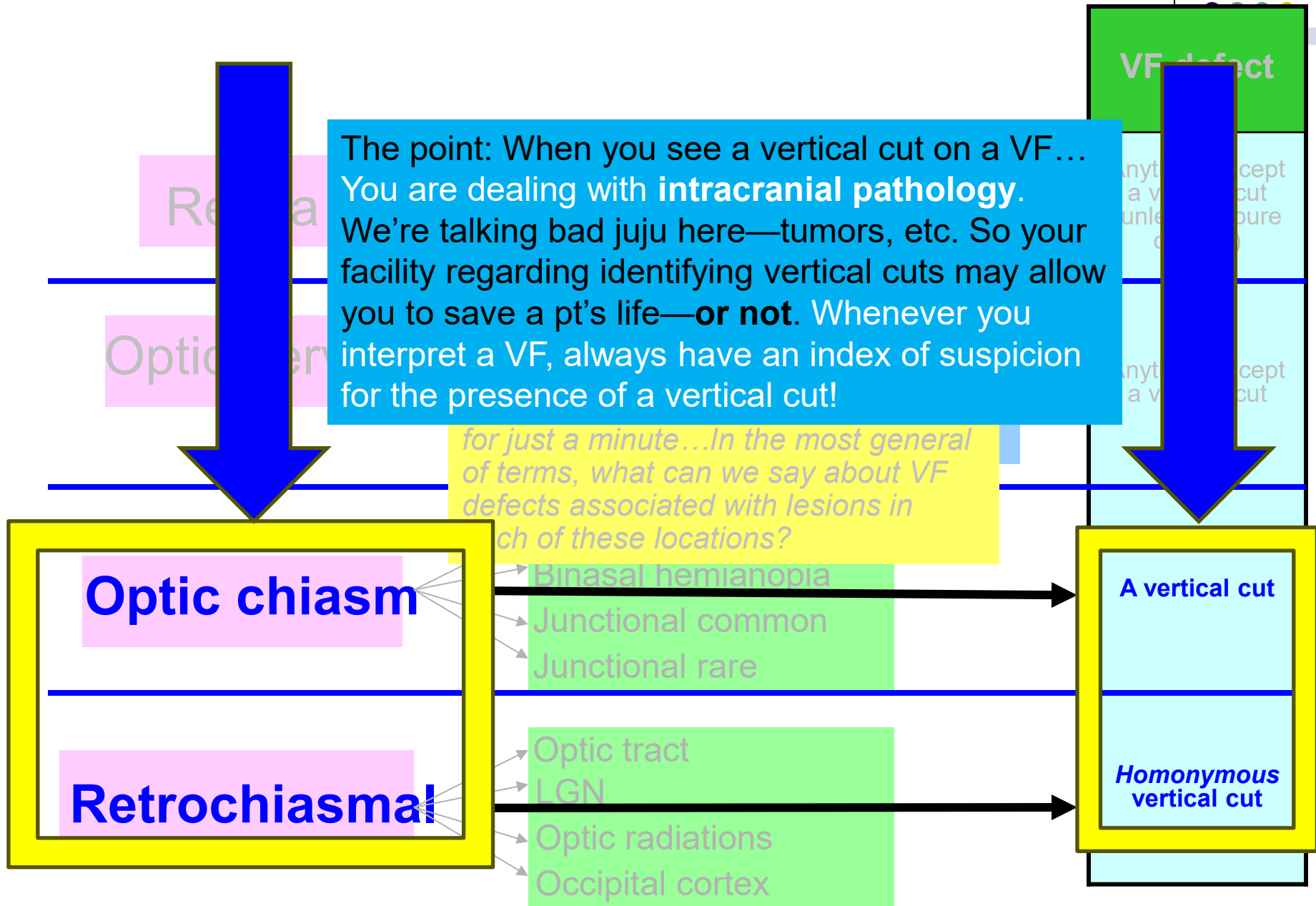
# Visual Field Defects



# Visual Field Defects



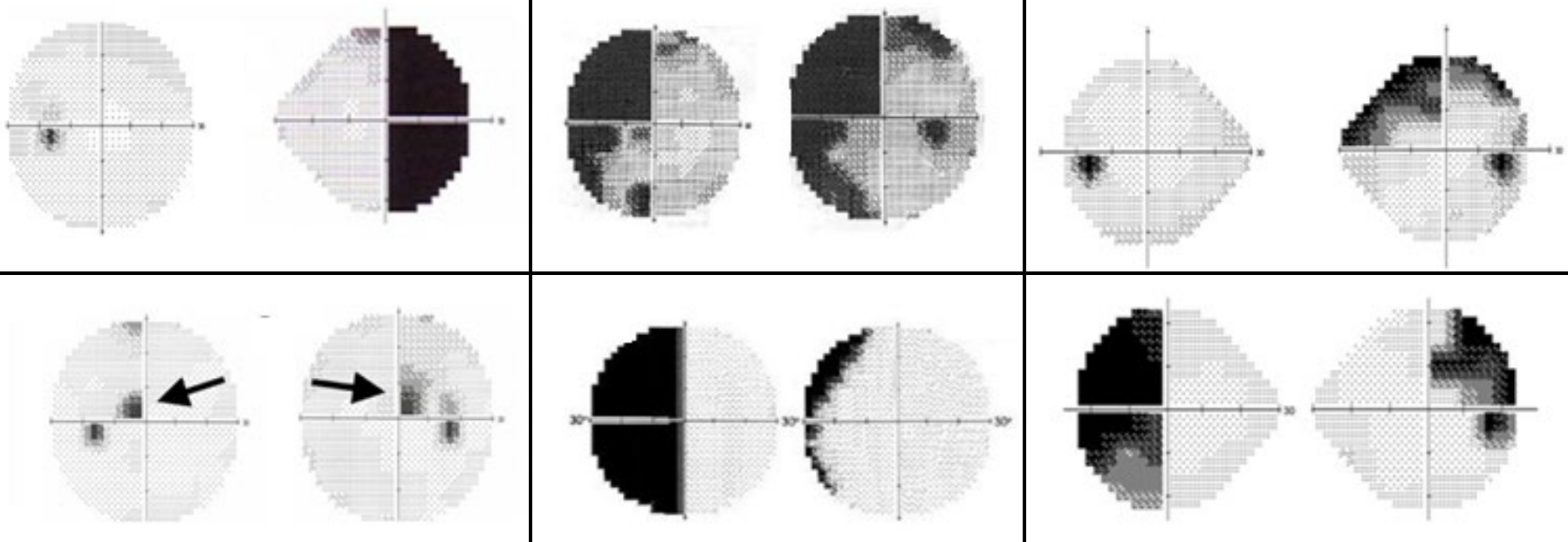
# Visual Field Defects



# Visual Field Defects



**Consider:** All of these represent chiasmal lesions, and you are not likely to miss the ‘vertical flavor’ in most of them.



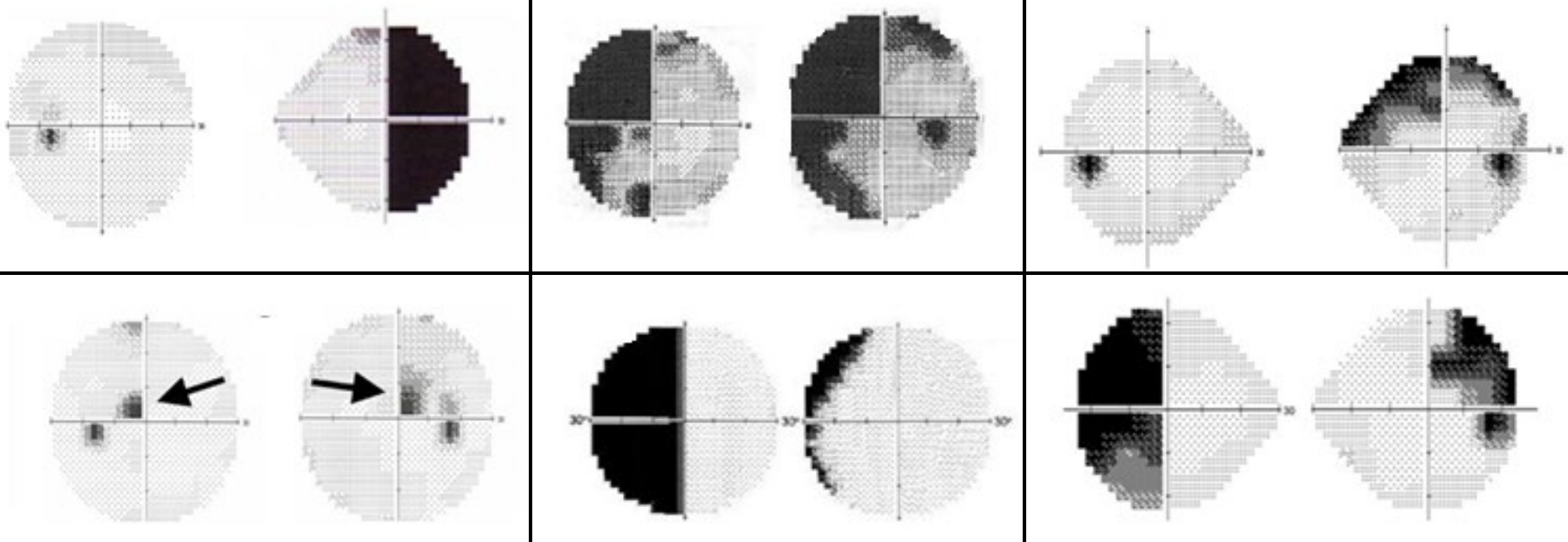


# Visual Field Defects

137



**Consider:** All of these represent chiasmal lesions, and you are not likely to miss the 'vertical flavor' in most of them.



*But what about in this one?*

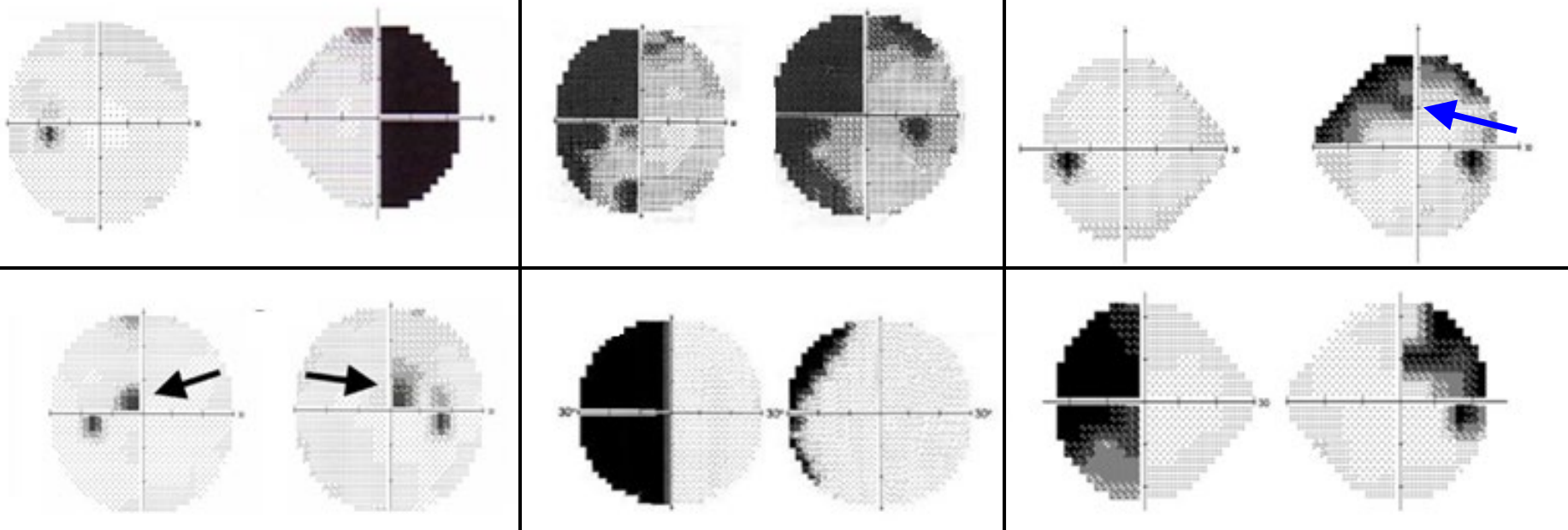
Image courtesy of Andrew G. Lee, MD

# Visual Field Defects



**Consider:** All of these represent chiasmal lesions, and you are not likely to miss the 'vertical flavor' in most of them.

*Or this one?*



# Visual Field Defects

139



**Consider:** All of these represent **chiasmal lesions**, and you are not likely to miss the 'vertical flavor' in most of them.

*Or this one?*

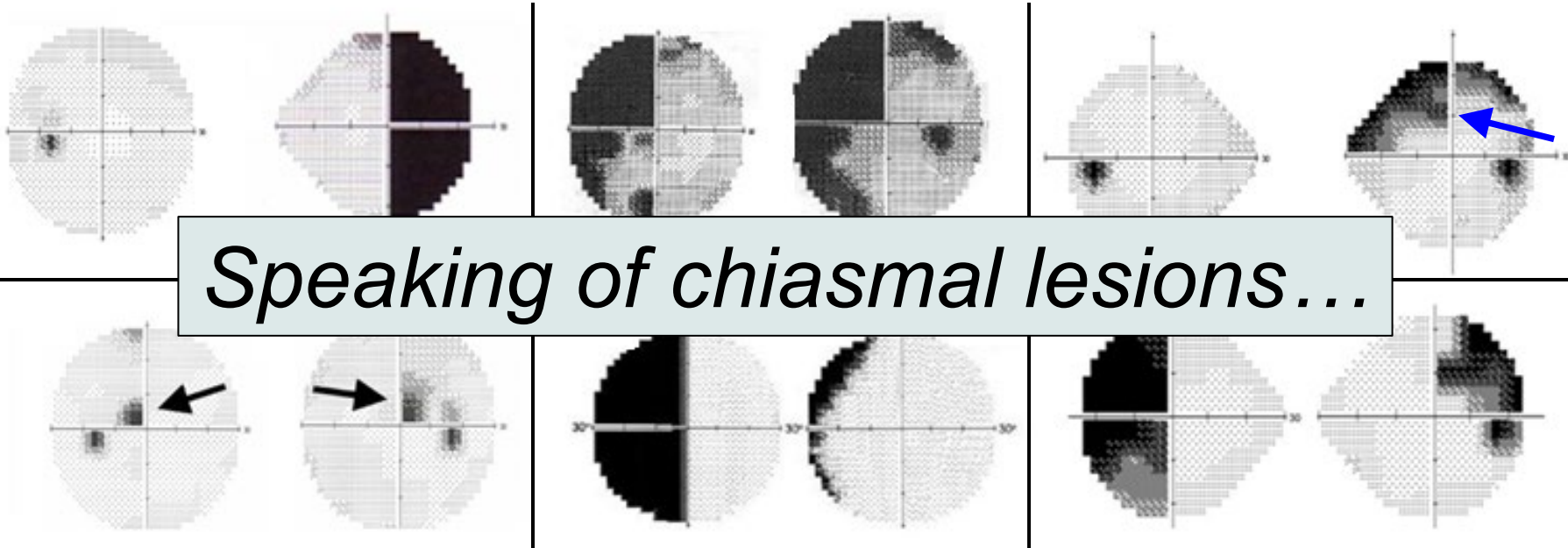
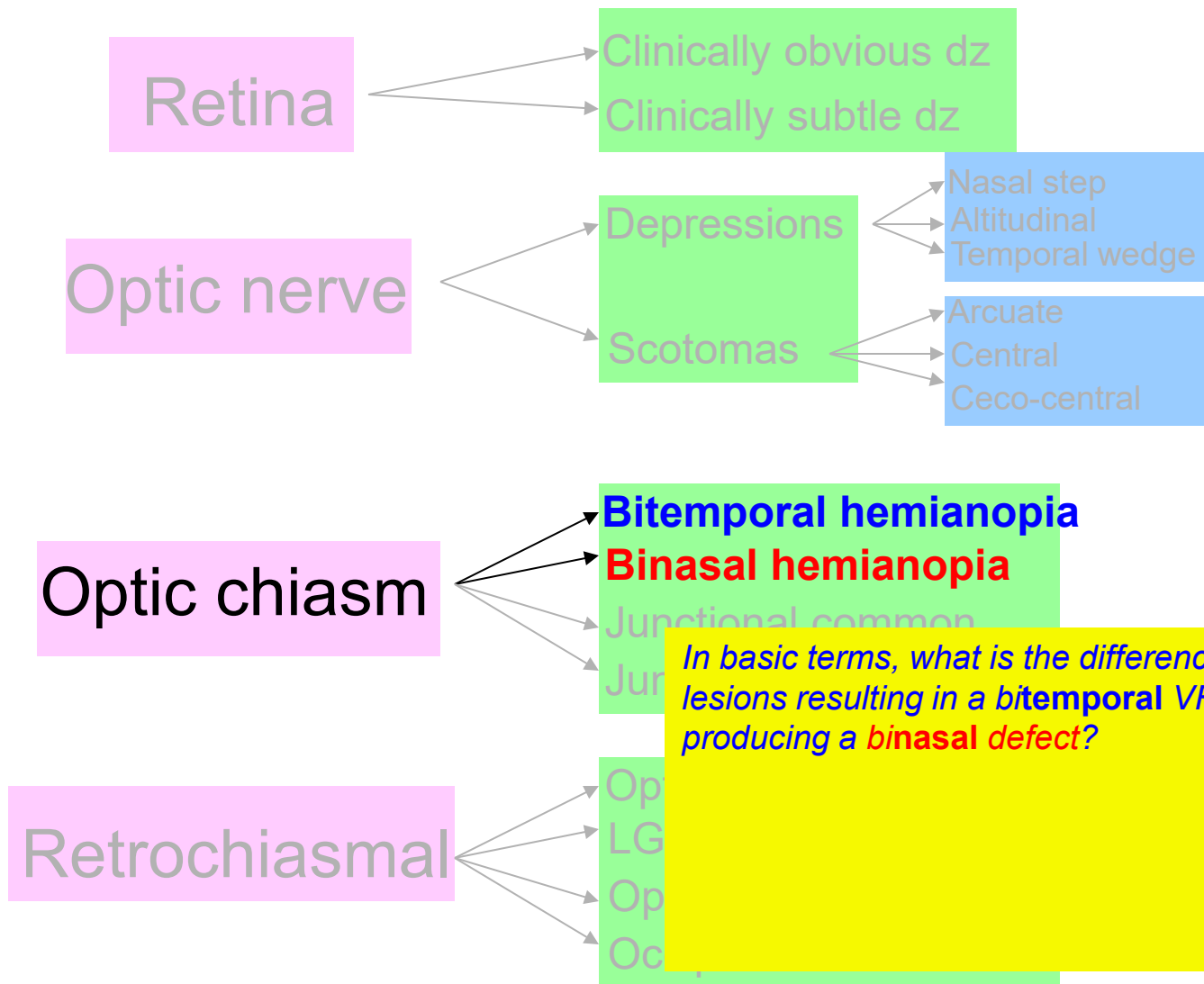


Image courtesy of Andrew G. Lee, MD

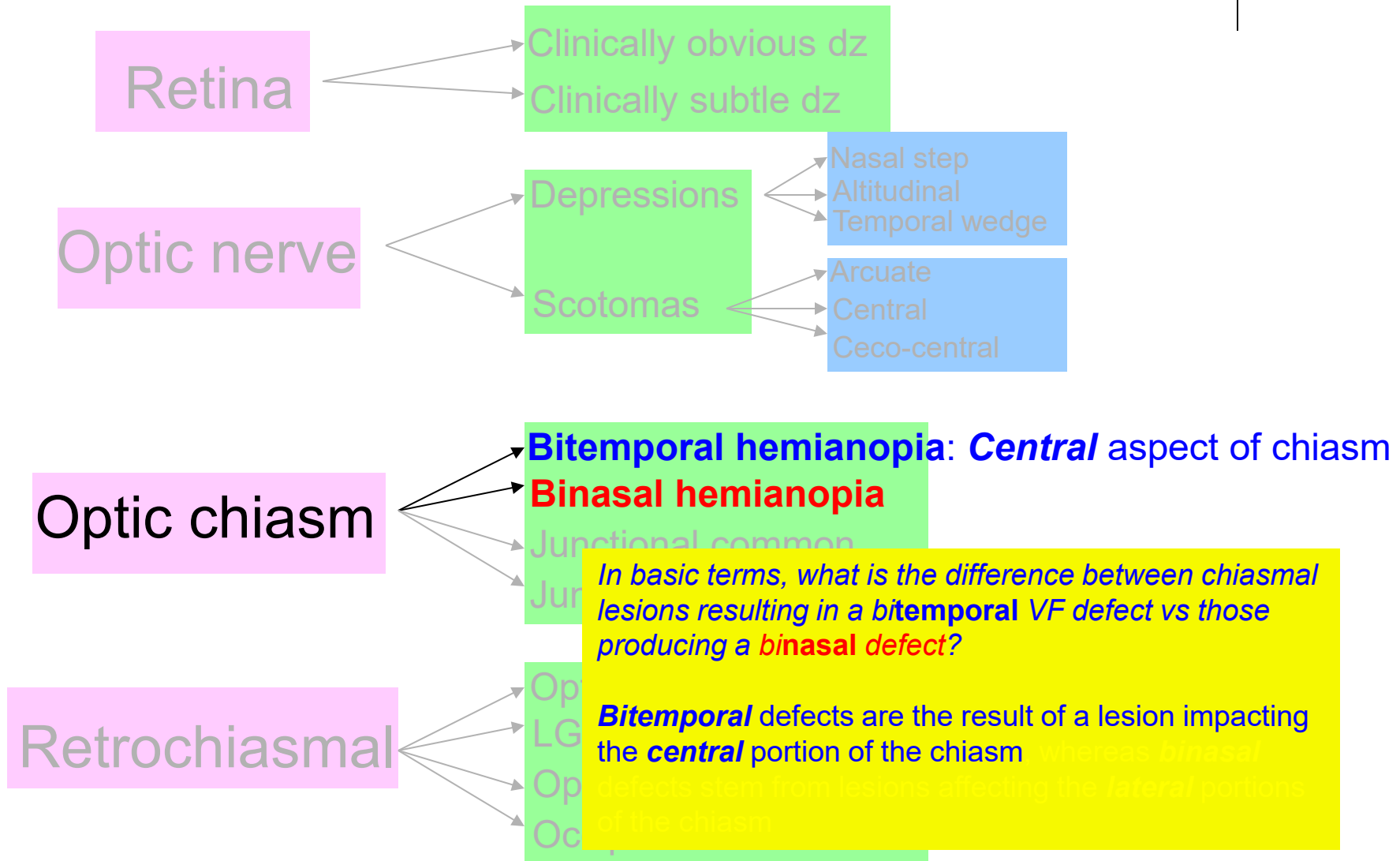


# Visual Field Defects

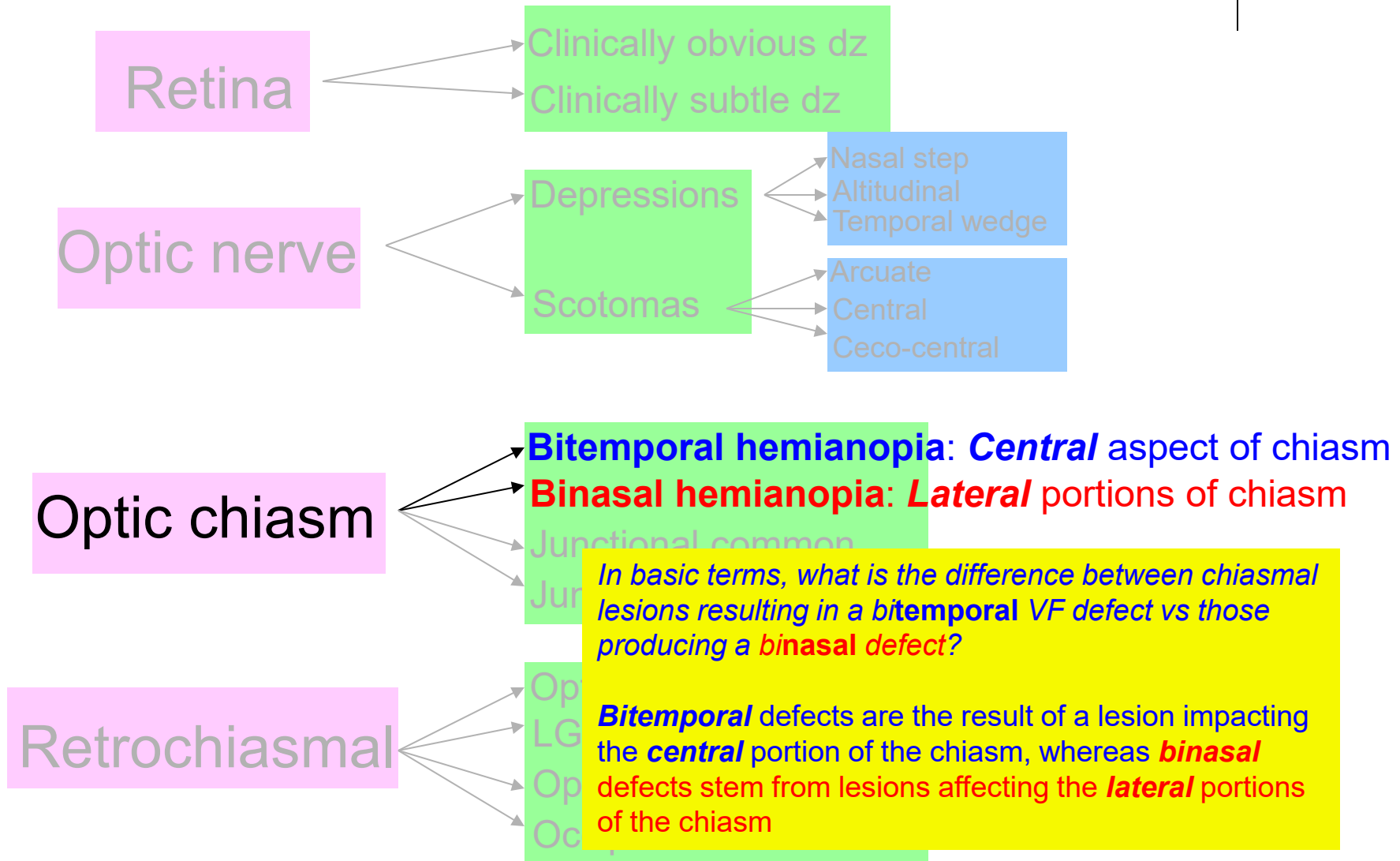


*In basic terms, what is the difference between chiasmal lesions resulting in a **bitemporal** VF defect vs those producing a **binasal** defect?*

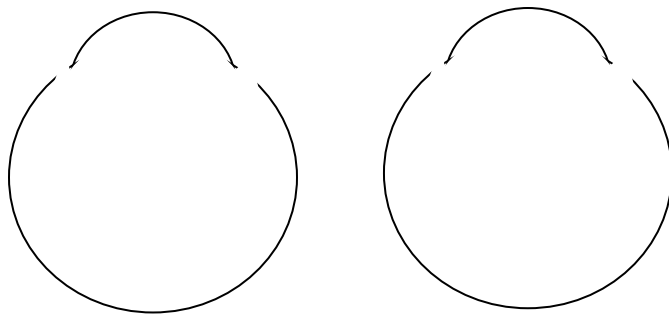
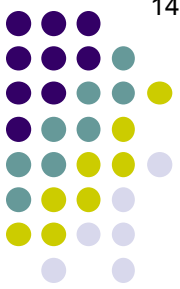
# Visual Field Defects



# Visual Field Defects



# Visual Field Defects



*Here's why:*

**Bitemporal hemianopia:** *Central* aspect of chiasm

**Binasal hemianopia:** *Lateral* portions of chiasm

*In basic terms, what is the difference between chiasmal lesions resulting in a bitemporal VF defect vs those producing a binasal defect?*

**Bitemporal** defects are the result of a lesion impacting the **central** portion of the chiasm, whereas **binasal** defects stem from lesions affecting the **lateral** portions of the chiasm.

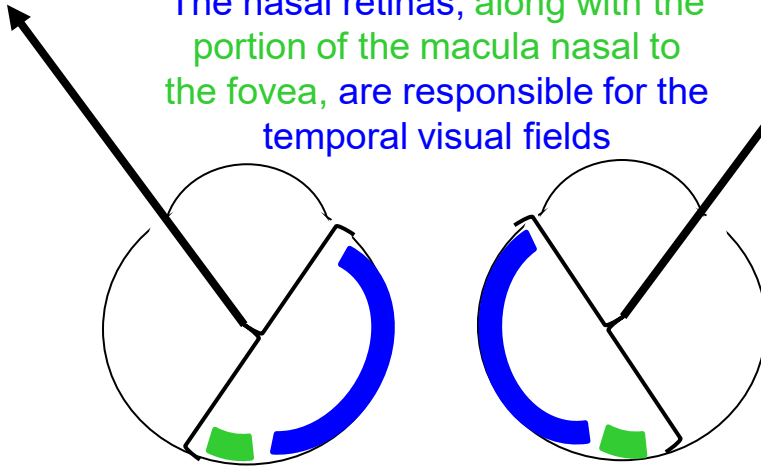
# Visual Field Defects



Temporal VF

The nasal retinas, along with the portion of the macula nasal to the fovea, are responsible for the temporal visual fields

Temporal VF



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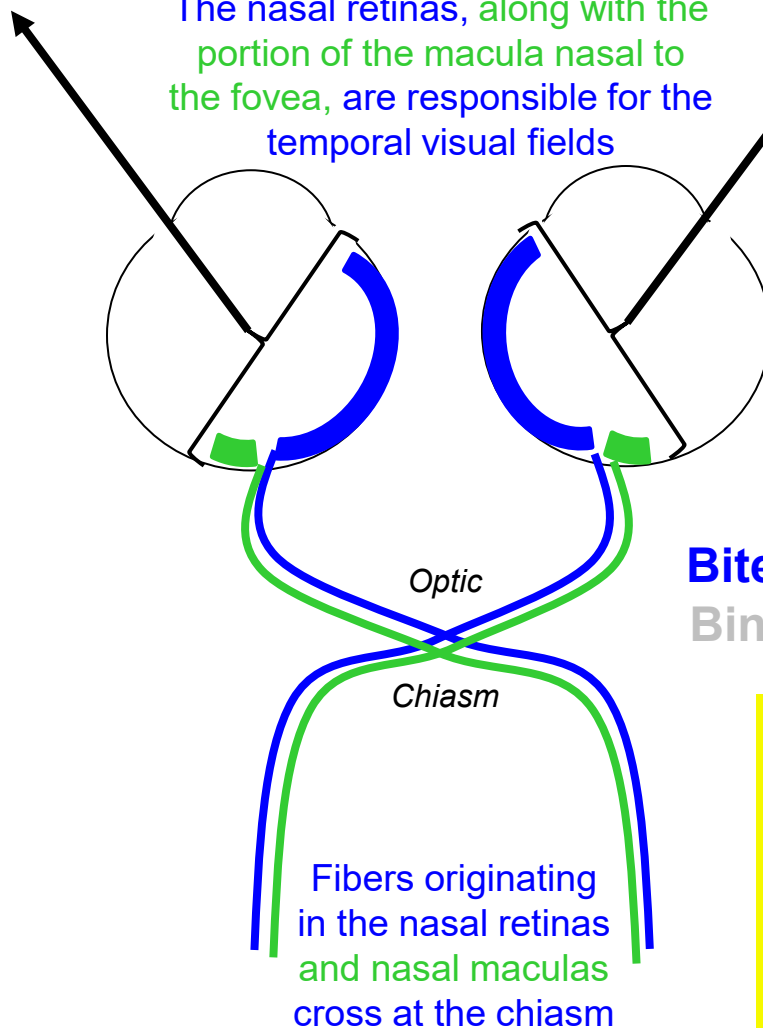
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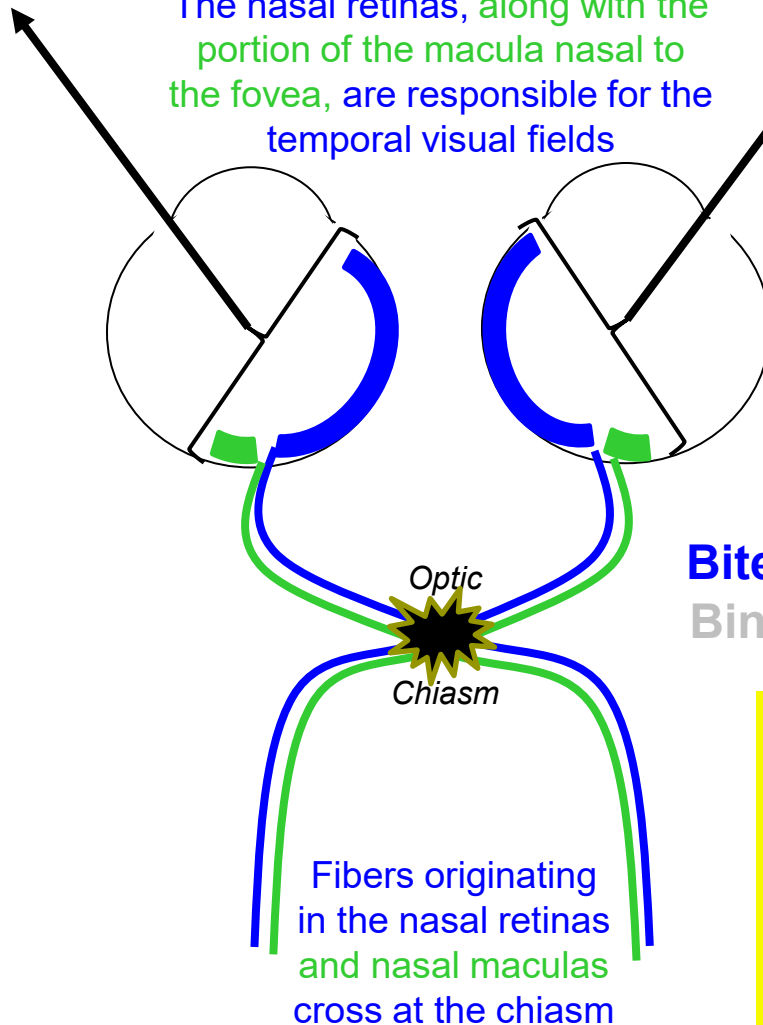
# Visual Field Defects



Temporal VF

The nasal retinas, along with the portion of the macula nasal to the fovea, are responsible for the temporal visual fields

Temporal VF



*Here's why:*

So a lesion of the **central** chiasm will bag these fibers, and thus tend to cause bitemporal defects

**Bitemporal hemianopia:** **Central** aspect of chiasm

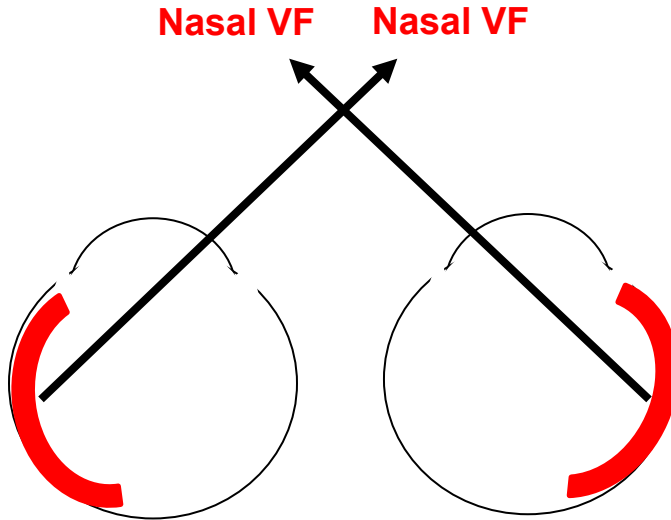
**Binasal hemianopia:** **Lateral** portions of chiasm

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# Visual Field Defects

The *temporal* retinas are responsible  
for the *nasal* visual fields



*Here's why:*

**Bitemporal hemianopia:** *Central* aspect of chiasm

**Binasal hemianopia:** *Lateral* portions of chiasm

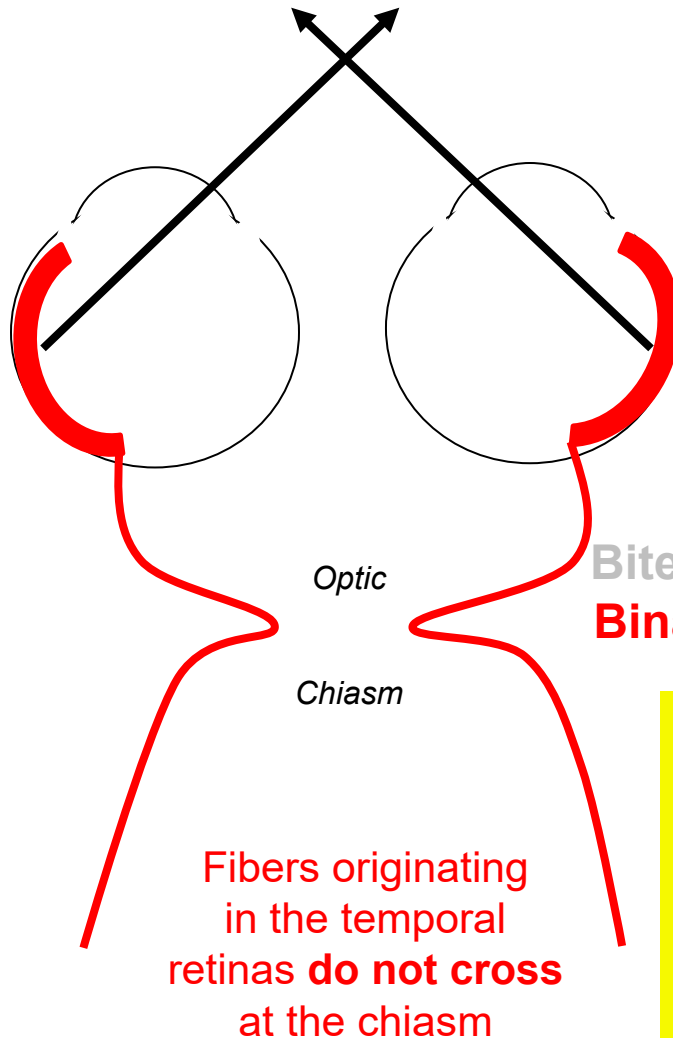
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# Visual Field Defects

The *temporal* retinas are responsible  
for the *nasal* visual fields

Nasal VF Nasal VF



Here's why:

Bitemporal hemianopia: *Central* aspect of chiasm

**Binasal hemianopia: Lateral** portions of chiasm

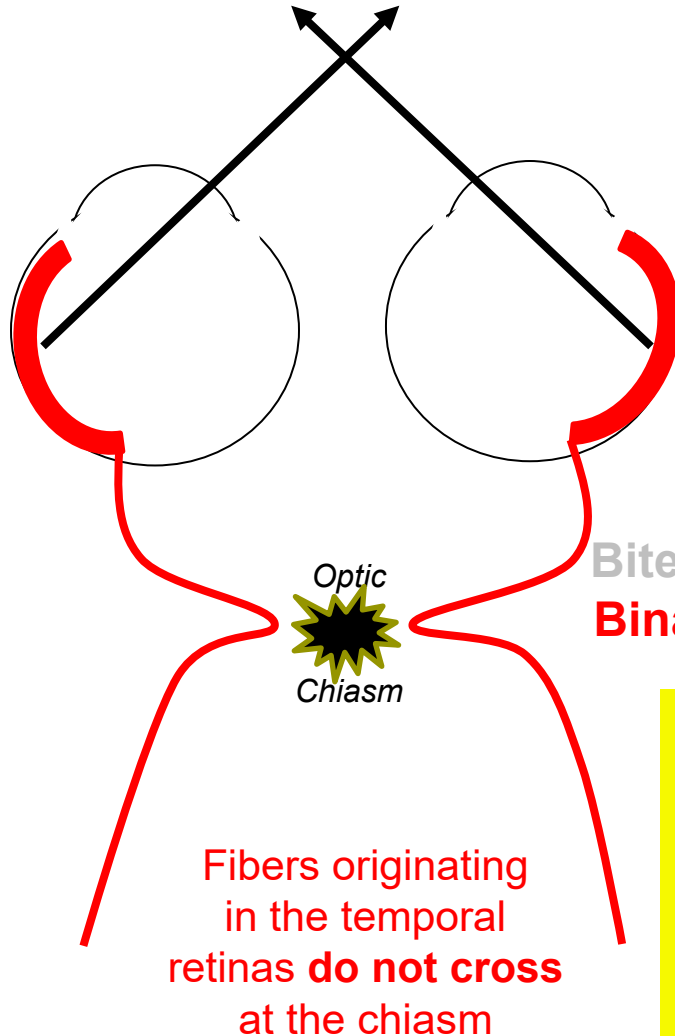
*In basic terms, what is the difference between chiasmal lesions resulting in a bitemporal VF defect vs those producing a binasal defect?*

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# Visual Field Defects

The *temporal* retinas are responsible  
for the *nasal* visual fields

Nasal VF Nasal VF



*Here's why:*

So lesions of the central chiasm will miss these fibers...

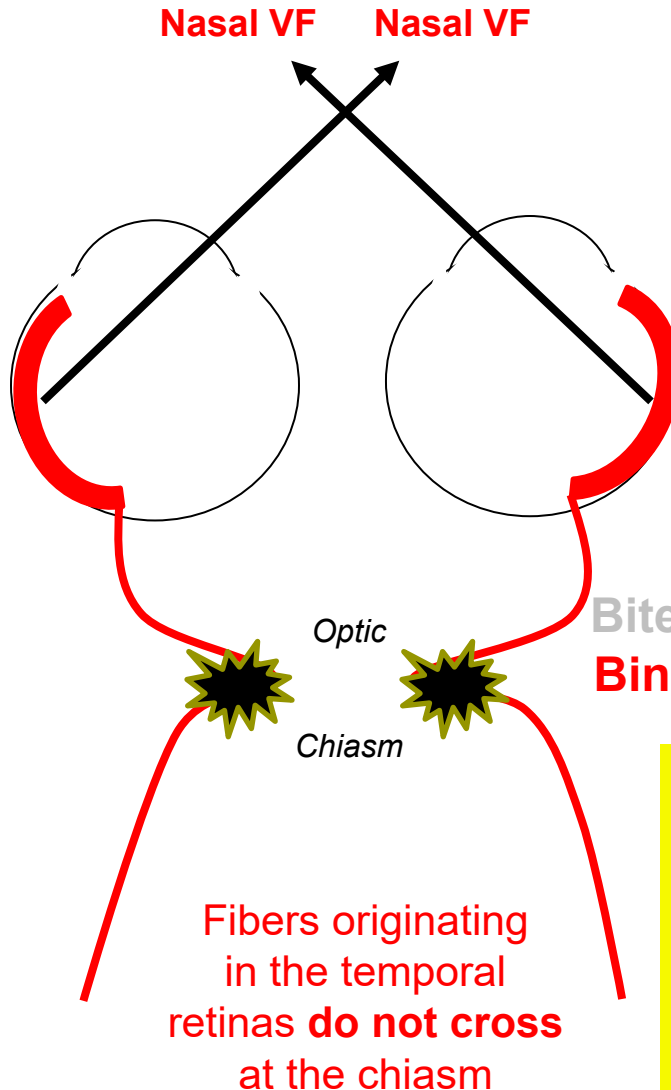
**Binasal hemianopia: *Lateral* portions of chiasm**

*In basic terms, what is the difference between chiasmal lesions resulting in a bitemporal VF defect vs those producing a binasal defect?*

*Bitemporal* defects are the result of a lesion impacting the **central** portion of the chiasm, whereas **binasal** defects stem from lesions affecting the **lateral** portions of the chiasm

# Visual Field Defects

The *temporal* retinas are responsible  
for the *nasal* visual fields



*Here's why:*

So lesions of the central chiasm will miss these fibers...But lesions of the **lateral** chiasm will bag them, thereby causing binasal defects (note that **two** lesions are required to do this)

**Binasal hemianopia: *Lateral* portions of chiasm**

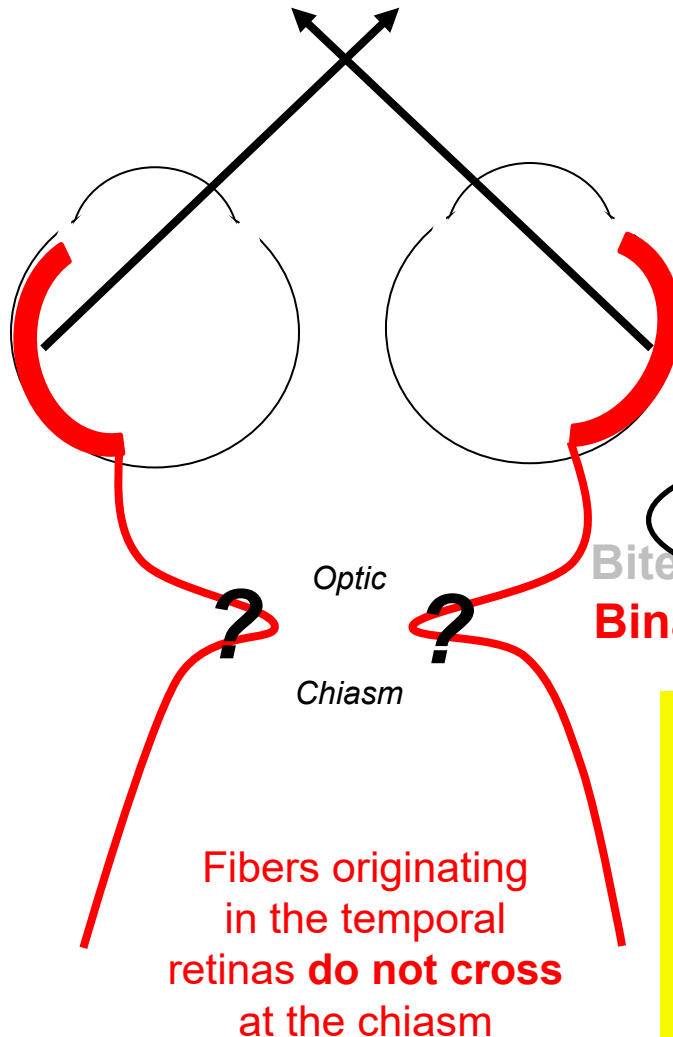
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# Visual Field Defects

The *temporal* retinas are responsible for the *nasal* visual fields

Nasal VF Nasal VF



What structures are located at the lateral aspects of the chiasm?

Here's why:

So lesions of the central chiasm will miss these fibers... But lesions of the **lateral** chiasm will bag them, thereby causing binasal defects (note that **two lesions are required to do this**)

**Binasal hemianopia: Lateral portions of chiasm**

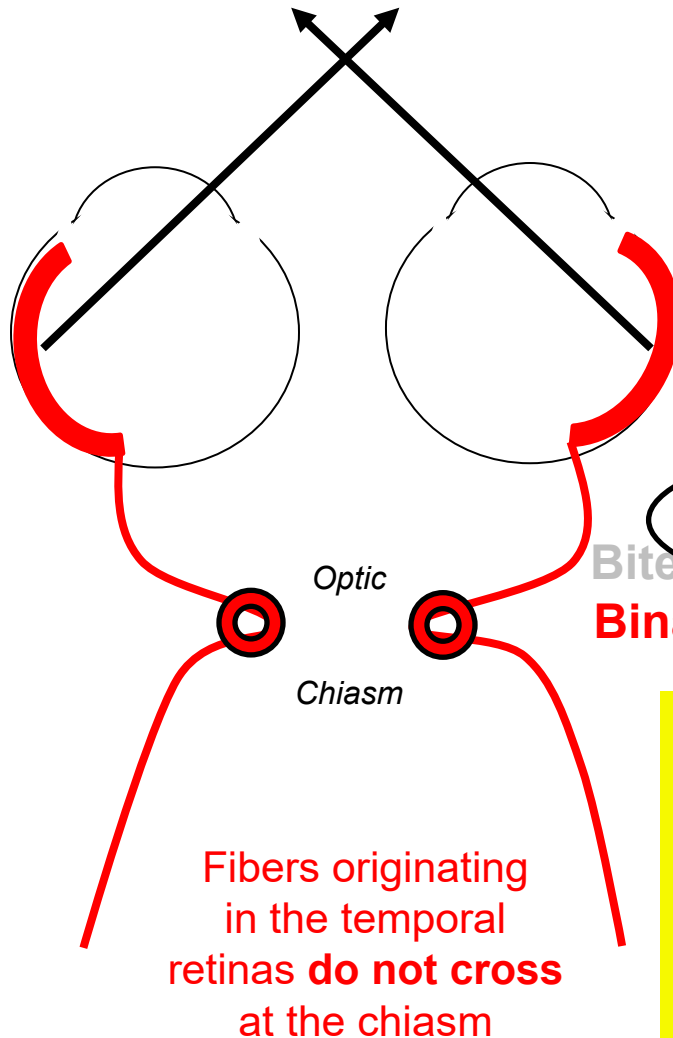
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# Visual Field Defects

The *temporal* retinas are responsible for the *nasal* visual fields

Nasal VF Nasal VF



What structures are located at the lateral aspects of the chiasm?  
The internal carotid arteries

Here's why:

So lesions of the central chiasm will miss these fibers... But lesions of the **lateral** chiasm will bag them, thereby causing binasal defects (note that **two** lesions are required to do this)

**Binasal hemianopia: Lateral** portions of chiasm

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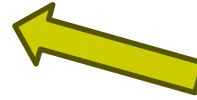
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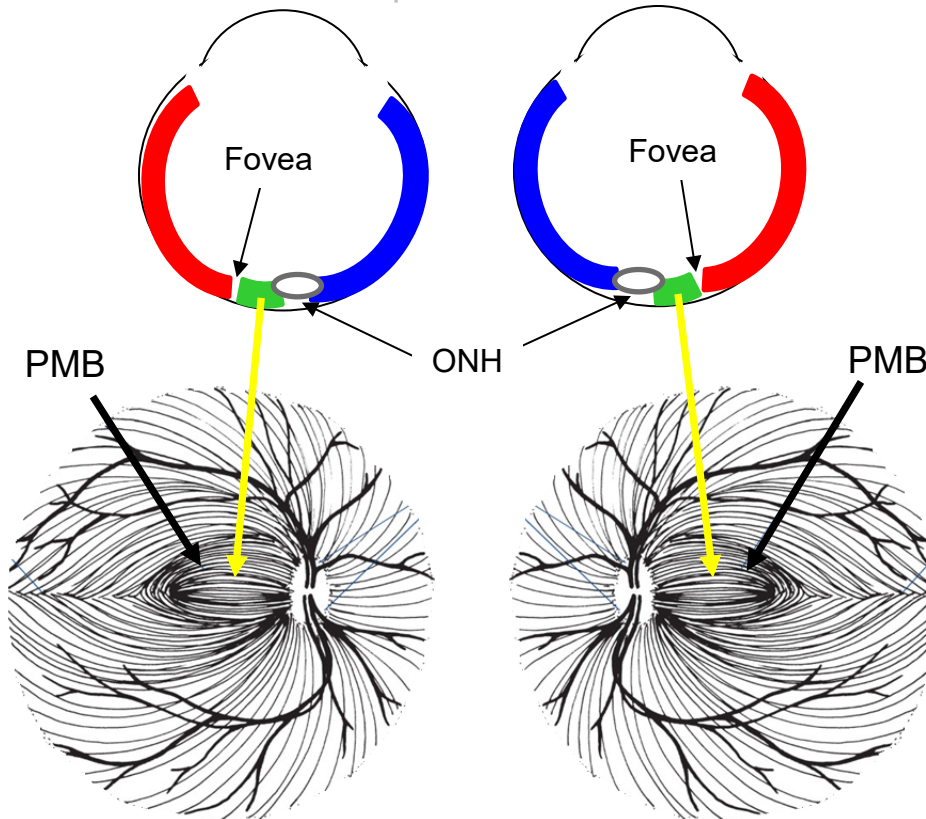
# Visual Field Defects



The nasal retinas, **along with the portion of the macula nasal to the fovea**, are responsible for the temporal visual fields



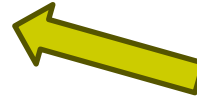
*Let's drill down on this little patch of macula, because it's really important—so important it has a name. What is it?*



# Visual Field Defects

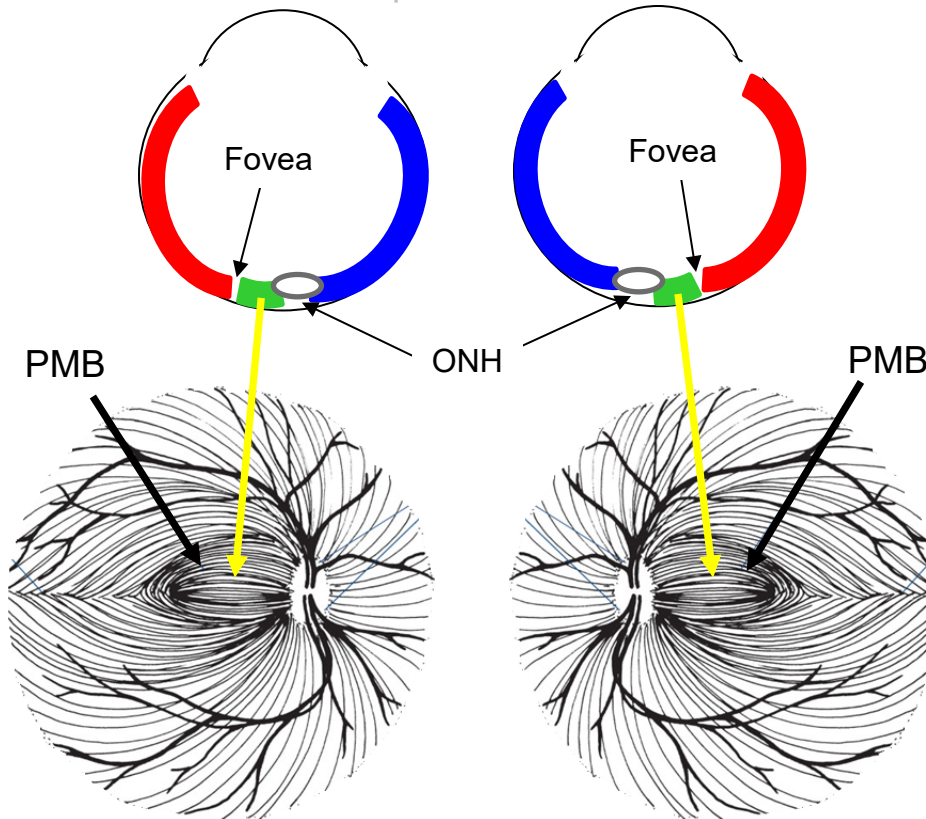


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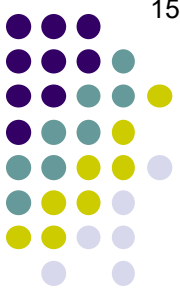


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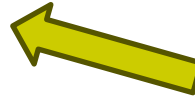
The papillomacular bundle (PMB), remember?



# Visual Field Defects



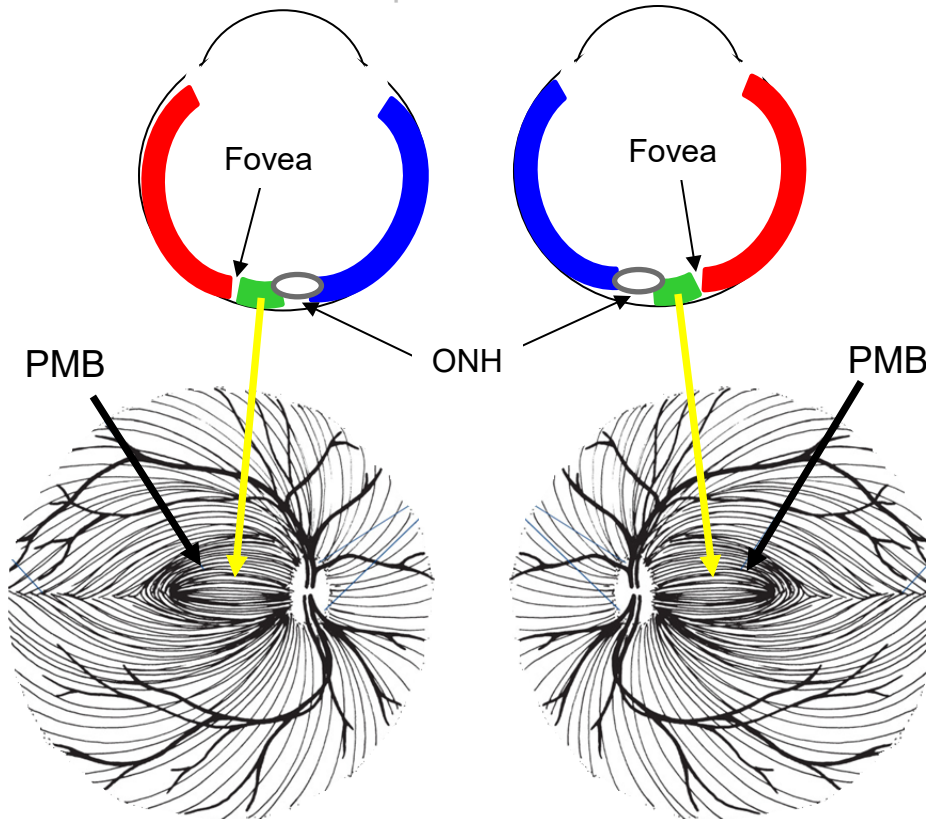
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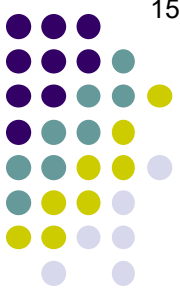
*Let's drill down on this little patch of macula, because it's really important—so important it has a name. What is it?*

The **papillomacular bundle (PMB)**

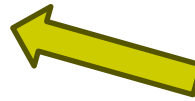
*Is the PMB comprised of all the fibers originating in the fovea, or only those from its nasal side?*



# Visual Field Defects



The nasal retinas, **along with the portion of the macula nasal to the fovea**, are responsible for the temporal visual fields

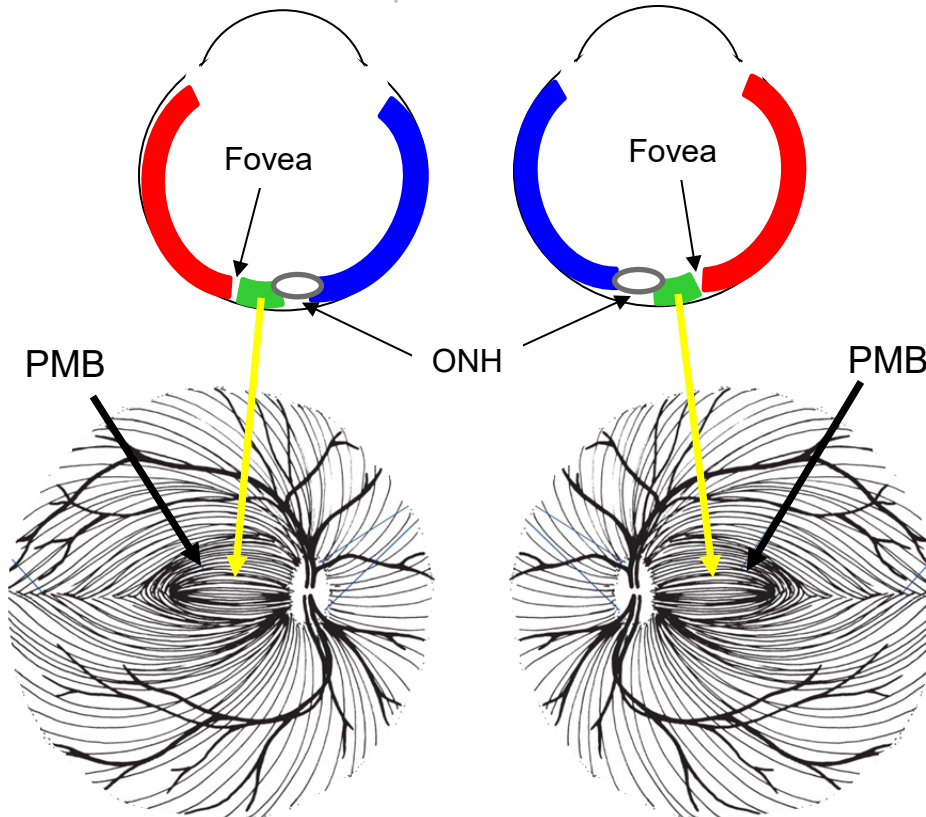


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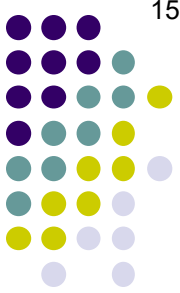
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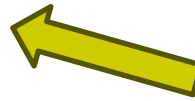
*The BCSC uses the term **PMB** both ways.*



# Visual Field Defects



The nasal retinas, **along with the portion of the macula nasal to the fovea**, are responsible for the temporal visual fields



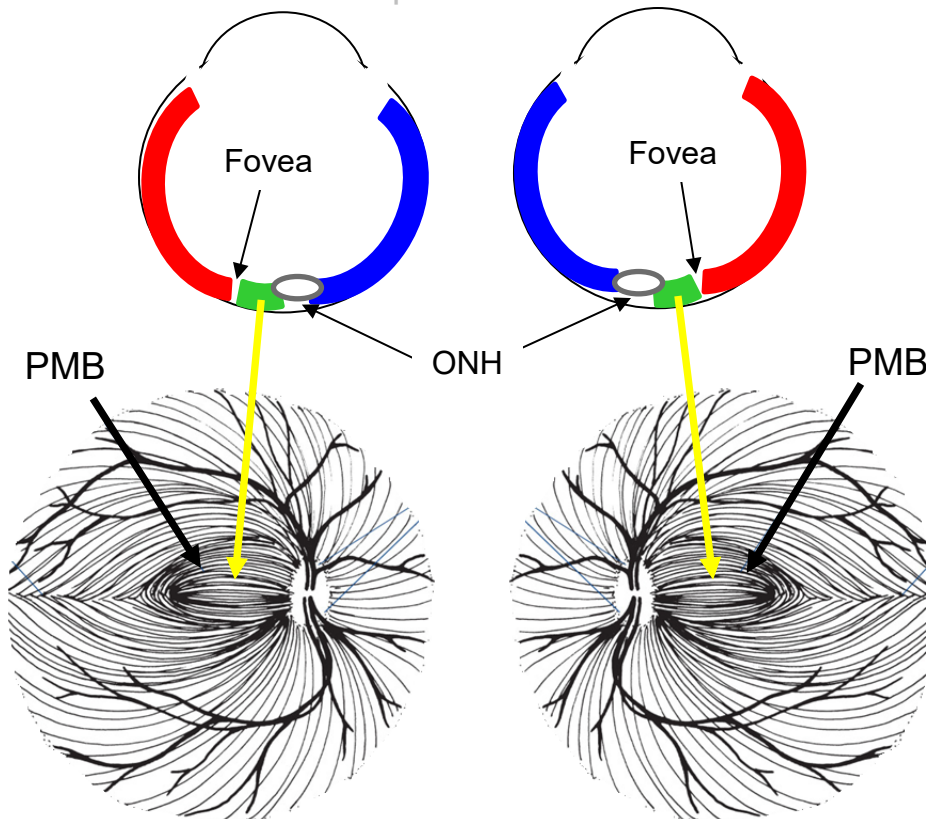
*Let's drill down on this little patch of macula, because it's really important—so important it has a name. What is it?*

The **papillomacular bundle (PMB)**

*Is the PMB comprised of all the fibers originating in the fovea, or only those from its nasal side?*

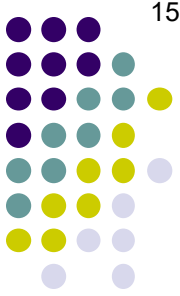
*The BCSC uses the term PMB both ways.*

For purposes of this slide-set, we'll use it to mean 'fibers originating from the nasal side of the fovea.'

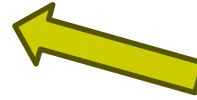




# Visual Field Defects



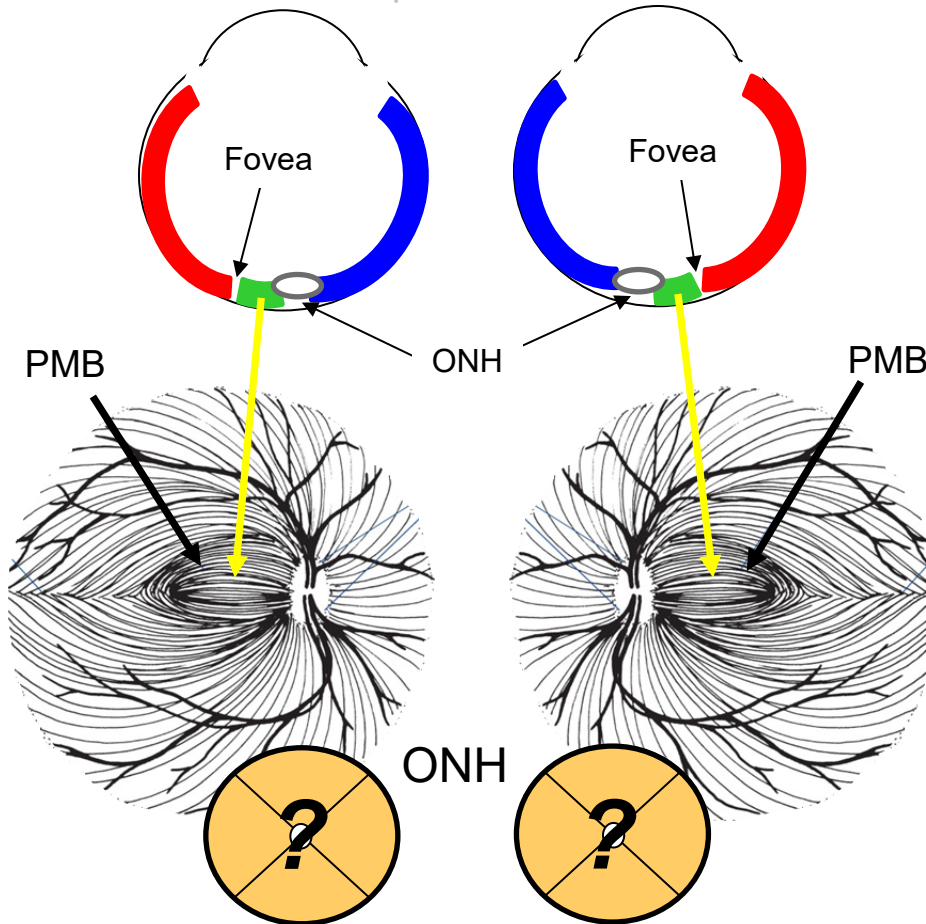
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*Let's drill down on this little patch of macula, because it's really important—so important it has a name. What is it?*

The papillomacular bundle (PMB)

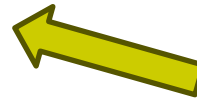
*Where do PMB fibers enter the ONH?*



# Visual Field Defects



The nasal retinas, **along with the portion of the macula nasal to the fovea**, are responsible for the temporal visual fields

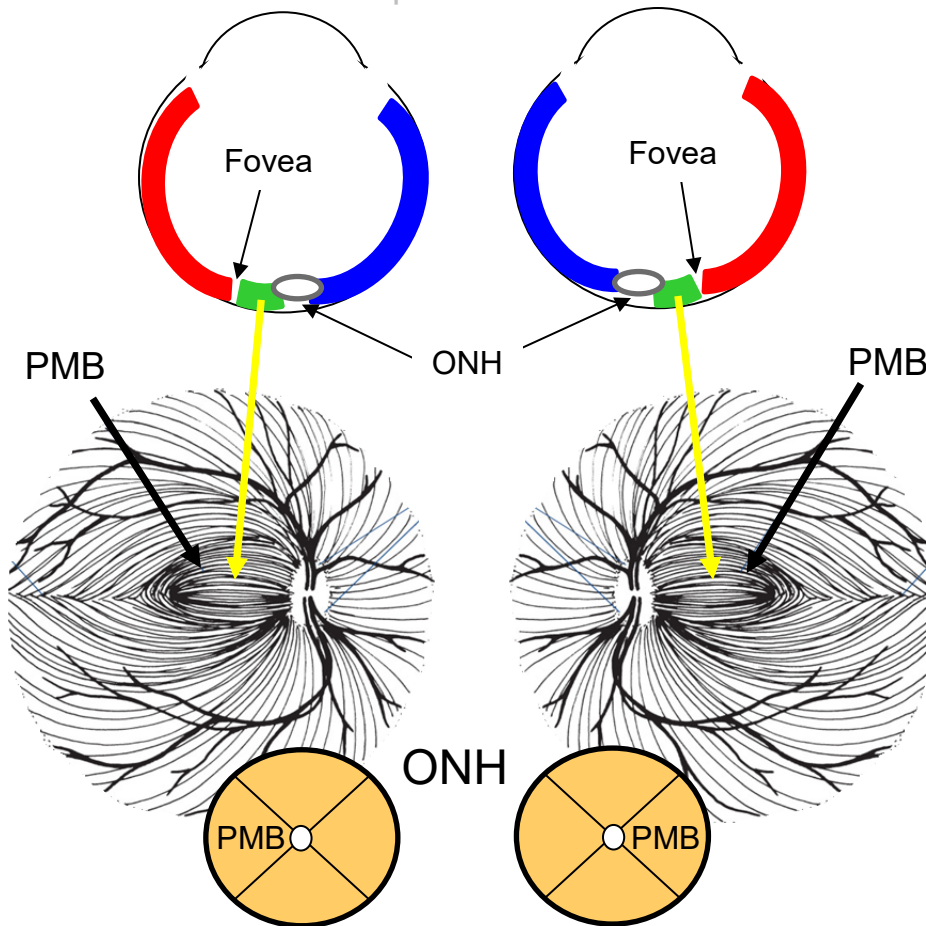


*Let's drill down on this little patch of macula, because it's really important—so important it has a name. What is it?*

The papillomacular bundle (PMB)

*Where do PMB fibers enter the ONH?*

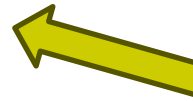
Its temporal quadrant



# Visual Field Defects



The nasal retinas, **along with the portion of the macula nasal to the fovea**, are responsible for the temporal visual fields



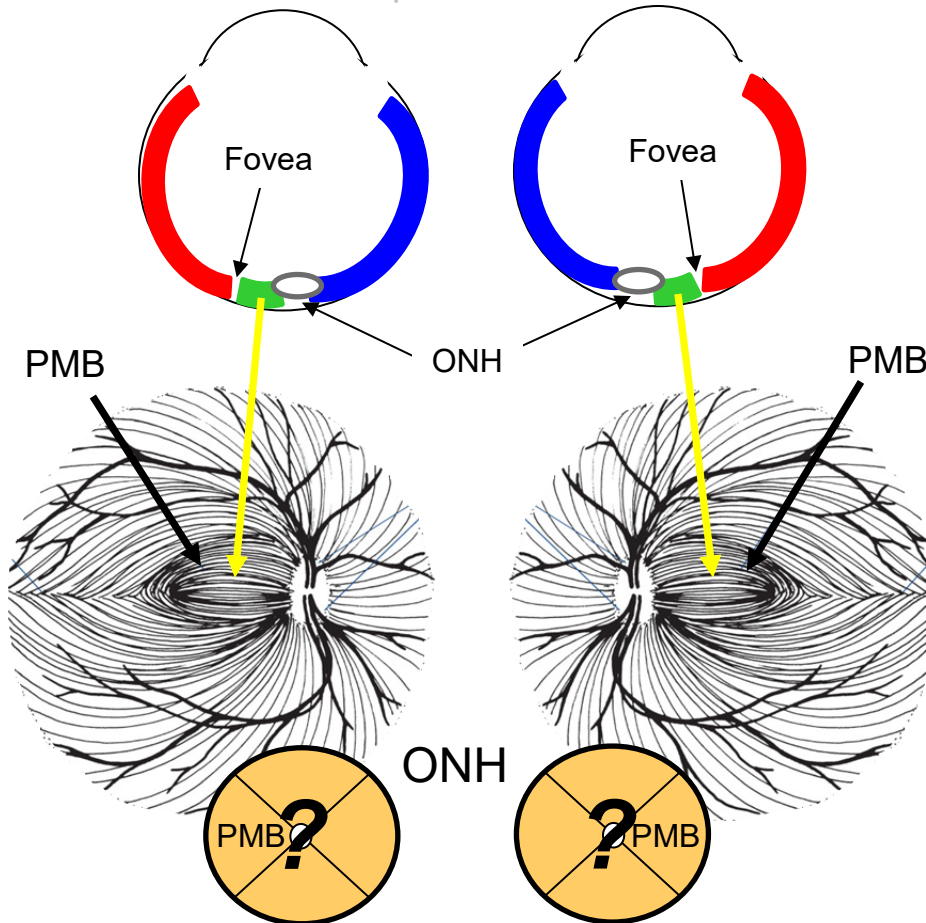
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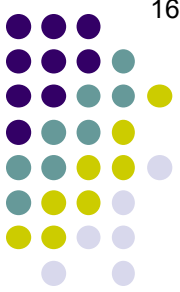
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*Where do fibers originating in the nasal retina enter the ONH?*

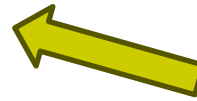




# Visual Field Defects



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*Let's drill down on this little patch of macula, because it's really important—so important it has a name. What is it?*

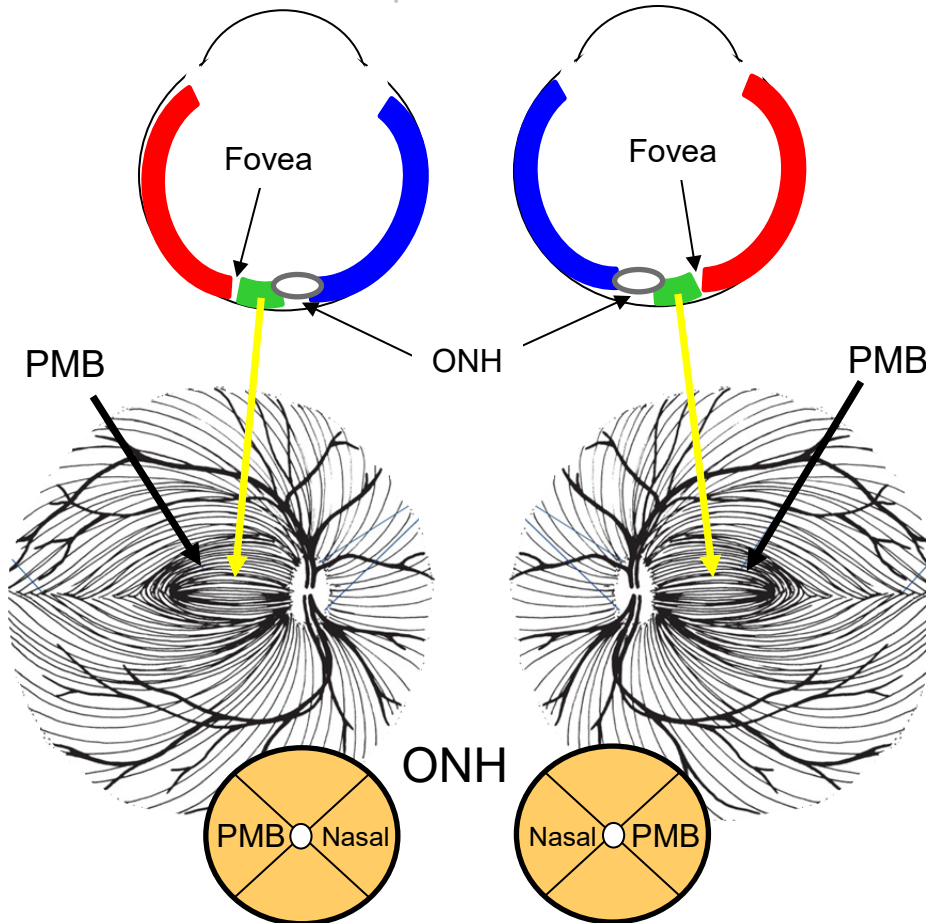
The papillomacular bundle (PMB)

*Where do PMB fibers enter the ONH?*

Its temporal quadrant

*Where do fibers originating in the nasal retina enter the ONH?*

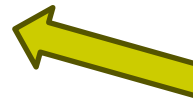
Its nasal quadrant



# Visual Field Defects



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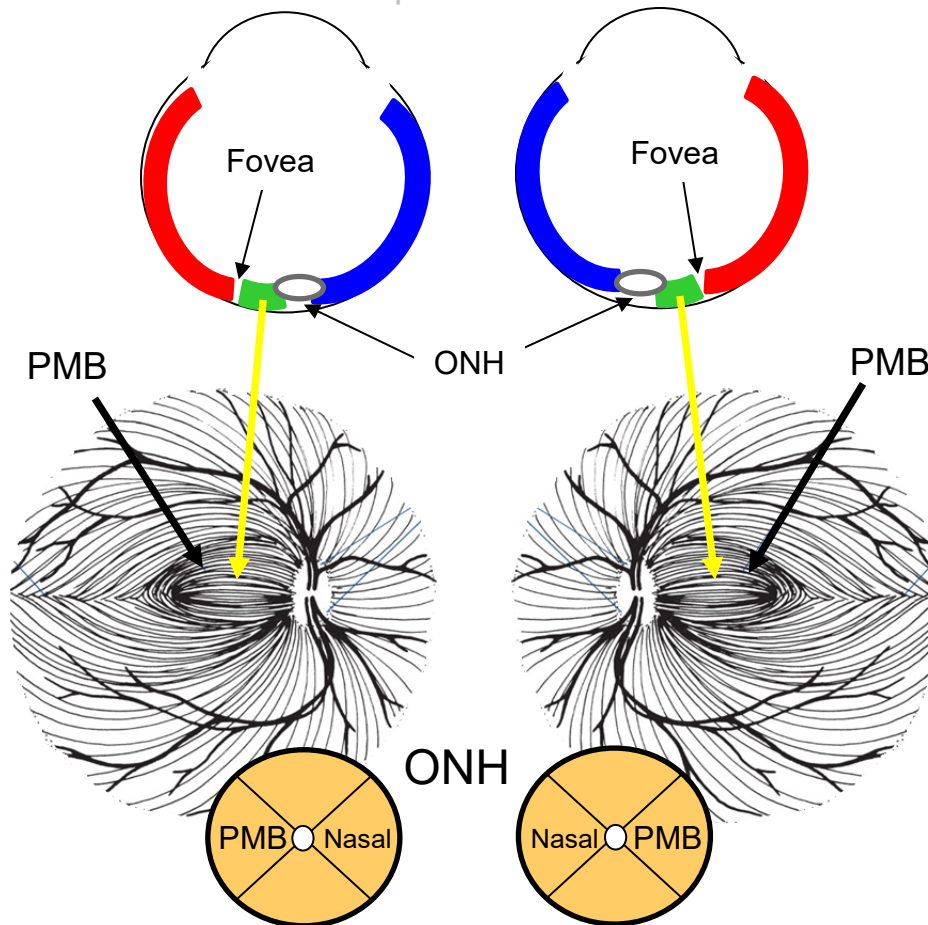
Its temporal quadrant

*Where do fibers originating in the nasal retina enter the ONH?*

Its nasal quadrant

*So fibers responsible for the temporal VF enter the ONH at its temporal and nasal quads.*

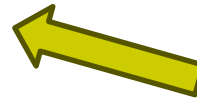
*What does this imply about the appearance of the ONHs when a chiasmal lesion is present?*



# Visual Field Defects



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Its temporal quadrant

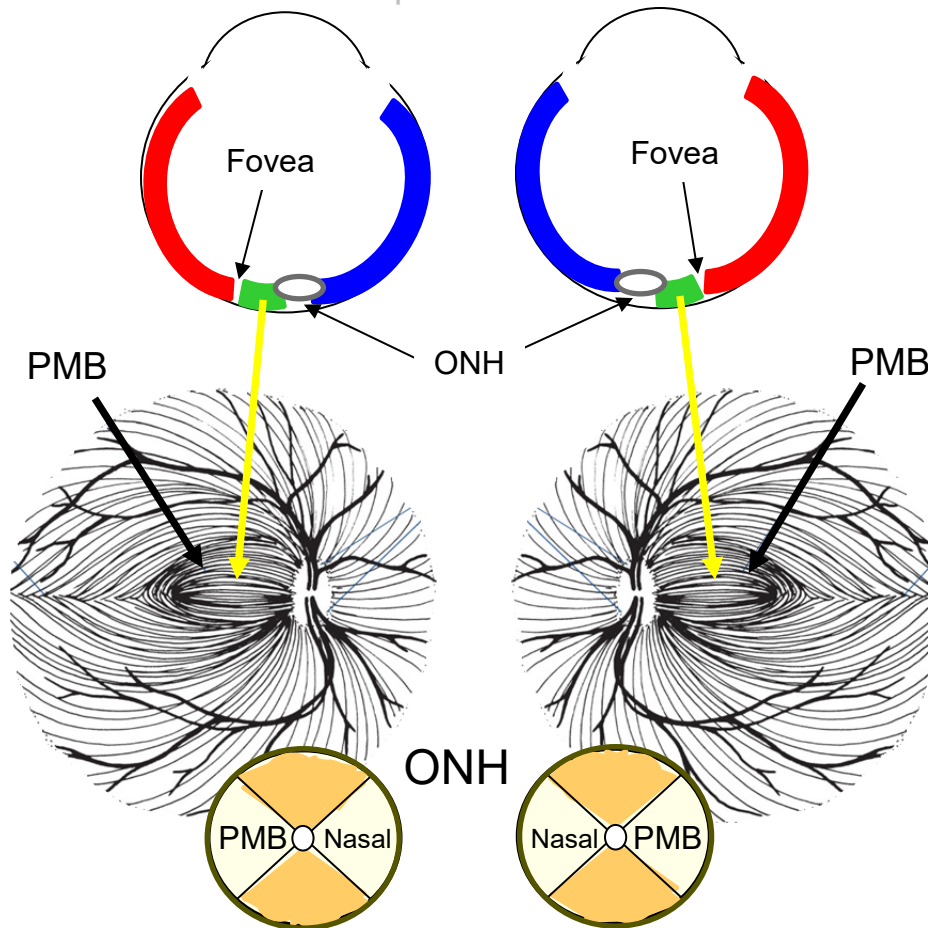
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*So fibers responsible for the temporal VF enter the ONH at its temporal and nasal quads.*

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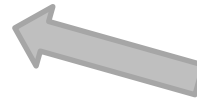
It implies they will be pallorous in these quads



# Visual Field Defects



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*Where do PMB fibers enter the ONH?*

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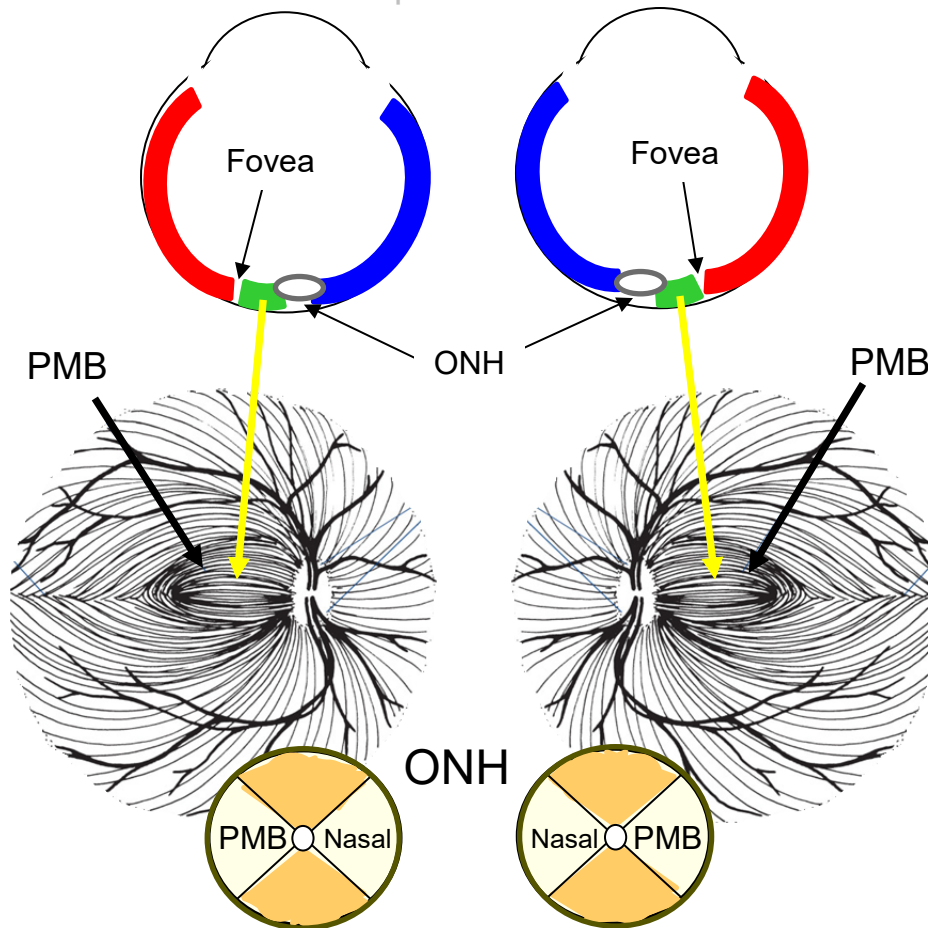
*Where do fibers originating in the nasal retina enter the ONH?*

Its nasal quadrant

*So fibers responsible for the temporal VF enter the ONH in the temporal quadrant.*

*What is the haberdashery-related term for this appearance?*

It implies they will be **pallorous in these quads**

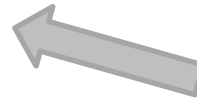




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*Where do fibers originating in the nasal retina enter the ONH?*

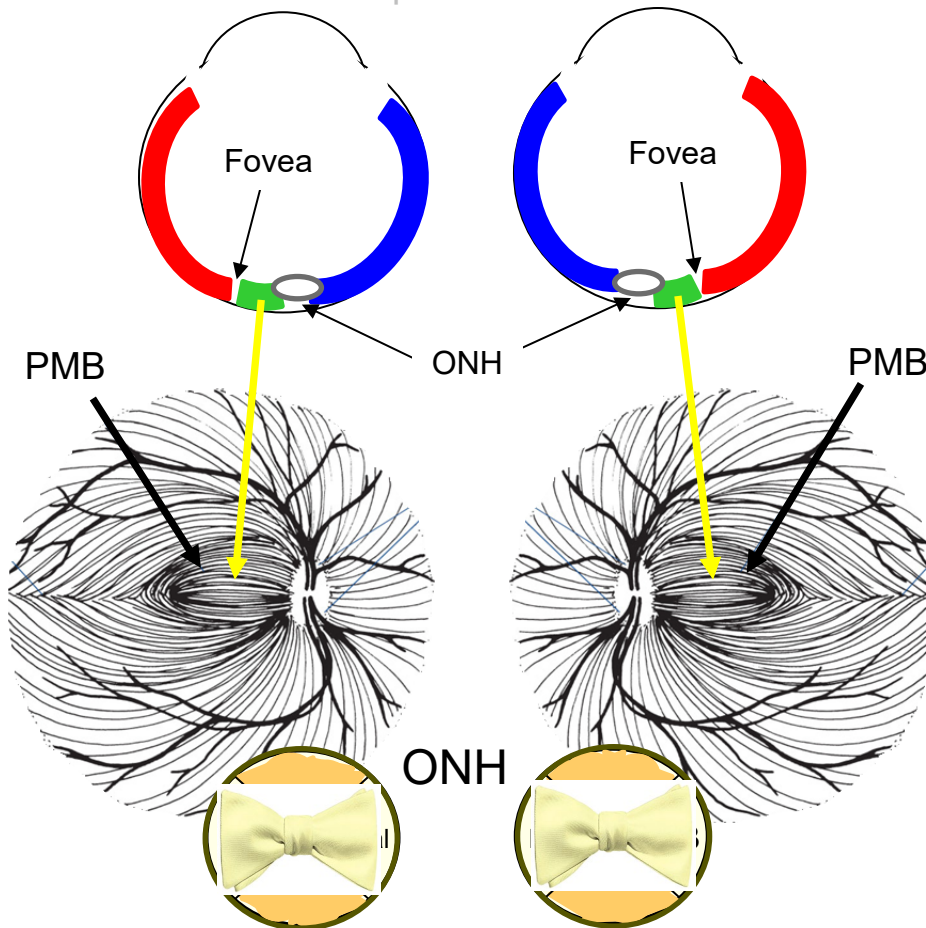
Its nasal quadrant

*So fibers responsible for the temporal VF enter the ONH in the temporal quadrant.*

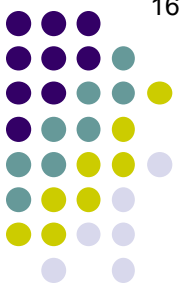
*What is the haberdashery-related term for this appearance?*

**'Bow-tie atrophy'**

*It implies they will be* **pallorous in these quads**



# Visual Field Defects

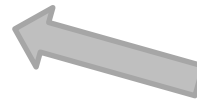


Bow-tie atrophy

# Visual Field Defects



The nasal retinas, along with the portion of the macula nasal to the fovea, are responsible for the temporal visual fields



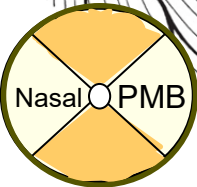
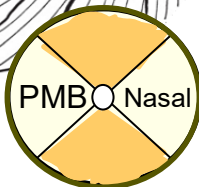
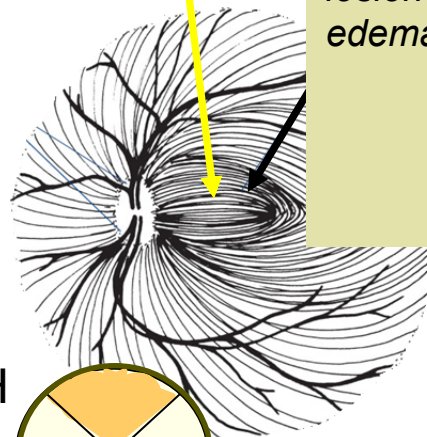
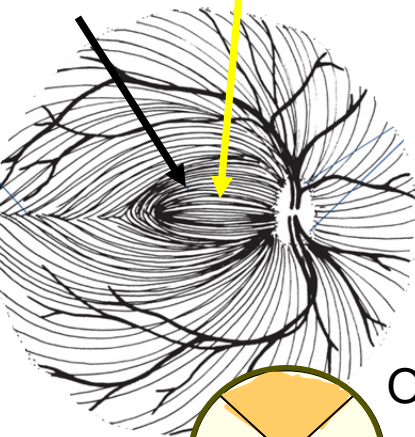
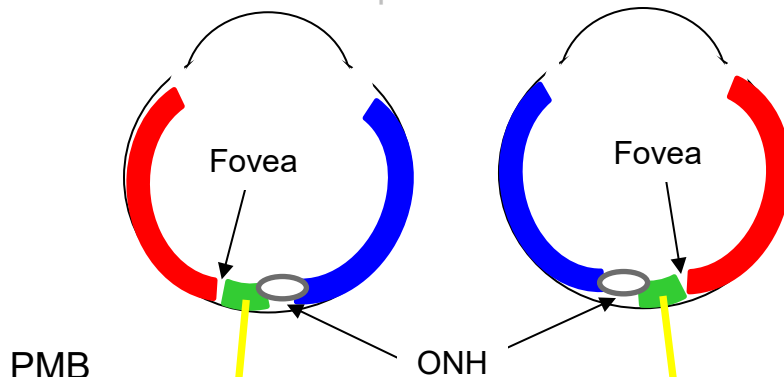
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*Where do PMB fibers enter the ONH?*

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*Atrophy of the ONH is a late sign. When a compressive lesion is to blame, is it safe to assume that the ONHs are edematous initially?*



*What for this appearance?*

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*It implies they will be pallorous in these quads*

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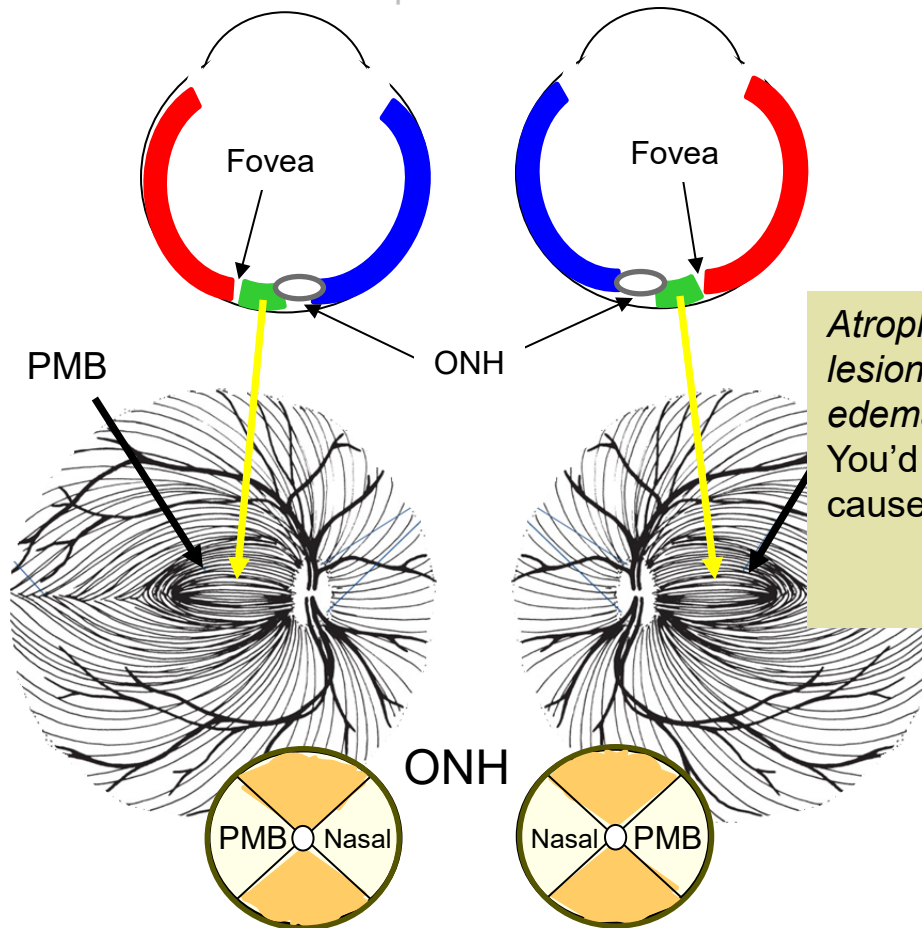
The papillomacular bundle (PMB)

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Its temporal quadrant

*Atrophy of the ONH is a late sign. When a compressive lesion is to blame, is it safe to assume that the ONHs are edematous initially?*

You'd think so, but no—chiasmal lesions essentially **never** cause ONH edema.



*What is this appearance?*

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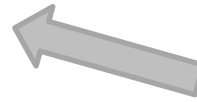
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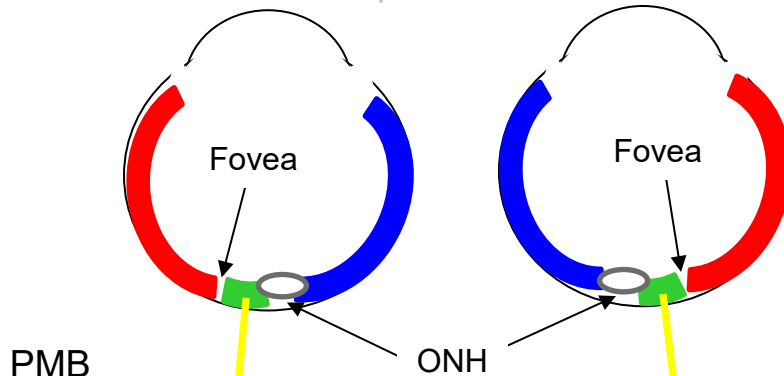


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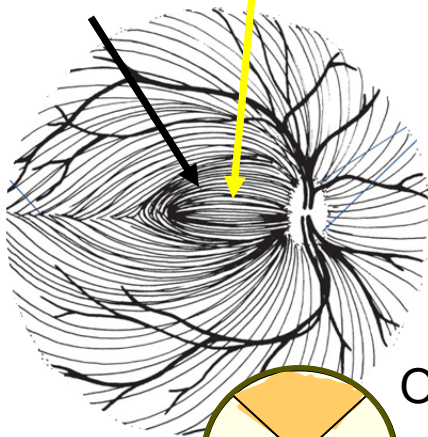
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Its temporal quadrant



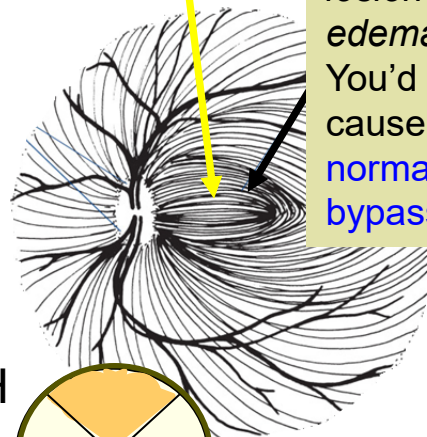
PMB

ONH



ONH

PMB Nasal



Nasal PMB

*Atrophy of the ONH is a late sign. When a compressive lesion is to blame, is it safe to assume that the ONHs are edematous initially?*

You'd think so, but no—chiasmal lesions essentially **never** cause ONH edema. **Early on the nerve heads will appear normal, even in the face of substantial VF loss. They then bypass edema and go straight to atrophy.**

*What is this appearance?*

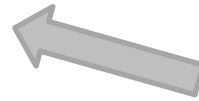
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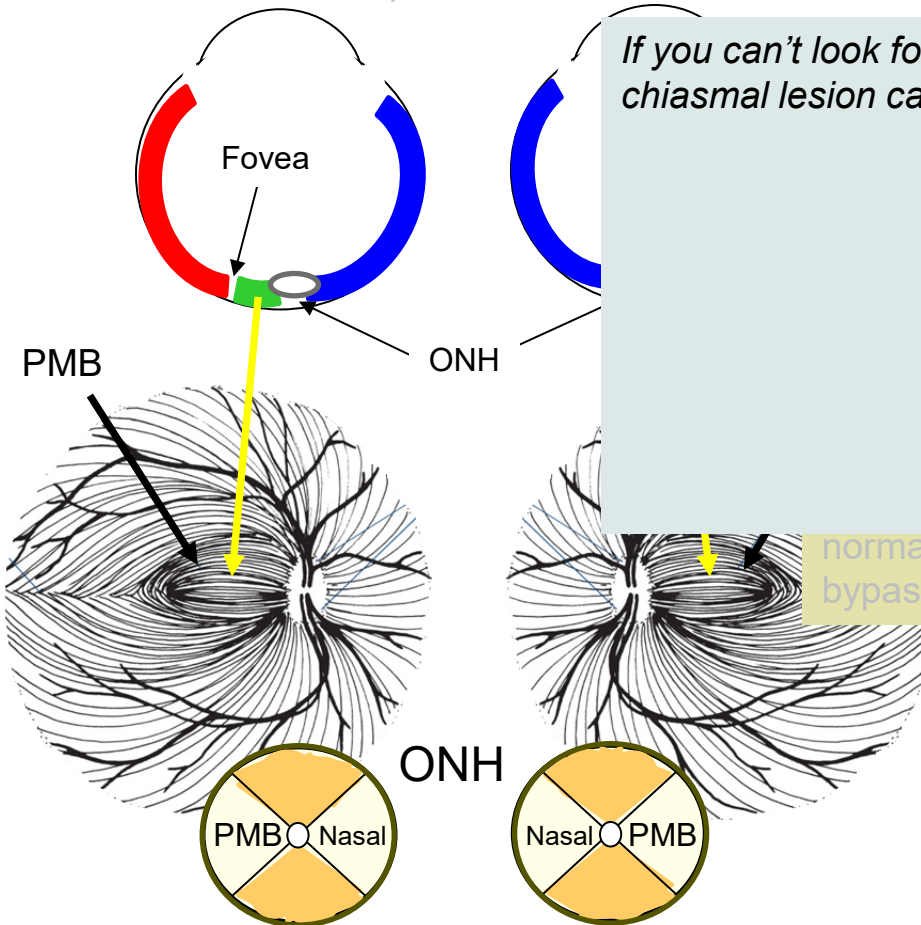


The nasal retinas, along with the portion of the macula nasal to the fovea, are responsible for the temporal visual fields



*Let's drill down on this little patch of macula, because it's really important—so important it has*

*If you can't look for edema, what can you do to assess for a chiasmal lesion causing a bitemporal hemianopia?*



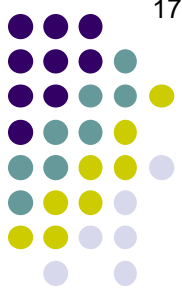
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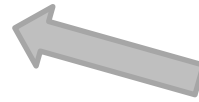
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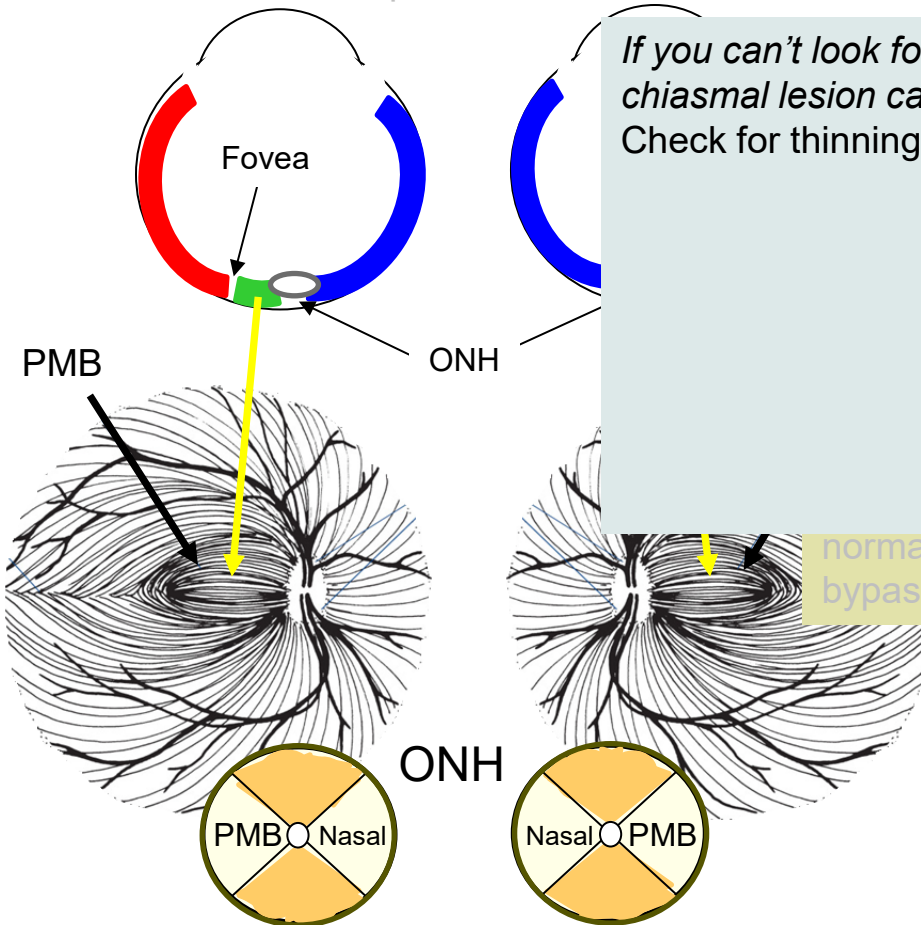


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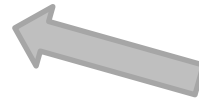
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# Visual Field Defects



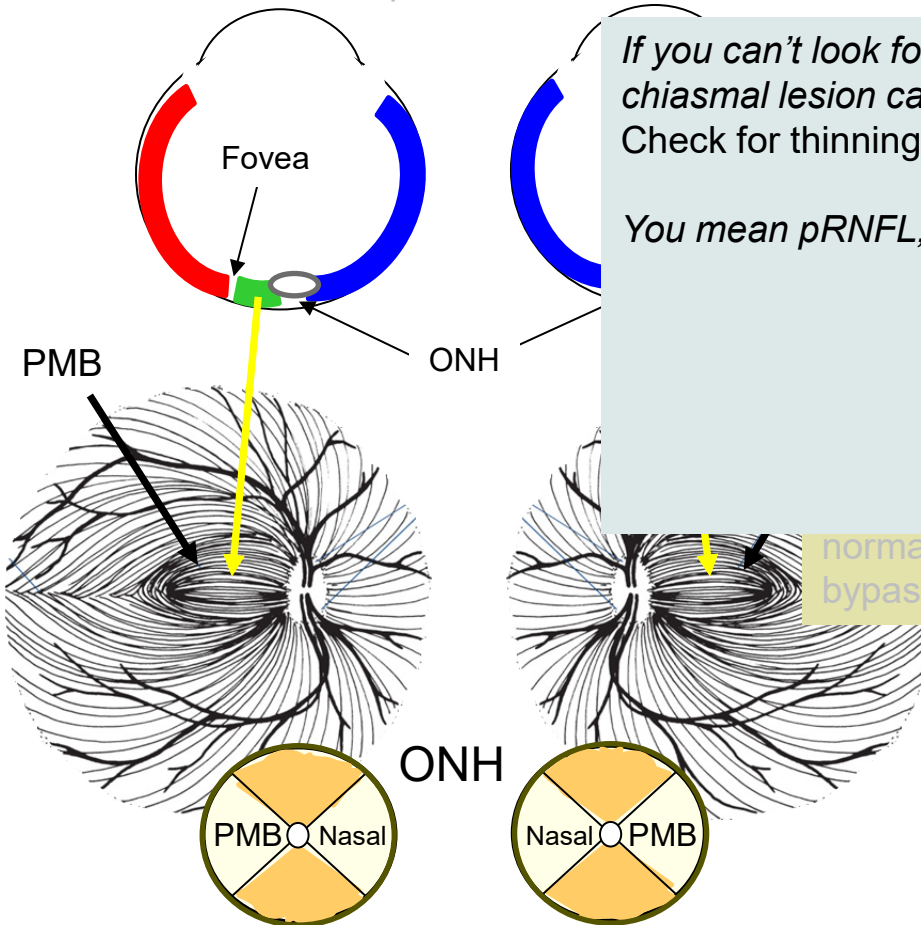
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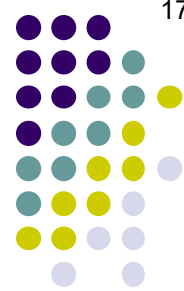
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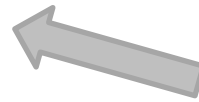
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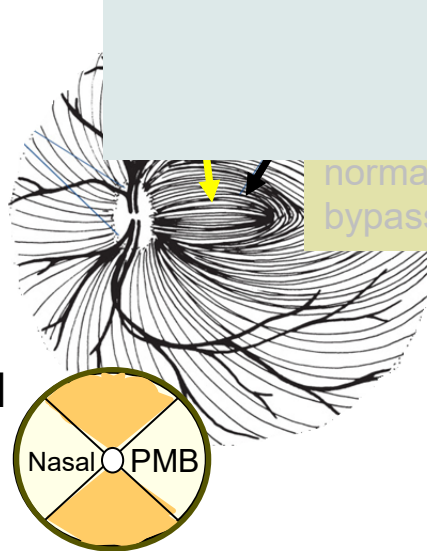
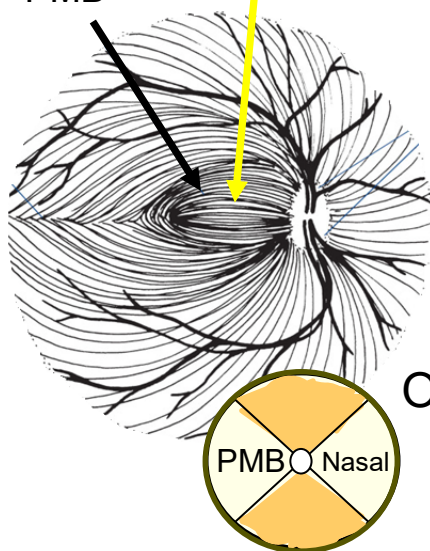
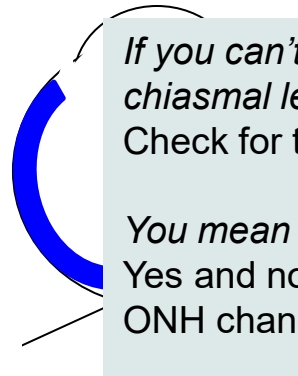
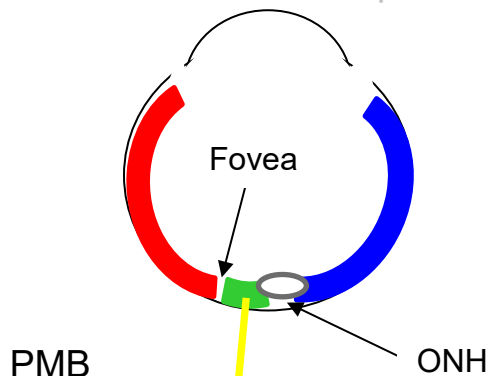


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*Yes and no. Without a doubt, this scan will reveal the expected ONH changes, specifically, thinning of the temp and nasal quads.*



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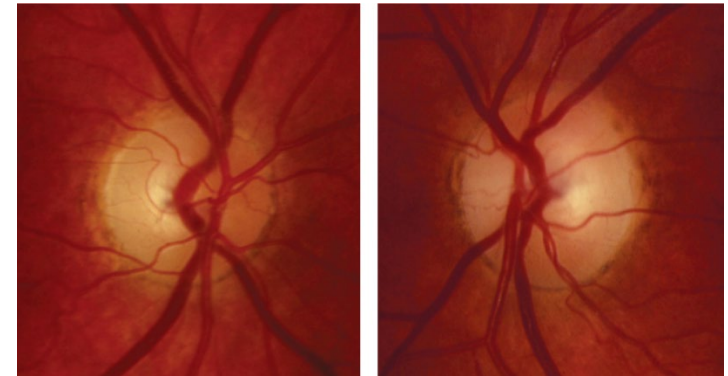
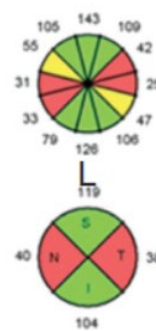
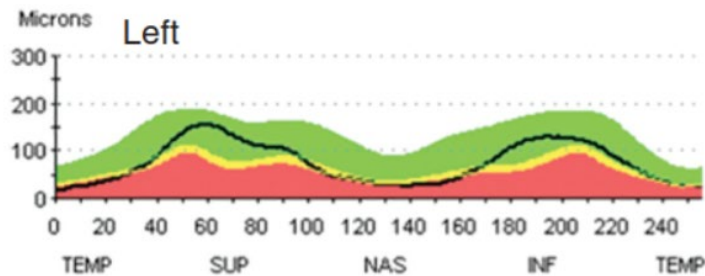
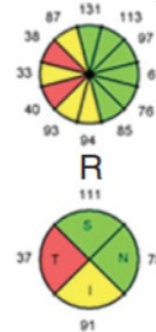
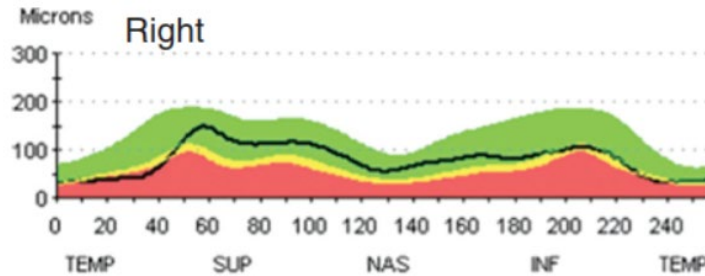
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# Visual Field Defects

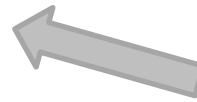


OCT pRNFL and ONHs in compressive chiasmal neuropathy

# Visual Field Defects



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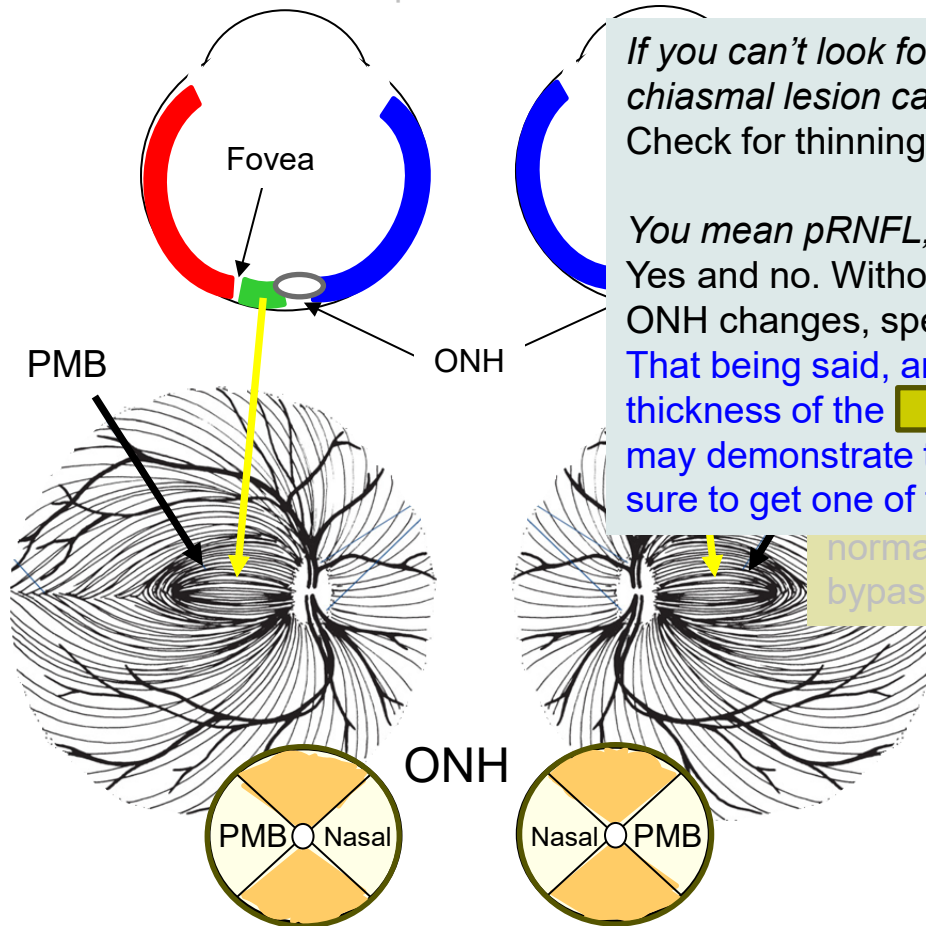
*That being said, an OCT mac with specific attention to the thickness of the five words may demonstrate thinning even before the pRNFL will. So be sure to get one of these as well.*

*normal, even in the face of substantial VF loss. They then bypass edema and go straight to atrophy.*

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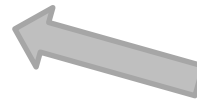
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You mean pRNFL, ie, a glaucoma-type scan?

Yes and no. Without a doubt, this scan will reveal the expected ONH changes, specifically, thinning of the temp and nasal quads.

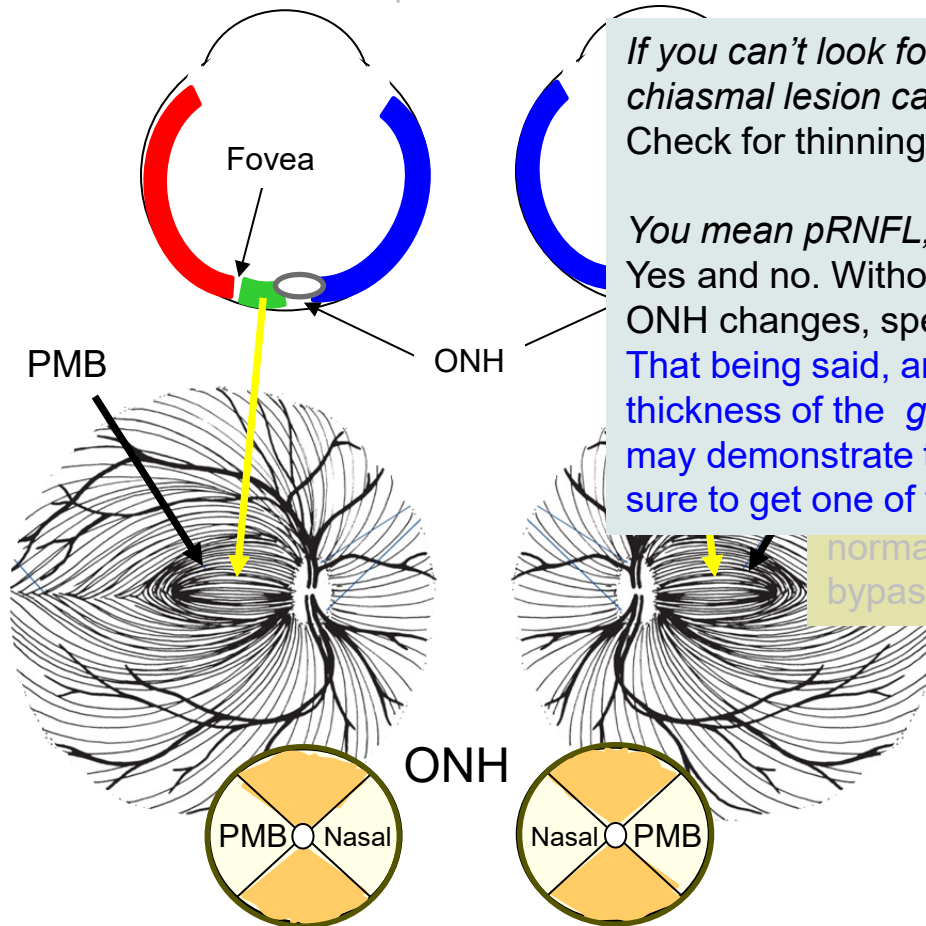
That being said, an OCT mac with specific attention to the thickness of the ganglion cell-inner plexiform layer (GC-IPL) may demonstrate thinning even before the pRNFL will. So be sure to get one of these as well.

normal, even in the face of substantial VF loss. They then bypass edema and go straight to atrophy.

What for this appearance?

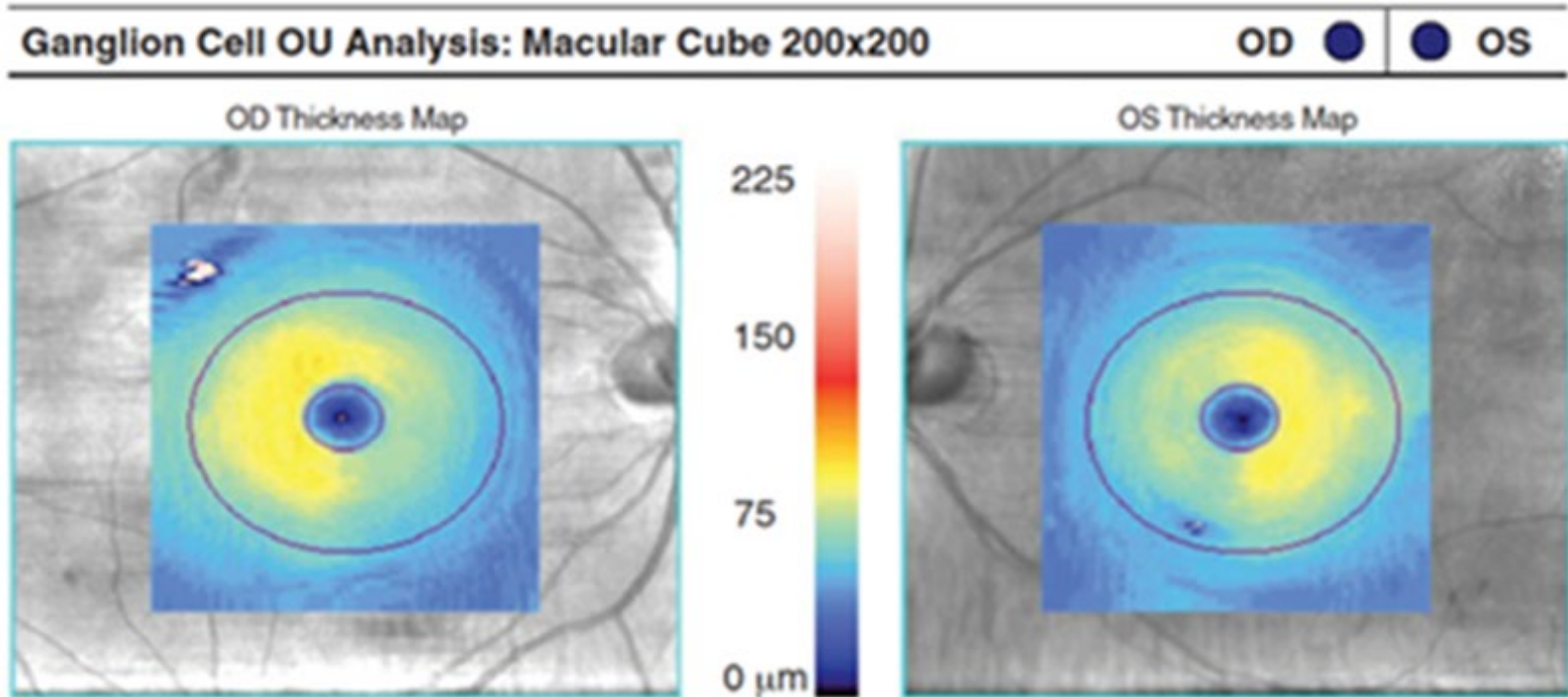
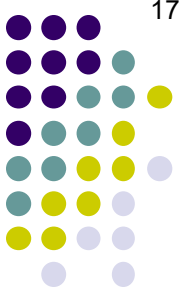
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# Visual Field Defects



GC-IPL demonstrating binasal thinning in chiasmal compression

# Visual Field Defects



*What is the classic cause of a bitemporal hemianopia?*

Retina

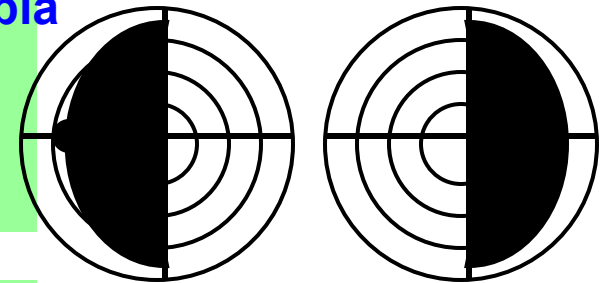
Clin  
Clin

Optic nerve

Dep  
Scc

Optic chiasm

**Bitemporal hemianopia**  
Binasal hemianopia  
Junctional common  
Junctional rare



Retrochiasmal

Optic tract  
LGN  
Optic radiations  
Occipital cortex

# Visual Field Defects

*What is the classic cause of a bitemporal hemianopia?*  
Pituitary adenoma

Retina

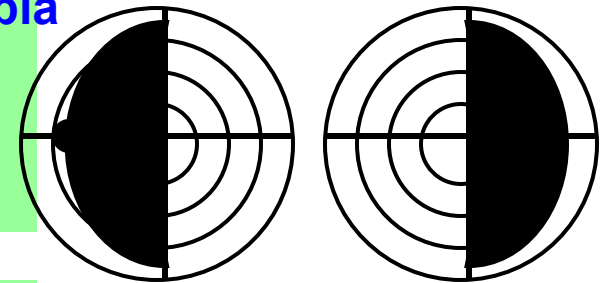
Clin  
Clin

Optic nerve

Dep  
Scot

Optic chiasm

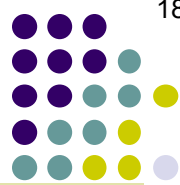
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Retrochiasmal

Optic tract  
LGN  
Optic radiations  
Occipital cortex

# Visual Field Defects



Retina

Clin  
Clim

*What is the classic cause of a bitemporal hemianopia?*

Pituitary adenoma

*Is the hemianopia usually inferior, superior or complete?*

Optic nerve

Dep  
Scc

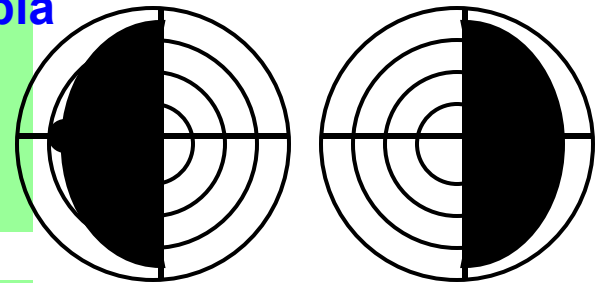
Optic chiasm

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Retrochiasmal

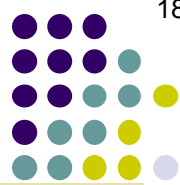
Optic tract

LGN

Optic radiations

Occipital cortex

# Visual Field Defects



Retina

Clin  
Clim

*What is the classic cause of a bitemporal hemianopia?*

Pituitary adenoma

*Is the hemianopia usually inferior, superior or complete?*

Superior

Optic nerve

Dep  
Scc

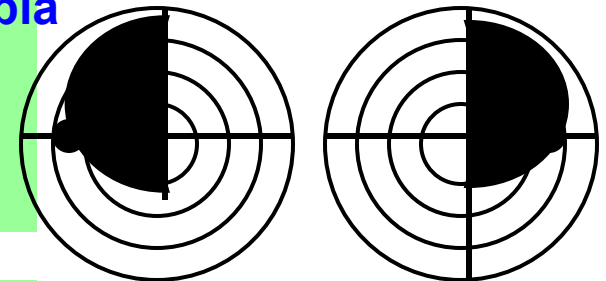
Optic chiasm

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Retrochiasmal

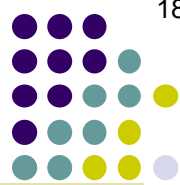
Optic tract

LGN

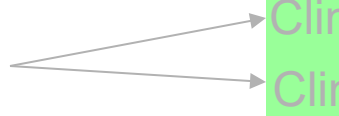
Optic radiations

Occipital cortex

# Visual Field Defects



Retina



*What is the classic cause of a bitemporal hemianopia?*

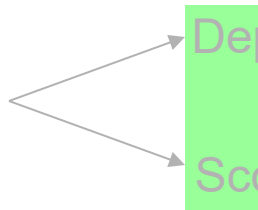
Pituitary adenoma

*Is the hemianopia usually inferior, superior or complete?*

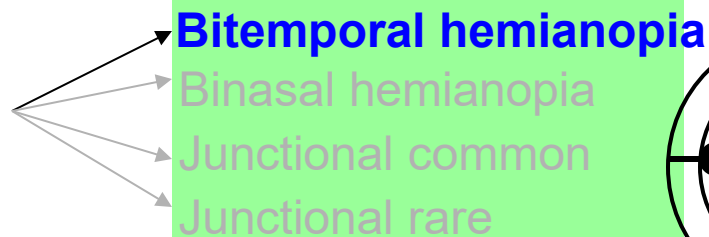
Superior

*Why usually superior?*

Optic nerve



Optic chiasm

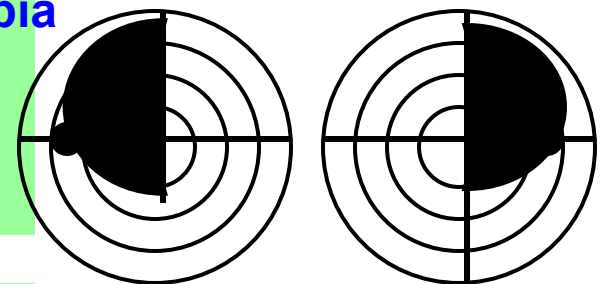


**Bitemporal hemianopia**

Binasal hemianopia

Junctional common

Junctional rare



Retrochiasmal



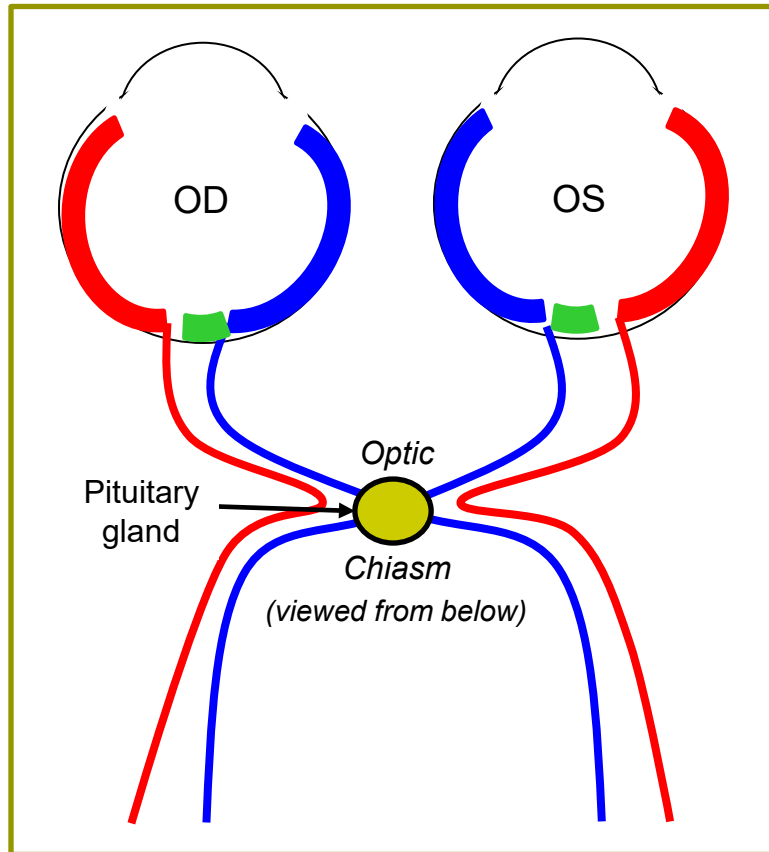
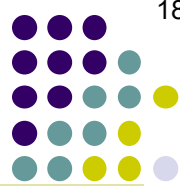
Optic tract

LGN

Optic radiations

Occipital cortex

# Visual Field Defects



*What is the classic cause of a bitemporal hemianopia?*

Pituitary adenoma

*Is the hemianopia usually inferior, superior or complete?*

Superior

*Why usually superior?*

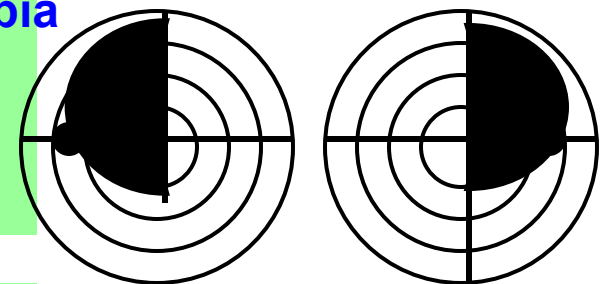
The pituitary gland is **below** the chiasm, therefore, pituitary lesions affect the inferior chiasmal fibers primarily. These fibers account for the **superior** visual field.

**temporal hemianopia**

nasal hemianopia

Junctional common

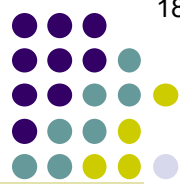
Junctional rare



Retrochiasmal

Optic tract  
LGN  
Optic radiations  
Occipital cortex

# Visual Field Defects



Retina

*What is the classic cause of a bitemporal hemianopia?*

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*Why usually superior?*

The pituitary gland is **below** the chiasm, therefore, pituitary lesions affect the inferior chiasmal fibers primarily. These fibers account for the **superior** visual field.

*Is it usually congruous or incongruous?*

Optic nerve

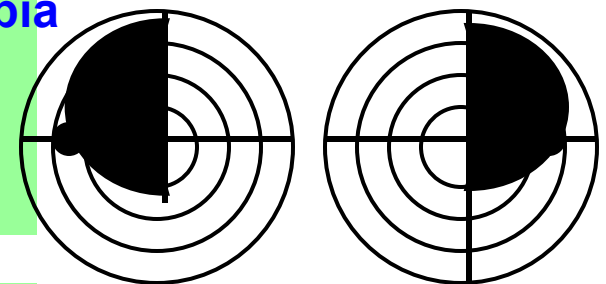
Optic chiasm

**Bitemporal hemianopia**

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Junctional common

Junctional rare



Retrochiasmal

Optic tract

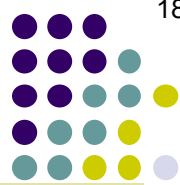
LGN

Optic radiations

Occipital cortex



# Visual Field Defects



Retina

*What is the classic cause of a bitemporal hemianopia?*

Pituitary adenoma

*Is the hemianopia usually inferior, superior or complete?*

Superior

*Why usually superior?*

The pituitary gland is **below** the chiasm, therefore, pituitary lesions affect the inferior chiasmal fibers primarily. These fibers account for the **superior** visual field.

*Is it usually congruous or incongruous?*

Incongruous

Optic nerve

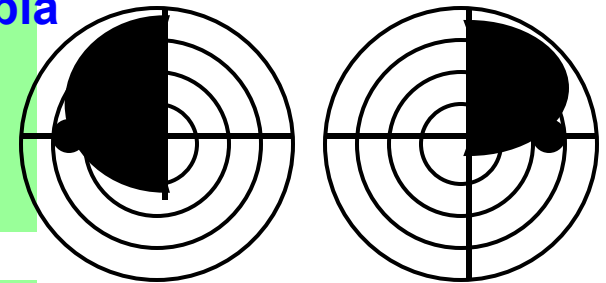
Optic chiasm

**Bitemporal hemianopia**

Binasal hemianopia

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Junctional rare



Retrochiasmal

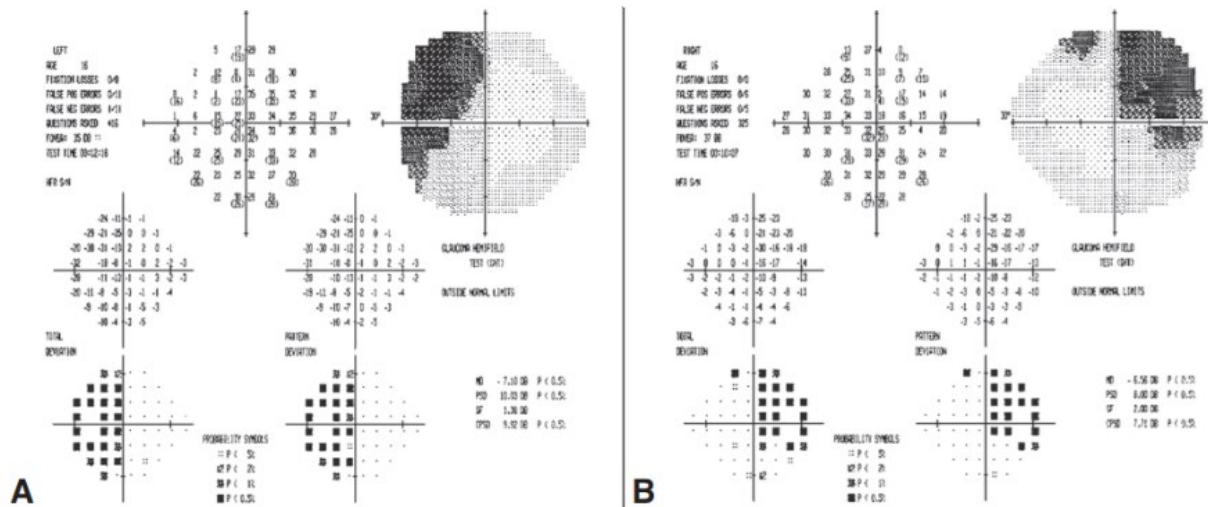
Optic tract

LGN

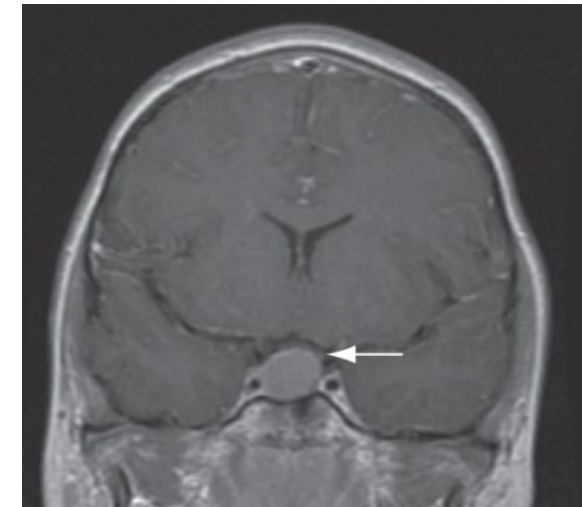
Optic radiations

Occipital cortex

# Visual Field Defects



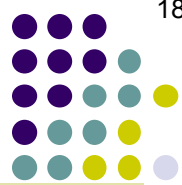
Bitemporal depression is worse superiorly, with margination along the vertical midline.



MRI showing an enhancing intrasellar mass with extension into the suprasellar cistern and upward displacement and compression of the chiasm (*arrow*).

Pituitary adenoma

# Visual Field Defects



*What is the classic cause of a bitemporal hemianopia?*

**Pituitary adenoma**

*Are pituitary adenomas typically benign, or malignant?*

Retina

Optic nerve

Optic chiasm

Retrochiasmal

**Bitemporal hemianopia**

Binasal hemianopia

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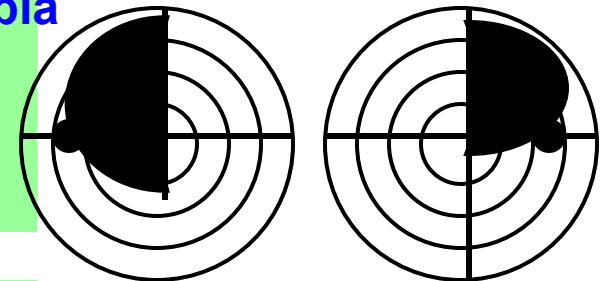
Junctional rare

Optic tract

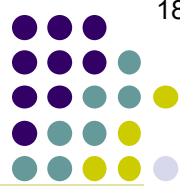
LGN

Optic radiations

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# Visual Field Defects



*What is the classic cause of a bitemporal hemianopia?*

**Pituitary adenoma**

*Are pituitary adenomas typically benign, or malignant?*

**Benign**

Retina

Optic nerve

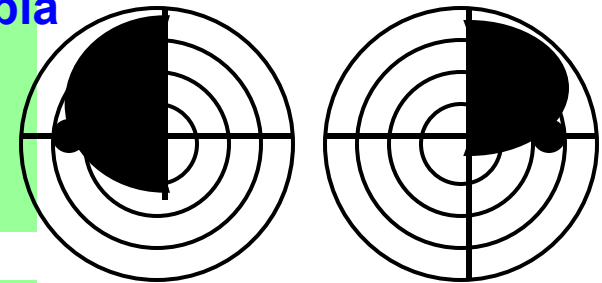
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Retrochiasmal

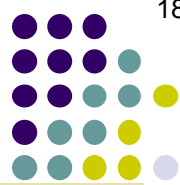
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# Visual Field Defects



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*They come in two sizes. What are they?*

Retina

Optic nerve

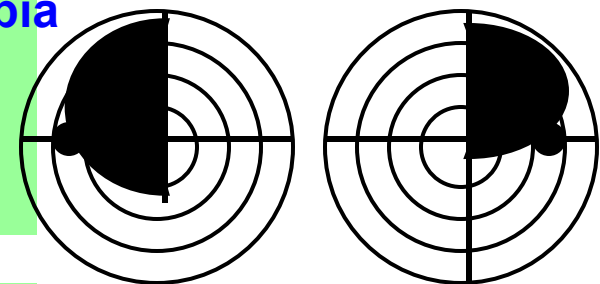
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Retrochiasmal

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**Microadenoma** (< # and unit in greatest diameter) and **macroadenoma** (> # and unit)

Retina

Optic nerve

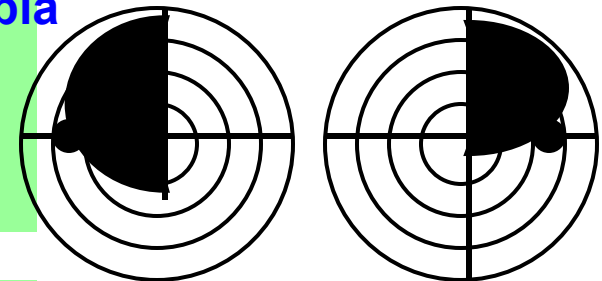
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Retrochiasmal

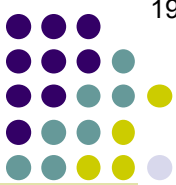
Optic tract

LGN

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Occipital cortex

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Retina

*Are pituitary adenomas typically benign, or malignant?*

Benign

*They come in two sizes. What are they?*

**Microadenoma** (< 10 mm in greatest diameter) and  
**macroadenoma** (> 10 mm )

Optic nerve

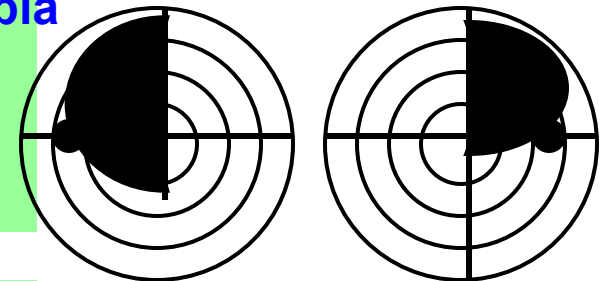
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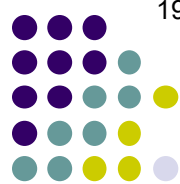
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LGN

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Is a pituitary microadenoma large enough to produce VF cuts?

Optic nerve

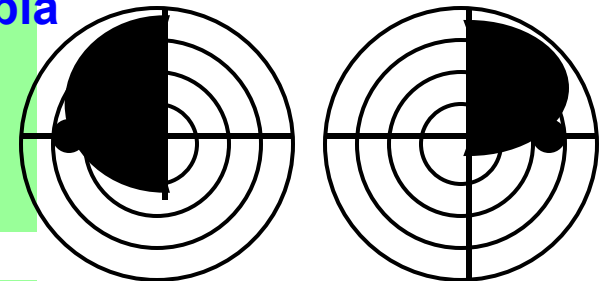
Optic chiasm

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Retrochiasmal

Optic tract

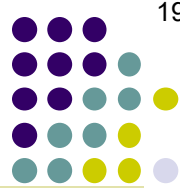
LGN

Optic radiations

Occipital cortex



# Visual Field Defects



What is the classic cause of a bitemporal hemianopia?

**Pituitary adenoma**

Retina

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Benign

They come in two sizes. What are they?

**Microadenoma** (< 10 mm in greatest diameter) and  
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Optic nerve

Is a pituitary microadenoma large enough to produce  
VF cuts?

No, it has to be a macroadenoma to do so

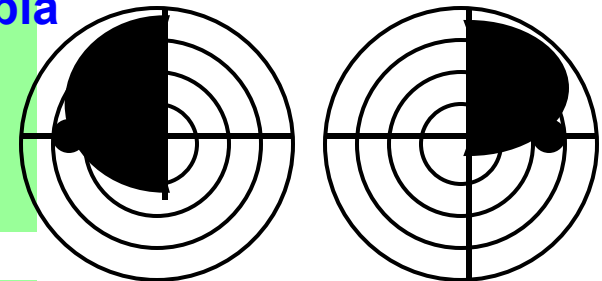
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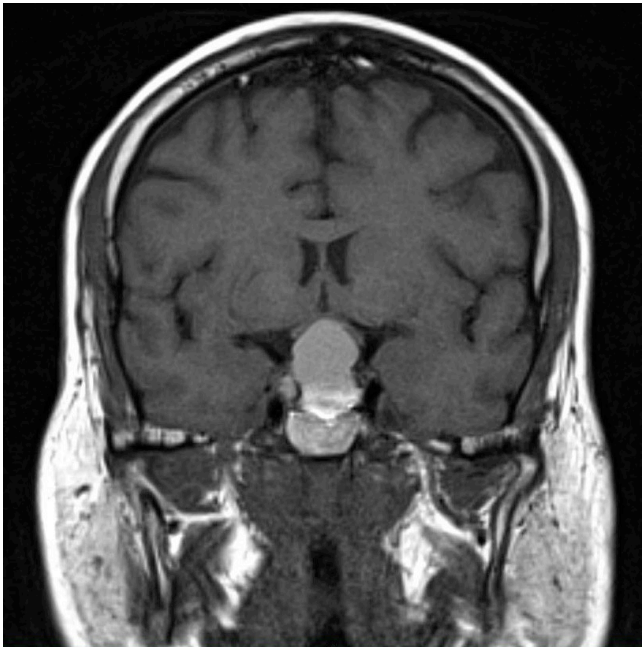
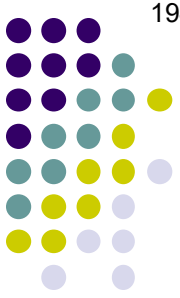
Retrochiasmal

Optic tract

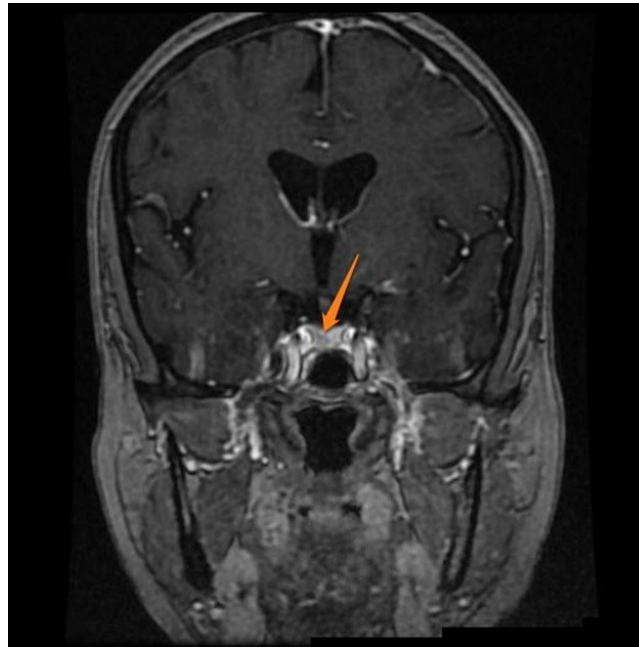
LGN

Optic radiations

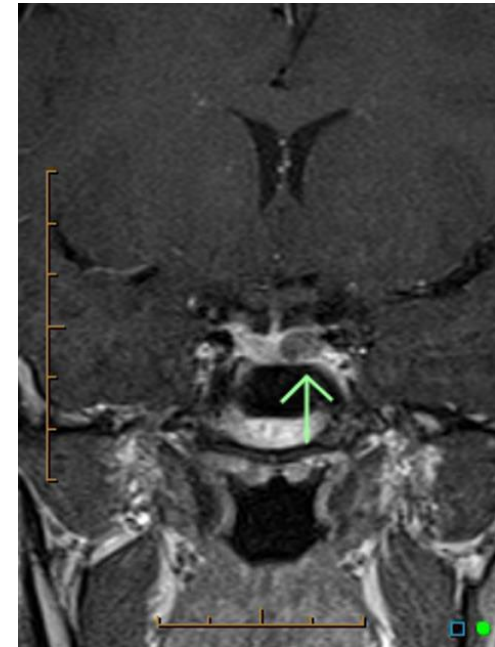
Occipital cortex



Macro



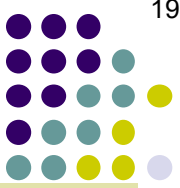
Micro



Micro

Pituitary adenoma: Macro vs micro

# Visual Field Defects



*What is the classic cause of a bitemporal hemianopia?*

**Pituitary adenoma**

*The presence of a pituitary adenoma places a pt at risk for what potentially fatal event?*

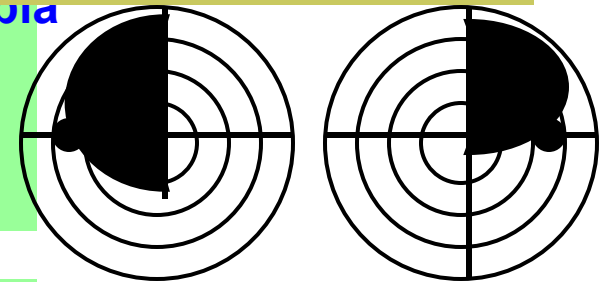
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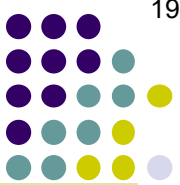
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# Visual Field Defects



*What is the classic cause of a bitemporal hemianopia?*

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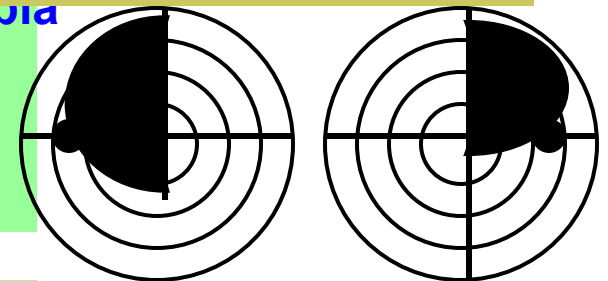
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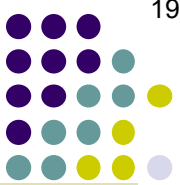
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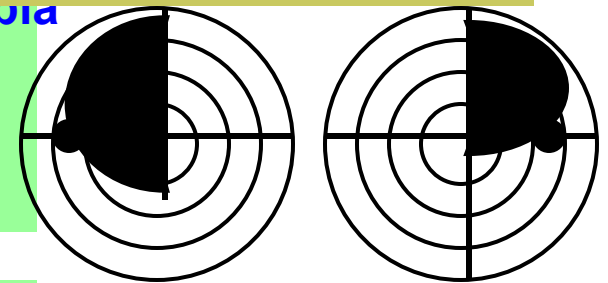
Optic chiasm

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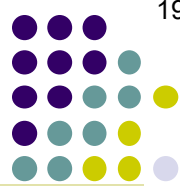
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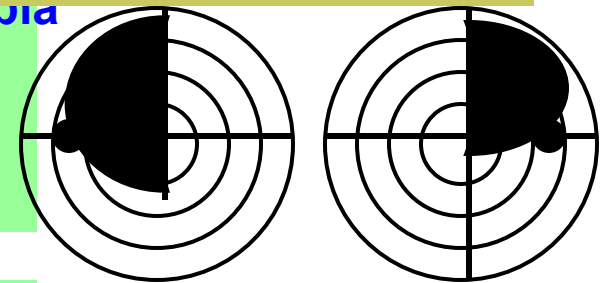
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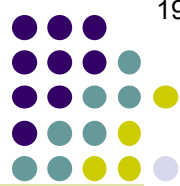
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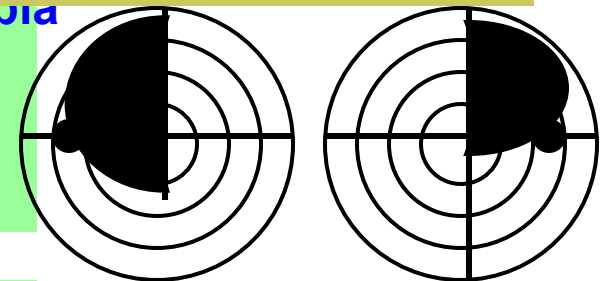
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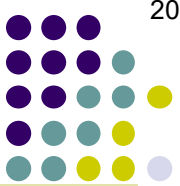
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Perhaps, but for sure they'll c/o sudden [redacted] (present in essentially all cases)

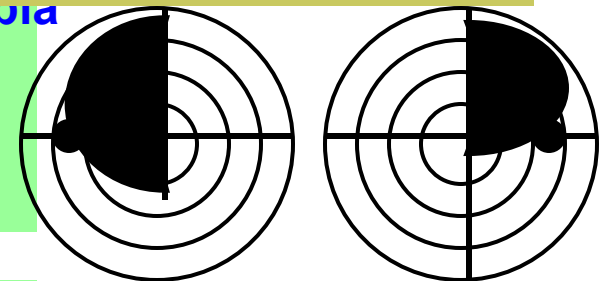
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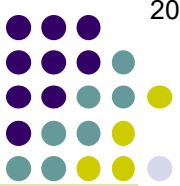
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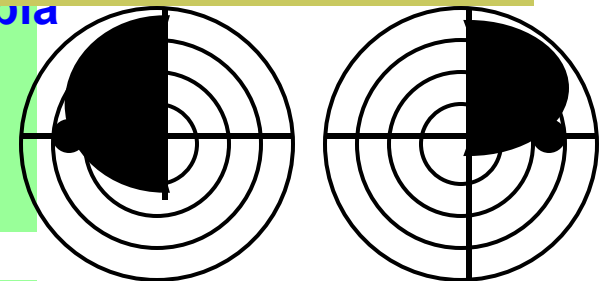
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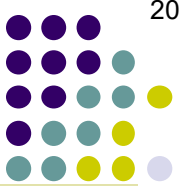
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In a nu

Sudden

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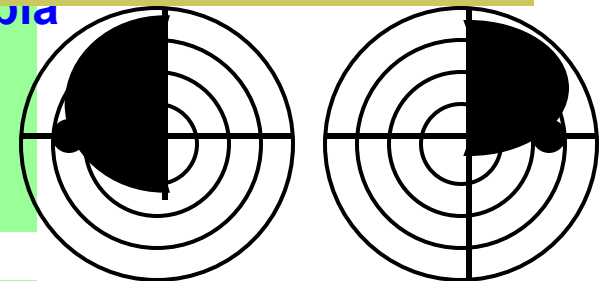
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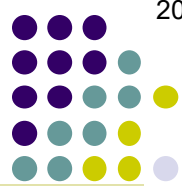
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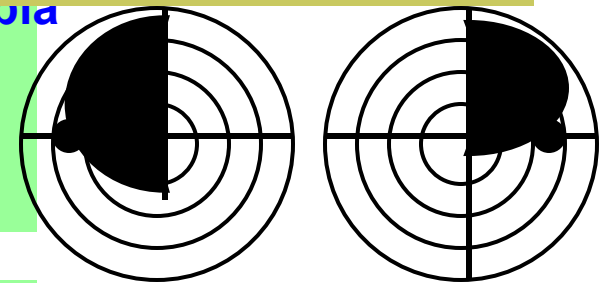
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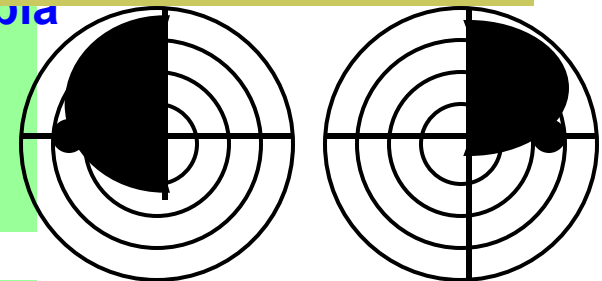
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Severe

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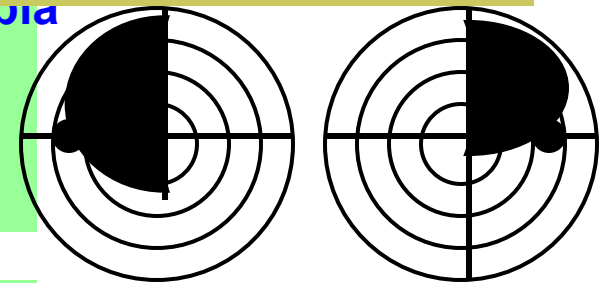
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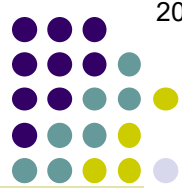
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*Involvement of the adjacent cavernous sinus can result in what accompanying signs?*

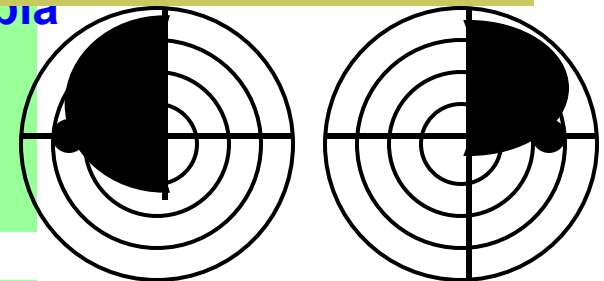
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Retrochiasmal

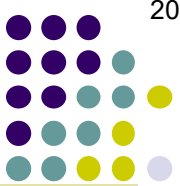
Optic tract

LGN

Optic radiations

Occipital cortex

# Visual Field Defects



*What is the classic cause of a bitemporal hemianopia?*

**Pituitary adenoma**

*The presence of a pituitary adenoma places a pt at risk for what potentially fatal event?*  
Pituitary apoplexy

*In a nutshell, what is pituitary apoplexy?*

Sudden loss of pituitary function 2ndry to hemorrhage or infarction (*apoplexy* is an old term meaning 'stroke')

*Does the pt present c/o bitemporal hemianopia?*

Perhaps, but for sure they'll c/o sudden headache (present in essentially all cases)

*Involvement of the adjacent cavernous sinus can result in what accompanying signs?*

Ophthalmoparesis and/or facial

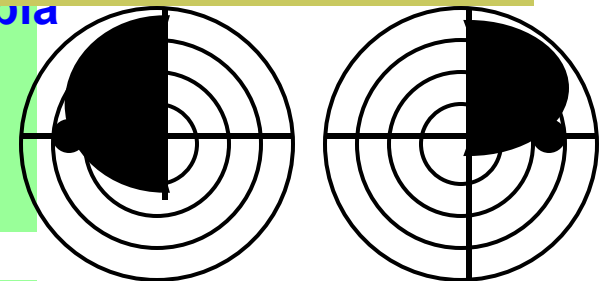
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**Bitemporal hemianopia**

Binasal hemianopia

Junctional common

Junctional rare



Retrochiasmal

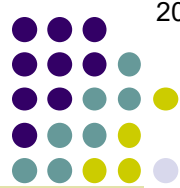
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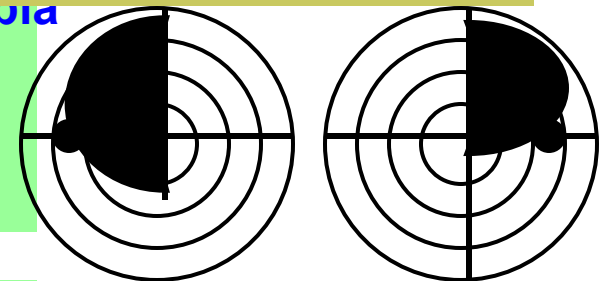
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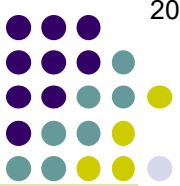
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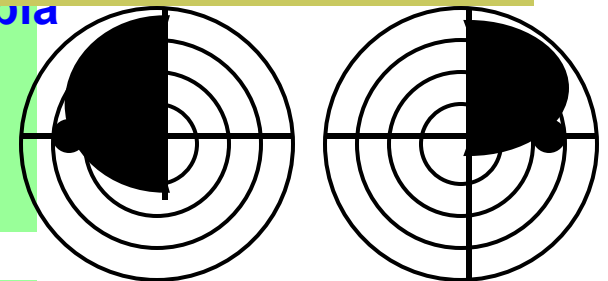
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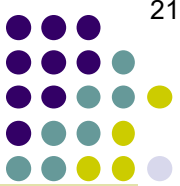
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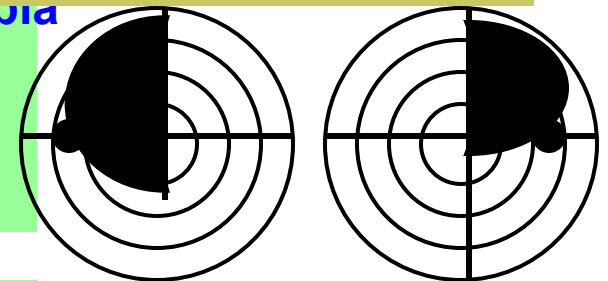
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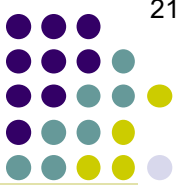
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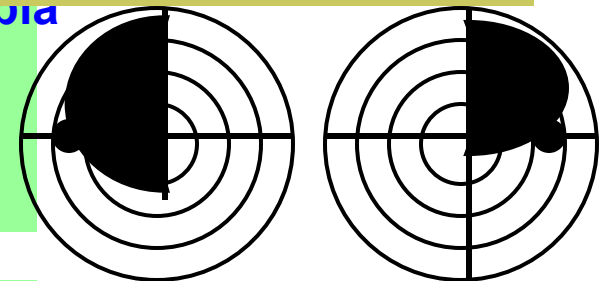
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*How is pituitary apoplexy diagnosed?*

In addition to the clinical setting (ie, HA; N/V; altered mental state; diplopia), imaging will reveal a pituitary adenoma with a necrotic center and a ring of gadolinium enhancement ( '*pituitary ring sign*' )

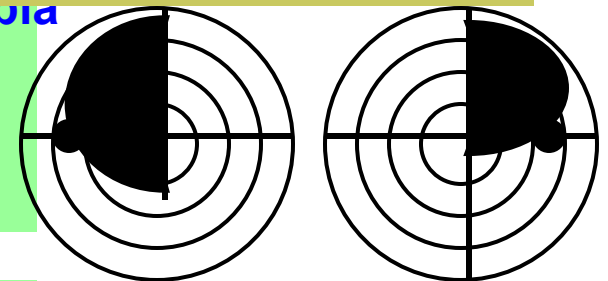
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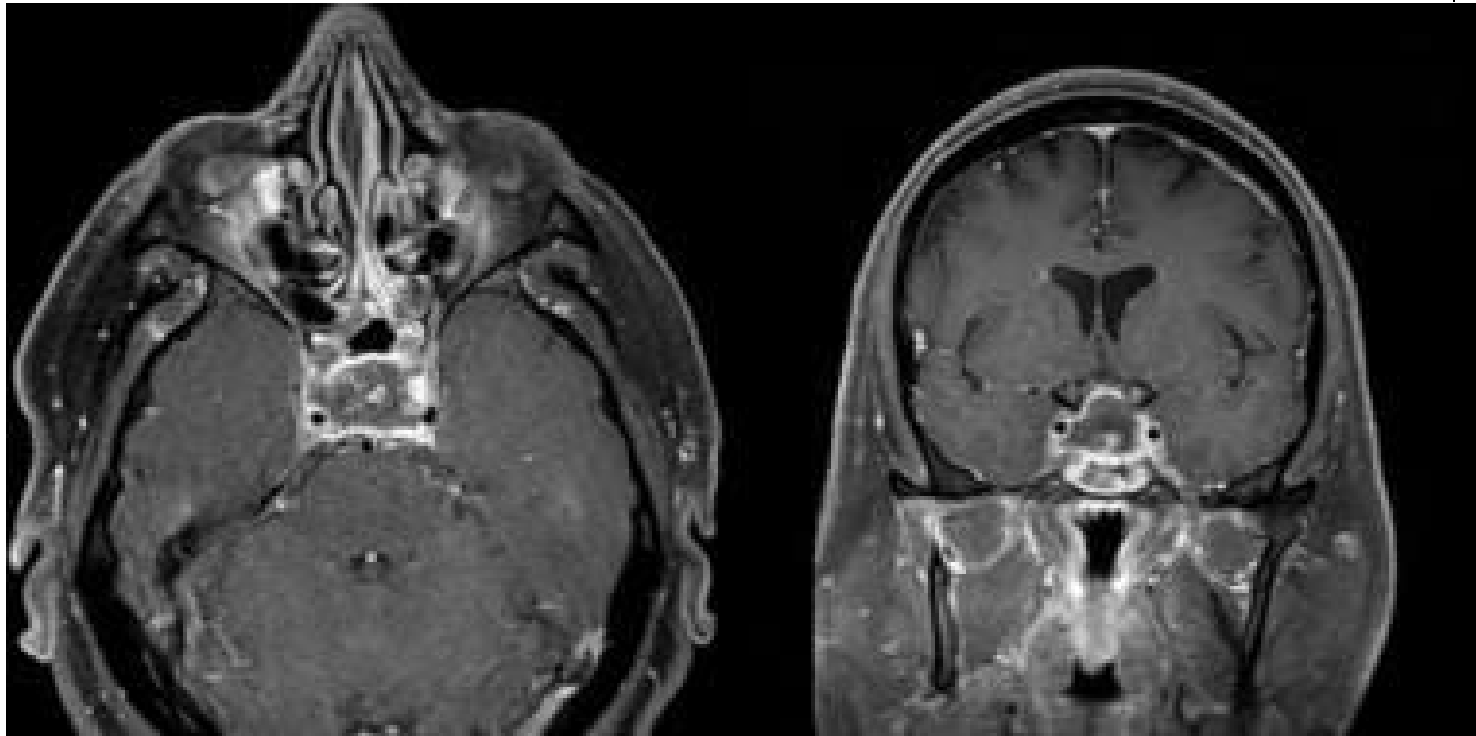
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# Visual Field Defects



MRI showing a large pituitary tumor that has recently undergone ischemic apoplexy showing a necrotic (hypointense) center and ring of gadolinium enhancement (hyperintense), ie, the "pituitary ring sign"

# Visual Field Defects



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a bitemporal hemianopia?

**potentially fatal event?**

The presence of  
Pituitary apoplexy

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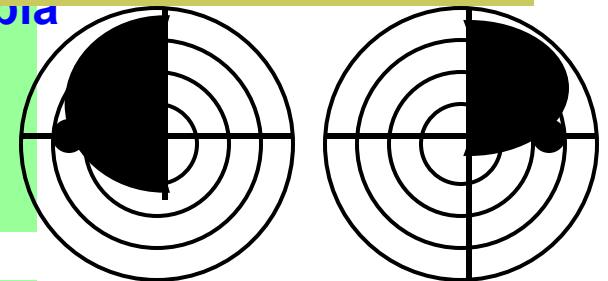
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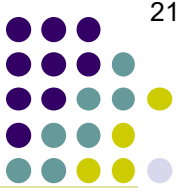
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# Visual Field Defects



What is the life-threatening emergency associated with pituitary apoplexy?

Adrenal crisis

**potentially fatal event?**

The present  
Pituitary a

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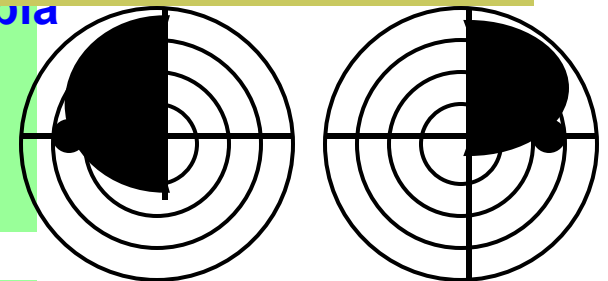
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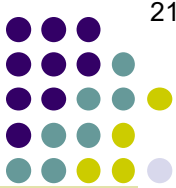
Optic tract

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# Visual Field Defects



What is the life-threatening emergency associated with pituitary apoplexy? *a bitemporal hemianopia?*

Adrenal crisis

**potentially fatal event?**

What intervention is needed to avert death?

The presence of  
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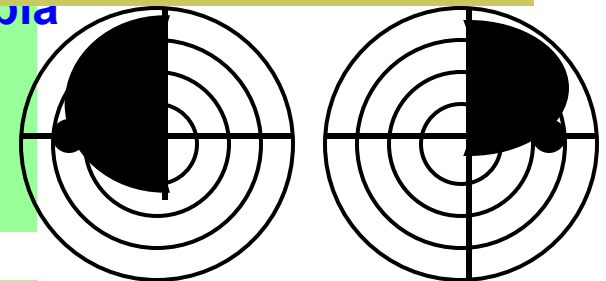
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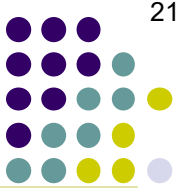
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# Visual Field Defects



*What is the life-threatening emergency associated with pituitary apoplexy?*

Adrenal crisis

*What intervention is needed to avert death?*

Corticosteroids must be started immediately

*What is the life-threatening emergency associated with a bitemporal hemianopia?*

**potentially fatal event?**

*The presentation*

*Pituitary apoplexy*

*In a nutshell, what is pituitary apoplexy?*

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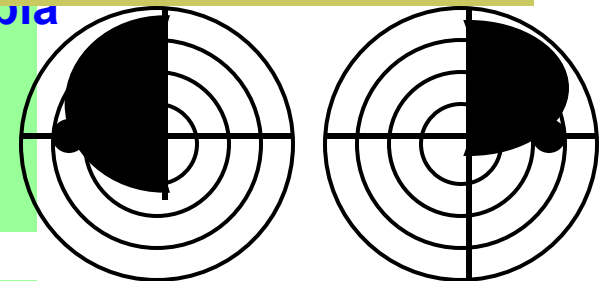
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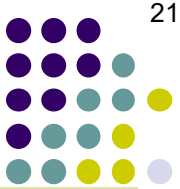
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Occipital cortex

# Visual Field Defects



What is the life-threatening emergency associated with pituitary apoplexy?

Adrenal crisis

**potentially fatal event?**

What intervention is needed to avert death?

**Corticosteroids must be started immediately**

What is the life-threatening sequelae averted by the steroids?

Does the pt present c/o bitemporal hemianopia?

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Involvement of the adjacent cavernous sinus can result in what accompanying signs?

Ophthalmoparesis and/or facial hypoesthesia (from CN5 involvement)

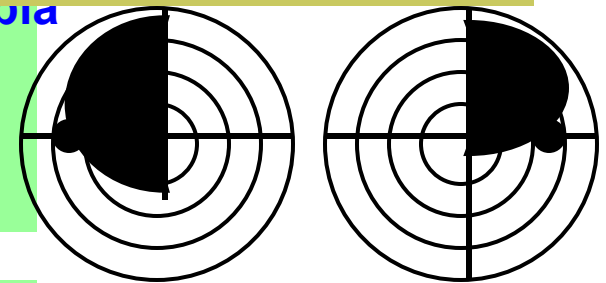
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Retrochiasmal

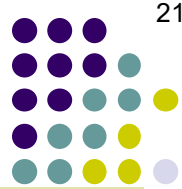
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# Visual Field Defects



What is the life-threatening emergency associated with pituitary apoplexy?

Adrenal crisis

What intervention is needed to avert death?

**Corticosteroids must be started immediately**

**potentially fatal event?**

What is the life-threatening sequelae averted by the steroids?

Severe hypotension

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Involvement of the adjacent cavernous sinus can result in what accompanying signs?

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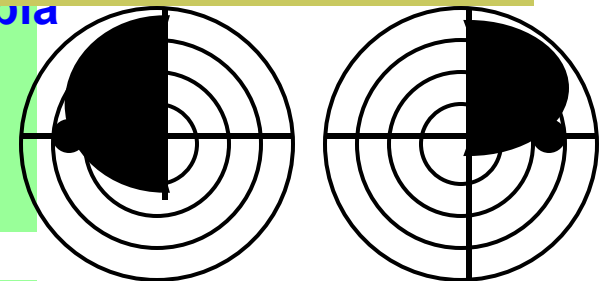
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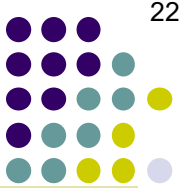
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What is the life-threatening emergency associated with pituitary apoplexy?

Adrenal crisis

The present

Pituitary a

What intervention is needed to avert death?

Corticosteroids must be started immediately

**potentially fatal event?**

In this context, what is Sheehan syndrome?

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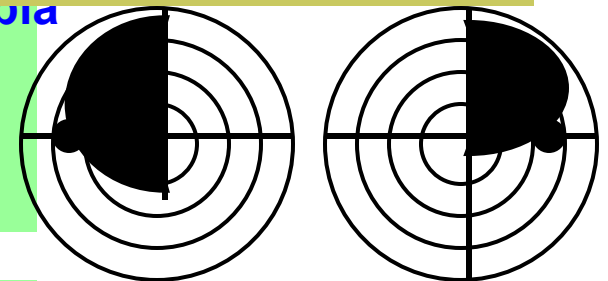
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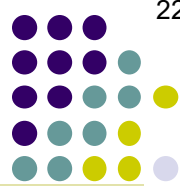
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Adrenal crisis

The prese

Pituitary a

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Pituitary apoplexy of a nontumorous gland precipitated by  
with subsequent spasm of the arterioles supplying the anterior pituitary gland

four key words

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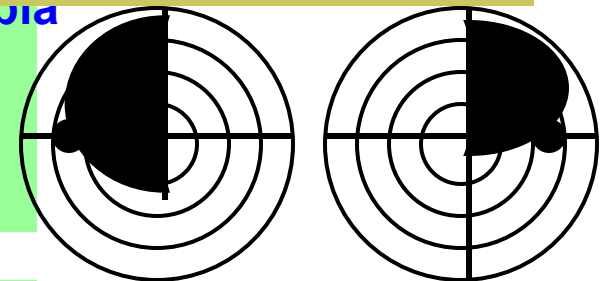
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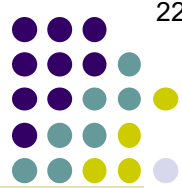
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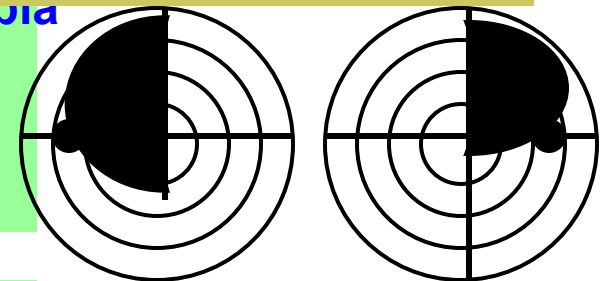
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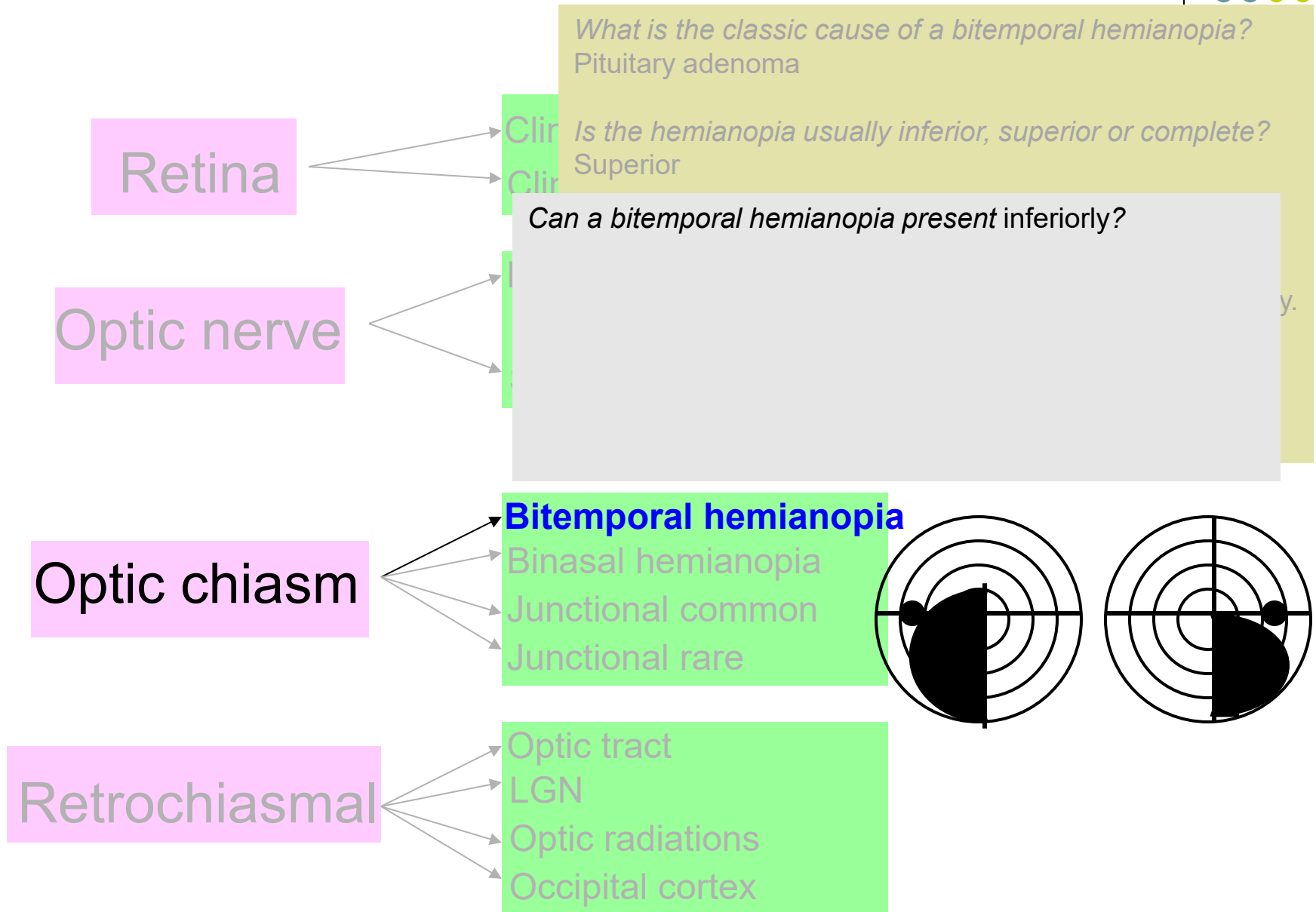
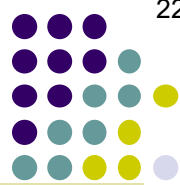
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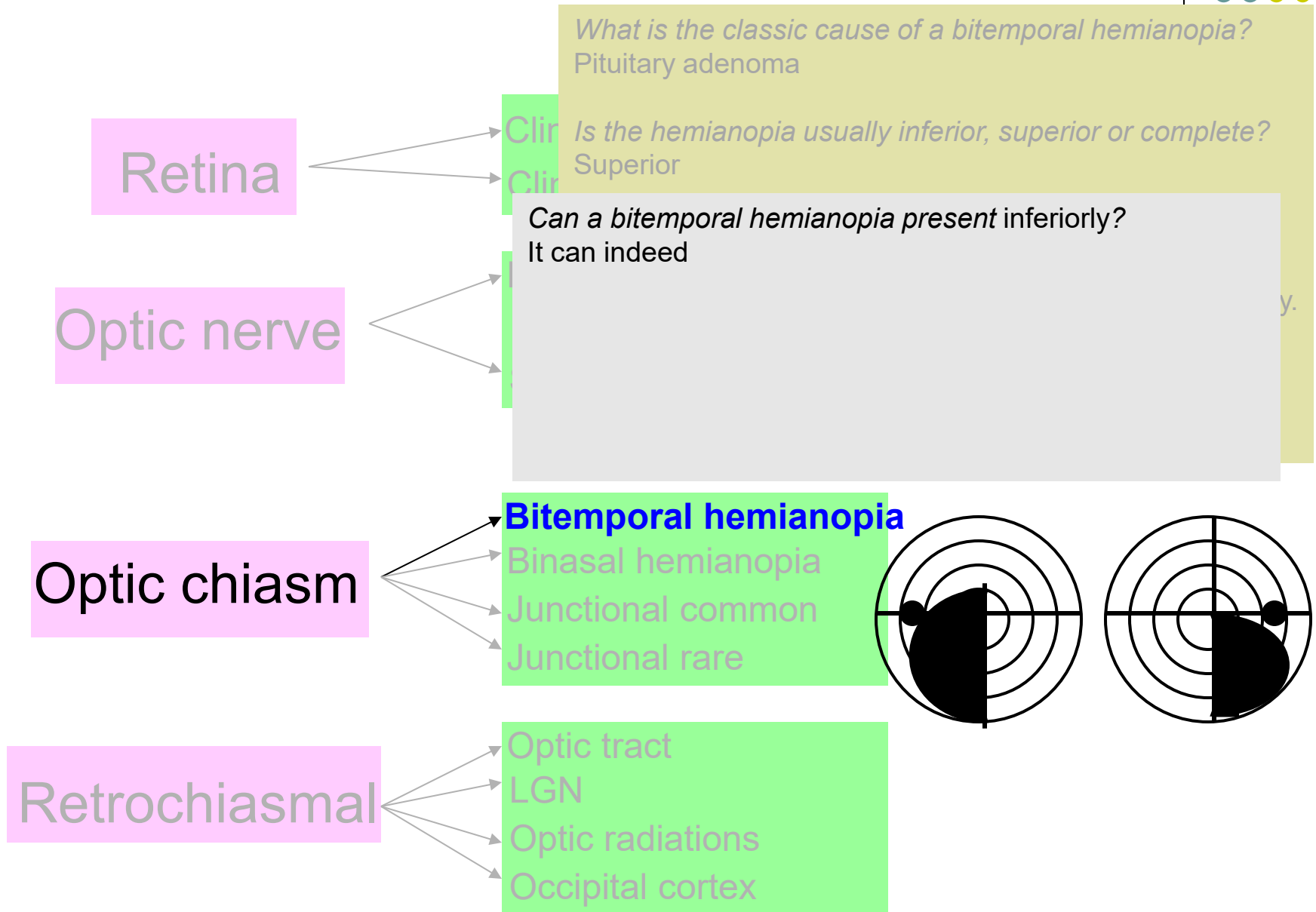
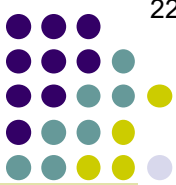
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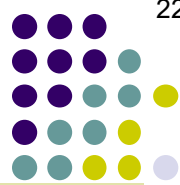


# Visual Field Defects





# Visual Field Defects



Retina

*What is the classic cause of a bitemporal hemianopia?*

Pituitary adenoma

*Is the hemianopia usually inferior, superior or complete?*

Superior

*Can a bitemporal hemianopia present inferiorly?*

It can indeed

*What would this imply about the location of the lesion?*

Optic nerve

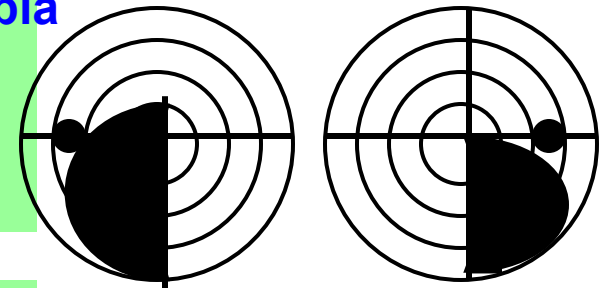
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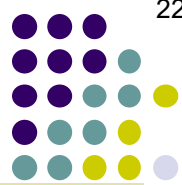
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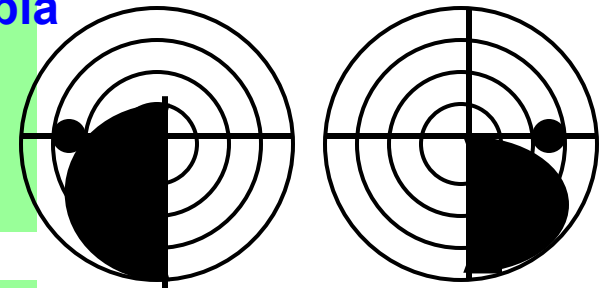
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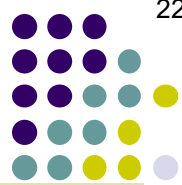
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*What is the classic suprachiasmal lesion implicated in this?*

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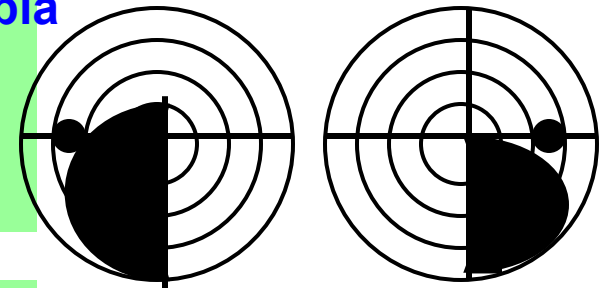
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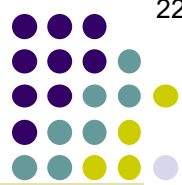
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*What is the classic suprachiasmal lesion implicated in this?*

Craniopharyngioma

Optic nerve

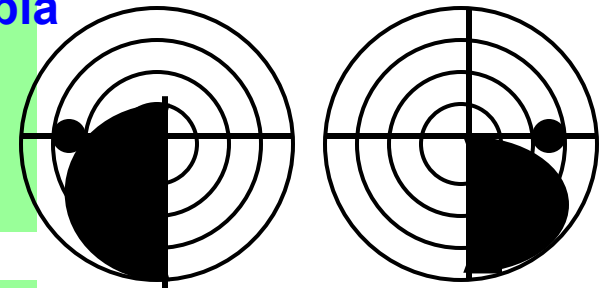
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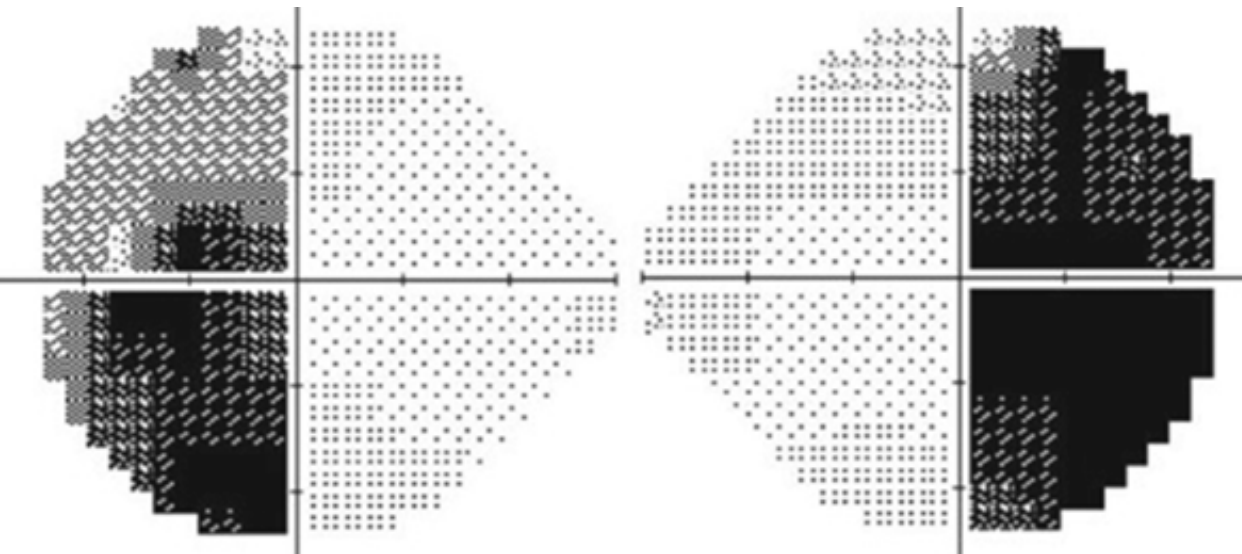
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# Visual Field Defects



Bitemporal hemianopia worse inferiorly

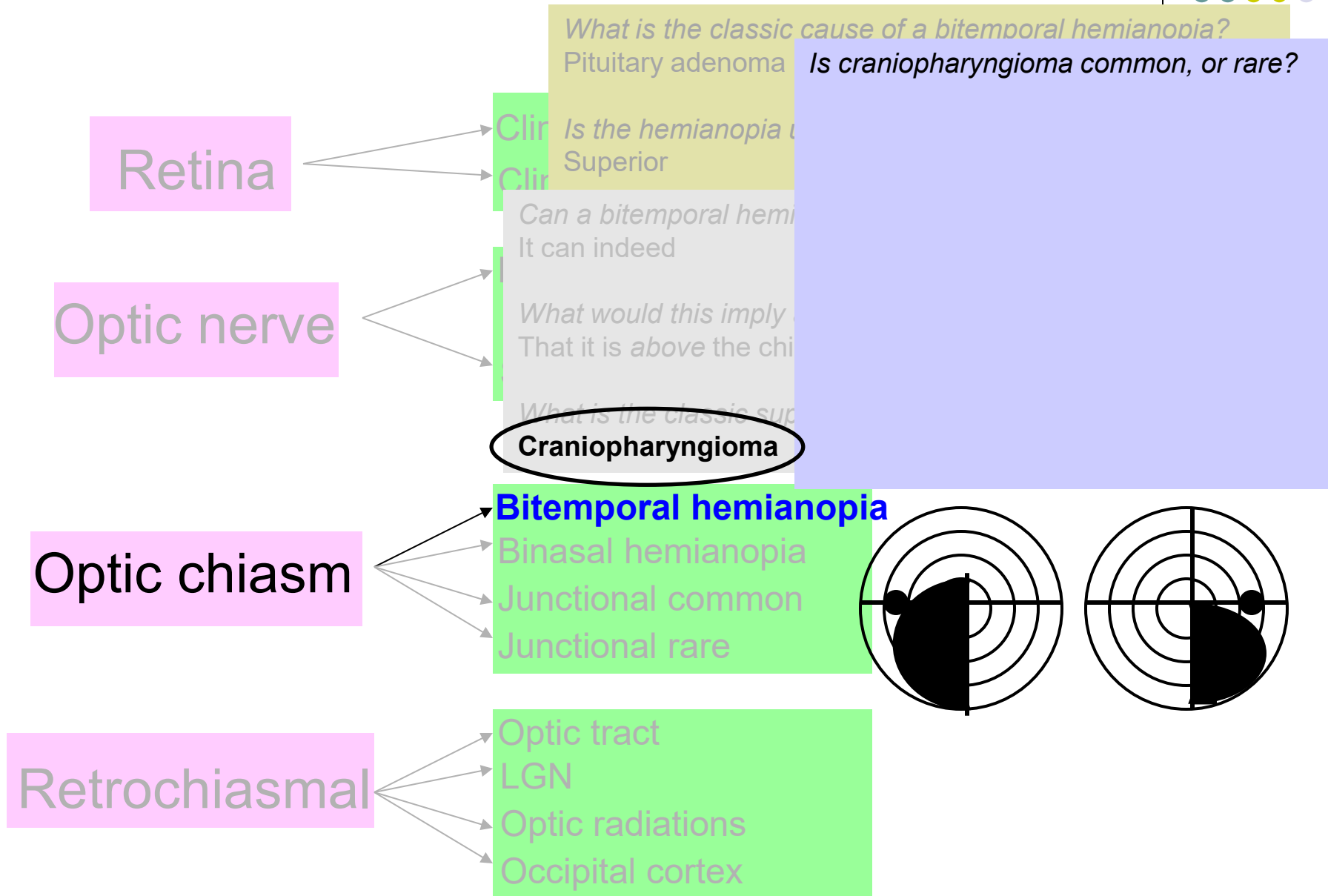
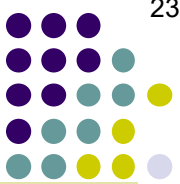


MRI with suprachiasmal mass

Craniopharyngioma

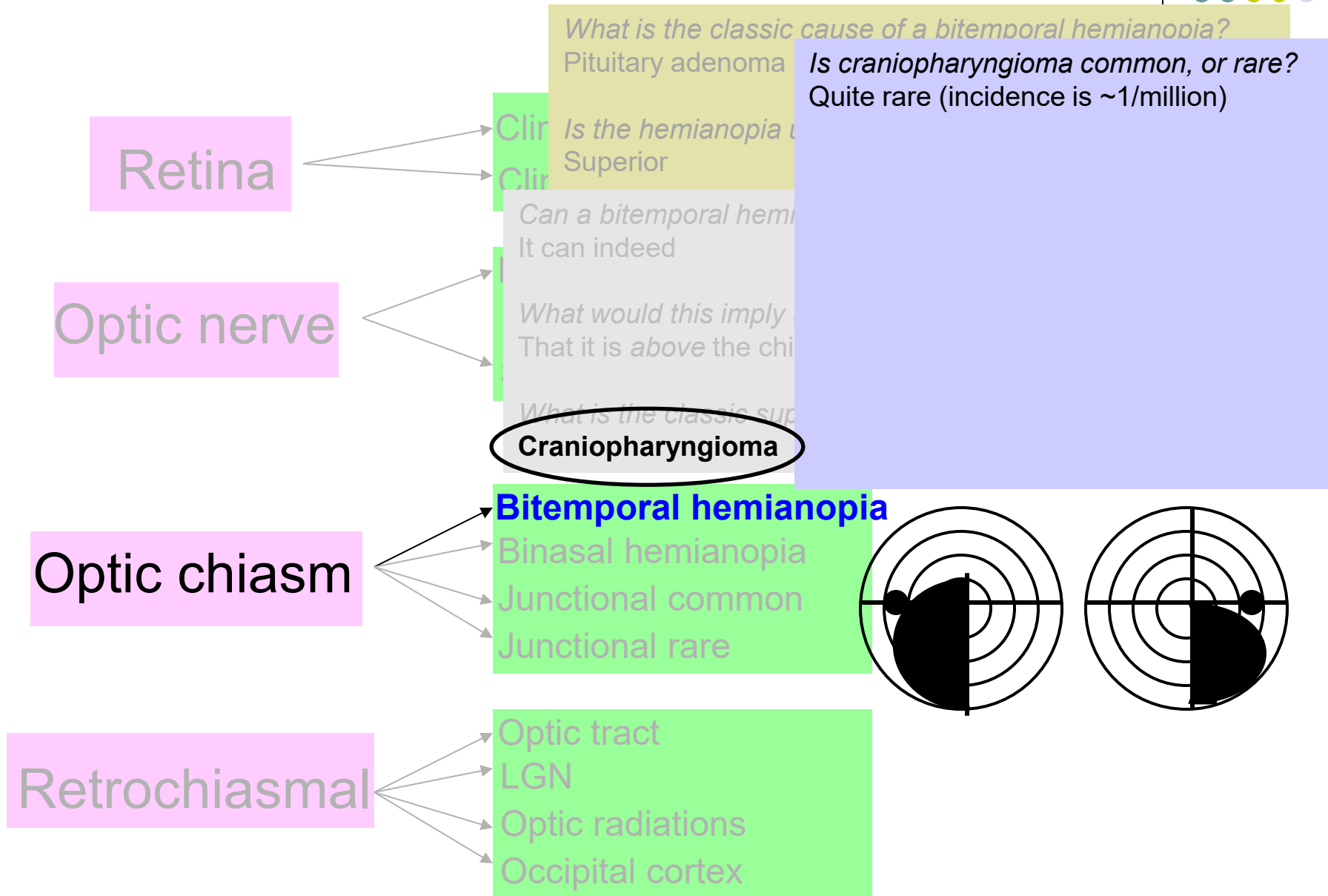
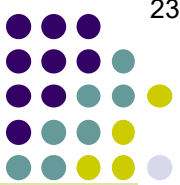
# Visual Field Defects

230



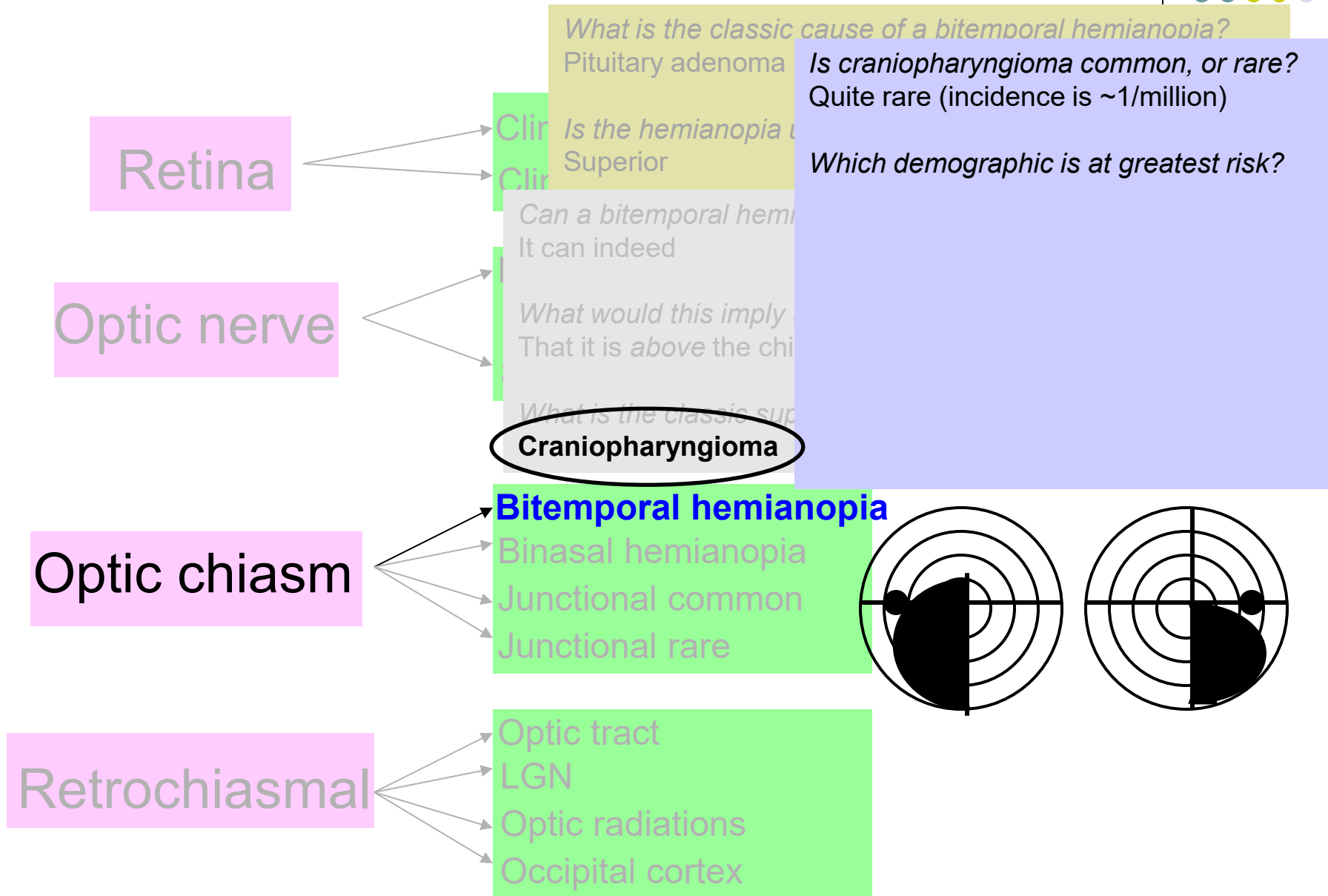
# Visual Field Defects

231





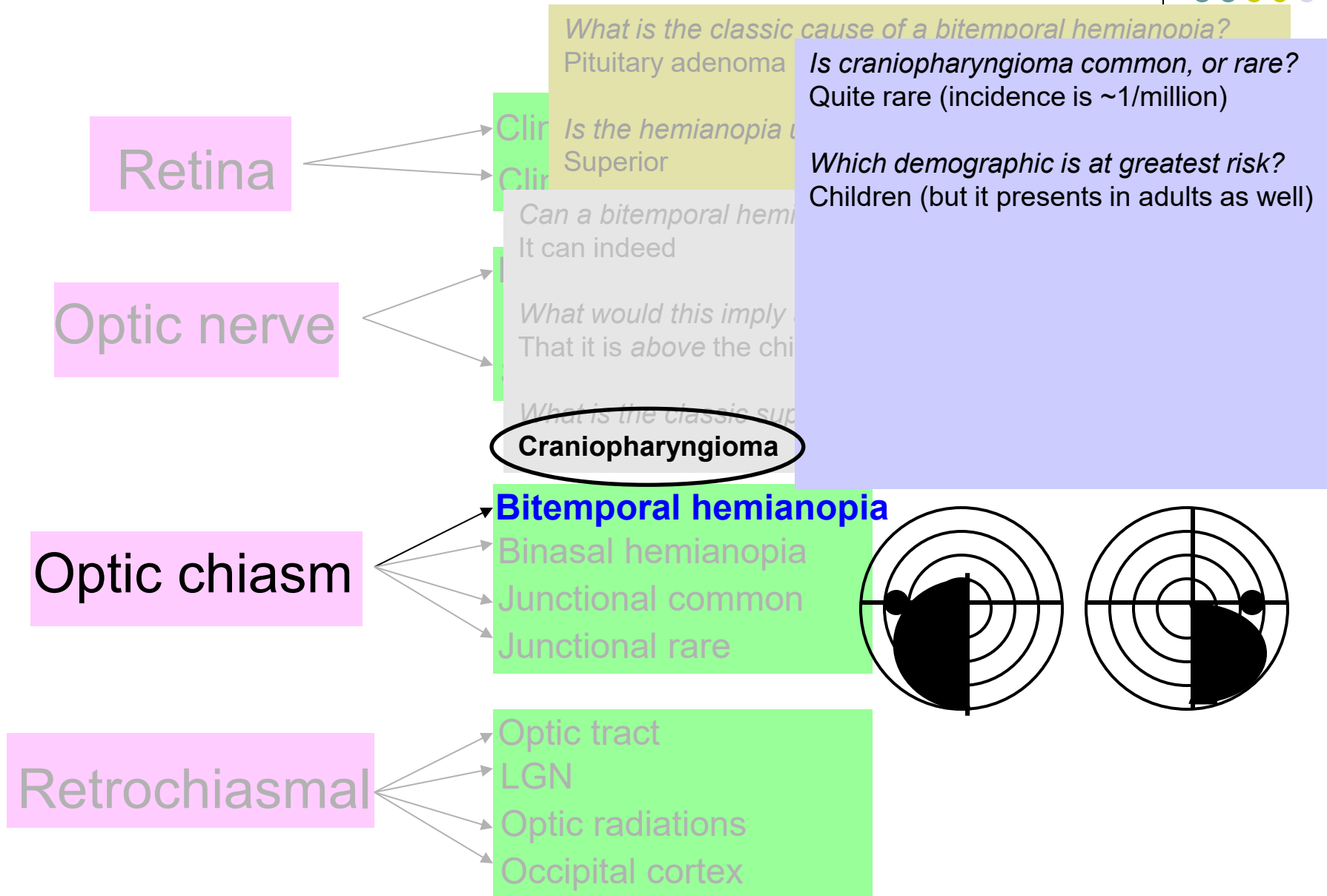
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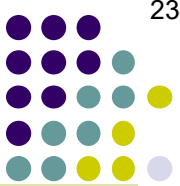




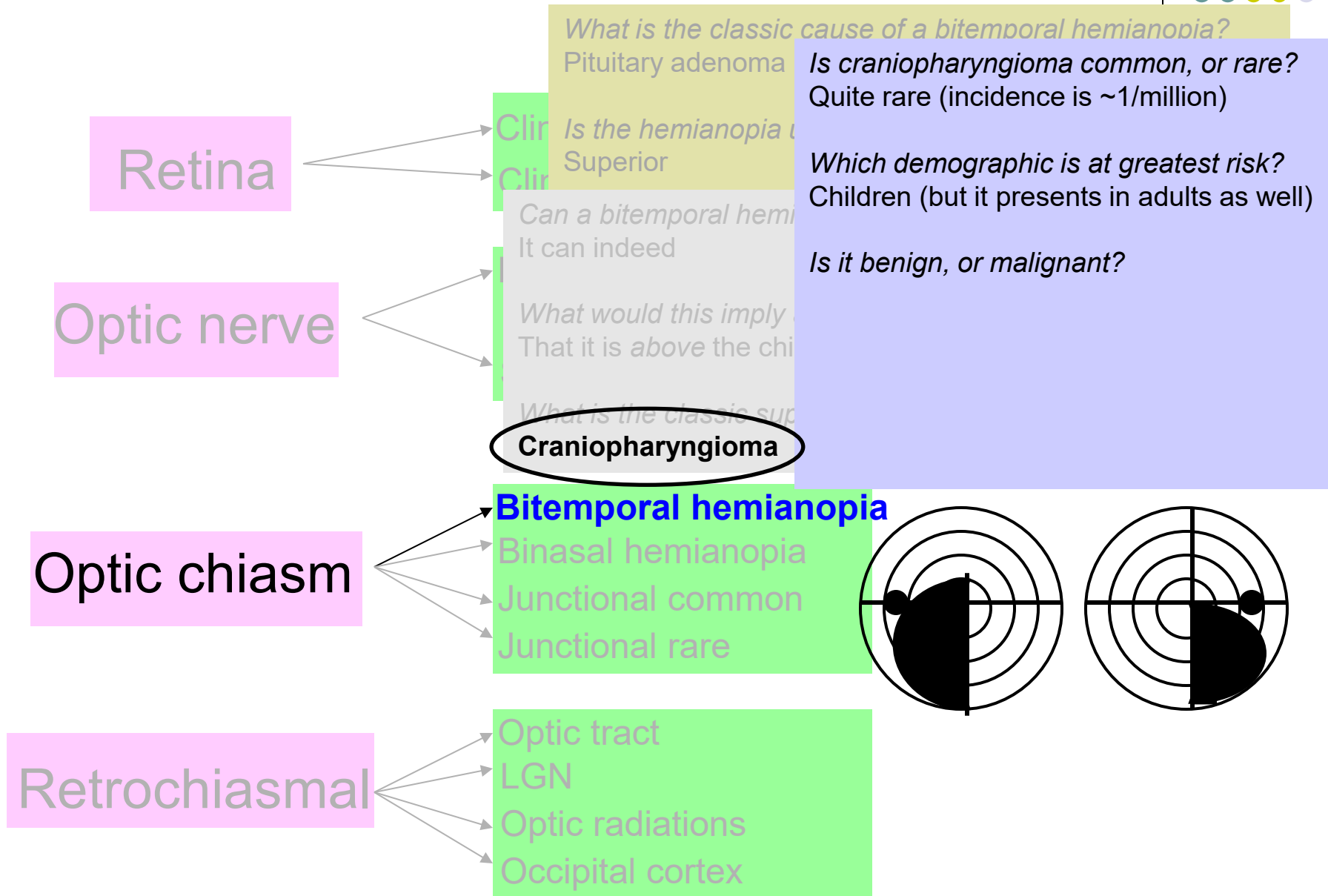


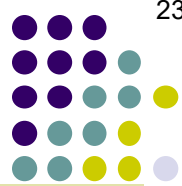
# Visual Field Defects



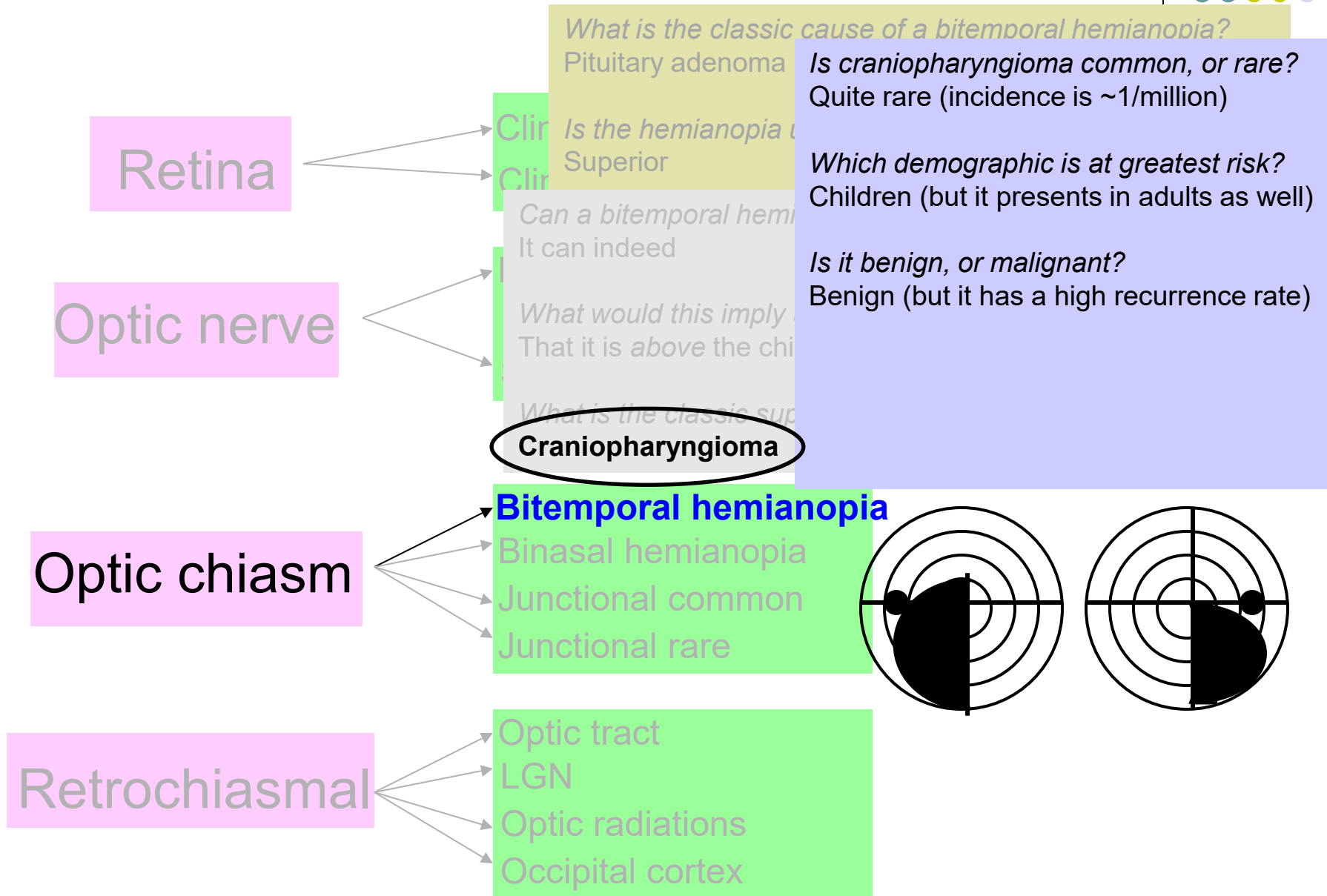


# Visual Field Defects



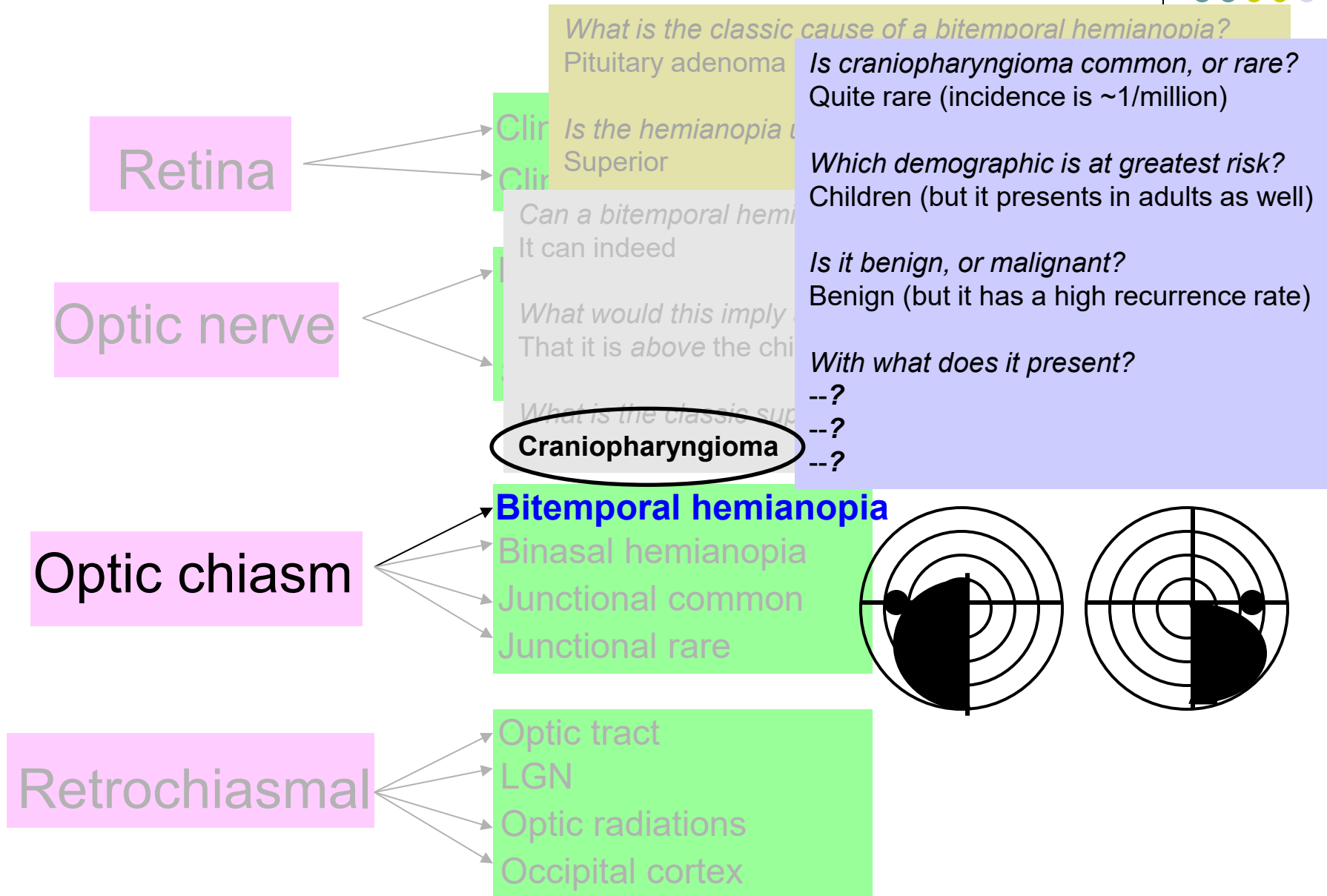


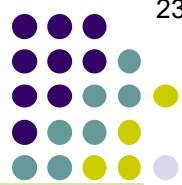
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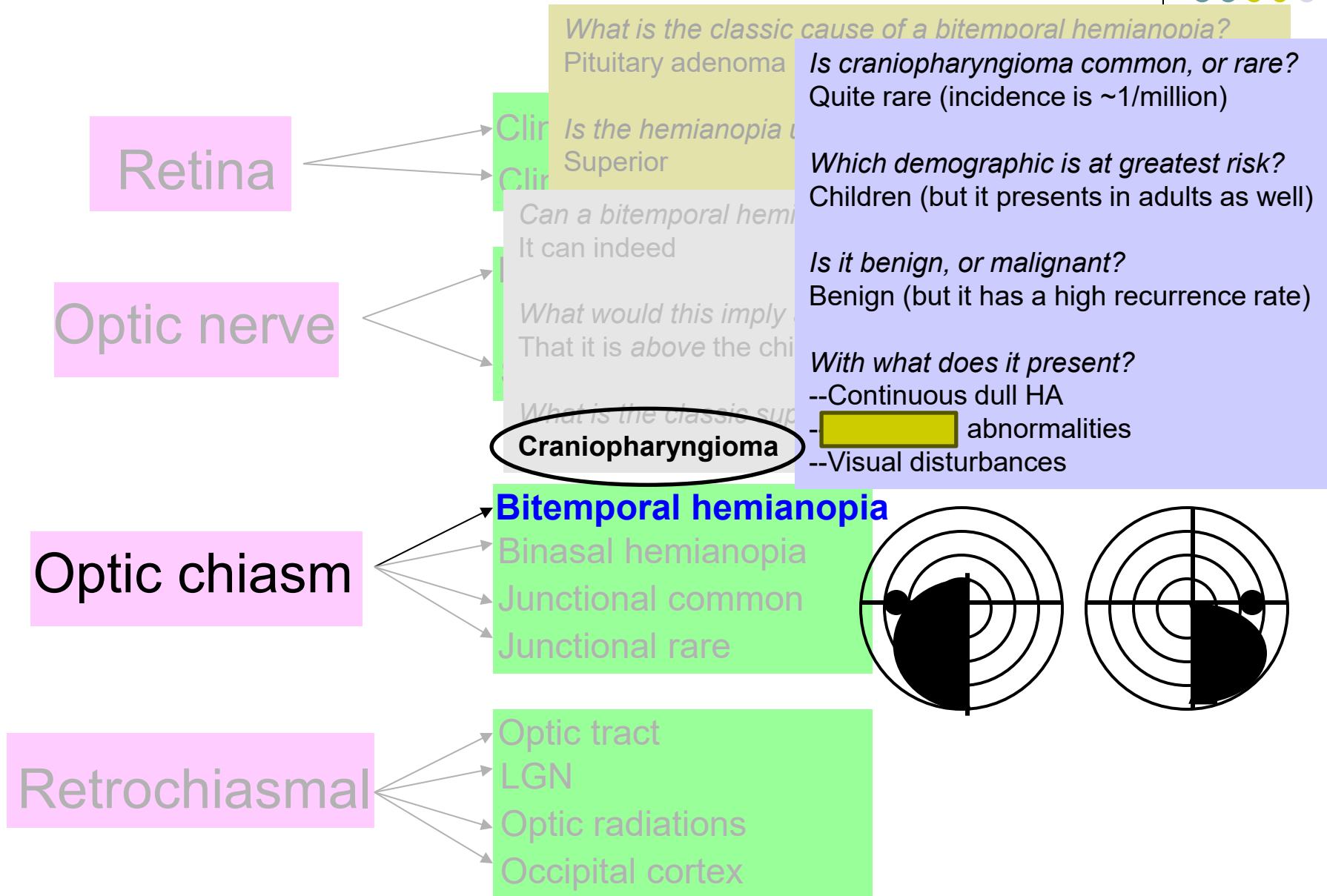


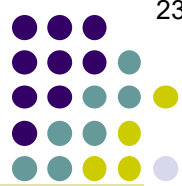
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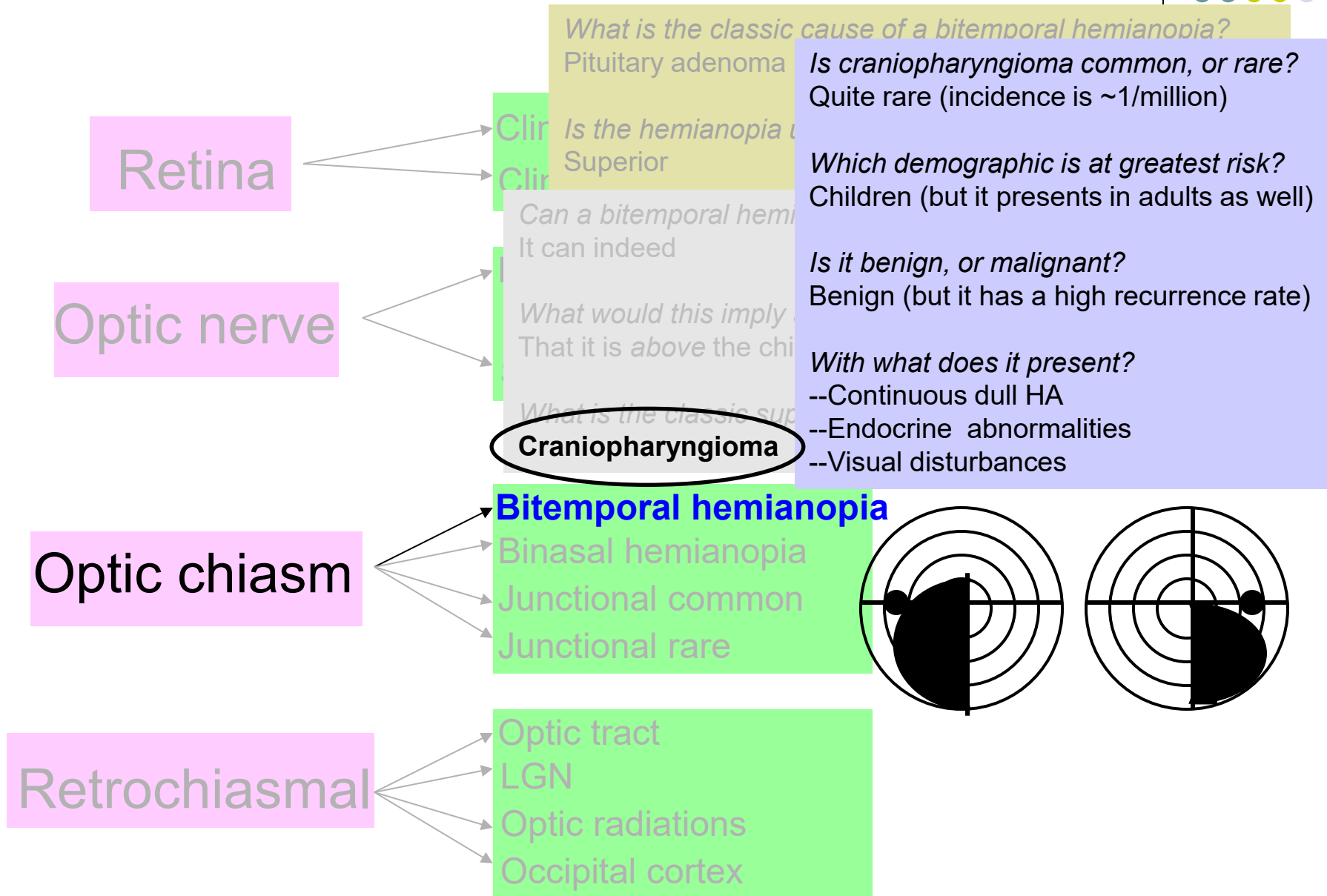


# Visual Field Defects





# Visual Field Defects



# Visual Field Defects



Retina

What is the classic cause of a bitemporal hemianopia?

Pituitary adenoma

Is craniopharyngioma common, or rare?

Quite rare (incidence is ~1/million)

Is the hemianopia

Superior

Which demographic is at greatest risk?

Children (but it can affect adults as well)

As suggested by the discussion thus far, lesions producing bitemporal VF loss are usually **etiology** in nature.

Incidence rate)

Optic

Craniopharyngioma

--Visual disturbances

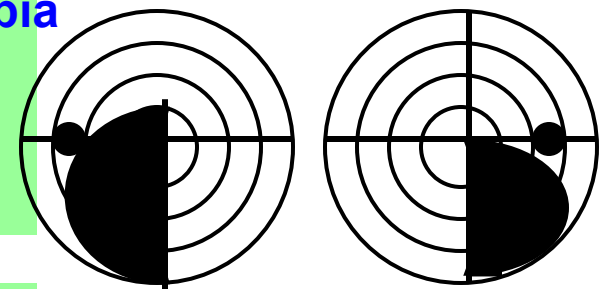
Optic chiasm

**Bitemporal hemianopia**

Binasal hemianopia

Junctional common

Junctional rare



Retrochiasmal

Optic tract

LGN

Optic radiations

Occipital cortex

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Optic

Incidence rate)

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--Visual disturbances

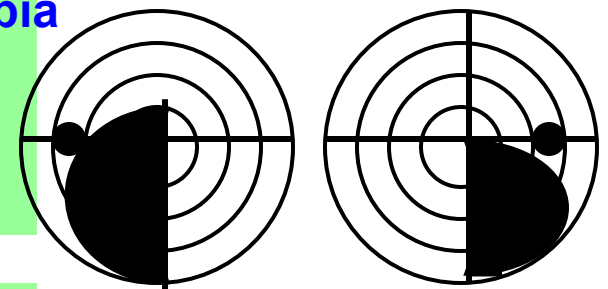
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- Craniopharyngioma
- ?
- ?

Incidence rate)

Craniopharyngioma

--Visual disturbances

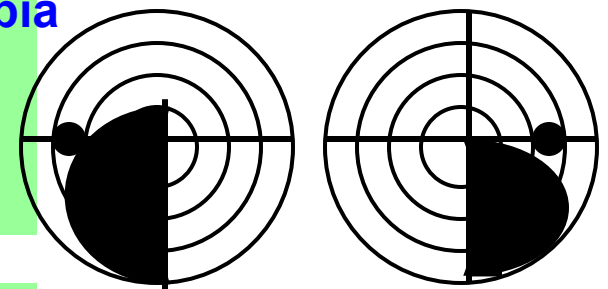
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--Craniopharyngioma

--location meningioma

--?

nce rate)

Craniopharyngioma

--Visual disturbances

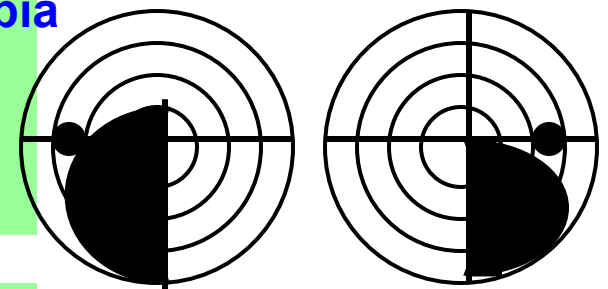
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Optic tract

LGN

Optic radiations

Occipital cortex

# Visual Field Defects

243



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- Craniopharyngioma
- Parasellar meningioma
- ?

Incidence rate)

Craniopharyngioma

--Visual disturbances

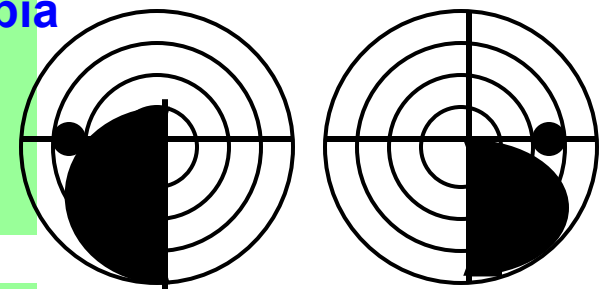
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LGN

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Occipital cortex

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--Pituitary adenoma

--Craniopharyngioma

--Parasellar meningioma

--vessel aneurysm

Craniopharyngioma

--Visual disturbances

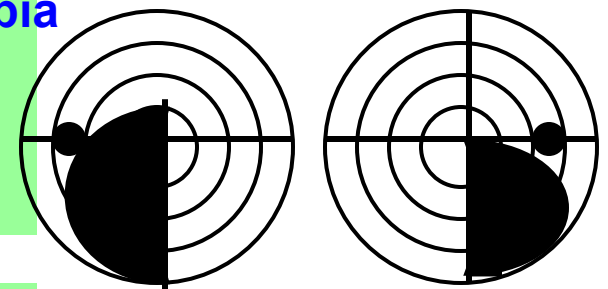
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- Craniopharyngioma
- Parasellar meningioma
- Internal carotid artery aneurysm

Incidence rate)

Craniopharyngioma

--Visual disturbances

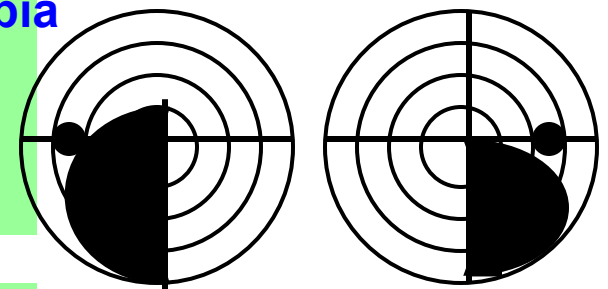
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Optic tract

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*Is craniopharyngioma common, or rare?*

Quite rare (incidence is ~1/million)

*Is the hemianopia*

Superior

*Which demographic is at greatest risk?*

Children (but it presents in adults as well)

*As suggested by the discussion thus far, lesions producing bitemporal VF loss are usually compressive in nature. What two other lesions round out the top four causes of bitemporal VF loss?*

--Pituitary adenoma

--Craniopharyngioma

--**Parasellar meningioma**

--Internal carotid artery aneurysm

*Demographically speaking, who is the classic parasellar meningioma pt?*

(incidence rate)

Optic

--Visual disturbances

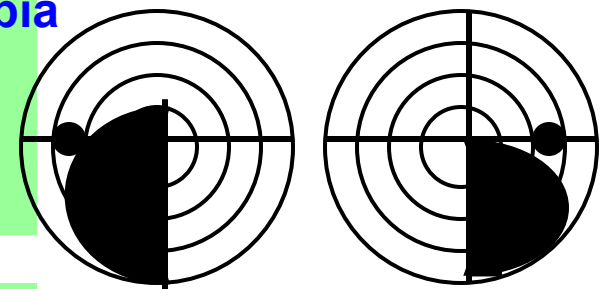
Optic chiasm

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Junctional rare



Retrochiasmal

Optic tract

LGN

Optic radiations

Occipital cortex

# Visual Field Defects

247



Retina

*What is the classic cause of a bitemporal hemianopia?*

Pituitary adenoma

*Is craniopharyngioma common, or rare?*

Quite rare (incidence is ~1/million)

*Is the hemianopia*

Superior

*Which demographic is at greatest risk?*

Children (but it can occur in adults as well)

*As suggested by the discussion thus far, lesions producing bitemporal VF loss are usually compressive in nature. What two other lesions round out the top four causes of bitemporal VF loss?*

--Pituitary adenoma

--Craniopharyngioma

--**Parasellar meningioma**

--Internal carotid artery aneurysm

*Demographically speaking, who is the classic parasellar meningioma pt?*

A middle-aged woman

(incidence rate)

Optic

--Visual disturbances

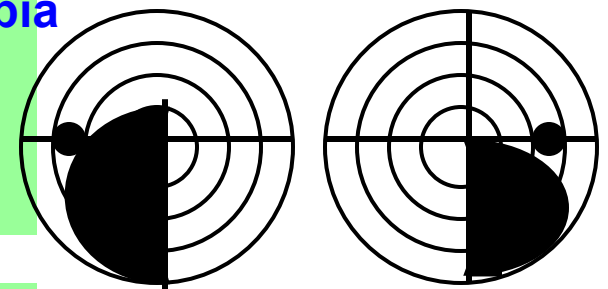
Optic chiasm

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Junctional rare



Retrochiasmal

Optic tract

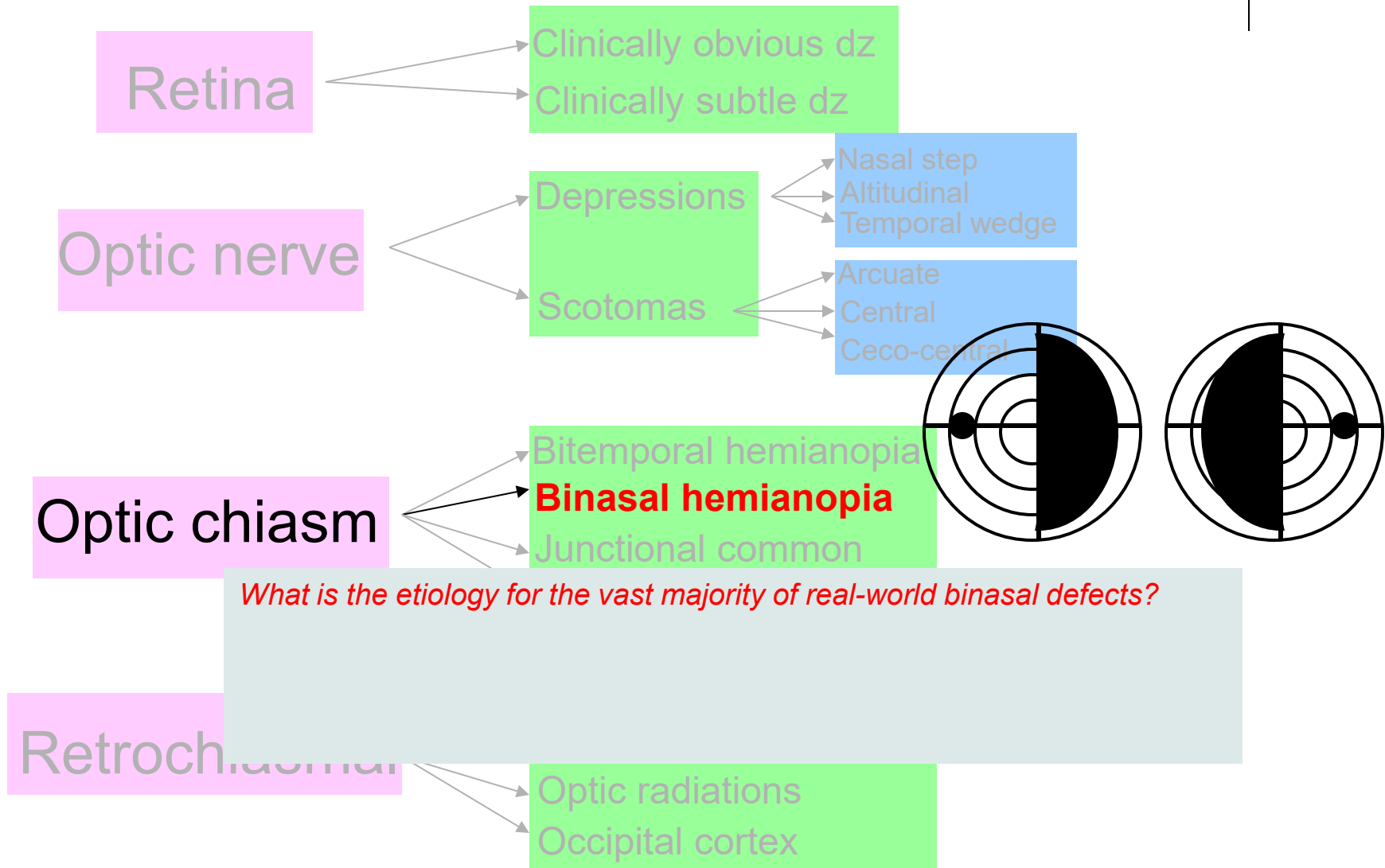
LGN

Optic radiations

Occipital cortex

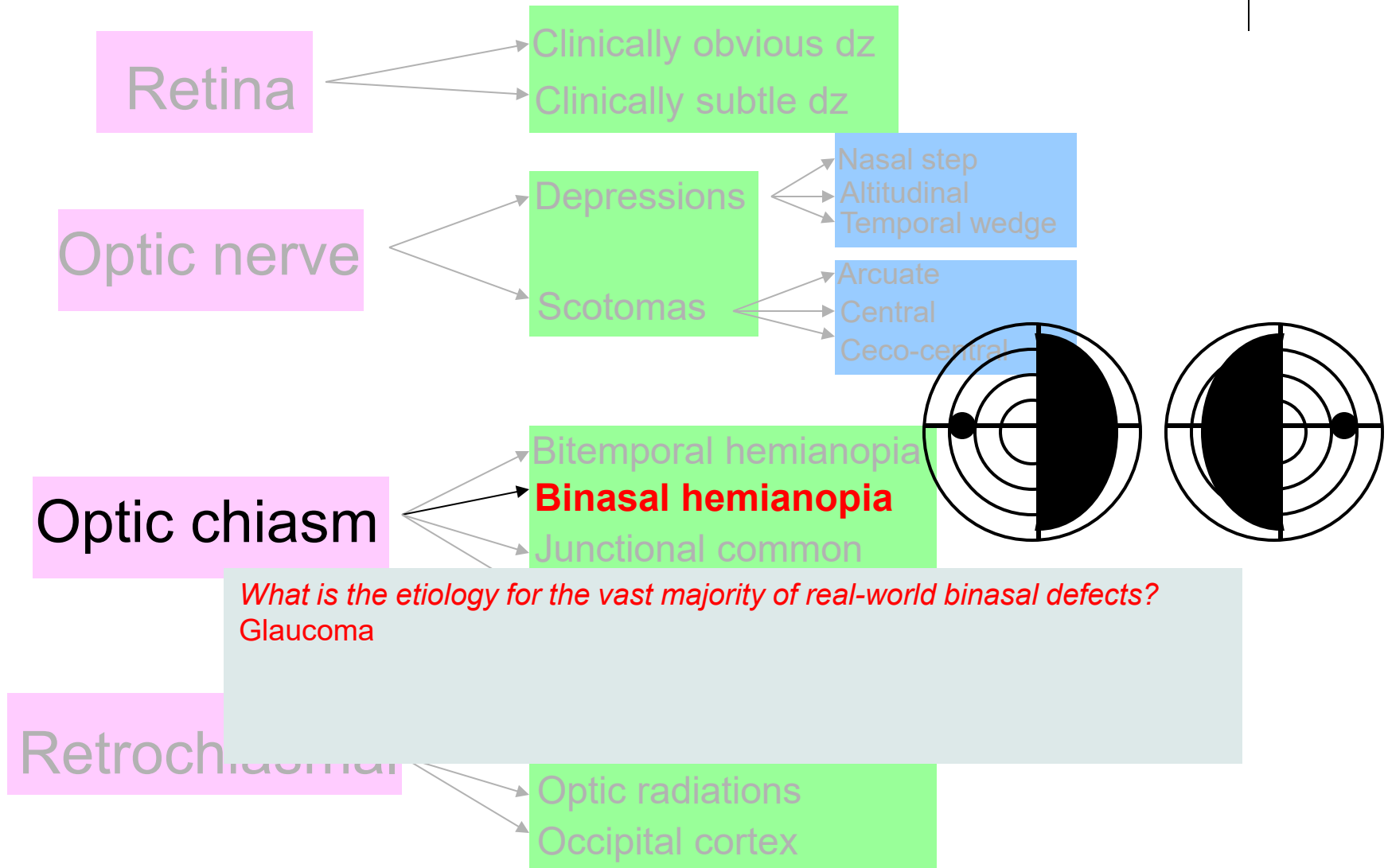


# Visual Field Defects

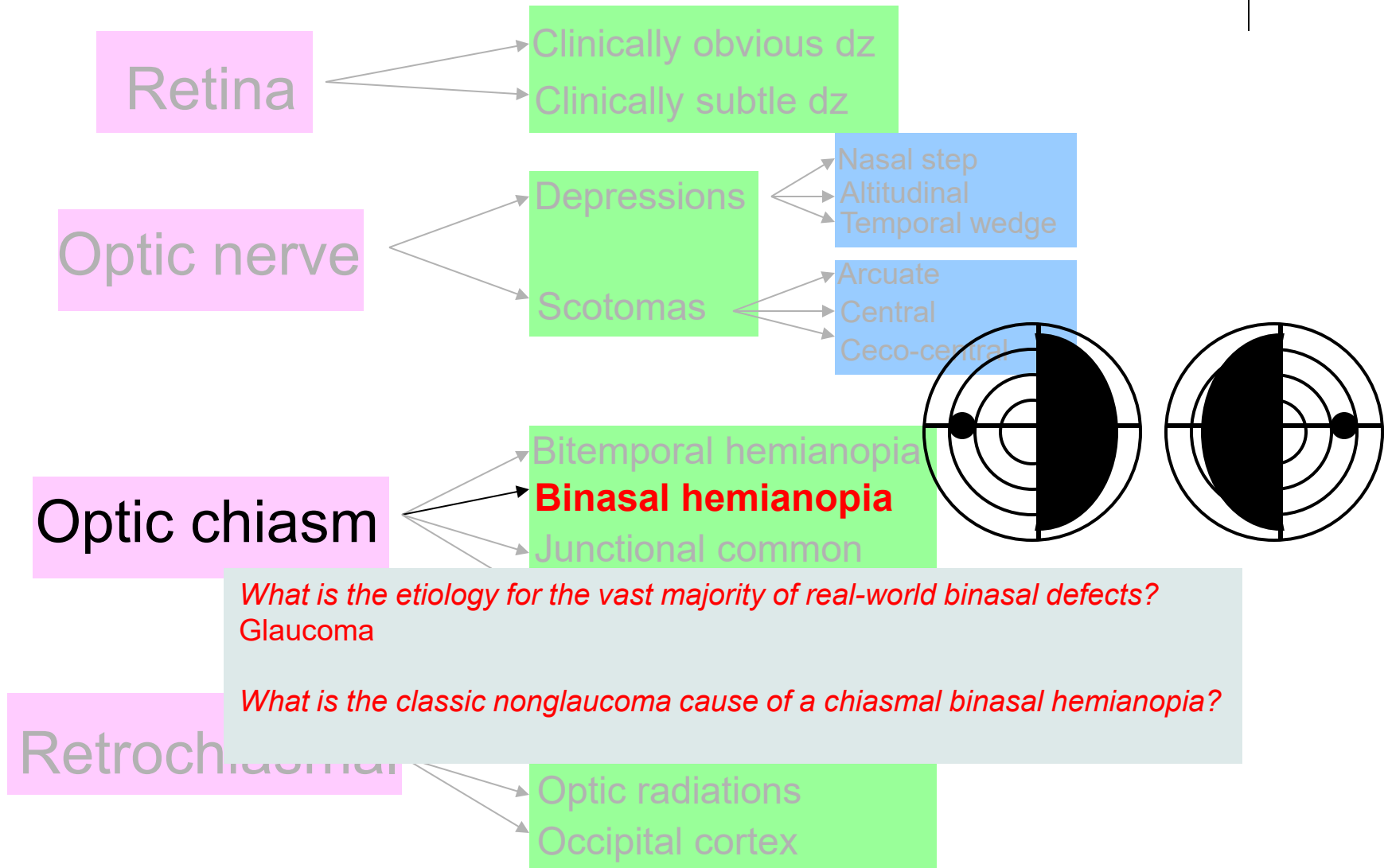




# Visual Field Defects

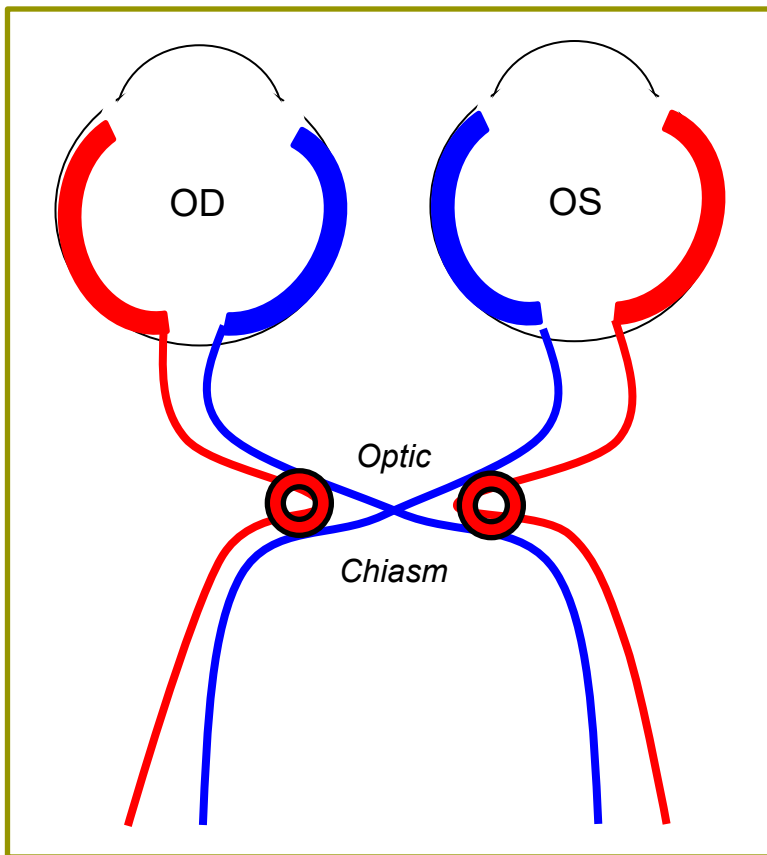


# Visual Field Defects





# ects



ically obvious dz  
ically subtle dz

pressions

Nasal step  
Altitudinal  
Temporal wedge

tomas

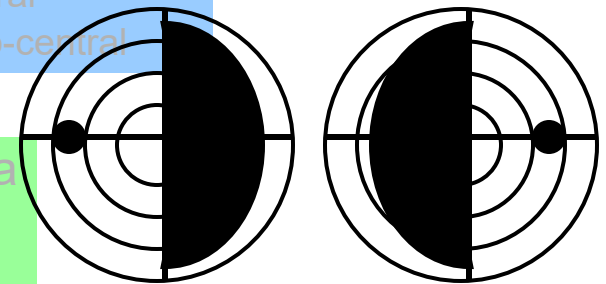
Arcuate  
Central  
Ceco-central

Optic chiasm

Bitemporal hemianopia

**Binasal hemianopia**

Junctional common

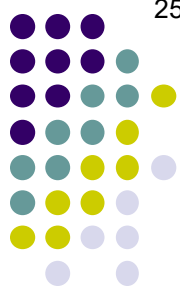


*What is the etiology for the vast majority of real-world binasal defects?*  
Glaucoma

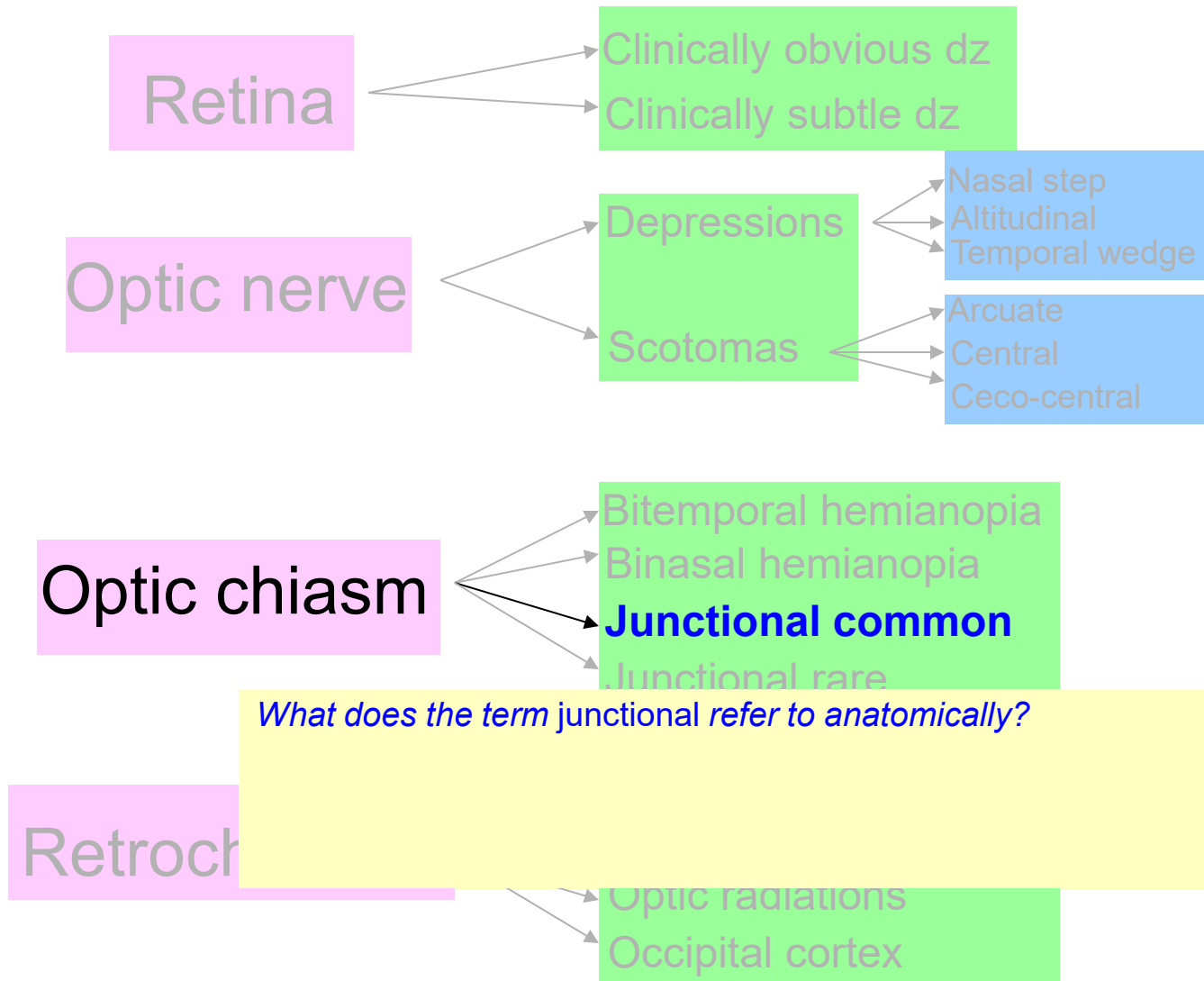
*What is the classic nonglaucoma cause of a chiasmal binasal hemianopia?*  
Bilateral carotid atherosclerotic dz compressing the outer chiasm bilaterally

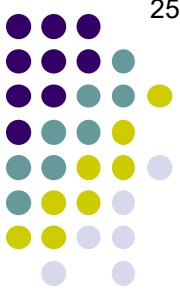
Retrochiasmal

Optic radiations  
Occipital cortex

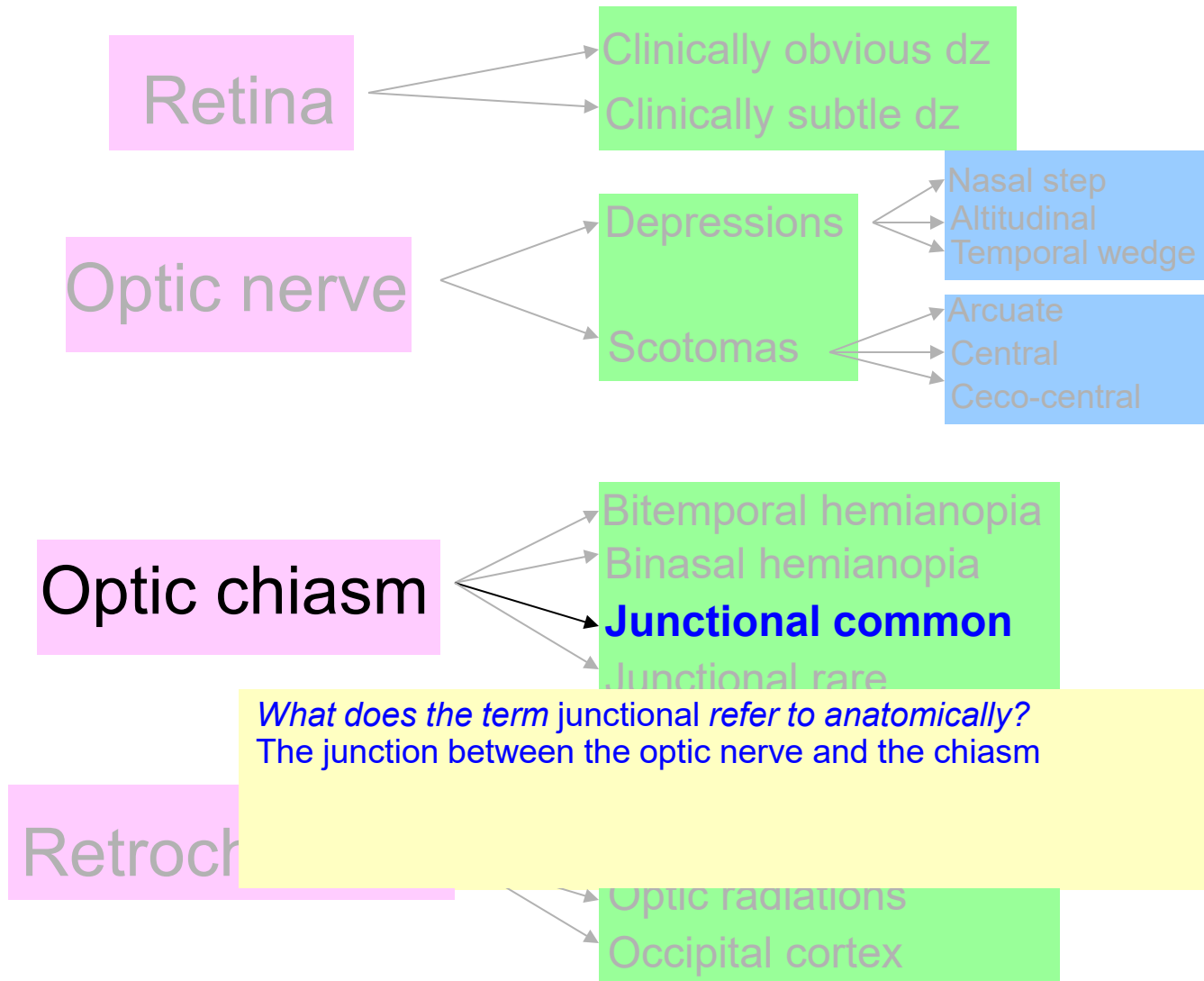


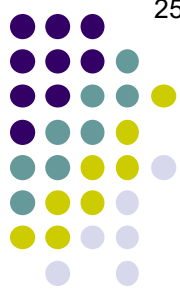
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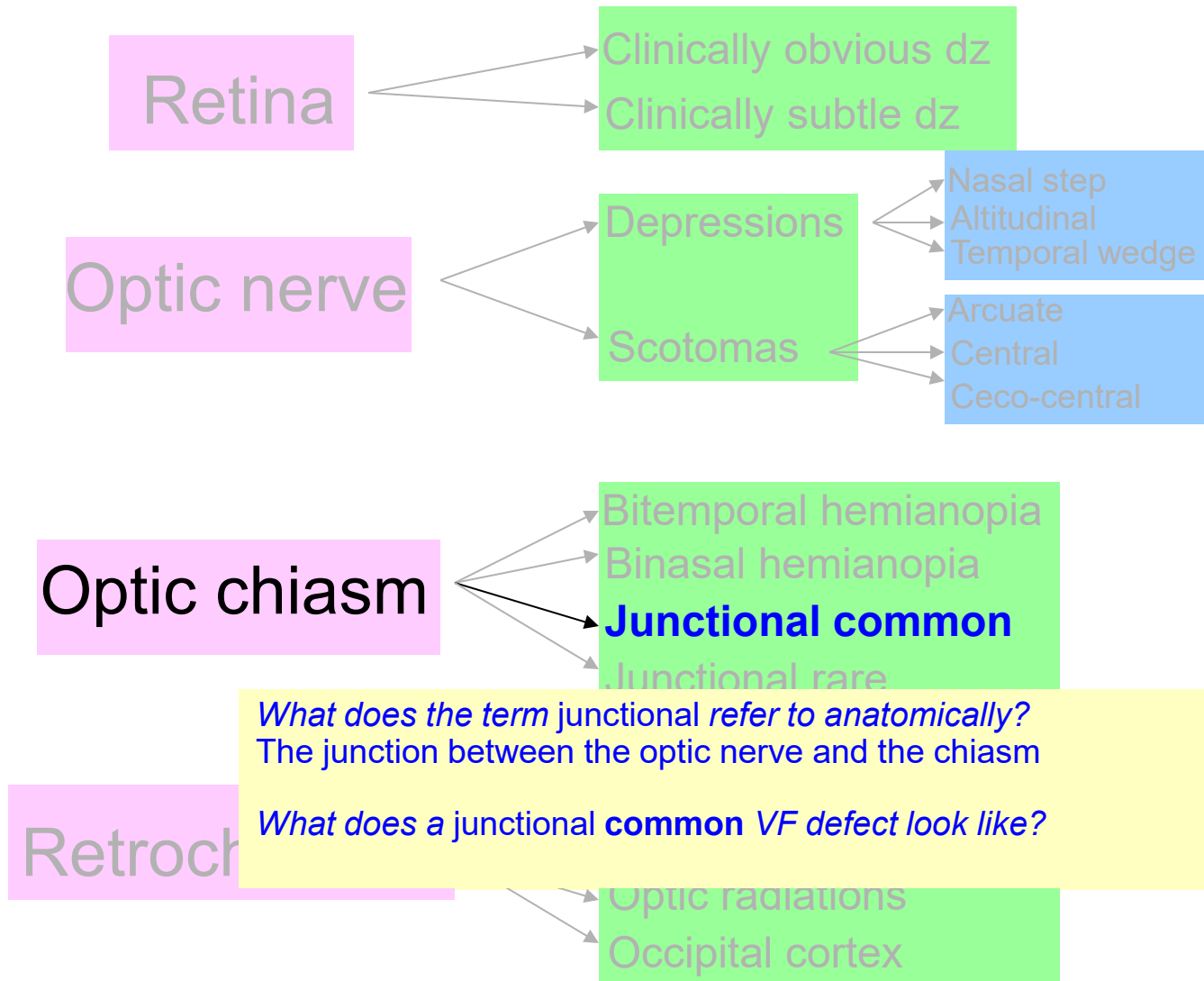


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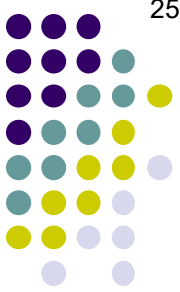


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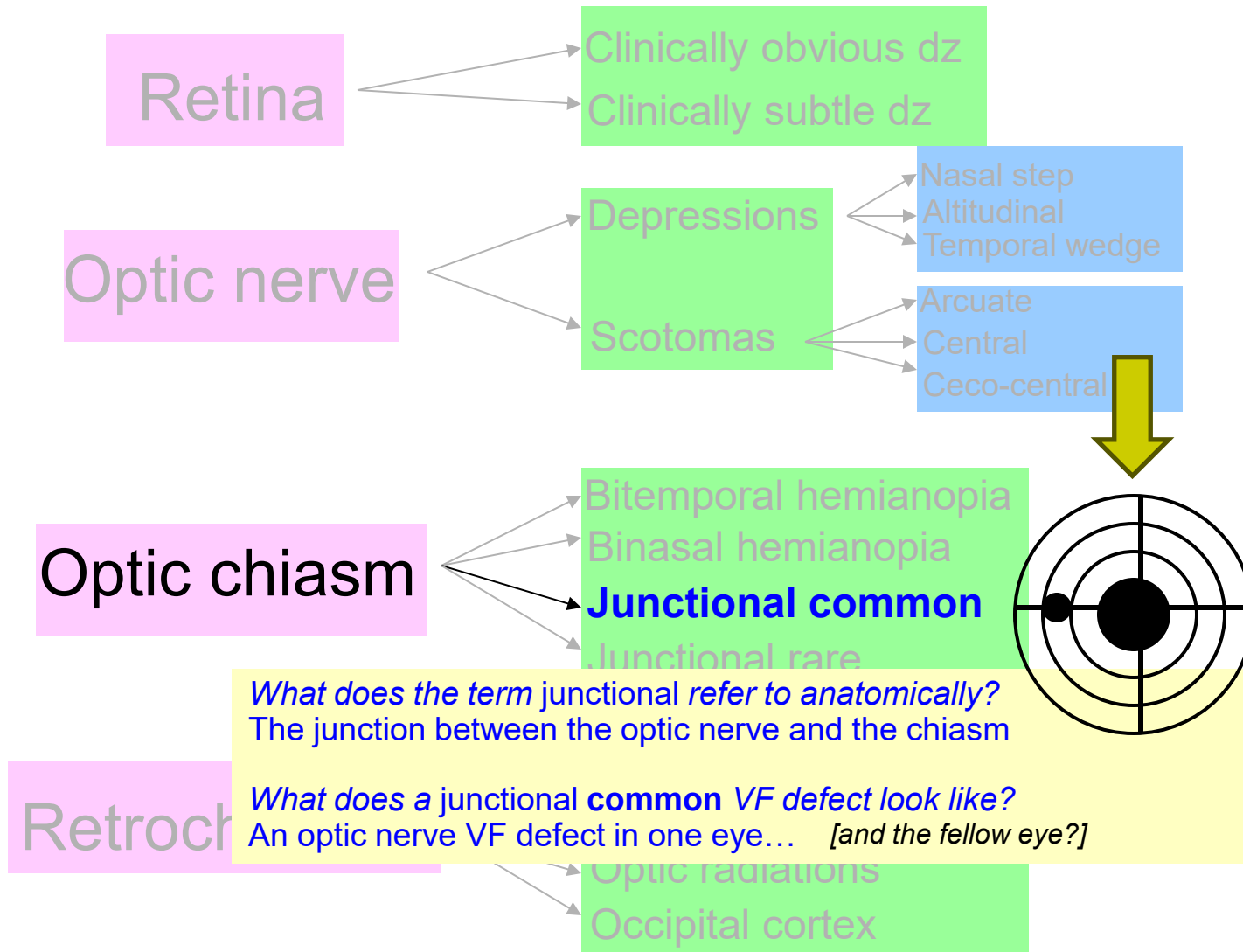


*What does the term junctional refer to anatomically?*  
The junction between the optic nerve and the chiasm

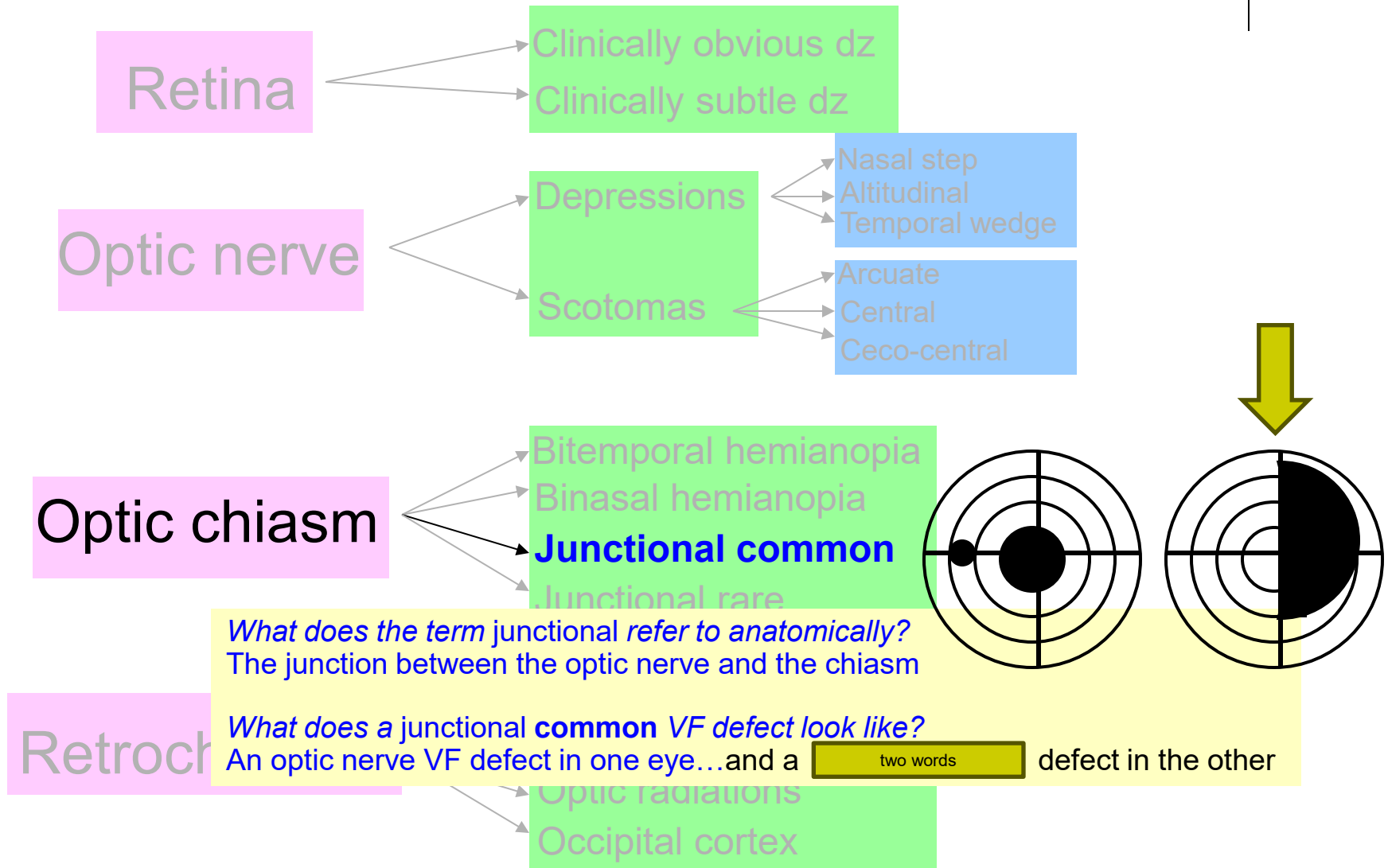
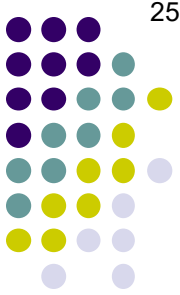
*What does a junctional **common** VF defect look like?*



# Visual Field Defects

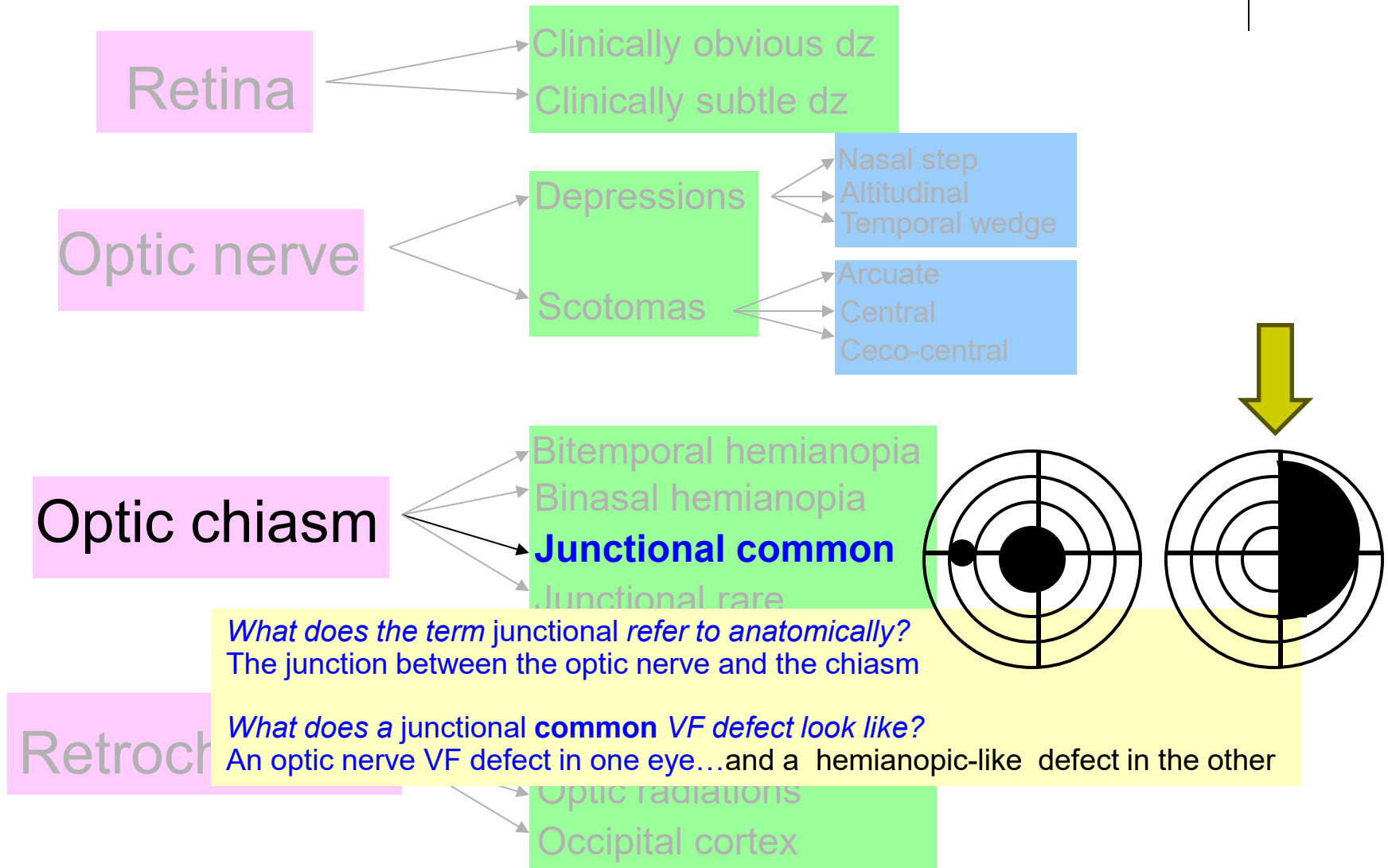


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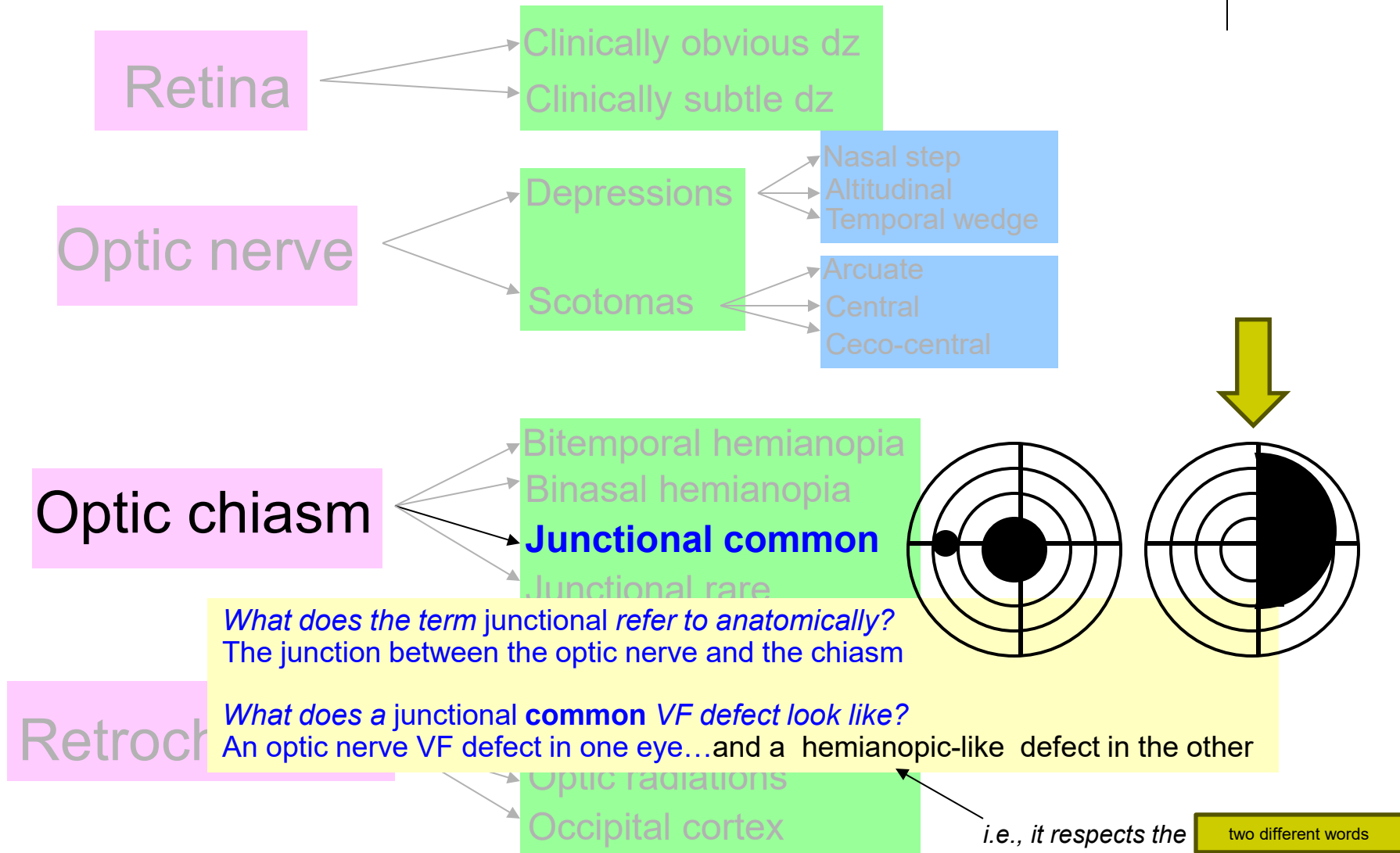




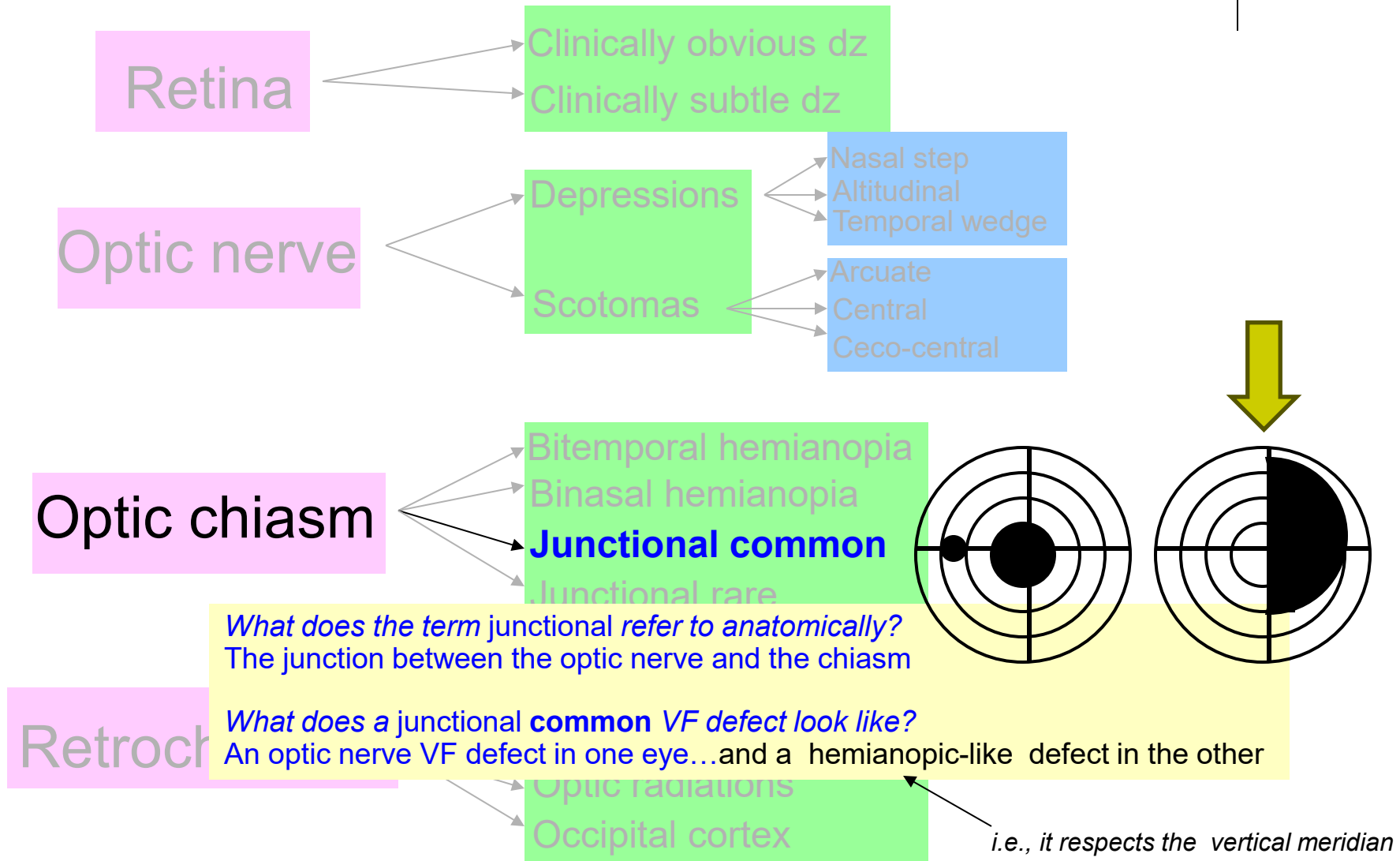
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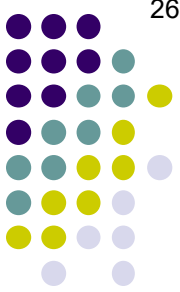


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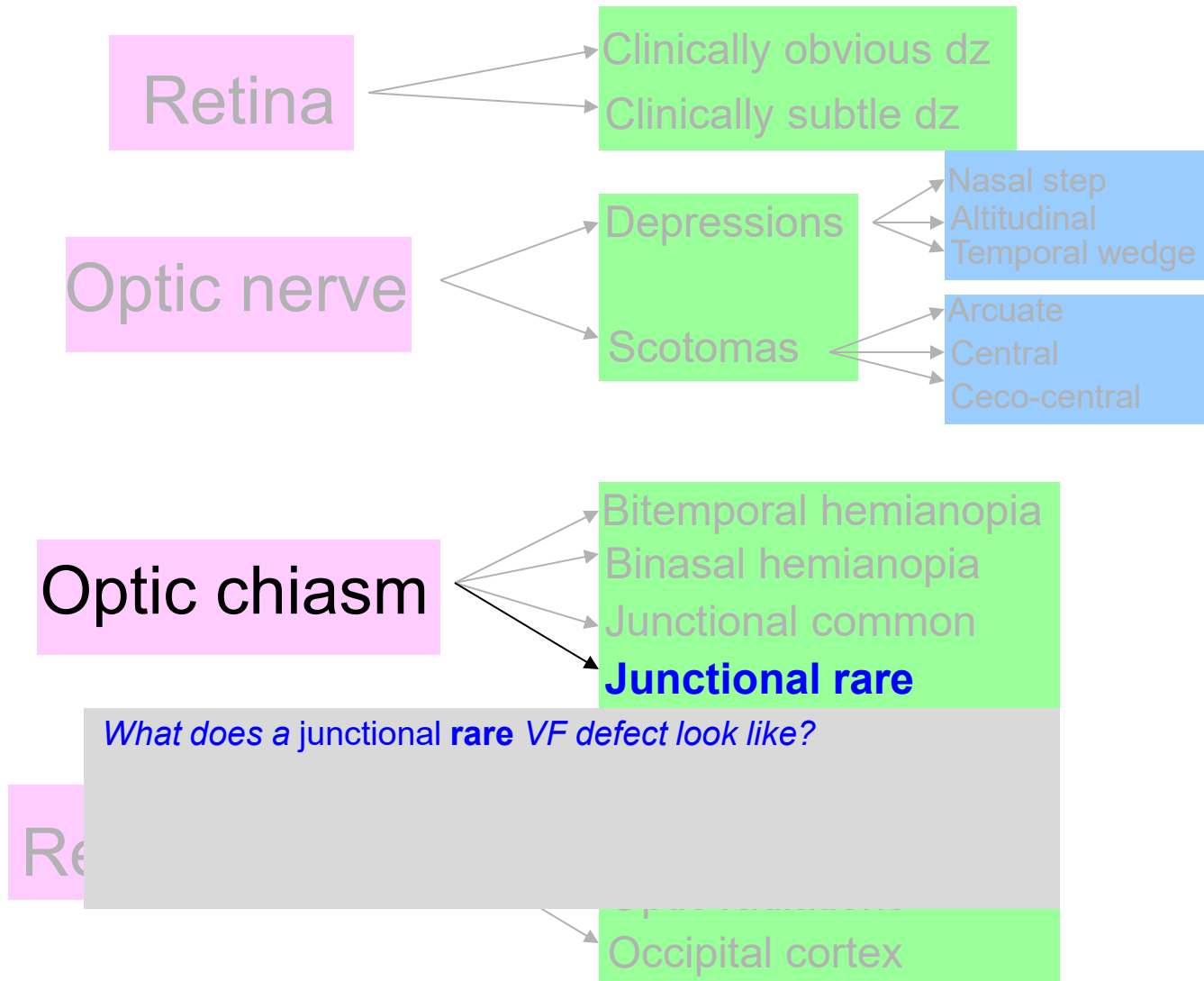


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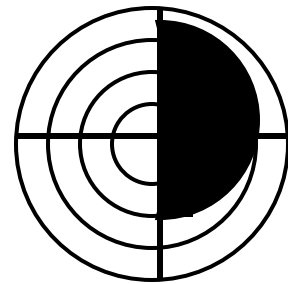
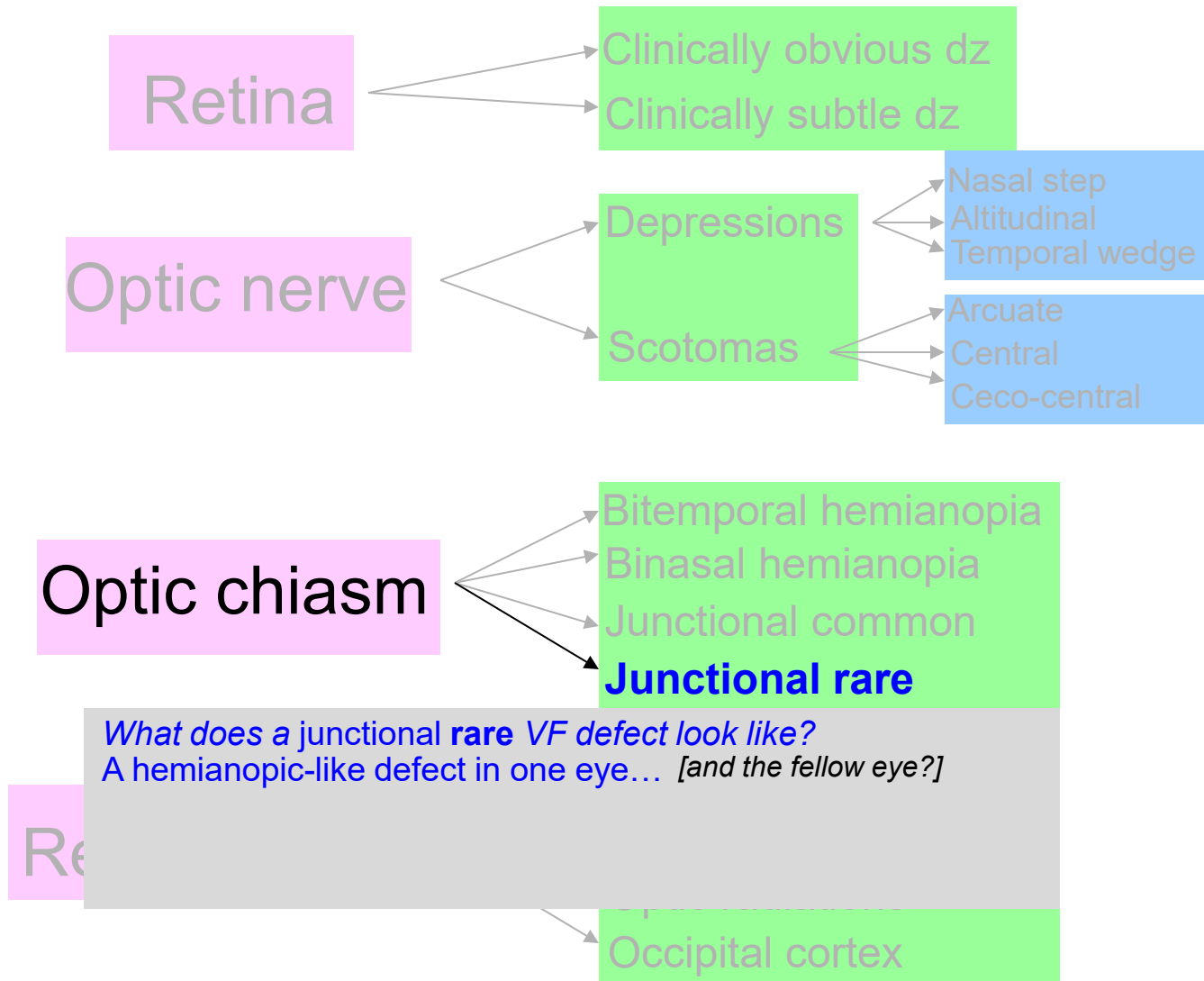


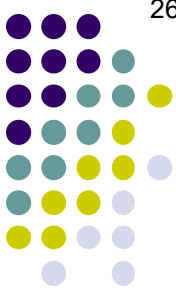


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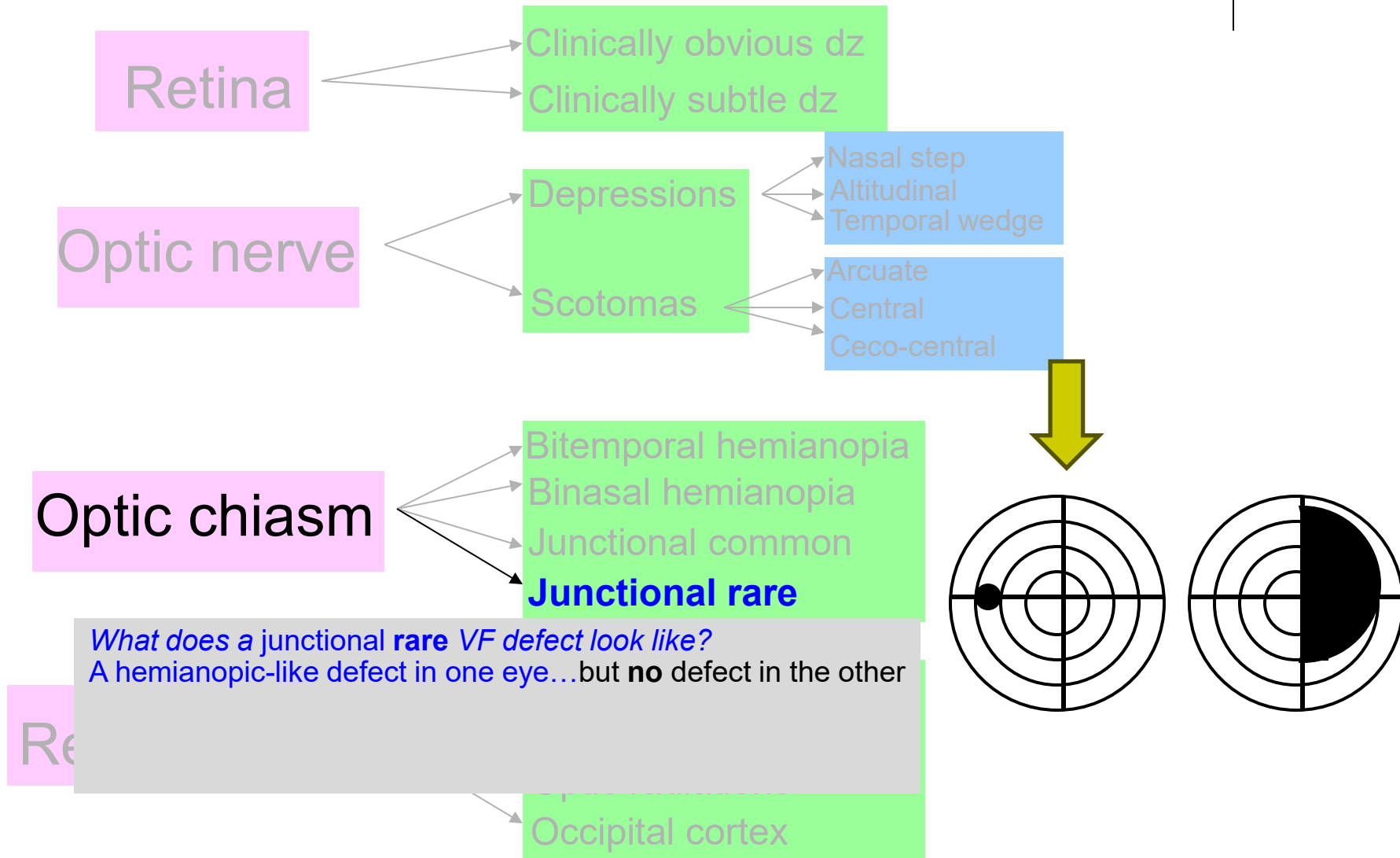


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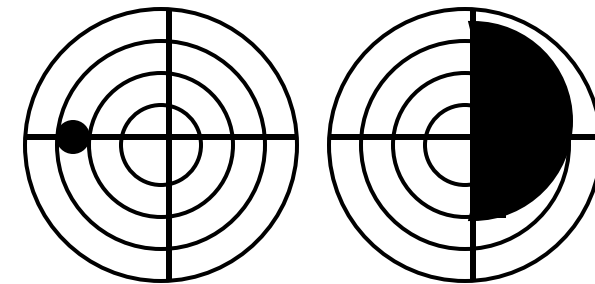
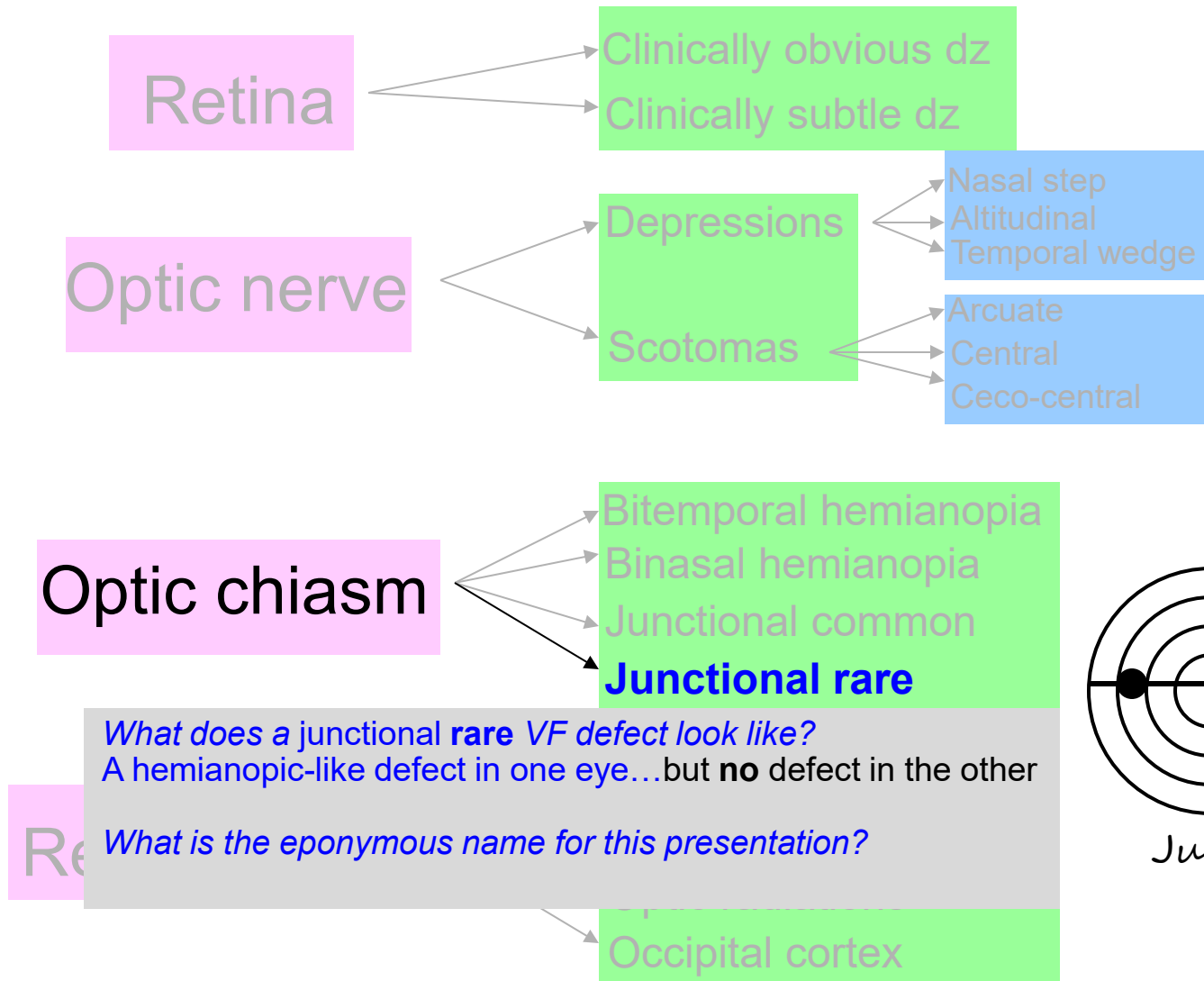




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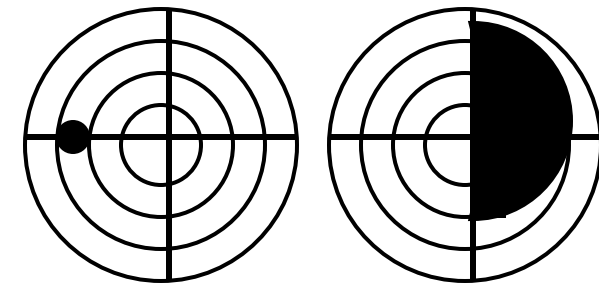
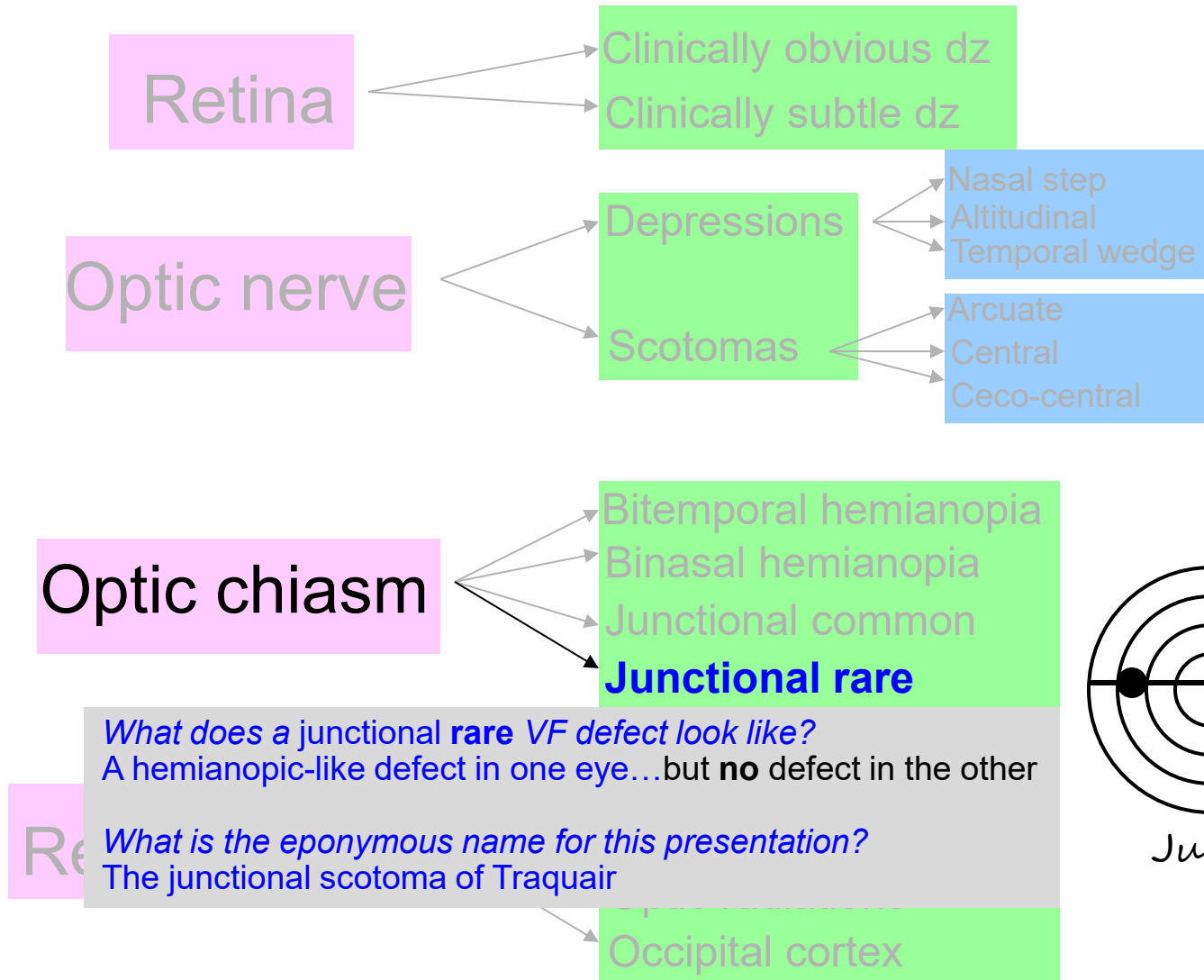


# Visual Field Defects



Junctional scotoma  
of...?

# Visual Field Defects

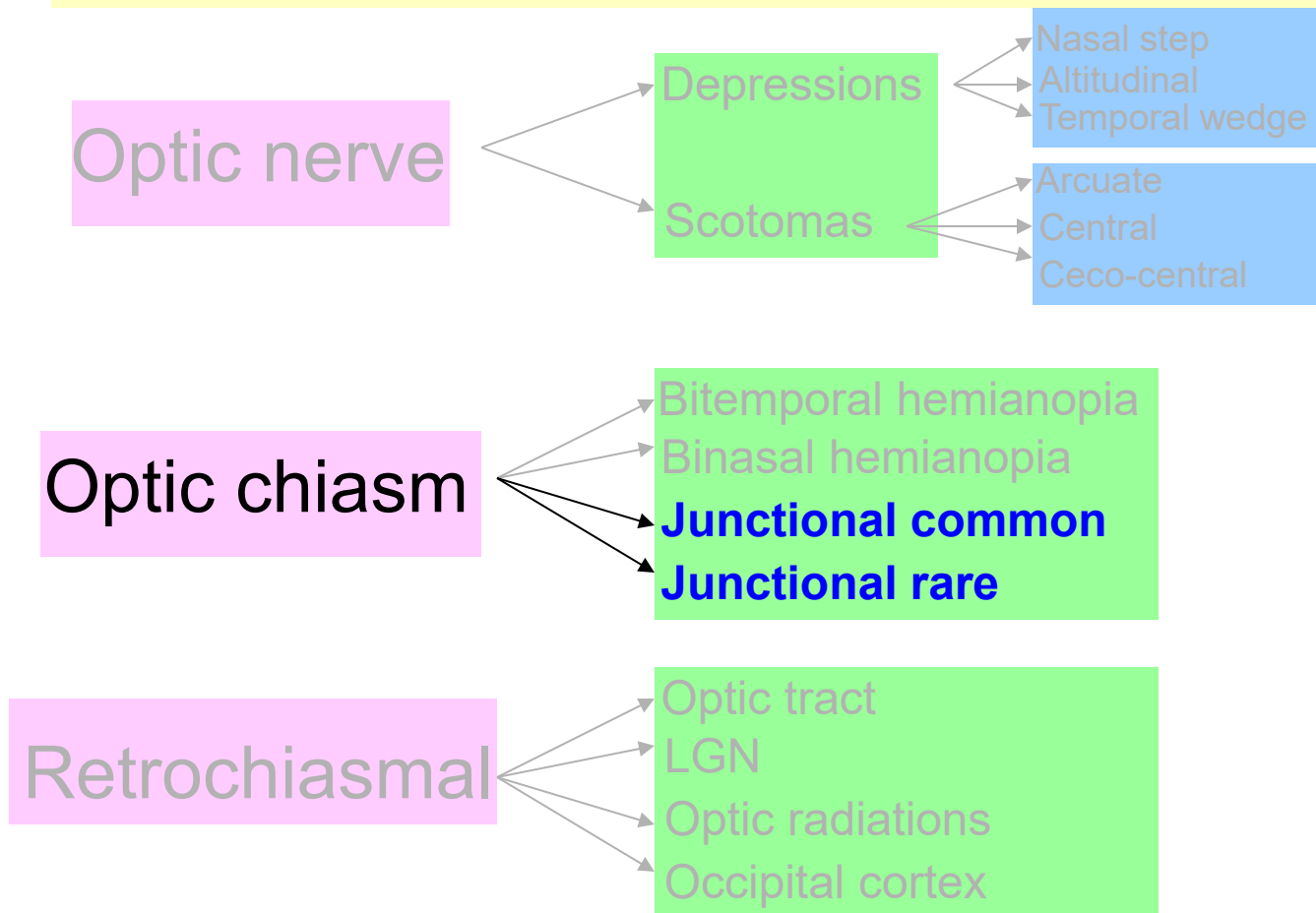


*Junctional scotoma  
of...Traquair*



# Visual Field Defects

*Something's bugging me about junctional scotomas. We said previously that the term junction here referred to the junction between the optic nerve and the chiasm. Given this, how is it possible to have a defect in the **fellow** eye?*

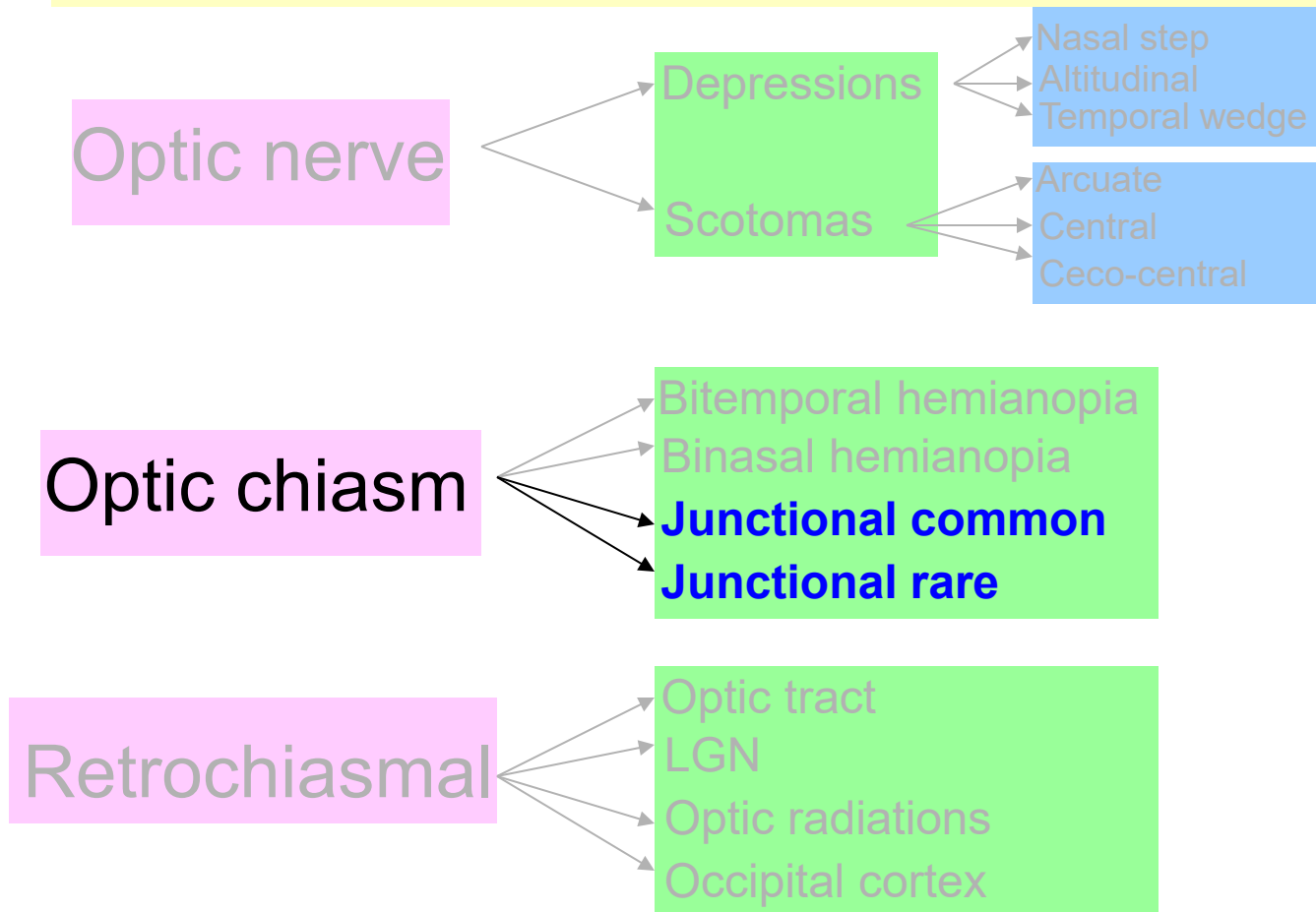


# Visual Field Defects



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It's possible because of an interesting quirk of neuroanatomy. As they reach the chiasm, a portion of the nasal fibers (ie, those responsible for the temporal VF) take a brief detour. Instead of simply crossing the chiasm, they first turn and travel up the distal optic nerve of the fellow eye, forming a small loop known as **eponym + bodypart**.

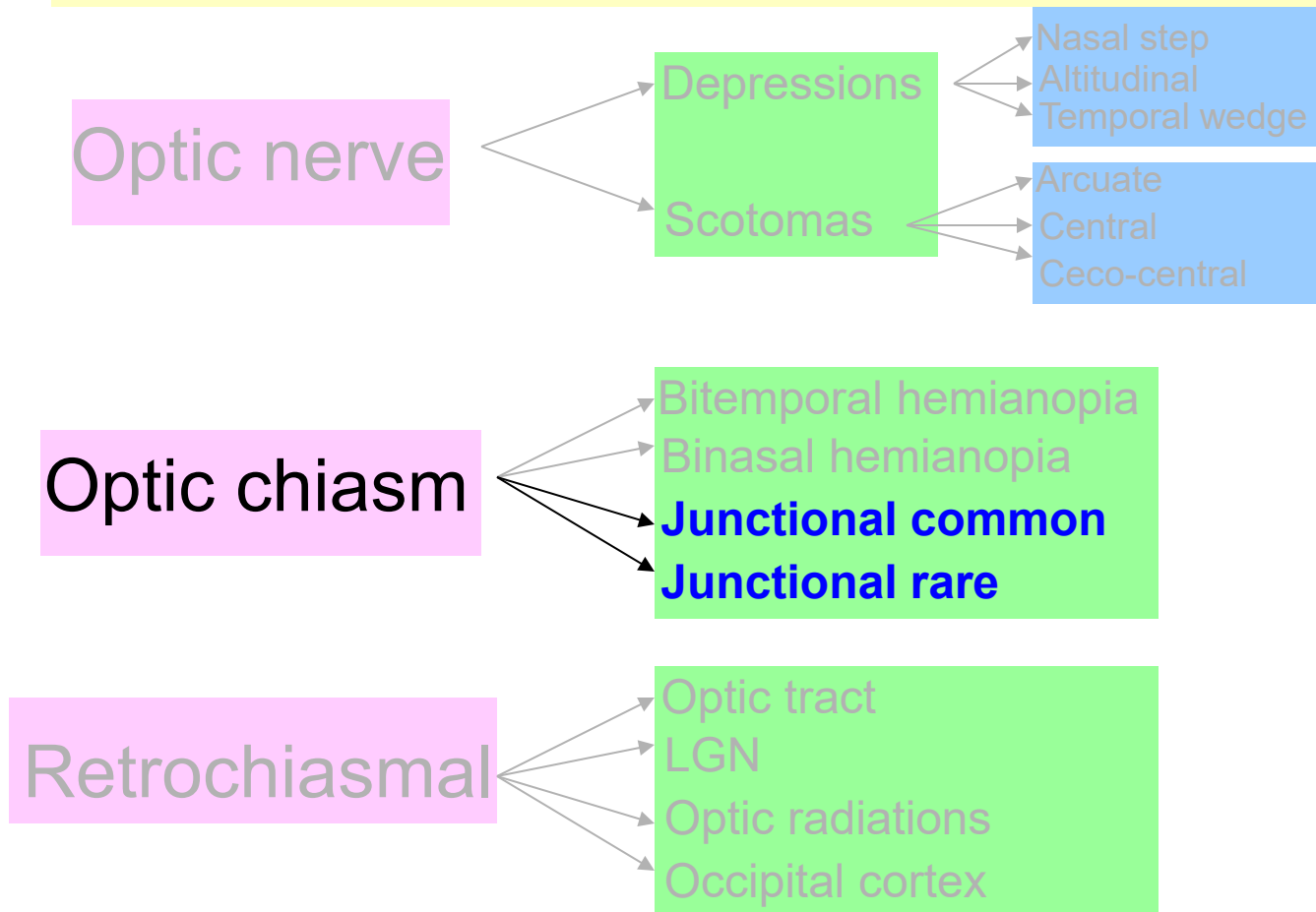


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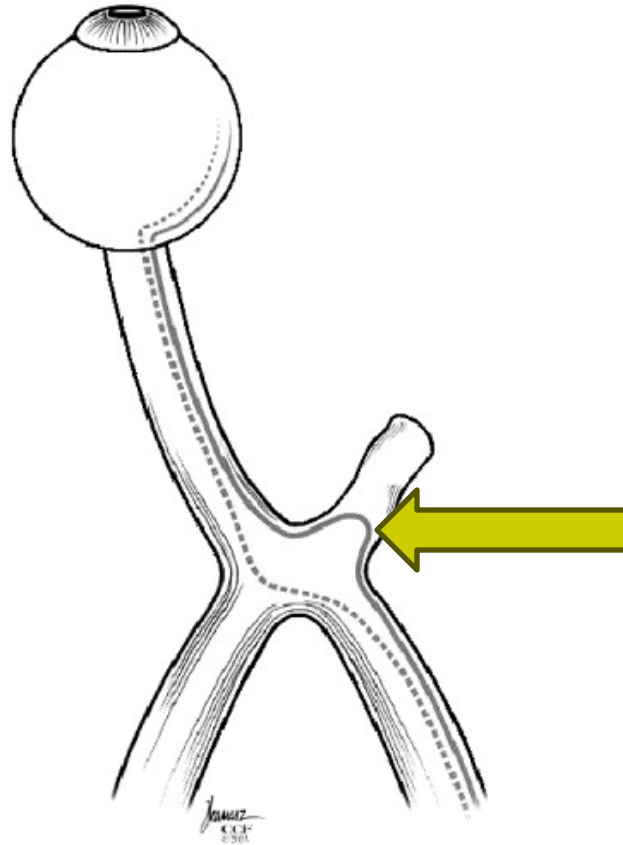
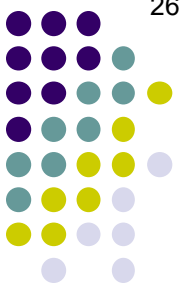


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# Visual Field Defects



Willbrand's knee

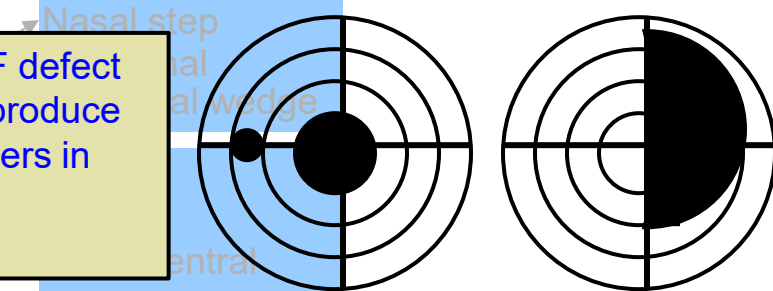
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Thus, in addition to producing the expected optic nerve-type VF defect in the eye ipsilateral to the lesion, a lesion at the junction may produce a temporal VF defect in the contralateral eye by bagging the fibers in Wilbrand's knee; together, these constitute what we're calling a *junctional common scotoma*.



*Common junctional scotoma*

Optic chiasm

- Bitemporal hemianopia
- Binasal hemianopia
- Junctional common**
- Junctional rare**

Retrochiasmal

- Optic tract
- LGN
- Optic radiations
- Occipital cortex

# Visual Field Defects

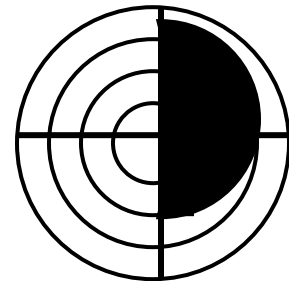
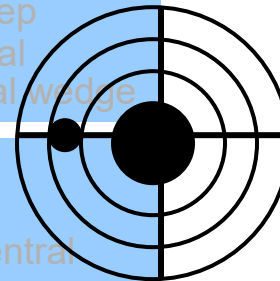


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It's possible because of an interesting quirk of neuroanatomy. As they reach the chiasm, a portion of the nasal fibers (ie, those responsible for the temporal VF) take a brief detour. Instead of simply crossing the chiasm, they first turn and travel up the distal optic nerve of the fellow eye, forming a small loop known as *Wilbrand's knee*.

Thus, in addition to producing the expected optic nerve-type VF defect in the eye ipsilateral to the lesion, a lesion at the junction may produce a temporal VF defect in the contralateral eye by bagging the fibers in Wilbrand's knee; together, these constitute what we're calling a *junctional common scotoma*.

Nasal step



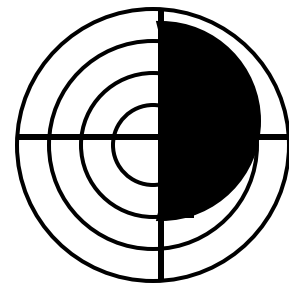
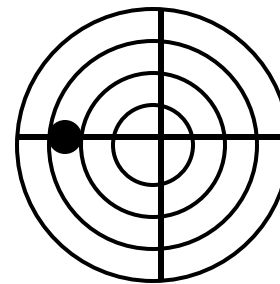
Common junctional scotoma

Optic chiasm

Bitemporal hemianopia

Binasal hemianopia

In rare cases, a junctional lesion might bag **only** Wilbrand's knee, resulting in a temporal VF defect in one eye and no VF defect in the fellow eye—that is, a *junctional rare scotoma* (of Traquair).



Junctional scotoma of...Traquair

Retrochiasmal

Optic tract

LGN

Optic radiations

Occipital cortex

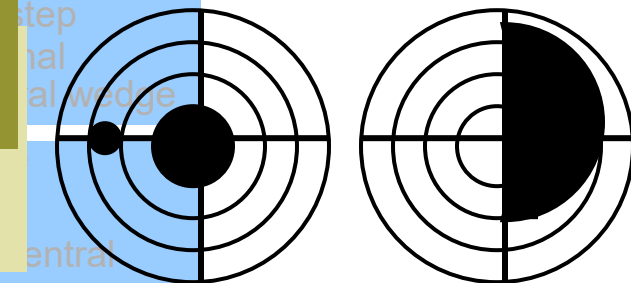
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Wilbrand...Isn't that the name of a bleeding dz or something?

Temporal wedge  
central  
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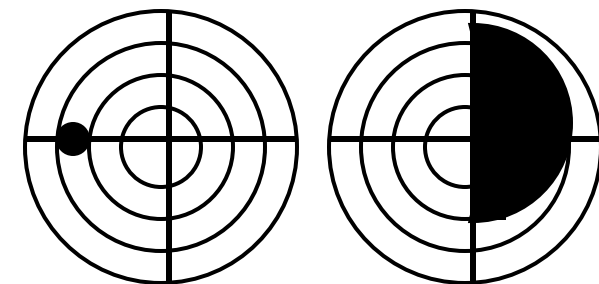
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Junctional scotoma of...Traquair

Retrochiasmal

Optic tract

LGN

Optic radiations

Occipital cortex

# Visual Field Defects

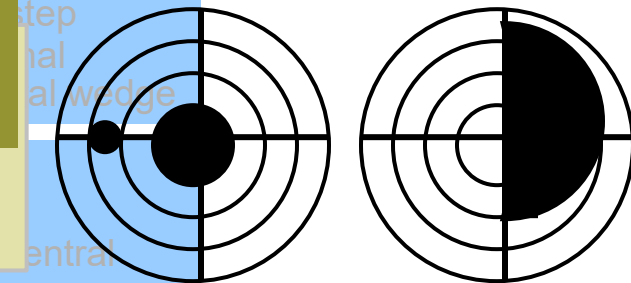


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Wilbrand...Isn't that the name of a bleeding dz or something? You're thinking of von Willebrand dz. It's a common conflation, ie, a resident will refer to 'von Willebrand's knee.' Don't be that resident.

T...in...a temporal VF defect in the contralateral eye by bagging the fibers in Wilbrand's knee; together, these constitute what we're calling a junctional common scotoma.

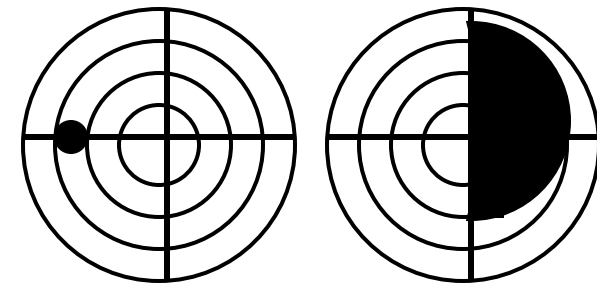


Common junctional scotoma

Optic chiasm

Bitemporal hemianopia  
Binasal hemianopia

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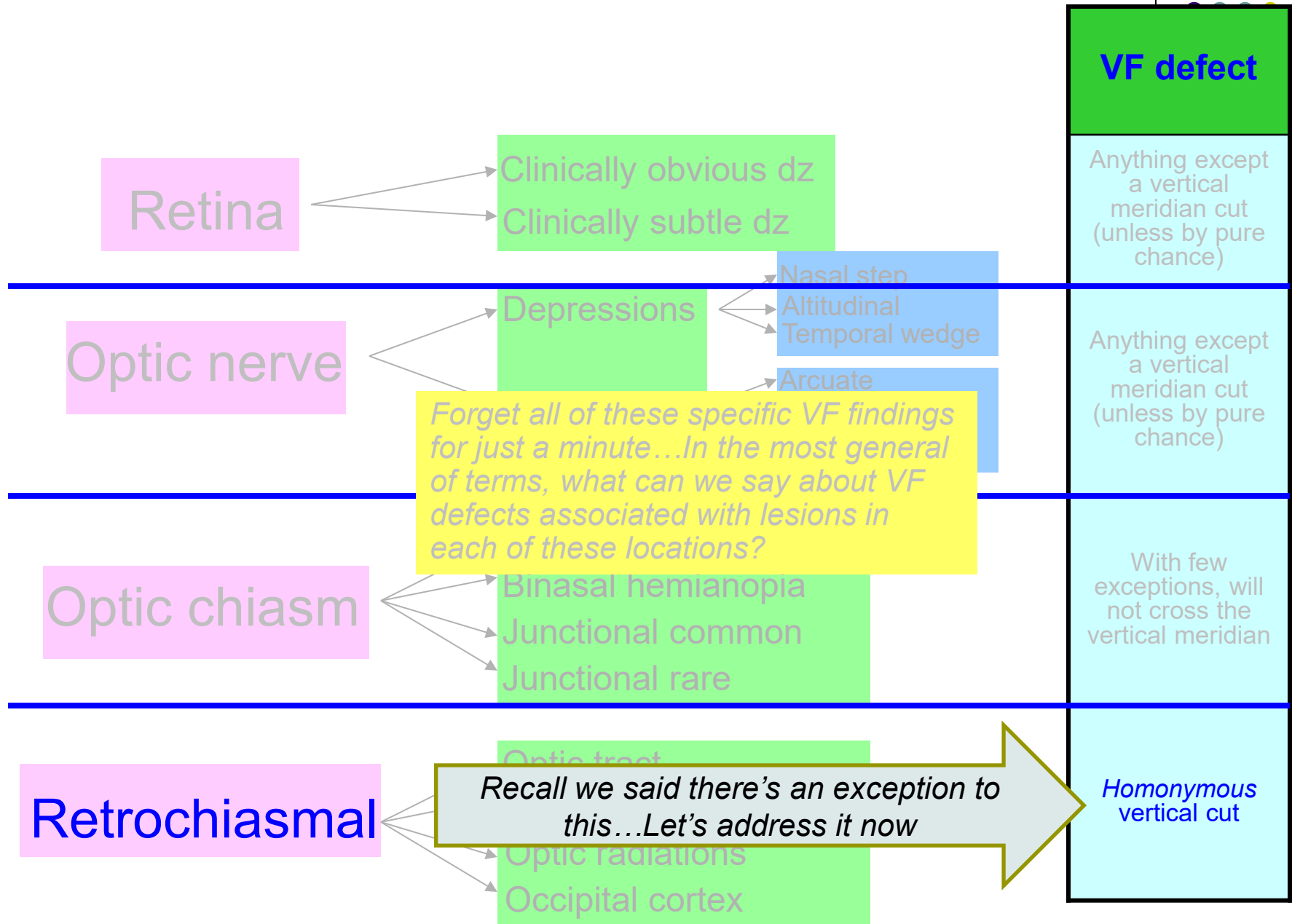
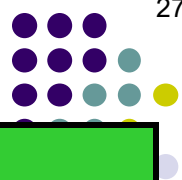
Junctional scotoma of...Traquair

Retrochiasmal

Optic tract  
LGN  
Optic radiations  
Occipital cortex



# Visual Field Defects



# Visual Field Defects

VF defect

*An elderly vasculopath presents c/o things 'sneaking up on her from the left.' You check her CVFs—they're fine. You get a 24-2—WNL OU. You send her on her way with reassurances that everything's fine.*

Junctional common  
Junctional rare

vertical meridian

Retrochiasmal

*Recall we said there's an exception to this...Let's address it now*

*Homonymous  
vertical cut*

Optic tract  
Optic radiations  
Occipital cortex

# Visual Field Defects

VF defect

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Junctional common  
Junctional rare

vertical meridian

Retrochiasmal

Recall we said there's an exception to this...Let's address it now

Homonymous vertical cut

Optic tract  
Optic radiations  
Occipital cortex

# Visual Field Defects

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Junctional common  
Junctional rare

vertical meridian

Retrochiasmal

Recall we said there's an exception to this...Let's address it now

Homonymous  
vertical cut

Optic tract  
Optic radiations  
Occipital cortex

# Visual Field Defects

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Junctional common  
Junctional rare

vertical meridian

Retrochiasmal

Recall we said there's an exception to this...Let's address it now

Homonymous vertical cut

Optic tract  
Optic radiations  
Occipital cortex

# Visual Field Defects

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Junctional common  
Junctional rare

vertical meridian

Retrochiasmal

Recall we said there's an exception to this...Let's address it now

Homonymous vertical cut

Optic tract  
Optic radiations  
Occipital cortex

# Visual Field Defects

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Junctional common  
Junctional rare

vertical meridian

Retrochiasmal

Recall we said there's an exception to this...Let's address it now

Homonymous vertical cut

Optic tract  
Optic radiations  
Occipital cortex

# Visual Field Defects

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You missed a classic case of loss of the temporal crescent. The temporal visual field of the eye ipsilateral to the field in question extends much farther ( deg ) than does the contribution from the fellow eye ( deg ).

Junctional common  
Junctional rare

vertical meridian

Retrochiasmal

Recall we said there's an exception to this...Let's address it now

Homonymous vertical cut

Optic tract  
Optic radiations  
Occipital cortex



# Visual Field Defects

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You missed a classic case of loss of the **temporal crescent**. The temporal visual field of the eye ipsilateral to the field in question extends much farther ( $\sim 100^\circ$ ) than does the contribution from the fellow eye ( $\sim 60^\circ$ ).

Junctional common  
Junctional rare

vertical meridian

Retrochiasmal

Recall we said there's an exception to this...Let's address it now

Homonymous vertical cut

Optic tract  
Optic radiations  
Occipital cortex

# Visual Field Defects

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Junctional common  
Junctional rare

vertical meridian

Retrochiasmal

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Homonymous vertical cut

Optic tract  
Optic radiations  
Occipital cortex

# Visual Field Defects

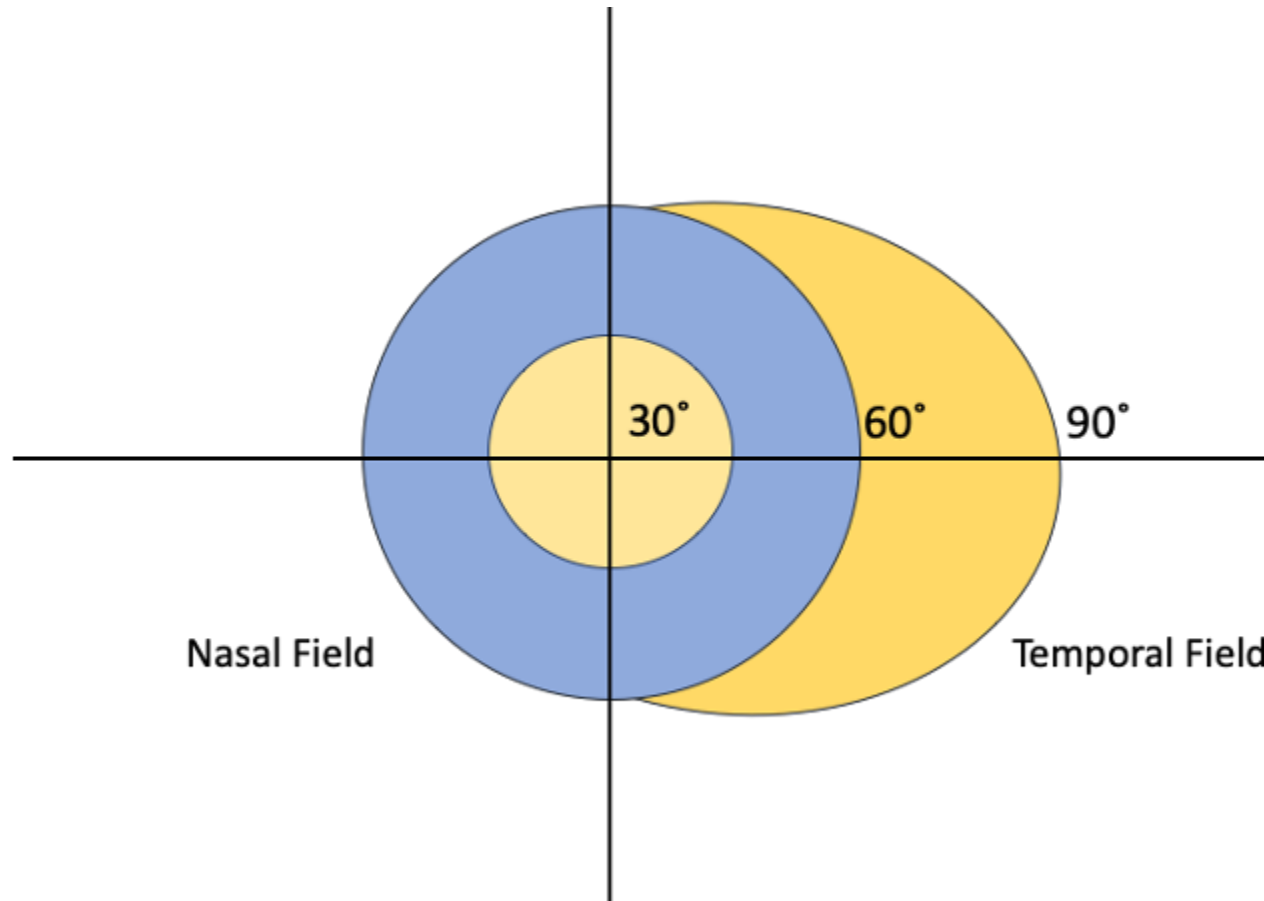


Diagram of the nasal VF (60 degrees) and temporal VF (90-100 degrees).  
The temporal 60-90° region is the temporal crescent.

# Visual Field Defects

VF defect

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Junctional common  
Junctional rare

vertical meridian

Retrochiasmal

Recall we said there's an exception to this...Let's address it now

Homonymous  
vertical cut

Optic tract  
Optic radiations  
Occipital cortex

# Visual Field Defects

VF defect

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Junctional common  
Junctional rare

vertical meridian

Retrochiasmal

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Homonymous  
vertical cut

Optic tract  
Optic radiations  
Occipital cortex

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Junctional common  
Junctional rare

vertical meridian

Retrochiasmal

Recall we said there's an exception to this...Let's address it now

Homonymous vertical cut

Optic tract  
Optic radiations  
Occipital cortex

# Visual Field Defects

VF defect

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Junctional common  
Junctional rare

vertical meridian

Retrochiasmal

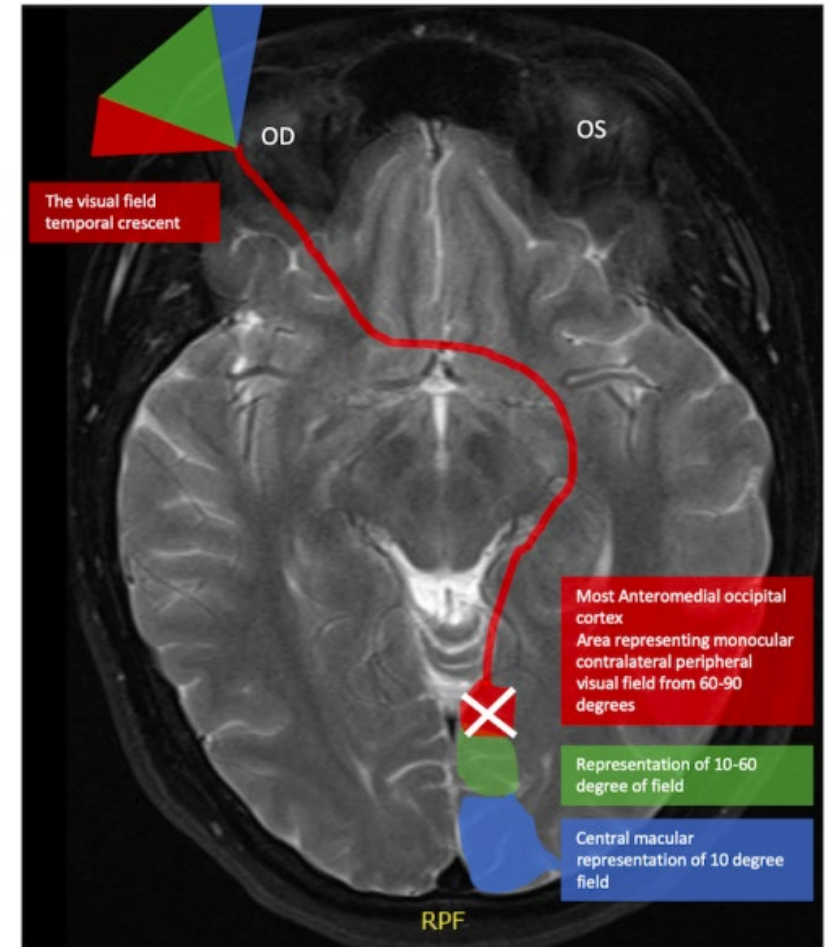
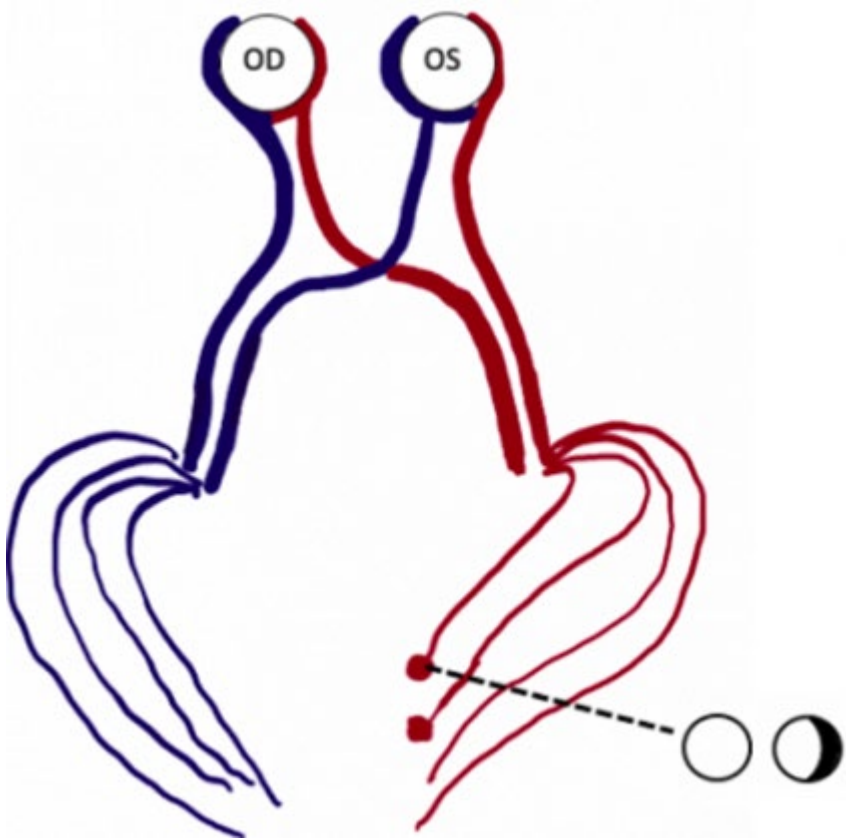
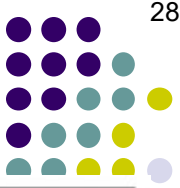
Recall we said there's an exception to this...Let's address it now

Homonymous vertical cut

Optic tract  
Optic radiations  
Occipital cortex

# Visual Field Defects

288



Images showcasing the location of a lesion producing Temporal Crescent Syndrome



- Which of the following is ***not*** associated with bitemporal visual-field loss?
  - Sectoral RP
  - Glaucoma
  - Fuchs coloboma
  - Chiasmal lesion
  - Toxic/hereditary/nutritional optic neuropathy



# Visual Field Defects

- Which of the following is **not** associated with bitemporal visual-field loss?
  - Sectoral RP
  - **Glaucoma**
  - Fuchs coloboma
  - Chiasmal lesion
  - Toxic/hereditary/nutritional optic neuropathy
- *Glaucoma*. Hemianopic (= respects the vertical midline) bitemporal VF loss is associated exclusively with *lesions compressing the chiasm*, specifically the mid- vs lateral chiasm.

# Visual Field Defects



- Which of the following is **not** associated with bitemporal visual-field loss?
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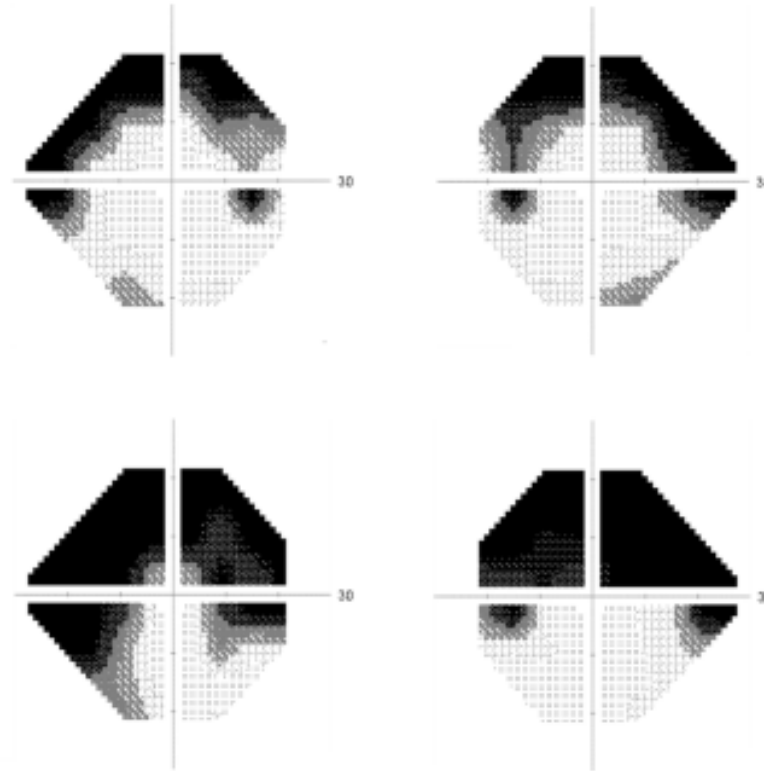
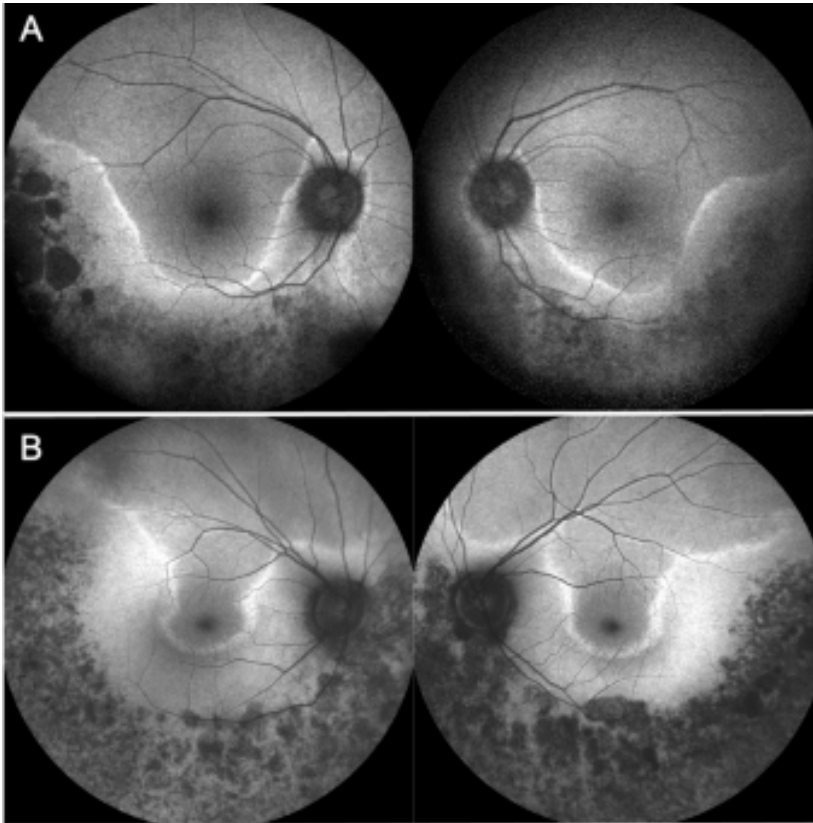


# Visual Field Defects

- Which of the following is **not** associated with bitemporal visual-field loss?
  - **Sectoral RP**
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  - Fuchs coloboma
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# Visual Field Defects

293



## Sectoral RP

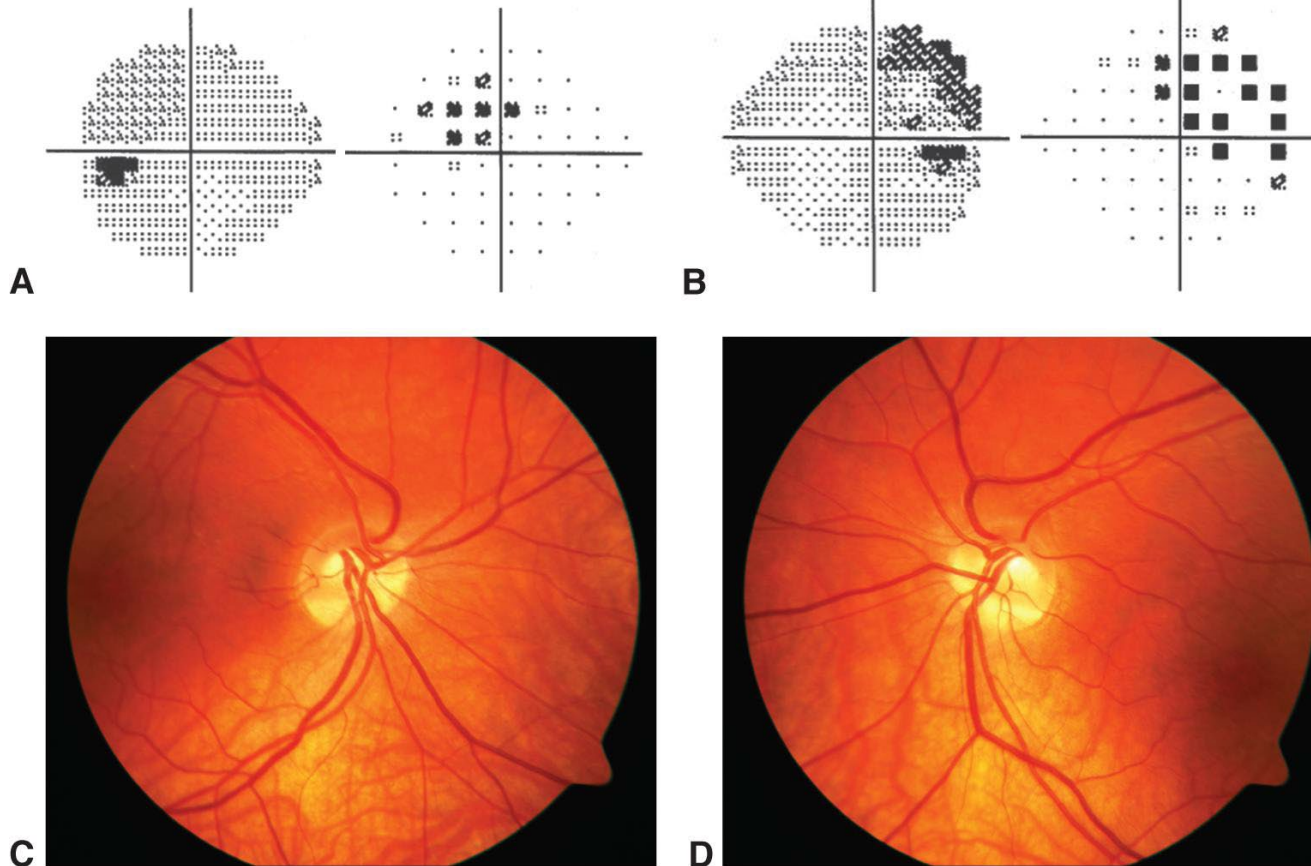
Images from JP Marques et al, *EYS-Associated Sector Retinitis Pigmentosa*. *Graefe's Archives for Clinical and Experimental Ophthalmology*, 2022 Apr;260(4):1405-1413.  
With kind permission of the first author.



# Visual Field Defects

- Which of the following is **not** associated with bitemporal visual-field loss?
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# Visual Field Defects



Tilted disc: Superior bitemporal VF defects

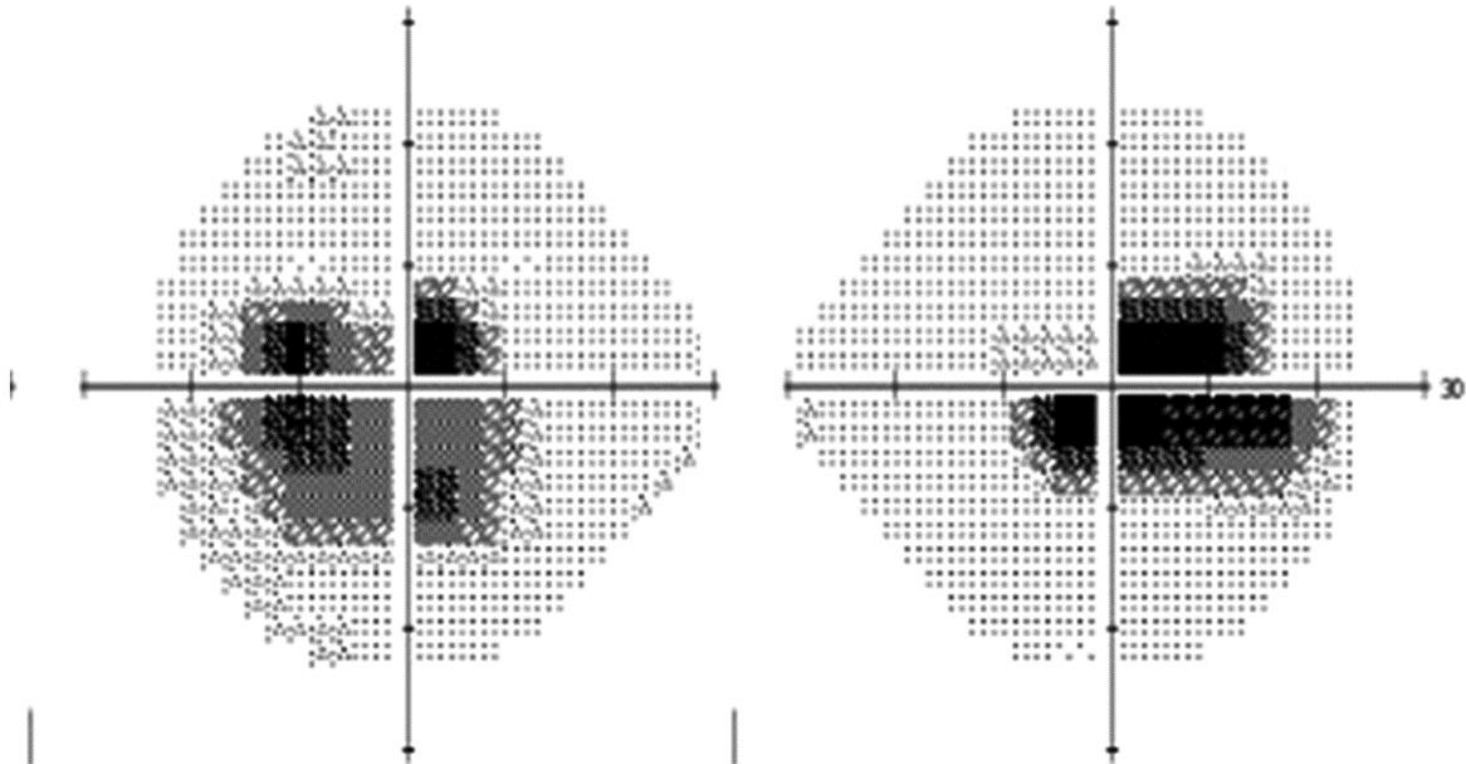
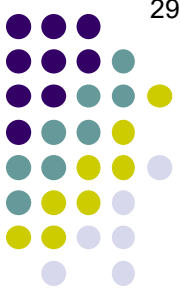


# Visual Field Defects

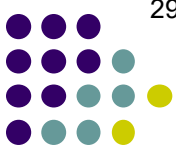
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# Visual Field Defects

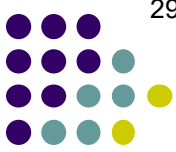


Visual field defects characteristic of toxic and metabolic optic neuropathies



# Visual Field Defects

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  - **Glaucoma**
  - Fuchs coloboma
  - Chiasmal lesion
  - Toxic/hereditary/nutritional optic neuropathy
- *Glaucoma*. Hemianopic (= respects the vertical midline) bitemporal VF loss is associated exclusively with *lesions compressing the chiasm*, specifically the mid-chiasm. Other causes of bitemporal loss do not respect the midline (except by happenstance). *Sectoral RP* is symmetric bilaterally, and thus can affect the temporal VF bilaterally. *Fuchs coloboma* (aka *tilted disc syndrome*) is associated with bitemporal loss that resolves with proper correction. *Toxic/hereditary/nutritional optic neuropathy* is associated with bilateral cecocentral VF loss, which can mimic bitemporal loss. Glaucoma almost always affects the nasal VF long before the temporal field is involved—if anything, glaucoma is far more likely to cause **binasal** VF loss (although this is a very rare occurrence).



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