Uveitis: *Lyme*

1) The uveitis is profiled
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Basics

What is the causative organism in Lyme dz?

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It is a spirochete

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Is it Gram positive, or Gram negative?

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How are humans infected?

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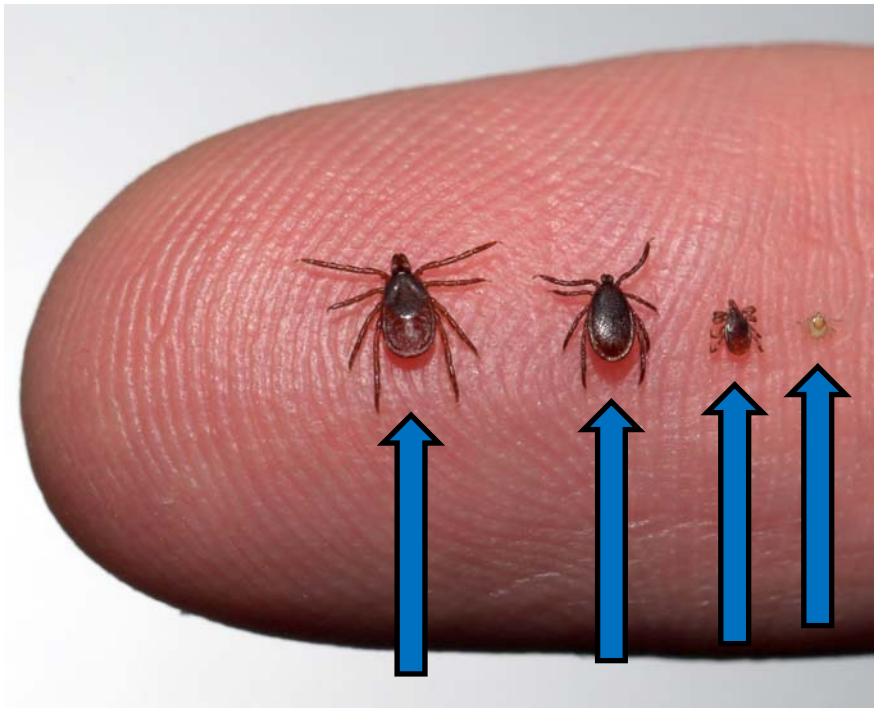
How are humans infected?
Via a bite from a tick of the *Ixodes* genus

Uveitis: ***Lyme***



Ixodes scapularis: Adult female, adult male, nymph, larva

Yuck

Ixodes tick

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Chiefly deer

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--The Northeast, especially Connecticut
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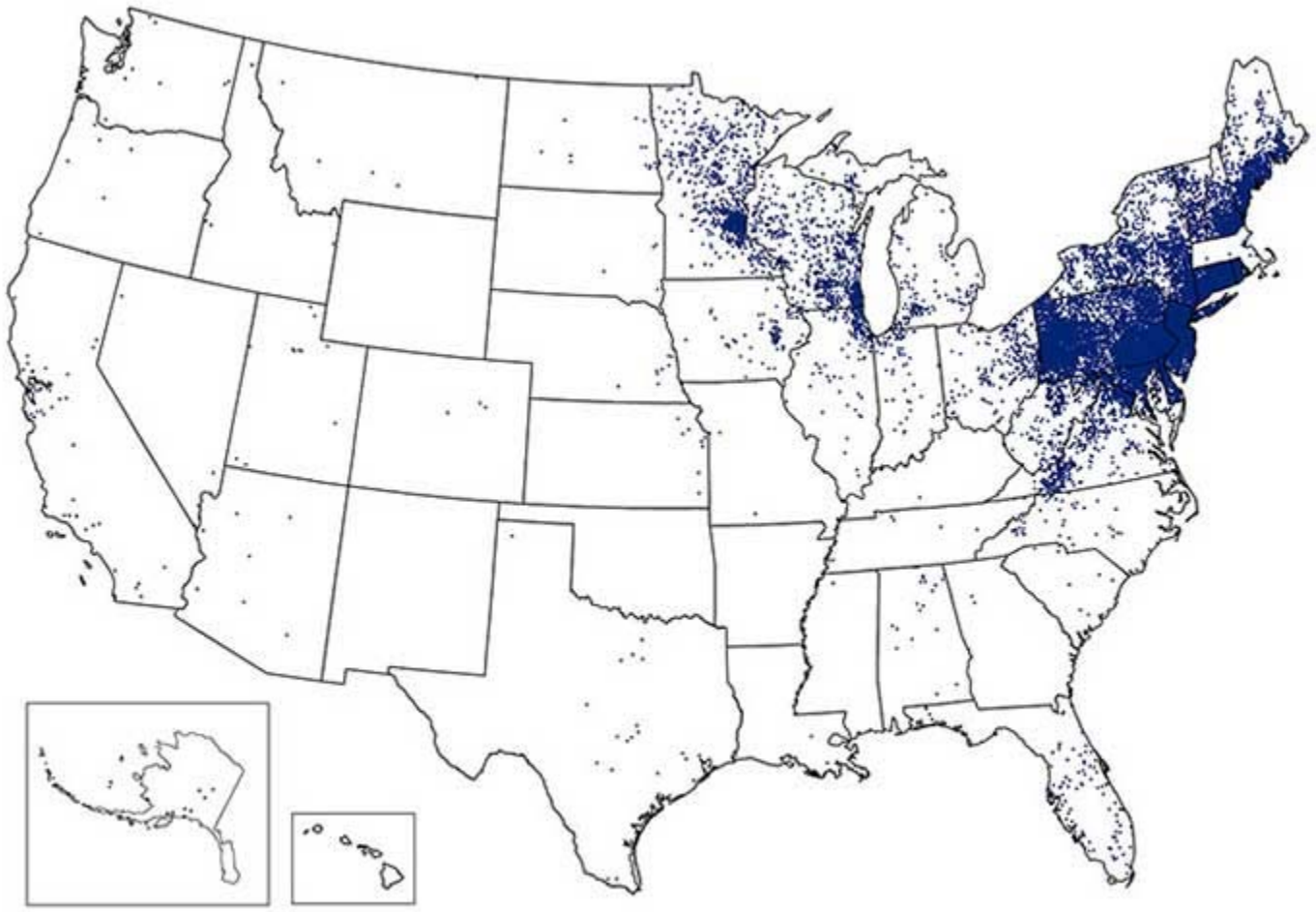

Lyme dz: Distribution in the US

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Summertime—May to August

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Summertime—May to August

What age group(s) is/are most likely to be affected?
The age distribution is bimodal, with peaks at # to # years, and again at # to #

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--The Northeast, especially Connecticut
--The Minnesota/Wisconsin region

What time of year is LD most likely to occur?
Summertime—May to August

What age group(s) is/are most likely to be affected?
The age distribution is bimodal, with peaks at 5-15 years, and again at 50-60

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Basics

LD passes through three stages--what are they?

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Basics

LD passes through three stages--what are they?

--The **Local disease** stage

--The **Disseminated disease** stage

--The **Persistent disease** stage

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4) Studies are obtained to identify the etiology
5) Treatment appropriate for the etiology is initiated

Basics

LD passes through three stages--what are they?

--The **Local disease** stage: ***?***

What eye manifestations are associated with this stage?

--The **Disseminated disease** stage

--The **Persistent disease** stage

Uveitis: ***Lyme***

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Basics

LD passes through three stages--what are they?

--The **Local disease** stage: Follicular conjunctivitis

What eye manifestations are associated with this stage?

--The **Disseminated disease** stage

--The **Persistent disease** stage

Uveitis: ***Lyme***

1) The uveitis is profiled
2) The profiled case is meshed
3) A differential diagnosis list is generated
4) Studies are obtained to identify the etiology
5) Treatment appropriate for the etiology is initiated

Basics

LD passes through three stages--what are they?

--The **Local disease** stage: Follicular conjunctivitis

--The **Disseminated disease** stage: ***?***

What eye manifestations are associated with this stage?

--The **Persistent disease** stage

Uveitis: ***Lyme***

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Basics

LD passes through three stages--what are they?

--The **Local disease** stage: Follicular conjunctivitis

--The **Disseminated disease** stage: Intraocular inflammatory dz

What eye manifestations are associated with this stage?

--The **Persistent disease** stage

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2) The profiled case is meshed
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LD passes through three stages--what are they?

--The **Local disease** stage: Follicular conjunctivitis

--The **Disseminated disease** stage: Intraocular inflammatory dz

--The **Persistent disease** stage: ***?***

What eye manifestations are associated with this stage?

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LD passes through three stages--what are they?

--The **Local disease** stage: Follicular conjunctivitis

--The **Disseminated disease** stage: Intraocular inflammatory dz

--The **Persistent disease** stage: Usually little eye involvement ([redacted] may be present)

What eye manifestations are associated with this stage?

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LD passes through three stages--what are they?

--The **Local disease** stage: Follicular conjunctivitis

--The **Disseminated disease** stage: Intraocular inflammatory dz

--The **Persistent disease** stage: Usually little eye involvement (**keratitis** may be present)

What eye manifestations are associated with this stage?

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Basics

LD passes through three stages--what are they?

How much time typically passes between the bite and the onset of Local disease?

--The **Local disease** stage

--The **Disseminated disease** stage

--The **Persistent disease** stage

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LD passes through three stages--what are they?

(2-28 days post-inoculation) The answer

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--The **Persistent disease** stage

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(2-28 days post-inoculation)
--The **Local disease** stage is characterized by…

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Basics

LD passes through three stages--what are they? How do they manifest?
(2-28 days post-inoculation)
--The **Local disease** stage is characterized by…the appearance of three Latin words at the bite site

--The **Disseminated disease** stage

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Basics

LD passes through three stages--what are they? How do they manifest?
(2-28 days post-inoculation)
--The **Local disease** stage is characterized by…the appearance of *erythema chronicum migrans* at the bite site

--The **Disseminated disease** stage

--The **Persistent disease** stage

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LD passes through three stages--what are they? How do they manifest?
(2-28 days post-inoculation)
--The **Local disease** stage is characterized by…the appearance of ***erythema chronicum migrans*** at the bite site

What is the classic appearance of the ECM rash?

--The **Disseminated disease** stage

--The **Persistent disease** stage

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--The **Local disease** stage is characterized by…the appearance of ***erythema chronicum migrans*** at the bite site

What is the classic appearance of the ECM rash?
That of a 'bull's eye'

--The **Disseminated disease** stage

--The **Persistent disease** stage

Uveitis: ***Lyme***

LD: Erythema chronicum migrans

Uveitis: ***Lyme***

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What is the classic appearance of the ECM rash?
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Is it macular, papular, or maculopapular?

--The **Disseminated disease** stage

--The **Persistent disease** stage

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What is the classic appearance of the ECM rash?
That of a 'bull's eye'

Is it macular, papular, or maculopapular?
Macular

--The **Disseminated disease** stage

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(2-28 days post-inoculation)
--The **Local disease** stage is characterized by…the appearance of *erythema chronicum migrans* at the bite site

In addition to the ECM rash, what other signs/symptoms characterize this stage?

--The **Disseminated di**

--The **Persistent disease** stage

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--The **Local disease** stage is characterized by…the appearance of *erythema chronicum migrans* at the bite site

--The **Disseminated di**

In addition to the ECM rash, what other signs/symptoms characterize this stage?
So-called 'constitutional' findings such as fever, fatigue, malaise and body aches

--The **Persistent disease** stage

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(2-28 days post-inoculation)
--The **Local disease** stage is characterized by…the appearance of *erythema chronicum migrans* at the bite site
How much time typically passes between the bite and the Disseminated disease stage?
--The **Disseminated disease** stage

--The **Persistent disease** stage

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LD passes through three stages--what are they? How do they manifest?

(2-28 days post-inoculation)

--The **Local disease** stage is characterized by…the appearance of *erythema chronicum migrans* at the bite site

(1-4 months post-inoculation)

The answer

--The **Disseminated disease** stage

--The **Persistent disease** stage

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--The skin
--The heart
--The CNS
--The joints
--The eye

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What skin finding is typical at this stage?

--The skin
--The heart
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--The eye

--The **Persistent disease** stage

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--The **Disseminated disease** stage is characterized by…**hematogenous spread** to different sites, including:
--The skin
--The heart
--The CNS
--The joints
--The eye

--The **Persistent disease** stage

What skin finding is typical at this stage?
The appearance of ECM rash at locations remote from the bite site

Uveitis: ***Lyme***

LD: Multiple skin lesions

Uveitis: *Lyme*

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--The skin
--The heart
--The CNS
--The joints
--The eye

--The **Persister**

How does cardiac involvement manifest?

Uveitis: *Lyme*

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--The **Persister**

How does cardiac involvement manifest?
As a conduction problem

Uveitis: *Lyme*

1) The uveitis is profiled
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What should the OKAP/Boards examinee be on the lookout for?

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What should the OKAP/Boards examinee be on the lookout for?
Signs/symptoms suggestive of conduction issues--syncope, irregular heartbeat, SOB

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If the examinee suspects cardiac involvement, what is the correct response?

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As a conduction problem

What should the OKAP/Boards examinee be on the lookout for?
Signs/symptoms suggestive of conduction issues--syncope, irregular heartbeat, SOB

If the examinee suspects cardiac involvement, what is the correct response?
Hospitalization on a telemetry unit (with appropriate consultations of course)

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Is CNS involvement common?

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Is CNS involvement common?
Yes; as many as % of LD pts will manifest neurologic findings

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What neurologic findings are typical at this stage?
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What neurologic findings are typical at this stage?
--Meningitis
--Encephalitis
--Cranial nerve palsies

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Is joint involvement common?

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Does LD tend to affect large joints, or small?

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Which joint is its 'favorite'?

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Which joint is its 'favorite'?
The knee

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--The eye in LD will be discussed in detail later in this slide-set!

--The **Persistent disease** stage

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How much time typically passes between the bite and the Persistent disease stage?
--The **Persistent disease** stage

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(5+ months post-inoculation)

The answer

--The **Persistent disease** stage

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--The **Persistent disease** stage is characterized by…episodic or even chronic

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(5+ months post-inoculation)

--The **Persistent disease** stage is characterized by…episodic or even chronic arthritis

Lyme dz stages: TLDR

(No questions—review slide)

Deer tick *bite*

A few days to weeks later

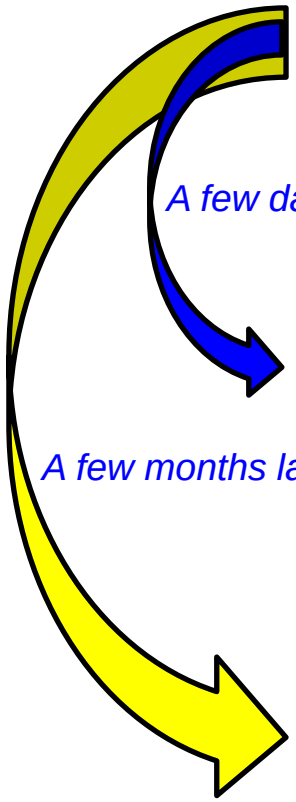
1st: *Local dz*

Systemic: Target rash at bite site; constitutional symptoms

Eye: Follicular conjunctivitis

Lyme dz stages: TLDR

(No questions—review slide)



Deer tick *bite*

A few days to weeks later

1st: *Local dz*

Systemic: Target rash at bite site; constitutional symptoms

Eye: Follicular conjunctivitis

A few months later

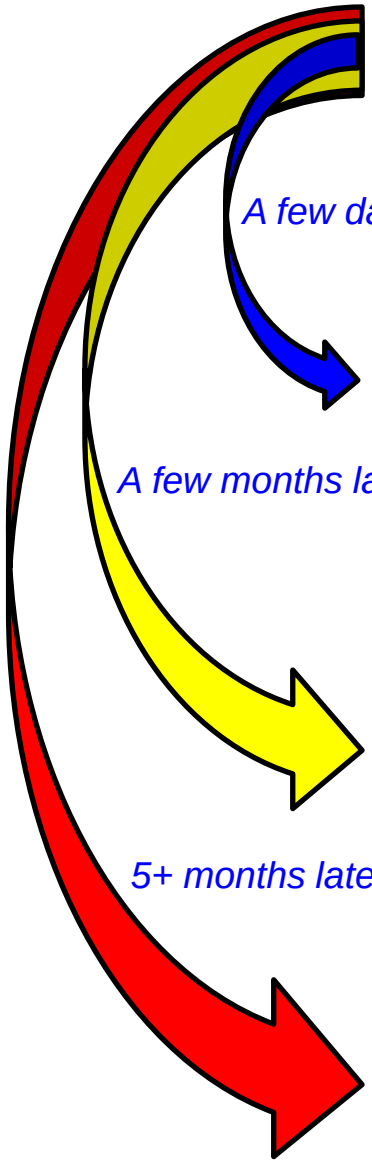
2nd: *Disseminated dz*

Systemic: Rash elsewhere; cardiac, CNS issues

Eye: **All the uveitis stuff we're fixing to discuss**

Lyme dz stages: TLDR

(No questions—review slide)



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A few days to weeks later

1st: *Local dz*

Systemic: Target rash at bite site; constitutional symptoms

Eye: Follicular conjunctivitis

A few months later

2nd: *Disseminated dz*

Systemic: Rash elsewhere; cardiac, CNS issues

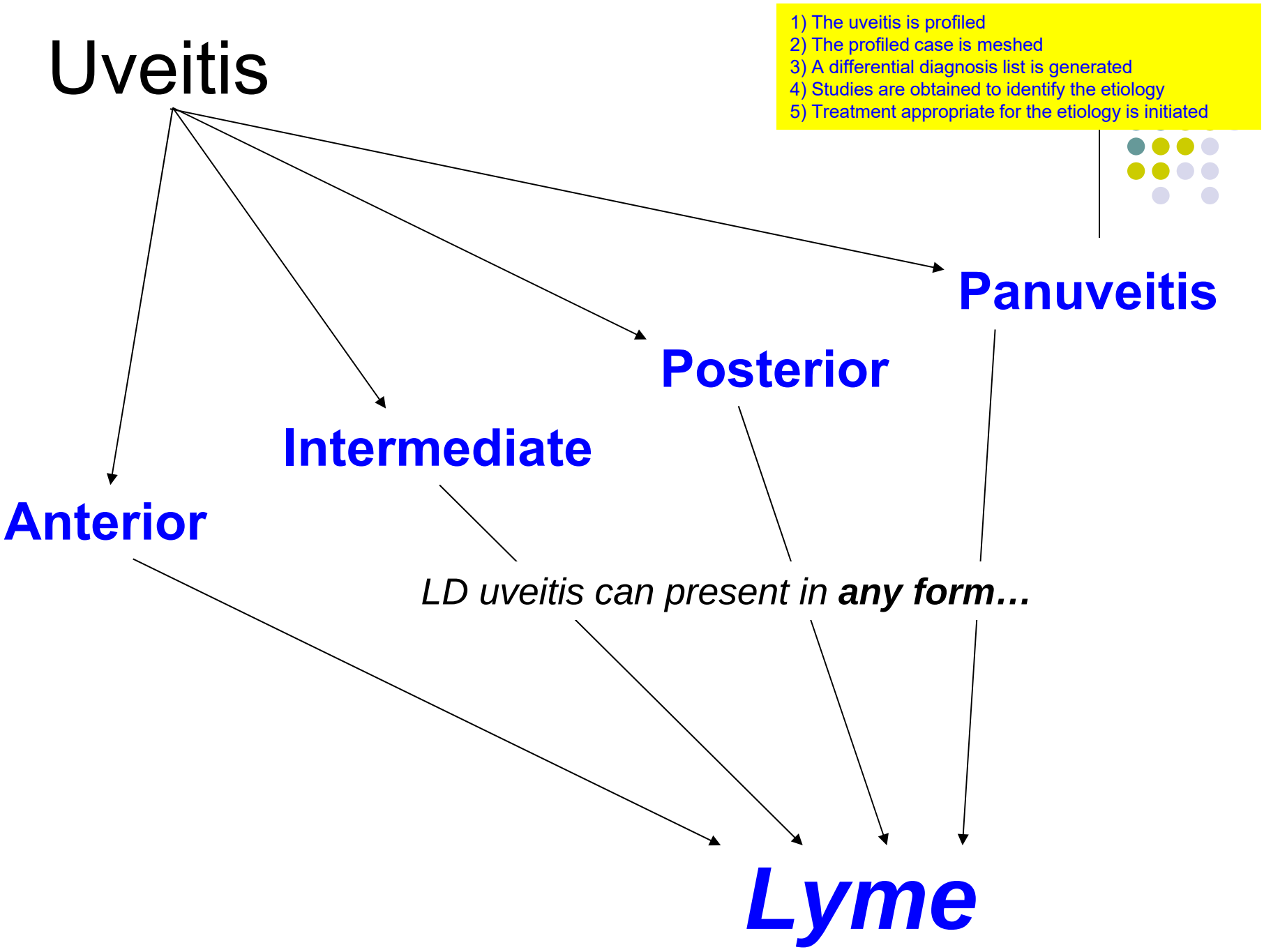
Eye: **All the uveitis stuff we're fixing to discuss**

5+ months later

3rd: *Persistent dz*

Systemic: Arthritis, probably in the knee

Eye: Not much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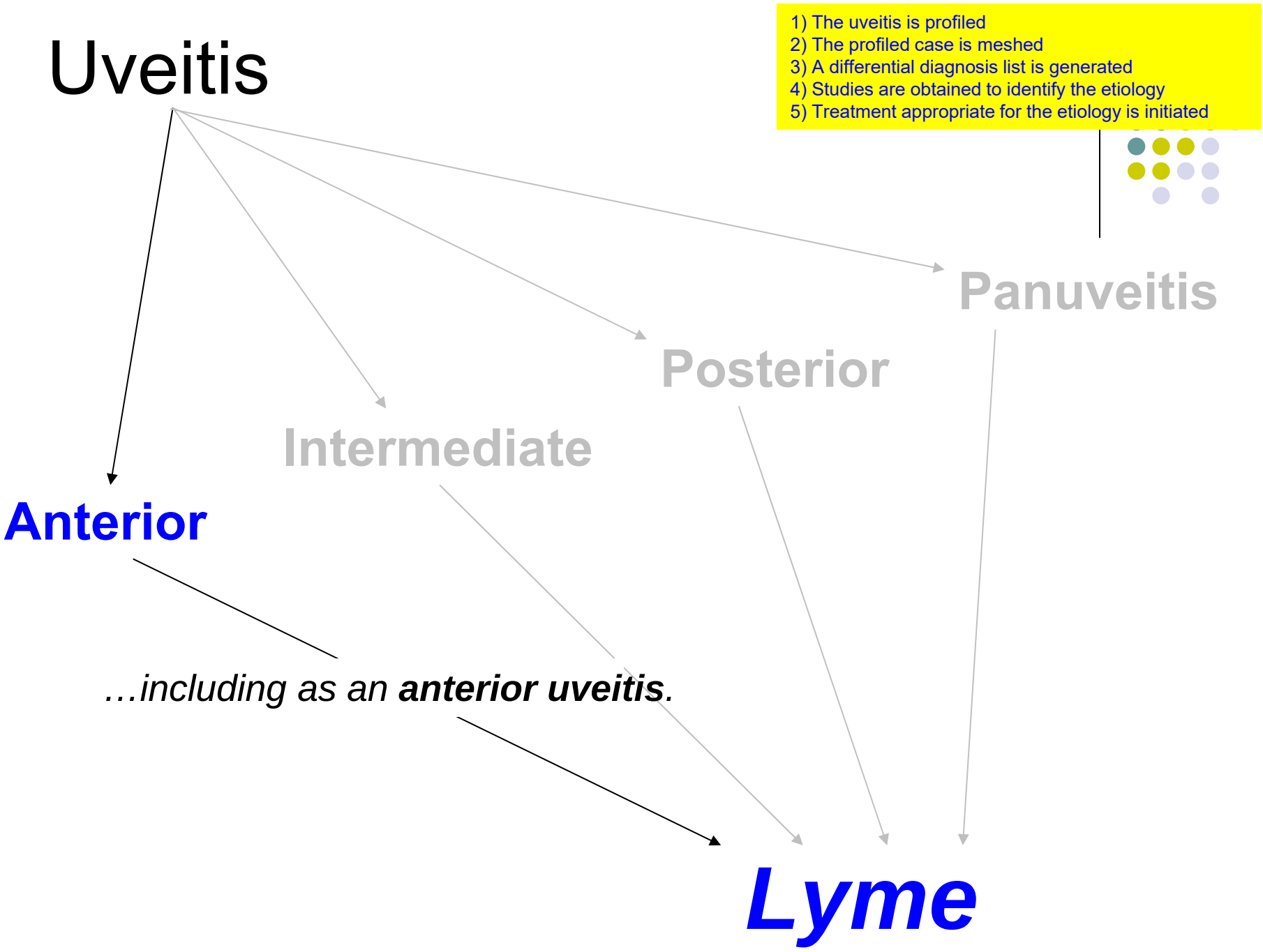
Panuveitis
Posterior
Intermediate
Anterior
LD uveitis can present in any form…
Lyme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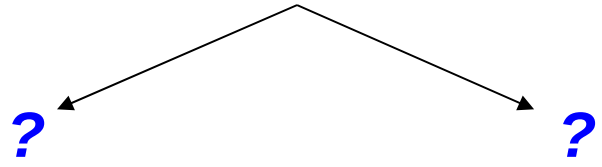
…including as an anterior uveitis.
Lyme

Uveitis: ***Anterior***



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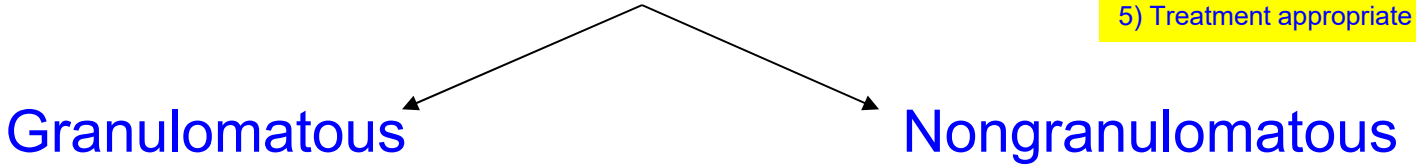

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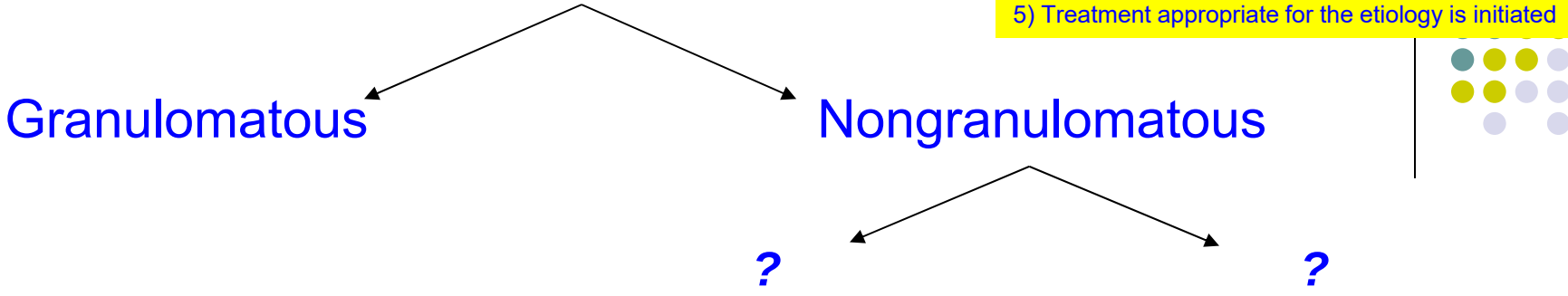

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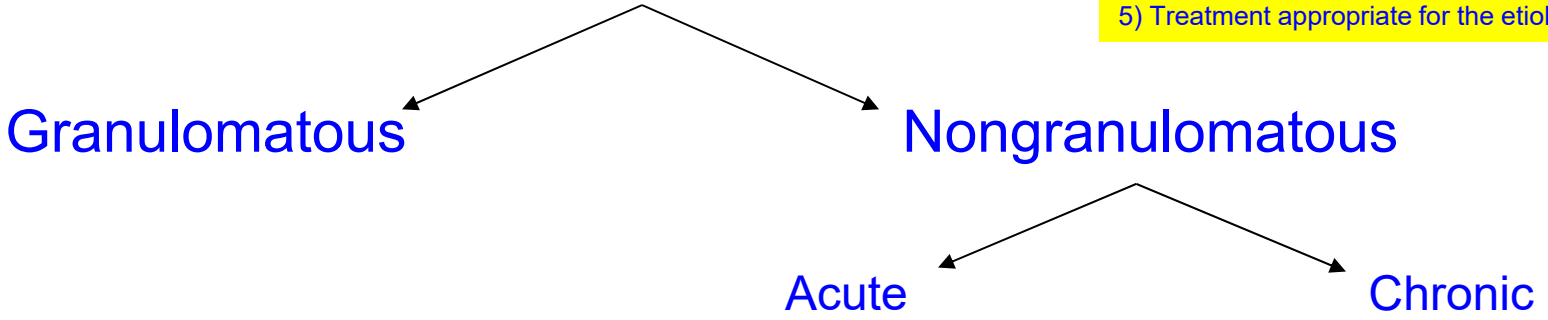

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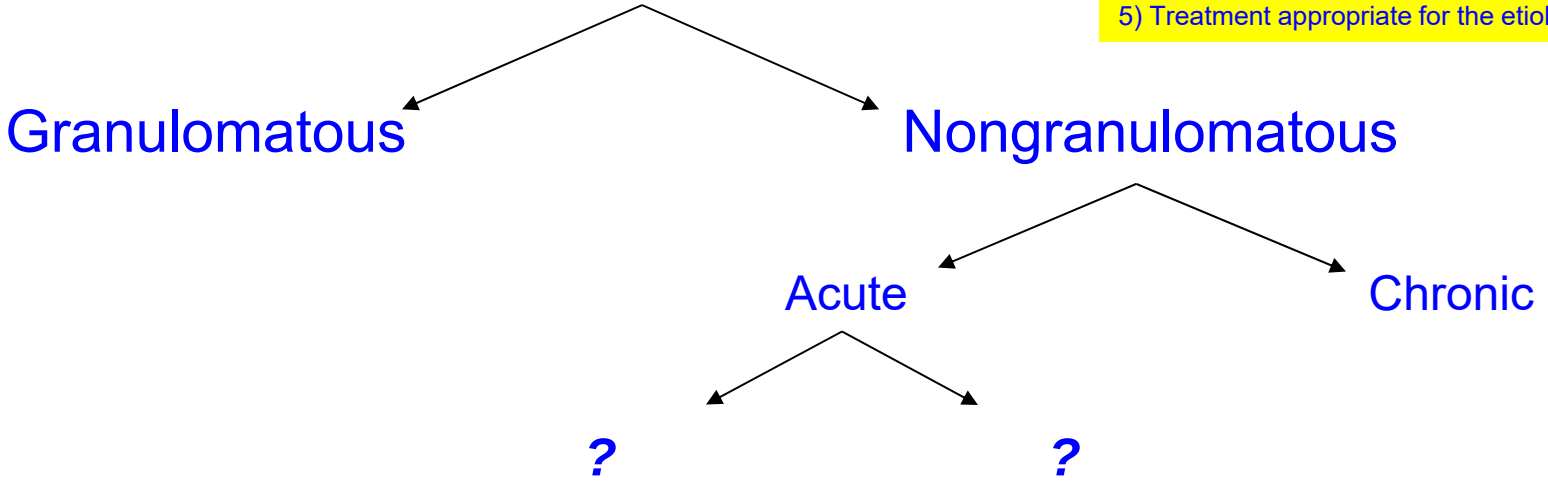

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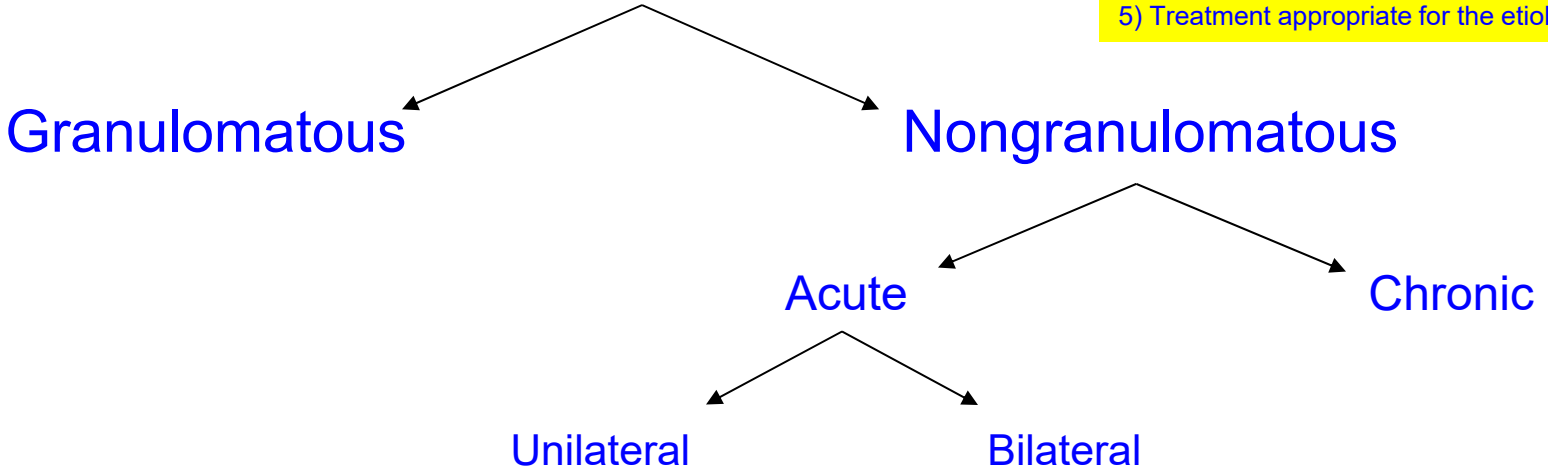

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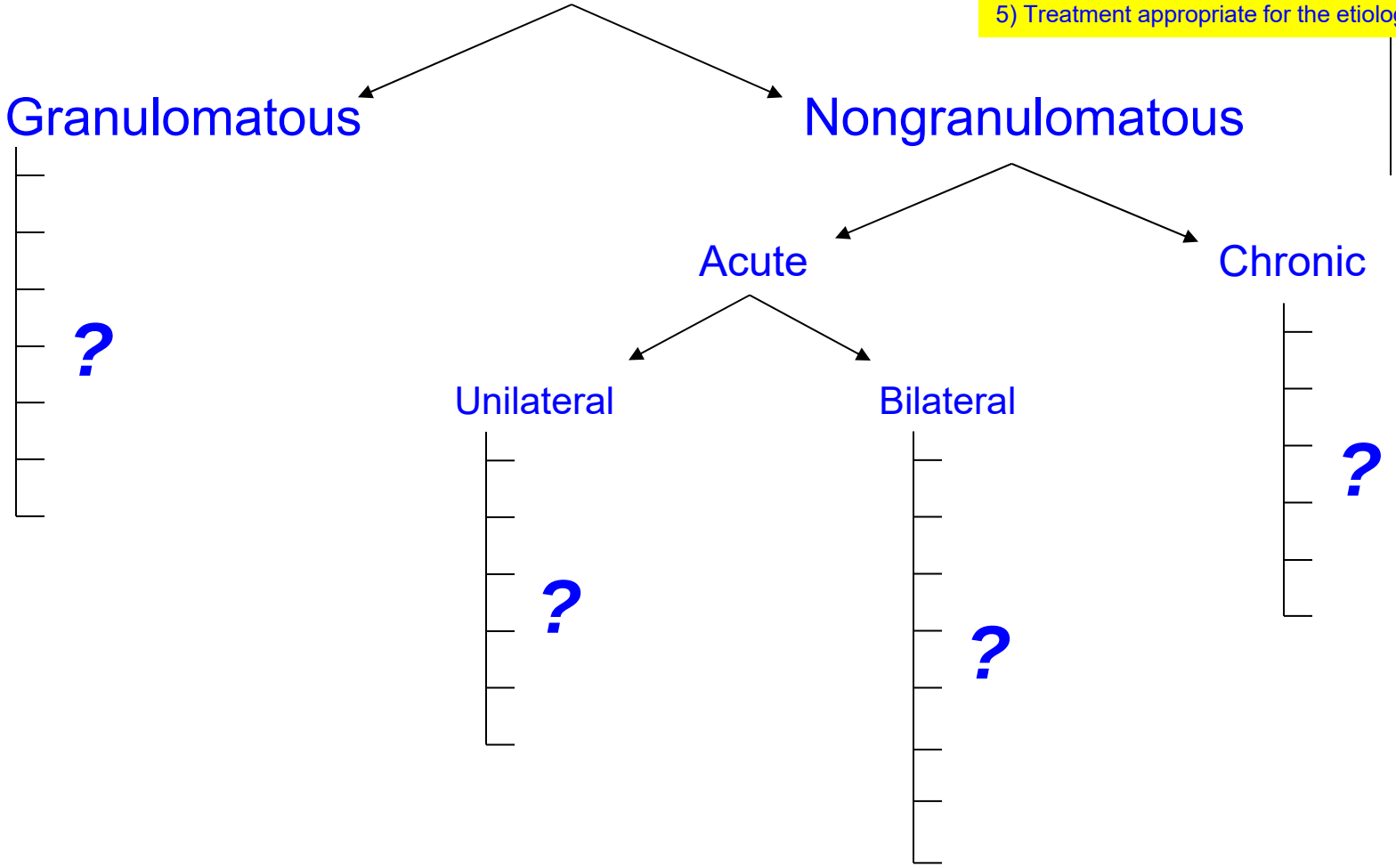

When LD presents as an anterior uveitis, in which form is it most likely to occur?

Uveitis: ***Anterior***

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2) The profiled case is meshed
3) A differential diagnosis list is generated
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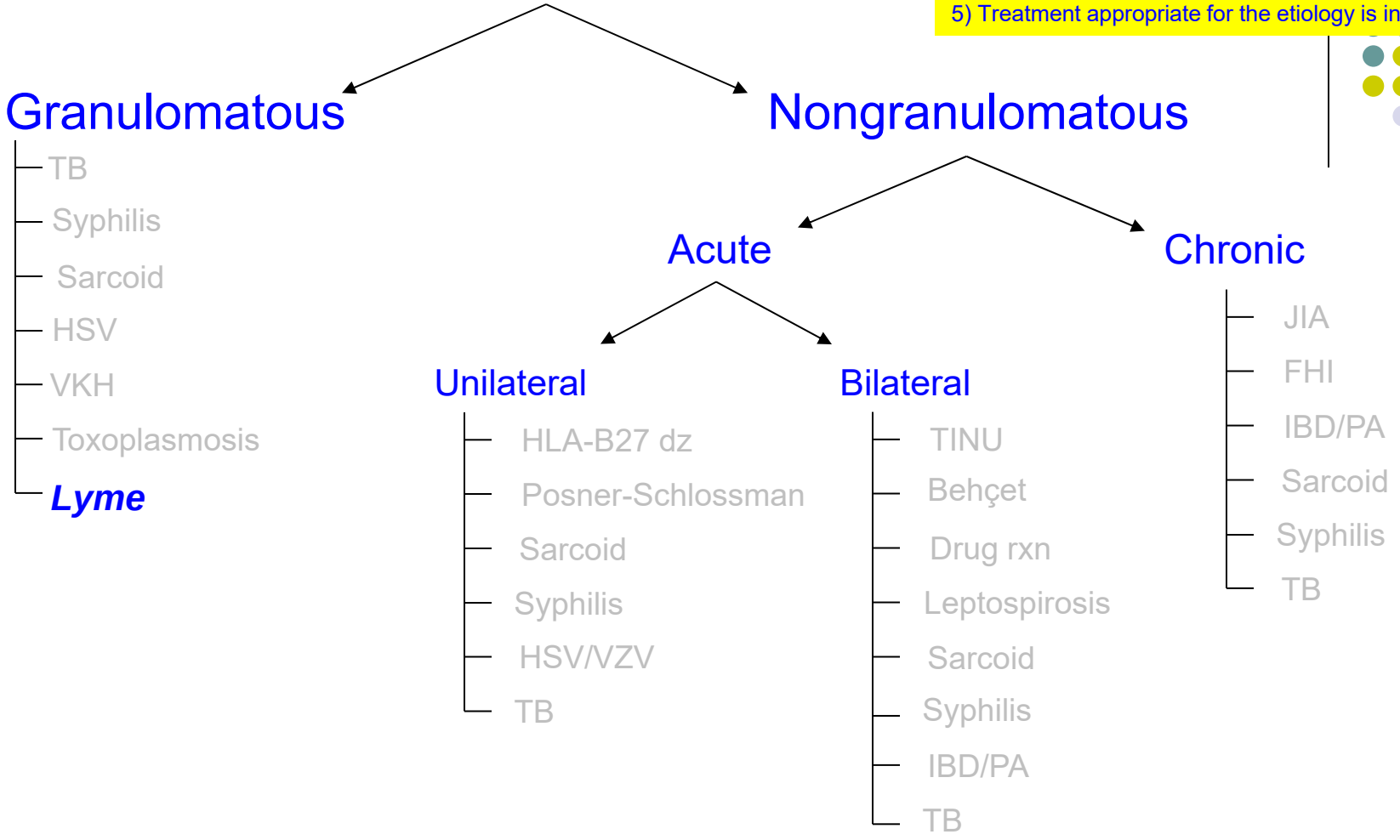

When LD presents as an anterior uveitis, in which form is it most likely to occur?
As a **granulomatous uveitis**

Uveitis

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3) A differential diagnosis list is generated
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Panuveitis

Posterior

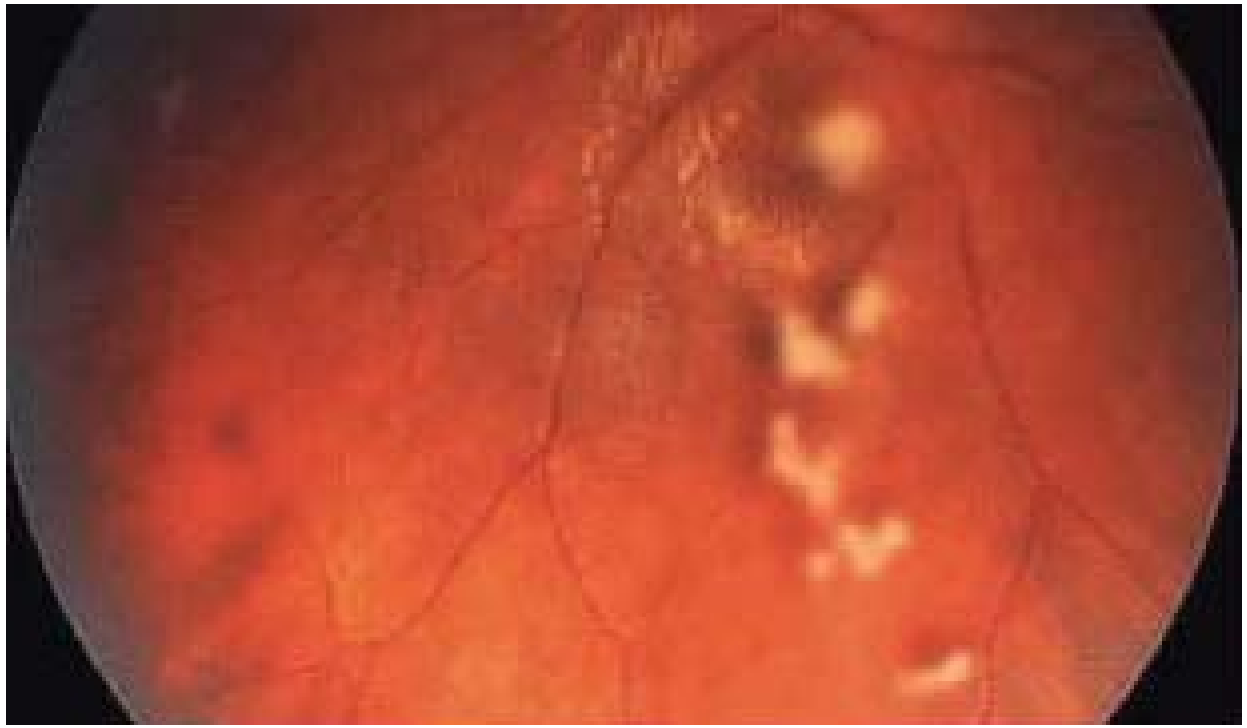
Intermediate

Anterior

*I**ntermediate uveitis** is a common presentation of LD, and this diagnosis should be given careful consideration in any pt presenting in this manner!*

Lyme

Uveitis: ***Lyme***



Intermediate uveitis

Uveitis

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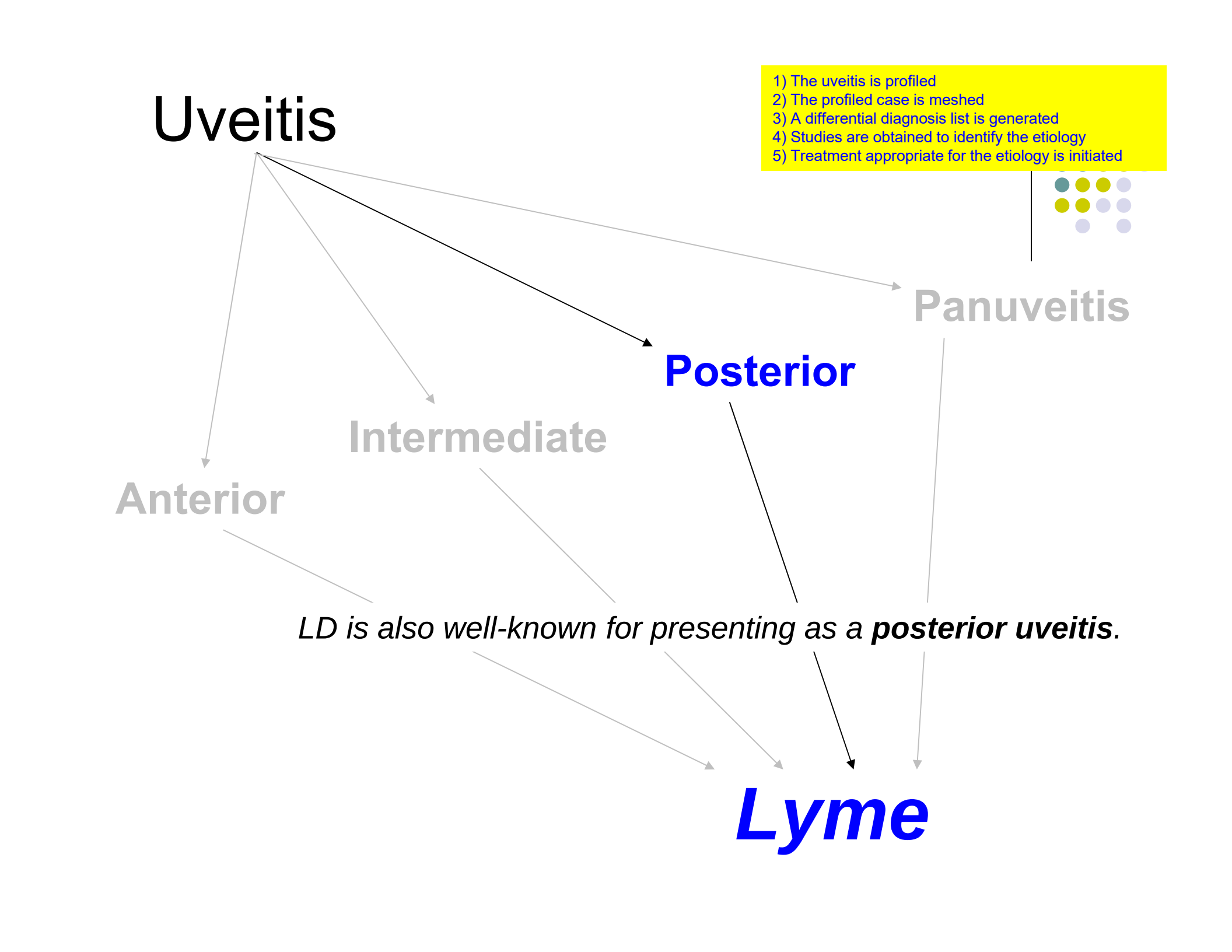

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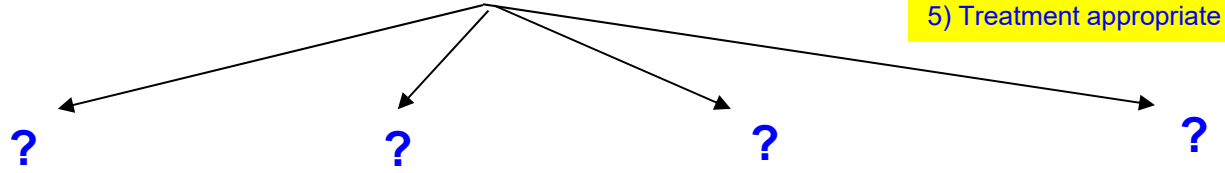

What are the four manifestations of posterior uveitis?

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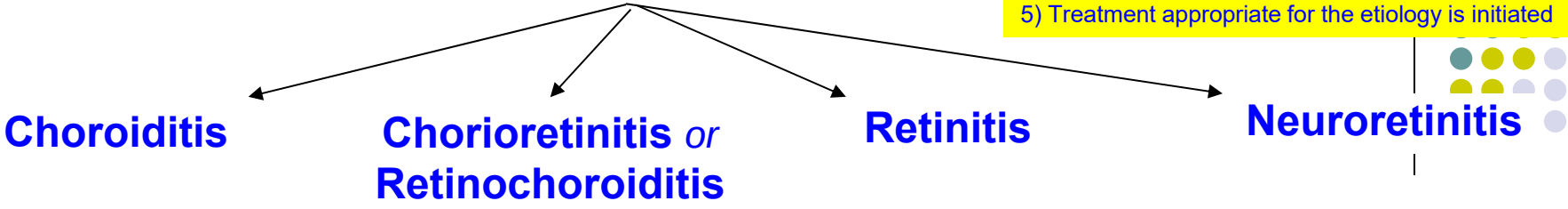

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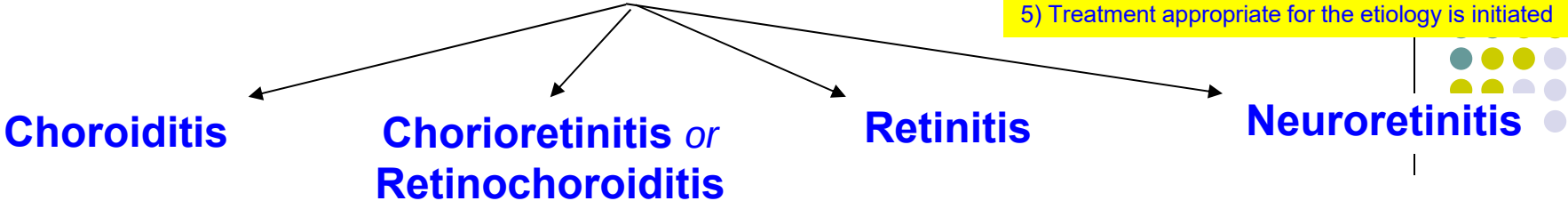

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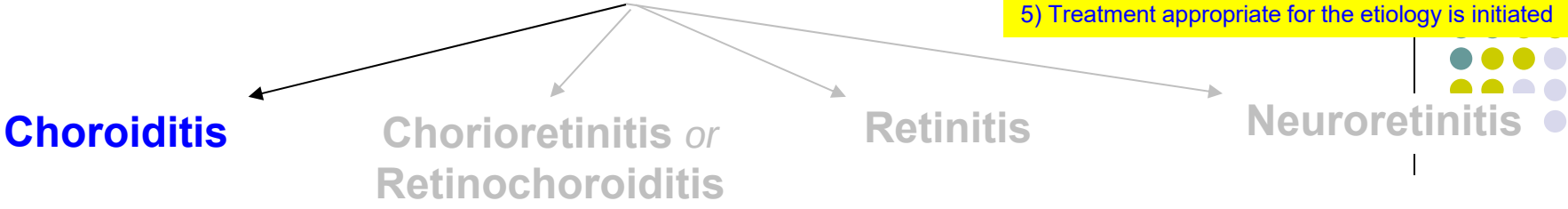

What is the classic posterior manifestation of LD?
A peripheral multifocal choroiditis

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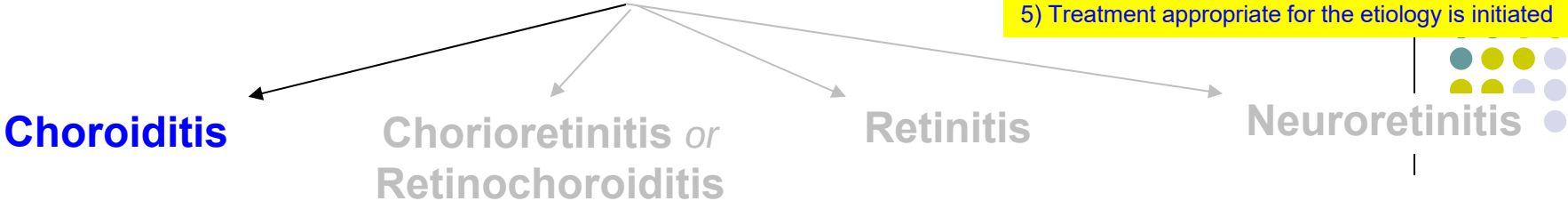

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Are the lesions…
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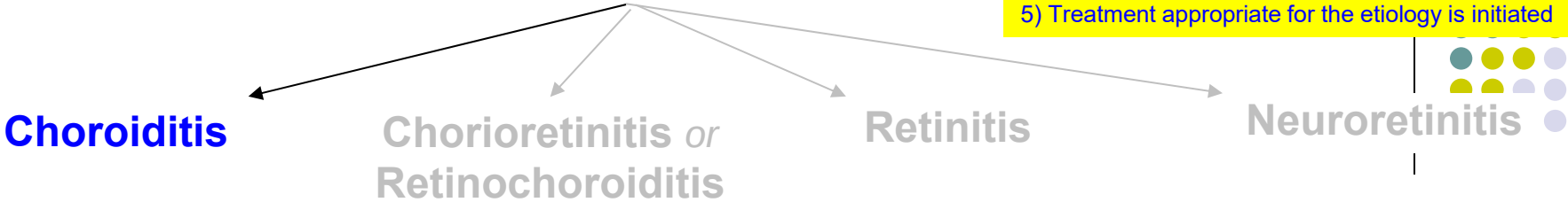

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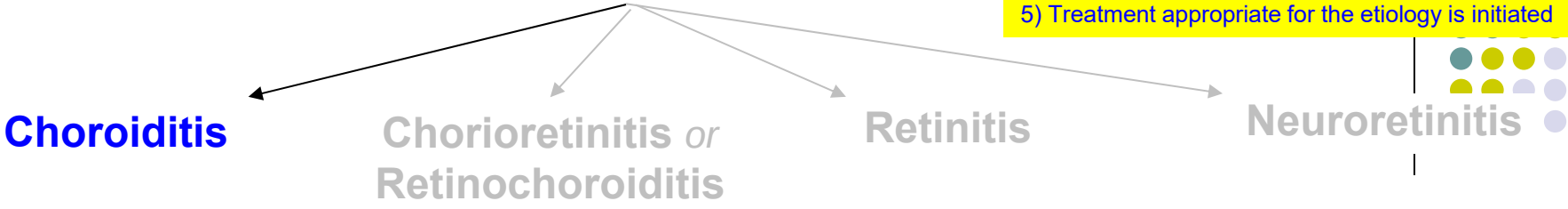

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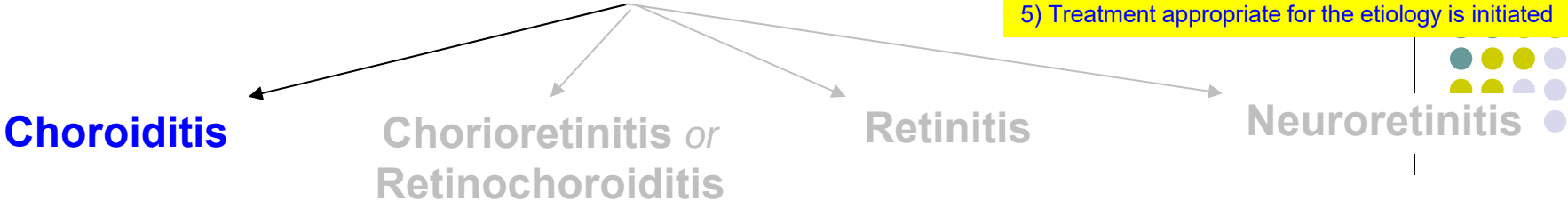

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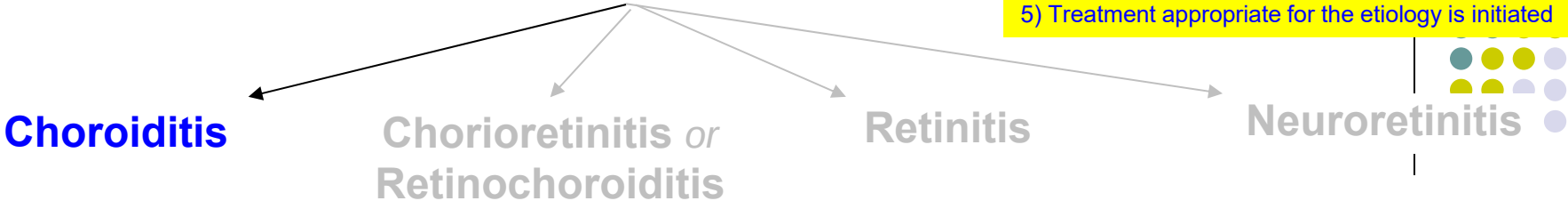

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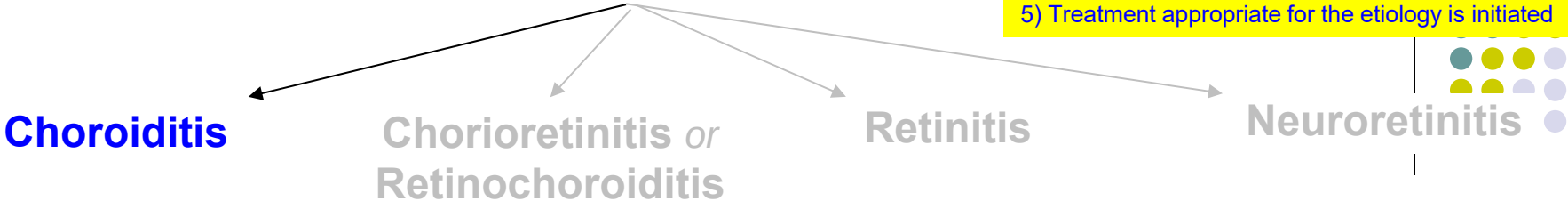

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Uveitis: ***Lyme***

LD: Peripheral multifocal choroiditis

Uveitis: ***Posterior***

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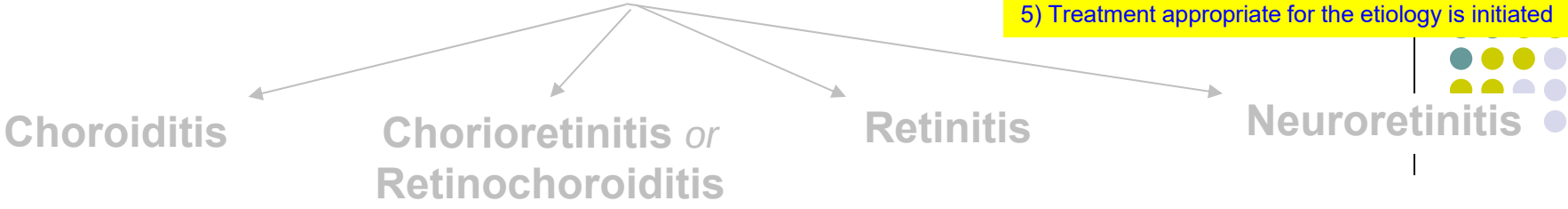

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In addition to choroiditis, in what other manner does LD posterior uveitis often manifest?

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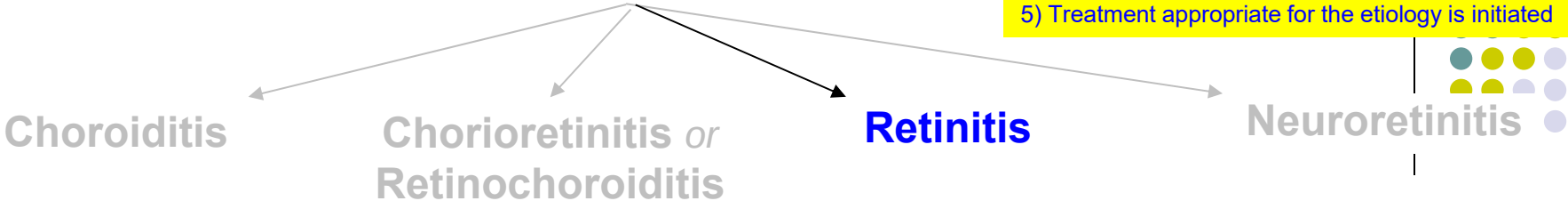

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In addition to choroiditis, in what other manner does LD posterior uveitis often manifest?
As a retinal vasculitis

Uveitis

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Panuveitis

Posterior

Intermediate

Anterior

*And of course, LD can present as a **panuveitis.***

Lyme

Uveitis: ***Lyme***

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What neuro-ophthalmic condition is LD notorious for (it was alluded to an earlier)?

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Of the CNs affecting the eye (ie, II - VII), which can be involved?

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Does LD Bell's palsy present unilaterally, or bilaterally?

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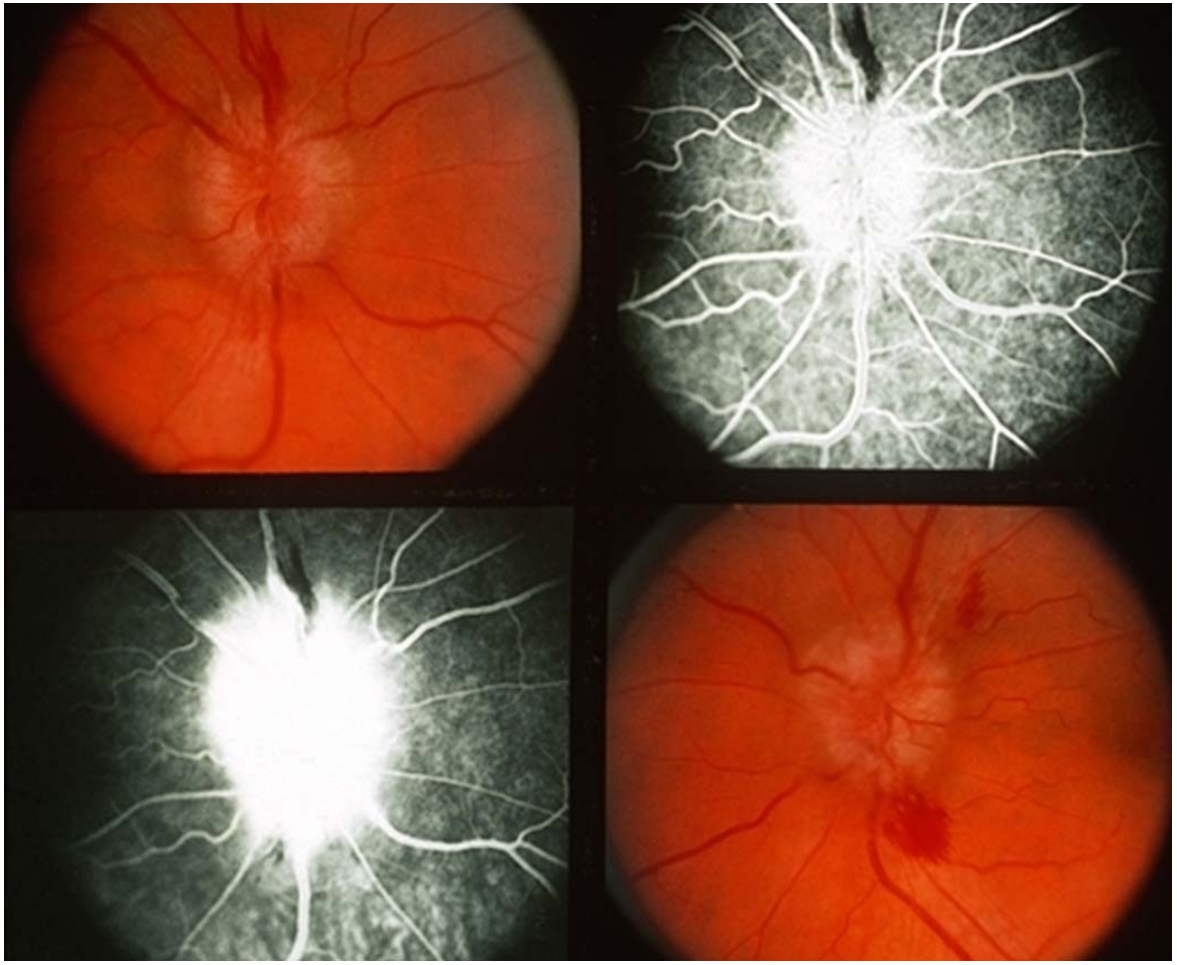
Does LD Bell's palsy present unilaterally, or bilaterally?
It can present either way

In what ways can the optic nerve be affected?
--An optic neuritis can occur
--If ICP increases because of a meningitic/encephalitic process, papilledema may be present

Uveitis: ***Lyme***

LD: Optic neuritis

Uveitis: ***Lyme***



LD: Papilledema

Uveitis: ***Lyme***

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Diagnosis

How is the diagnosis of LD made?

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The diagnosis can be made clinically (eg, the presence of ECM is considered diagnostic in the proper clinical setting). The diagnosis can also be made serologically, but this can be challenging, as there is a lack of consensus concerning what lab values should be considered positive.

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How is LD treated?

Treatment depends upon the stage of disease, and what organ-systems are involved

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What if CSF analysis fails to confirm the presence of CNS LD?

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LP with CSF studies should be performed to confirm the diagnosis. If CNS involvement is confirmed, IV ceftriaxone should be administered per protocol

What if CSF analysis fails to confirm the presence of CNS LD?
In this case, treatment of LD uveitis is a function of the severity of the dz. Less-severe uveitis can be managed with PO antibiotics (first line: doxycycline; if pediatric or pregnant/lactating, amoxicillin or cefuroxime).

Uveitis: ***Lyme***

1) The uveitis is profiled
2) The profiled case is meshed
3) A differential diagnosis list is generated
4) Studies are obtained to identify the etiology
5) Treatment appropriate for the etiology is initiated

Diagnosis

How is the diagnosis of LD made?
The diagnosis can be made clinically (eg, the presence of ECM is considered diagnostic in the proper clinical setting). The diagnosis can also be made serologically, but this can be challenging, as there is a lack of consensus concerning what lab values should be considered positive. The CDC recommends ELISA testing for Ig levels, followed by Western blot testing.

Treatment

How is LD treated?
Treatment depends upon the stage of disease, and what organ-systems are involved

OK, how should LD uveitis be treated?
As with syphilitic uveitis, the presence of intraocular inflammation in the context of LD should be considered presumptive evidence of CNS involvement, and thus LD uveitis should be managed as suspected CNS LD

How is suspected CNS LD managed?
LP with CSF studies should be performed to confirm the diagnosis. If CNS involvement is confirmed, IV ceftriaxone should be administered per protocol

What if CSF analysis fails to confirm the presence of CNS LD?
In this case, treatment of LD uveitis is a function of the severity of the dz. Less-severe uveitis can be managed with PO antibiotics (first line: doxycycline; if pediatric or pregnant/lactating, amoxicillin or cefuroxime). On the other hand, severe posterior-segment LD uveitis should be treated with IV antibiotics regardless of the outcome of CSF studies.