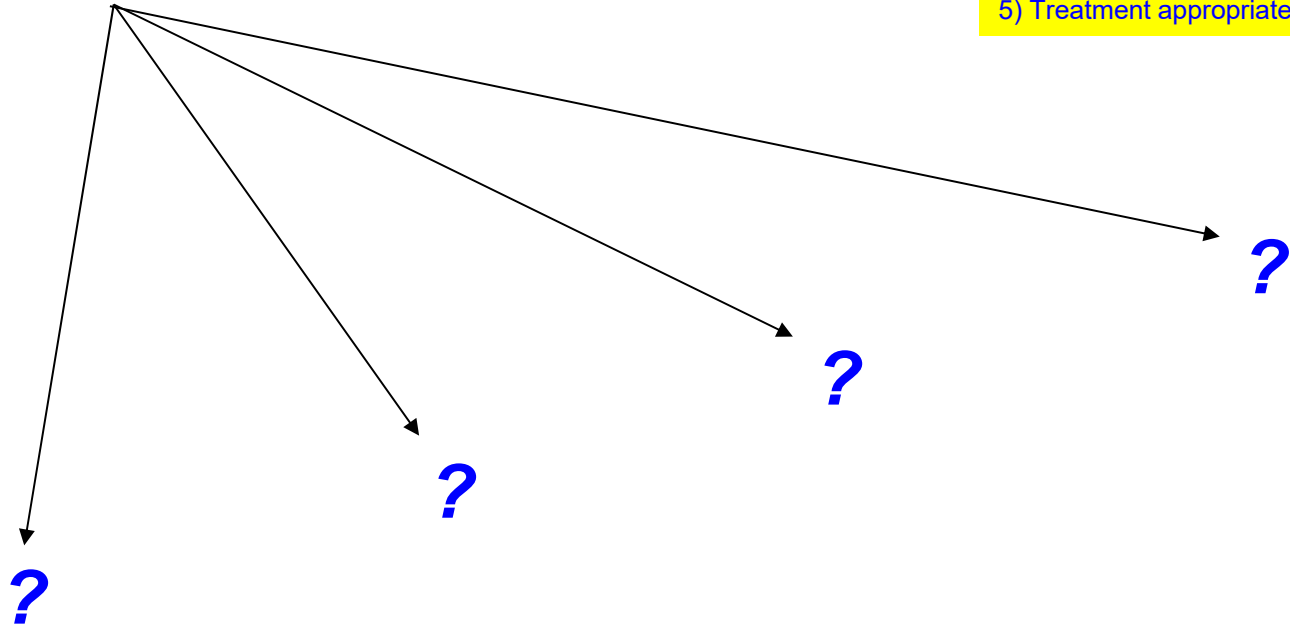


Uveitis

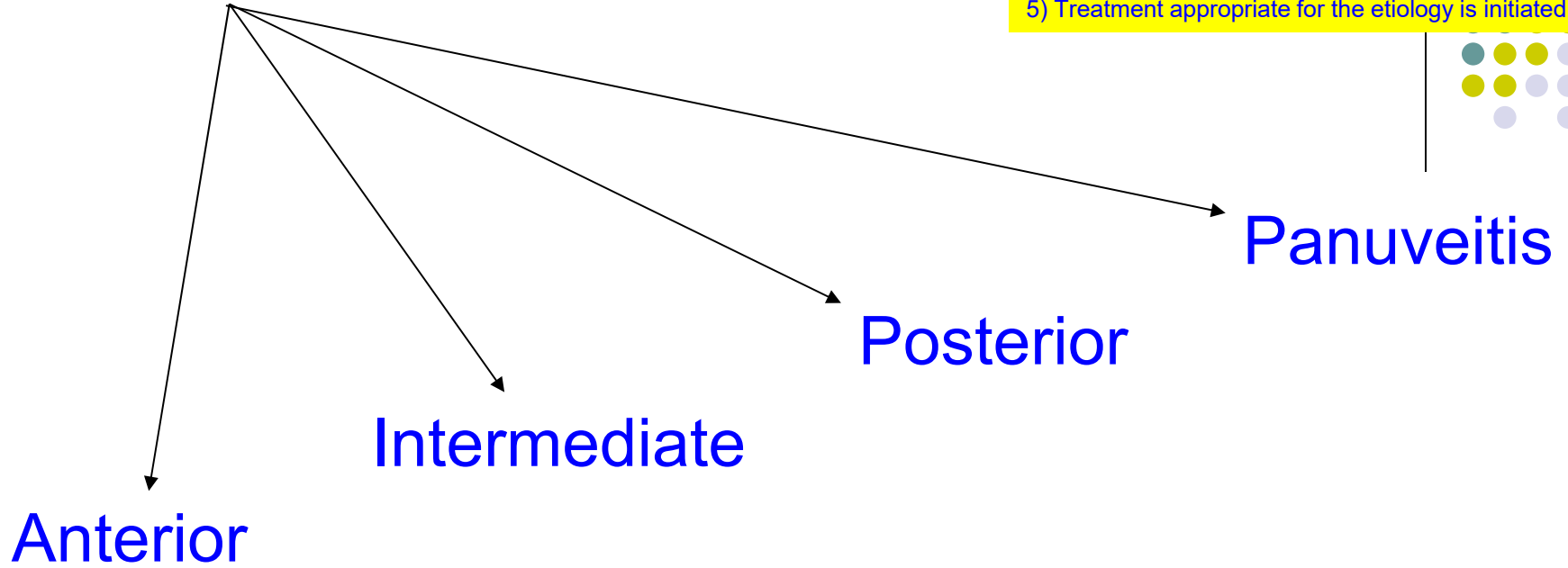
- 1) The uveitis is profiled
- 2) The profiled case is meshed
- 3) A differential diagnosis list is generated
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- 5) Treatment appropriate for the etiology is initiated



What are the four basic anatomic locations for uveitis?

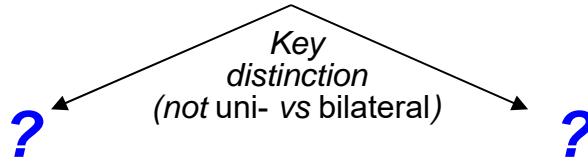
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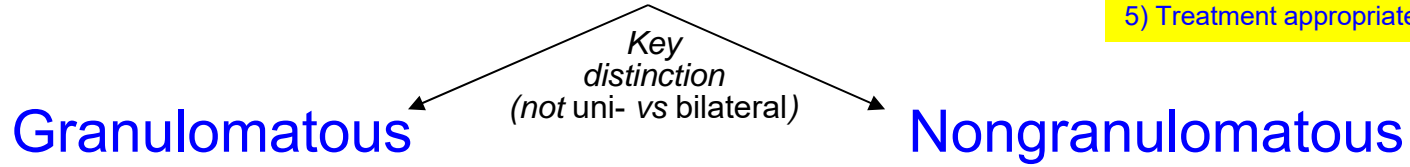
Uveitis: *Anterior*



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Uveitis: *Anterior*

Granulomatous

Nongranulomatous

?

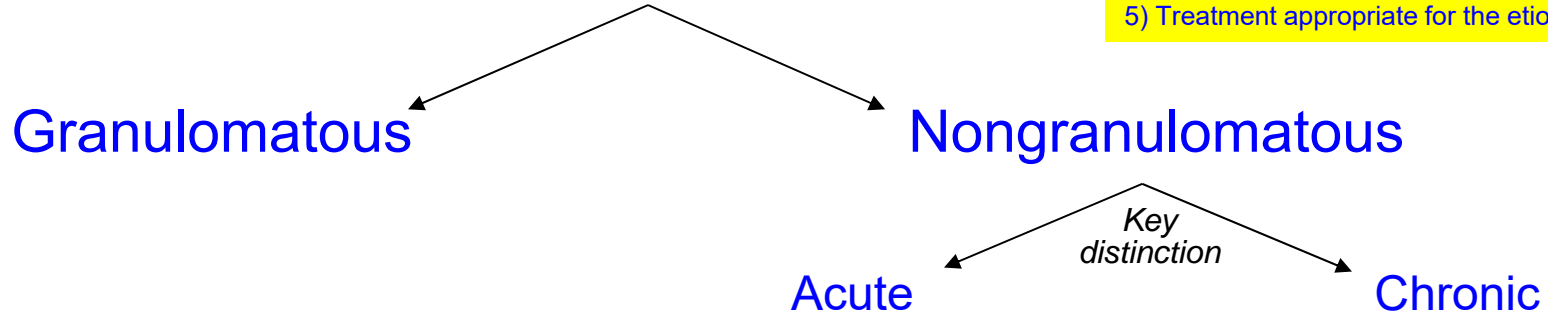
*Key
distinction*

?

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Granulomatous

Nongranulomatous

Acute

Chronic

Key distinction

?

?



Uveitis: *Anterior*

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Granulomatous

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Acute

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Key distinction

Unilateral

Bilateral



Uveitis: *Anterior*

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Granulomatous

Nongranulomatous

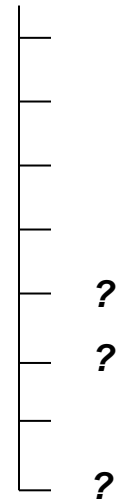
Acute

Chronic

Unilateral

Bilateral

These three causes are in the DDX for every case of uveitis, including acute bilateral nongranulomatous uveitis. What are they?



Uveitis: *Anterior*

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Granulomatous

Nongranulomatous

Acute

Chronic

Unilateral

Bilateral

These three causes are in the DDX for every case of uveitis, including acute bilateral nongranulomatous uveitis. What are they?

- Sarcoid
- Syphilis
- TB



Uveitis: *Anterior*

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Granulomatous

Nongranulomatous

Acute

Chronic

Unilateral

Bilateral

What are the others?

- ?
- ?
- ?
- ?
- Sarcoid
- Syphilis
- ?
- TB

Uveitis: *Anterior*

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Granulomatous

Nongranulomatous

Acute

Chronic

Unilateral

Bilateral

What are the others?

- TINU
- Behçet
- Drug rxn
- Leptospirosis
- Sarcoid
- Syphilis
- IBD/PA
- TB

Uveitis: *Anterior*

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Bilateral

TINU

What does TINU stand for?
Tubulointerstitial nephritis and uveitis (syndrome)

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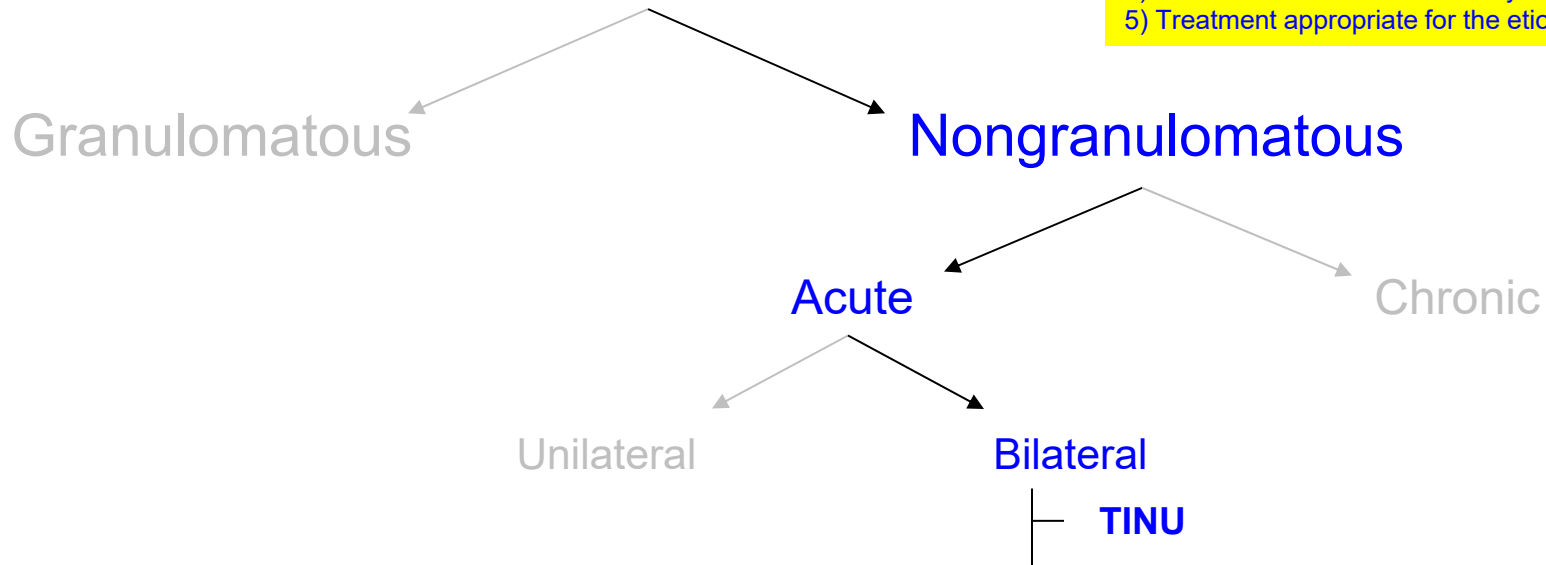
TINU

What does TINU stand for?
Tubulointerstitial nephritis and uveitis (syndrome)

Who is the typical TINU pt?
A female age 16-30

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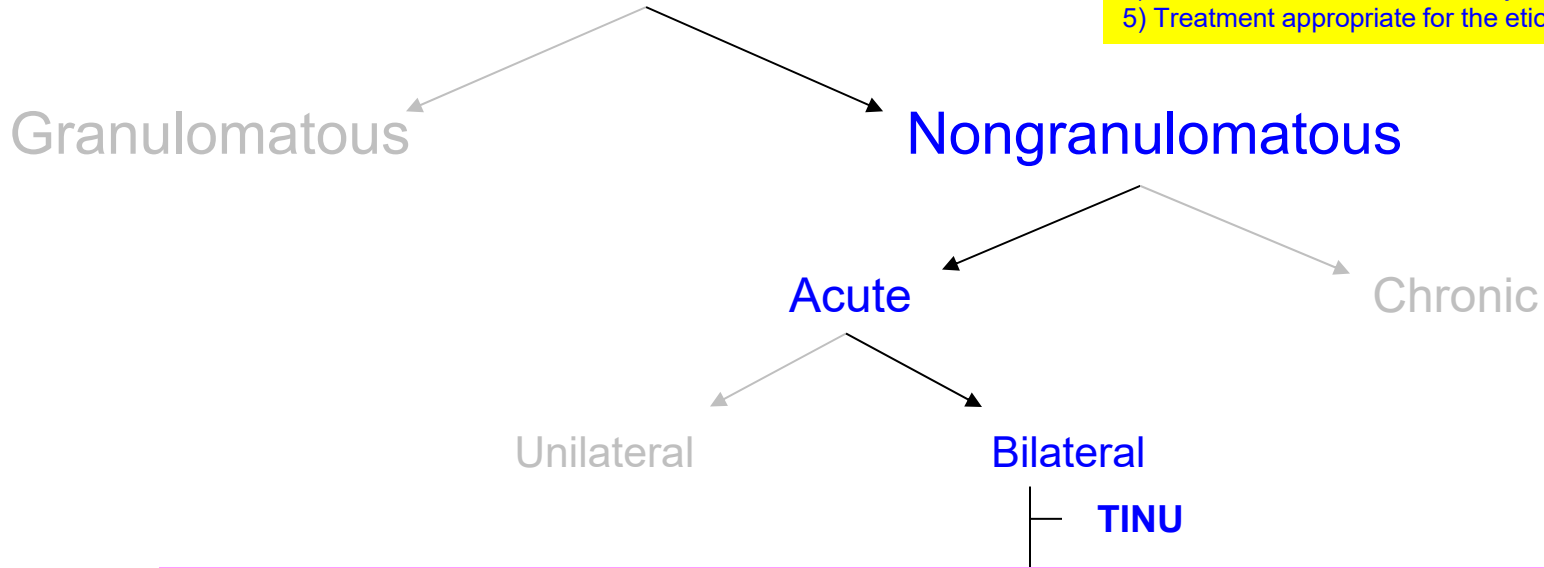
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--First is a ?
--
--

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A female age 16-30

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(Note: Not all pts read the book, so some will present in the 'wrong' order)

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TINU

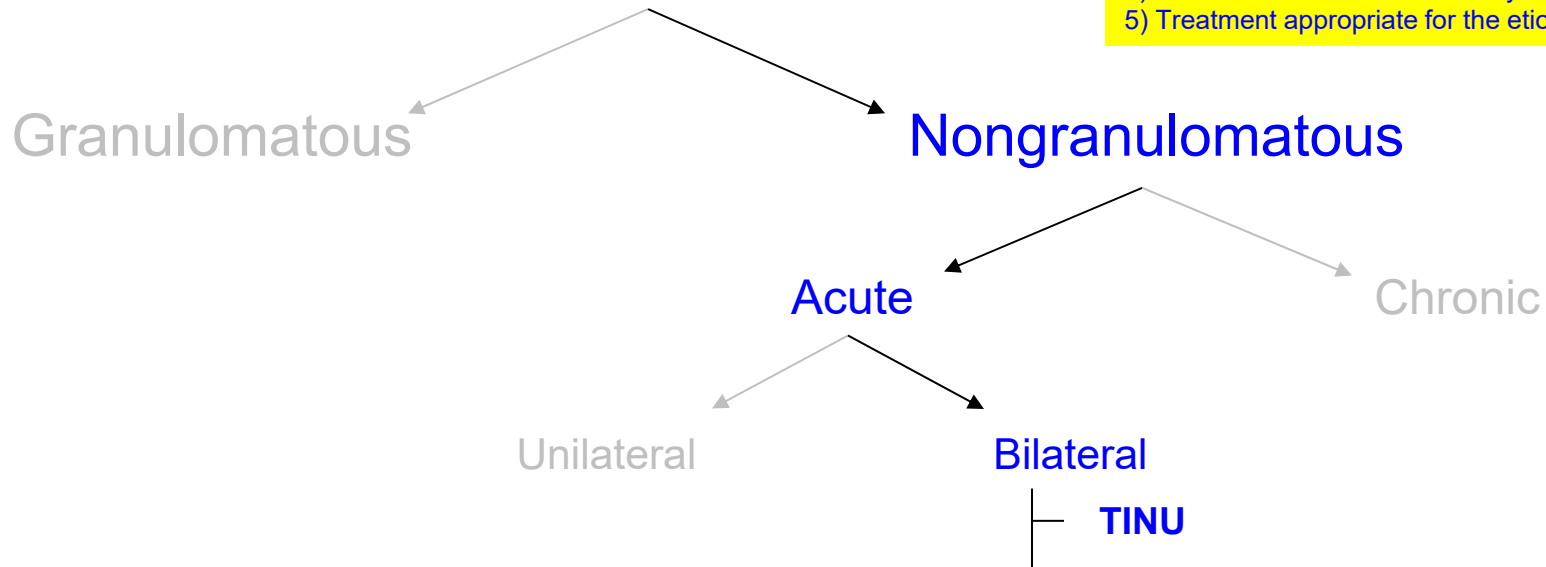
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How much time typically elapses between phases?

Uveitis: *Anterior*



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What does TINU stand for'?

Tubulointerstitial nephritis and uveitis (syndrome)

Who is the typical TINU pt?

A female age 16-30

TINU typically presents in three phases--what are they?

--First is a **systemic** phase: Fever, weight loss, fatigue, abdominal pain; this is followed by...

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*How much time typically elapses between phases? **A few weeks to a couple of months***

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(Note: Not all pts read the book, so some will present in the 'wrong' order)

What is the etiology of TINU?

It is unknown at this time

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TINU

What does
Tubulointer

Urine levels of what specific gammaglobulin is usually elevated?

Who is the
A female a

TINU typic

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TINU

What does TINU stand for? *Urine levels of what specific gammaglobulin is usually elevated?*
Tubulointerstitial nephropathy. β_2 -microglobulin. (This is a 'buzzword' for TINU—remember it!)

Who is the classic patient?
A female aged 40-50

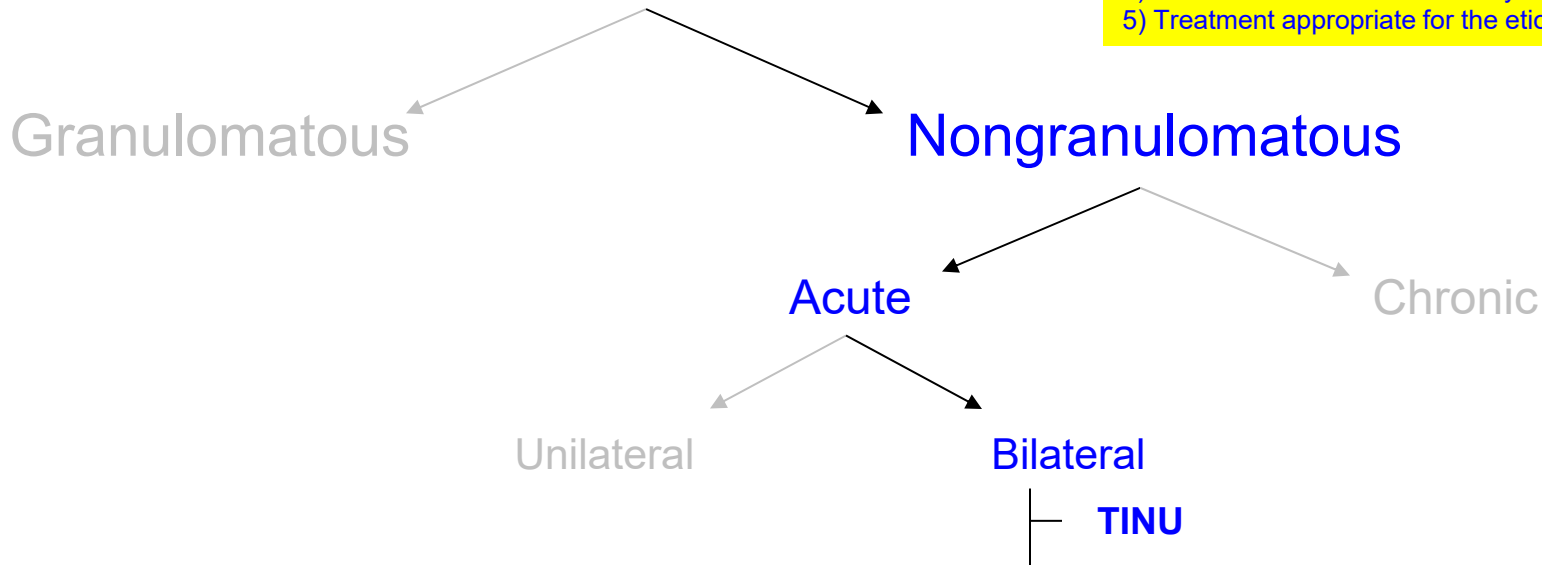
TINU typical presentation

- First is a **systemic** phase: Fever, weight loss, fatigue, abdominal pain; this is followed by...
 - the **nephropathy** phase: Proteinuria, hypergammaglobulinuria, glycosuria; followed by...
 - the **uveitis** phase: A bilateral nongranulomatous anterior uveitis
- (Note: Not all pts read the book, so some will present in the 'wrong' order)

What is the etiology of TINU?
It is unknown at this time

Uveitis: *Anterior*

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What does Tubulointerstitial nephropathy with uveitis (TINU) look like?
Urine levels of what specific gammaglobulin is usually elevated?
 β_2 -microglobulin. (This is a 'buzzword' for TINU—remember it!)

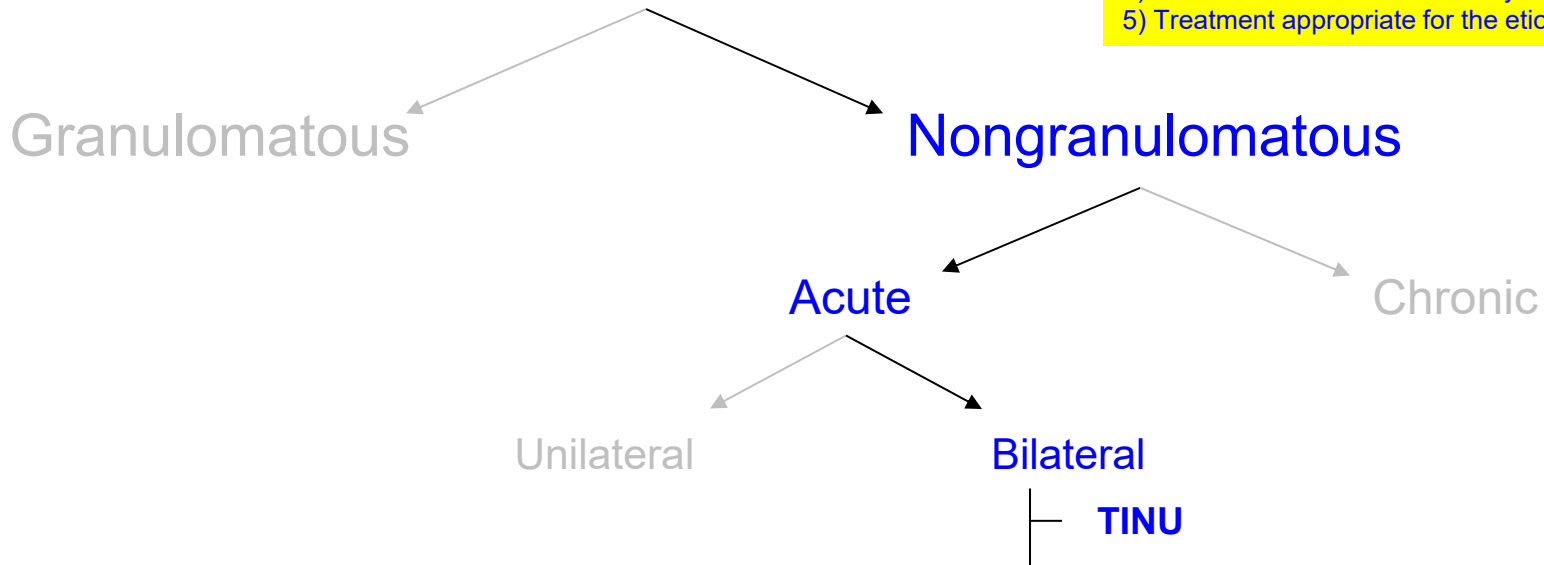
Who is the typical patient?
Do TINU pts spill glucose because their serum glucose is elevated?
A female a

TINU typical presentation
--First is a **systemic** phase: Fever, weight loss, fatigue, abdominal pain; this is followed by...
--the **nephropathy** phase: Proteinuria, hypergammaglobulinuria, **glycosuria**; followed by...
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What does Tubulointerstitial nephritis refer to? Urine levels of what specific gammaglobulin is usually elevated? β_2 -microglobulin. (This is a 'buzzword' for TINU—remember it!)

Who is the patient? Do TINU pts spill glucose because their serum glucose is elevated? A female patient. No, it is a normoglycemia glycosuria; ie, they spill glucose not because serum levels are high (like poorly-controlled diabetics do), but rather because the nephritis impairs glucose filtration/reclamation

TINU typical presentation? --First is a **systemic** phase: Fever, weight loss, fatigue, abdominal pain; this is followed by... --the **nephropathy** phase: Proteinuria, hypergammaglobulinuria, **glycosuria**; followed by... --the **uveitis** phase: A bilateral nongranulomatous anterior uveitis (Note: Not all pts read the book, so some will present in the 'wrong' order)

What is the etiology of TINU? It is unknown at this time

Uveitis: *Anterior*

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Nongranulomatous

Acute

Chronic

Unilateral

Bilateral

TINU

What does
Tubulointerstitial

How is the diagnosis of TINU made?

Who is the
A female a

TINU typic
--First is a
--the neph
--the uvei
(Note that

owed by...
d by...

What is the etiology of TINU?
It is unknown at this time

Uveitis: *Anterior*

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How is the diagnosis of TINU made?
Formally, it can be made only via renal biopsy

Who is the
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Unilateral

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TINU

What does Tubulointerstitial nephritis and uveitis (TINU) mean?
 How is the diagnosis of TINU made?
 Formally, it can be made only via renal biopsy

Who is the typical patient?
 A female aged 15-30

TINU typically presents with:
 --First is a febrile illness
 --the nephritis
 --the uveitis
 (Note that the uveitis is typically bilateral and chronic)

If TINU is suspected, what steps should the ophtho take?
 1) Obtain a detailed history
 2) Obtain a physical exam
 3) Obtain a complete blood count (CBC) and erythrocyte sedimentation rate (ESR)

What is the etiology of TINU?
 It is unknown at this time

Followed by...
 preceded by...

Uveitis: *Anterior*

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TINU

What does Tubulointerstitial nephritis

How is the diagnosis of TINU made?
Formally, it can be made only via renal biopsy

Who is the A female

If TINU is suspected, what steps should the ophtho take?
1) Treat the uveitis with topical steroids and cycloplegia
2) Obtain labs:

TINU typical
--First is a
--the neph
--the uvei

3) Refer to Nephrology

What is the etiology of TINU?
It is unknown at this time



owed by...
ed by...

Uveitis: *Anterior*

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TINU

What does Tubulointerstitial nephritis mean?
 How is the diagnosis of TINU made?
 Formally, it can be made only via renal biopsy

Who is the typical patient?
 If TINU is suspected, what steps should the ophtho take?
 1) Treat the uveitis with topical steroids and cycloplegia
 2) Obtain labs:
 ---Serum creatinine and BUN (will indicate impaired renal function)
 ---ESR (will be significantly elevated)
 ---H/H (anemia will be present)
 ---Urinalysis (will be abnormal as described previously)
 3) Refer to Nephrology

TINU typical presentation
 ---First is a unilateral or bilateral acute nongranulomatous uveitis
 ---the nephritis is usually asymptomatic
 ---the uveitis is usually bilateral and acute
 (Note that the uveitis is usually bilateral and acute)

What is the etiology of TINU?
 It is unknown at this time

Uveitis: *Anterior*

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Bilateral

TINU

What does Tubulointerstitial nephritis refer to?
 Tubulointerstitial nephritis is a kidney disease that involves inflammation of the tubules and interstitium of the kidney.

Who is the typical patient for TINU?
 A female patient with a long history of uveitis.

TINU typically presents with...
 --First is a bilateral, painless, and recurrent uveitis
 --the nephritis is usually bilateral and progressive
 --the uveitis is usually bilateral and recurrent
 (Note that the uveitis is usually bilateral and recurrent)

How is the diagnosis of TINU made?
 Formally, it can be made only via renal biopsy

If TINU is suspected, what steps should the ophtho take?
 1) Treat the uveitis with topical steroids and cycloplegia
 2) Obtain labs:
 ---ESR (will be significantly elevated)
 ---H/H (anemia will be present)
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TINU has a very strong HLA association--what is it?

What is the etiology of TINU?
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What does Tubulointerstitial nephritis refer to?
 Tubulointerstitial nephritis is a kidney disease that causes inflammation and damage to the tubules and interstitium of the kidney.

Who is the typical patient?
 A female patient with a long history of uveitis.

TINU typical lab findings:
 --First is a high ESR (will be significantly elevated)
 --the nephritis (H/H (anemia will be present))
 --the uveitis (Urinalysis (will be abnormal as described previously))
 (Note that 3) Refer to Nephrology

What is the etiology of TINU?
 It is unknown at this time

How is the diagnosis of TINU made?
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If TINU is suspected, what steps should the ophtho take?
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TINU has a very strong HLA association--what is it? HLA-DRB1*0102

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TINU

What does Tubulointerstitial nephritis and uveitis (TINU) mean?

How is the diagnosis of TINU made?
Formally, it can be made only via renal biopsy

Who is the typical patient?
A female aged 20-40

If TINU is suspected, what steps should the ophtho take?
1) Treat the uveitis with topical steroids and cycloplegia
2) Obtain lab work

TINU typically presents with...
--First is a...
--the next...
--the uveitis...
(Note that...)

TINU has a **very strong HLA association**- what is it? **HLA-DRB1*0102**
---ESR (will be significantly elevated)

How strong is very strong?

What is the etiology of TINU?
It is unknown at this time

Uveitis: *Anterior*

- 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

Granulomatous

Nongranulomatous

Acute

Chronic

Unilateral

Bilateral

TINU

What does
Tubulointerstitial

How is the diagnosis of TINU made?
Formally, it can be made only via renal biopsy

Who is the
A female

If TINU is suspected, what steps should the ophtho take?
1) Treat the uveitis with topical steroids and cycloplegia
2) Obtain labo

TINU typic
--First is a
--the nep
--the uve
(Note that

TINU has a **very strong HLA association**- what is it? **HLA-DRB1*0102**
---ESR (will be significantly elevated)

How strong is very strong?
It is the strongest of all known HLA ↔ uveitis associations

What is the etiology of TINU?
It is unknown at this time



Uveitis: *Anterior*

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Granulomatous

Nongranulomatous

Acute

Chronic

Unilateral

Bilateral

TINU

What is the first-line systemic treatment for TINU?

What does Ho
Tubulointer

Who is the
A female a

TINU typic
--First is a
--the neph
--the uvei
(Note that

Formally, it can be made only via renal biopsy

If TINU is suspected, what steps should the ophtho take?
1) Treat the uveitis with topical steroids and cycloplegia
2) Obtain labs:
----Serum creatinine and BUN (will indicate impaired renal function)
----ESR (will be significantly elevated)
----H/H (anemia will be present)
----Urinalysis (will be abnormal as described previously)
3) Refer to Nephrology

ved by...
ed by...

What is the etiology of TINU?
It is unknown at this time

Uveitis: *Anterior*

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TINU

What is the first-line systemic treatment for TINU? PO steroids

What does Ho
Tubulointer

Formally, it can be made only via renal biopsy

Who is the
A female a

If TINU is suspected, what steps should the ophtho take?

- 1) Treat the uveitis with topical steroids and cycloplegia
- 2) Obtain labs:

TINU typic
--First is a
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(Note that

- Serum creatinine and BUN (will indicate impaired renal function)
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Unilateral

Bilateral

- TINU
- **Behçet**
- Drug rxn
- Sarcoid
- Syphilis
- IBD/PA
- TB

Behcet disease is addressed in its own slide-set (U17)



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Chronic

Unilateral

Bilateral

- TINU
- Behçet
- Drug rxn**

Of the following drug-delivery routes, which have been associated with drug-reaction uveitis?

--Systemic?

--Topical?

--Intravitreal?

- IBD/PA
- TB



Uveitis: *Anterior*

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Bilateral

- TINU
- Behçet
- **Drug rxn**

Of the following drug-delivery routes, which have been associated with drug-reaction uveitis?

- Systemic
- Topical
- Intravitreal

All of them!

- IBD/PA
- TB



Uveitis: *Anterior*

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Bilateral

- TINU
- Behçet
- **Drug rxn**

Of the following drug-delivery routes, which have been associated with drug-reaction uveitis?
--Systemic?
--Topical?
--Intravitreal?

For each route, does it cause a unilateral, or a bilateral uveitis?

- IBD/PA
- TB

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- TINU
- Behçet
- **Drug rxn**

Of the following drug-delivery routes, which have been associated with drug-reaction uveitis?
--Systemic? Can be **either**
--Topical? **Unilateral**
--Intravitreal? **Unilateral**

For each route, does it cause a unilateral, or a bilateral uveitis?

- IBD/PA
- TB



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- **Drug rxn**

Of the following drug-delivery routes, which have been associated with drug-reaction uveitis?

- Systemic**
- Topical
- Intravitreal

Many systemic drugs have been implicated in causing uveitis, but four are notorious for doing so. What are they?

Hints forthcoming...

- ?
- ?
- ?
- ?

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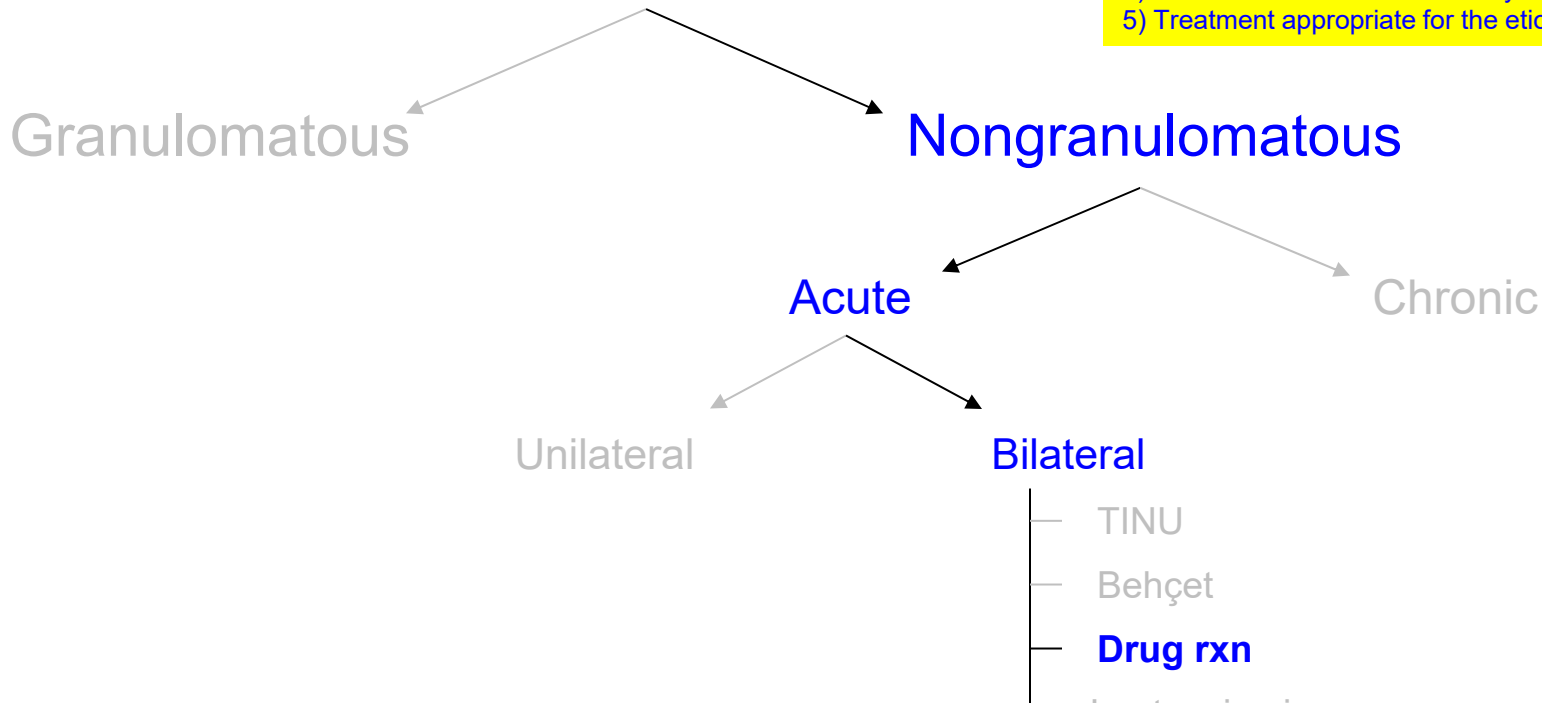
- Systemic**
- Topical
- Intravitreal

Many systemic drugs have been implicated in causing uveitis, but four are notorious for doing so. What are they?

- the most notorious of all--if you only remember one, make it this one
- ?
- ?
- ?

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- Systemic**
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- Rifabutin
- ?
- ?
- ?

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- Topical
- Intravitreal

Many systemic drugs have been implicated in causing uveitis, but four are notorious for doing so. What are they?

- Rifabutin
- a class of drugs used most often in elderly women
- ?
- ?

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- Systemic**
- Topical
- Intravitreal

Many systemic drugs have been implicated in causing uveitis, but four are notorious for doing so. What are they?

- Rifabutin
- Bisphosphonates
- another drug class; of the four, is the most commonly Rx'd, but the least likely to cause uveitis
- ?

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- Sulfonamides
- ?

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- Bisphosphonates
- Sulfonamides
-

of the four, the only one that is also delivered intravitreally

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Of the following drug-delivery routes, which have been associated with drug-reaction uveitis?
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What is rifabutin used to treat?

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--Sulfonamides
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Of the following drug-delivery routes, which have been associated with drug-reaction uveitis?

- Systemic**
- Topical
- Intravitreal

What is rifabutin used to treat?
Mycobacterium avium complex infections in AIDS pts

Many systemic drugs have been associated with drug-reaction uveitis.
What are they?

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How long after initiation of treatment does the uveitis typically occur?

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How long after initiation of treatment does the uveitis typically occur?
Weeks to months

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Is it associated with development of a hypopyon?

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Mycobacterium avium complex infections in AIDS pts

How long after initiation of treatment does the uveitis typically occur?
Weeks to months

Is it associated with development of a hypopyon?
Yes! Always consider rifabutin when evaluating hypopyon uveitis

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--Bisphosphonates
--Sulfonamides
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What are bisphosphonates used to treat?
The most common indication is prevention. They are used also to treat associated with various conditions.

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- Rifabutin
- Bisphosphonates**
- Sulfonamides
- Cidofovir

What are bisphosphonates used to treat?
The most common indication is osteoporosis prevention. They are used also to treat hypercalcemia associated with various conditions.

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Which bisphosphonate is most strongly associated with uveitis?

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Is it associated with development of a hypopyon?

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Is it associated with development of a hypopyon?
 No. But it is associated with one -itis, another and another

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Which bisphosphonate is most strongly associated with uveitis?
 IV pamidronate

Is it associated with development of a hypopyon?
 No. But it is associated with conjunctivitis, episcleritis and scleritis

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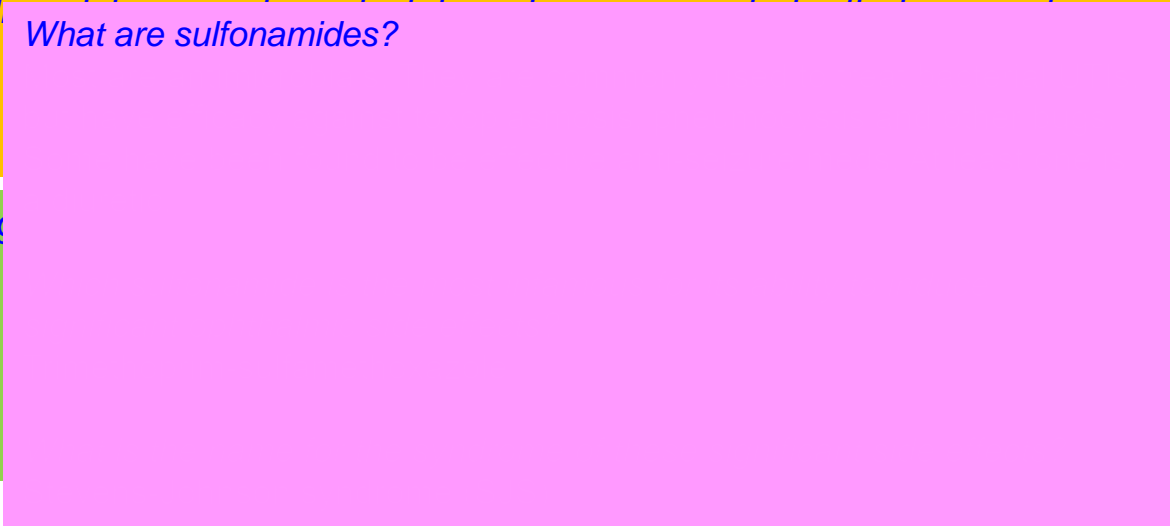
Unilateral

Bilateral

- TINU
- Behçet
- **Drug rxn**

Of the following drugs, which are used in the treatment of acute anterior uveitis?
--**Systemic**
--Topical
--Intravitreal

Many systemic drugs are used in the treatment of acute anterior uveitis. What are they?
--Rifabutin
--Bisphosphonates
--**Sulfonamides**
--Cidofovir



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- TINU
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- **Drug rxn**

Of the following drugs, which are most likely to cause anterior uveitis?
--**Systemic**
--Topical
--Intravitreal

Many systemic drugs are used to treat uveitis. What are they?
--Rifabutin
--Bisphosphonates
--**Sulfonamides**
--Cidofovir

What are sulfonamides?
Most are antimicrobials. They are commonly used to treat bacterial UTIs, but have efficacy against toxoplasmosis, pneumocystis and other bugs. Some have been found to be effective anti-seizure meds. At least one is a diuretic.

ing so.

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Unilateral

Bilateral

- TINU
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- **Drug rxn**

Of the following drugs, which is most likely to cause anterior uveitis?
--**Systemic**
--Topical
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--Rifabutin
--Bisphosphonates
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--Cidofovir

What are sulfonamides?
Most are antimicrobials. They are commonly used to treat bacterial UTIs, but have efficacy against toxoplasmosis, pneumocystis and other bugs. Some have been found to be effective anti-seizure meds. At least one is a diuretic.

Which sulfonamide is the most infamous for its ability to induce significant ophthalmic side effects?

Uveitis: *Anterior*

- 1) The uveitis is profiled
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What is the name for the syndrome of these significant side effects?

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What are they?
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--Bisphosphonates
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SJS is also known as...

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Severe cases may meet the definition of...

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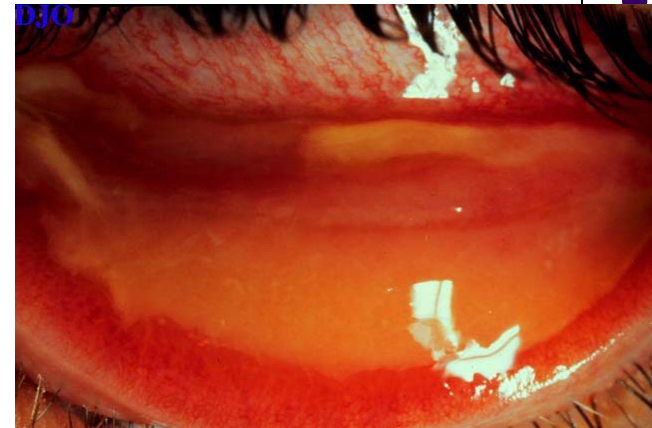
SJS is also known as...**erythema multiforme major**
Severe cases may meet the definition of...**toxic epidermal necrolysis (TEN)**

What is the name for the syndrome of these significant side effects?
Stevens-Johnson syndrome (SJS)

Uveitis: *Anterior*



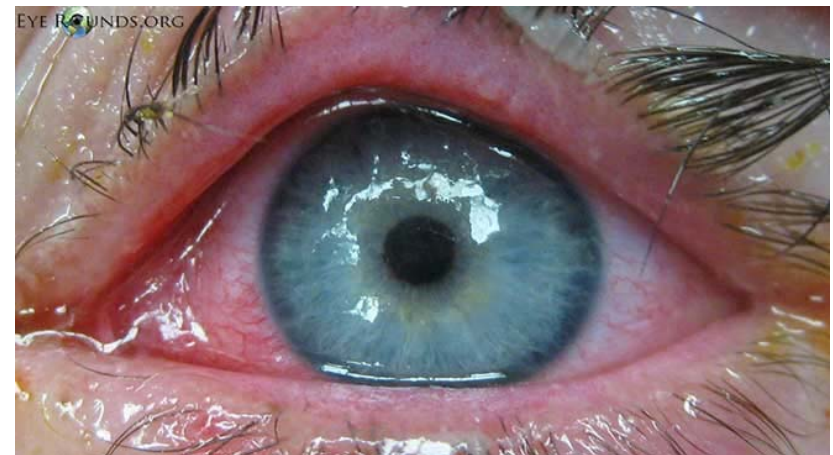
Symblephara



Membranous conjunctivitis



Oral lesions



Corneal epithelial defect and diffuse conjunctival injection

Stevens-Johnson syndrome

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Three other drugs/drug classes are most commonly implicated. What are they?

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Mnemonic forthcoming...

Severe cases may meet the definition of...toxic epidermal necrolysis (TEN)
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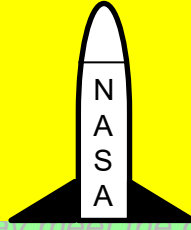
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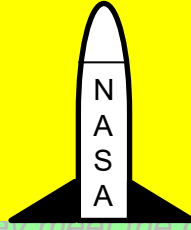
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Three other drugs/drug classes are most commonly implicated.
What are they?
--NSAIDs
--Anticonvulsants
--Sulfonamides
--Allopurinol



Many systemic drugs are associated with uveitis.
What are the significant side effects of these drugs?
--Rifabutin
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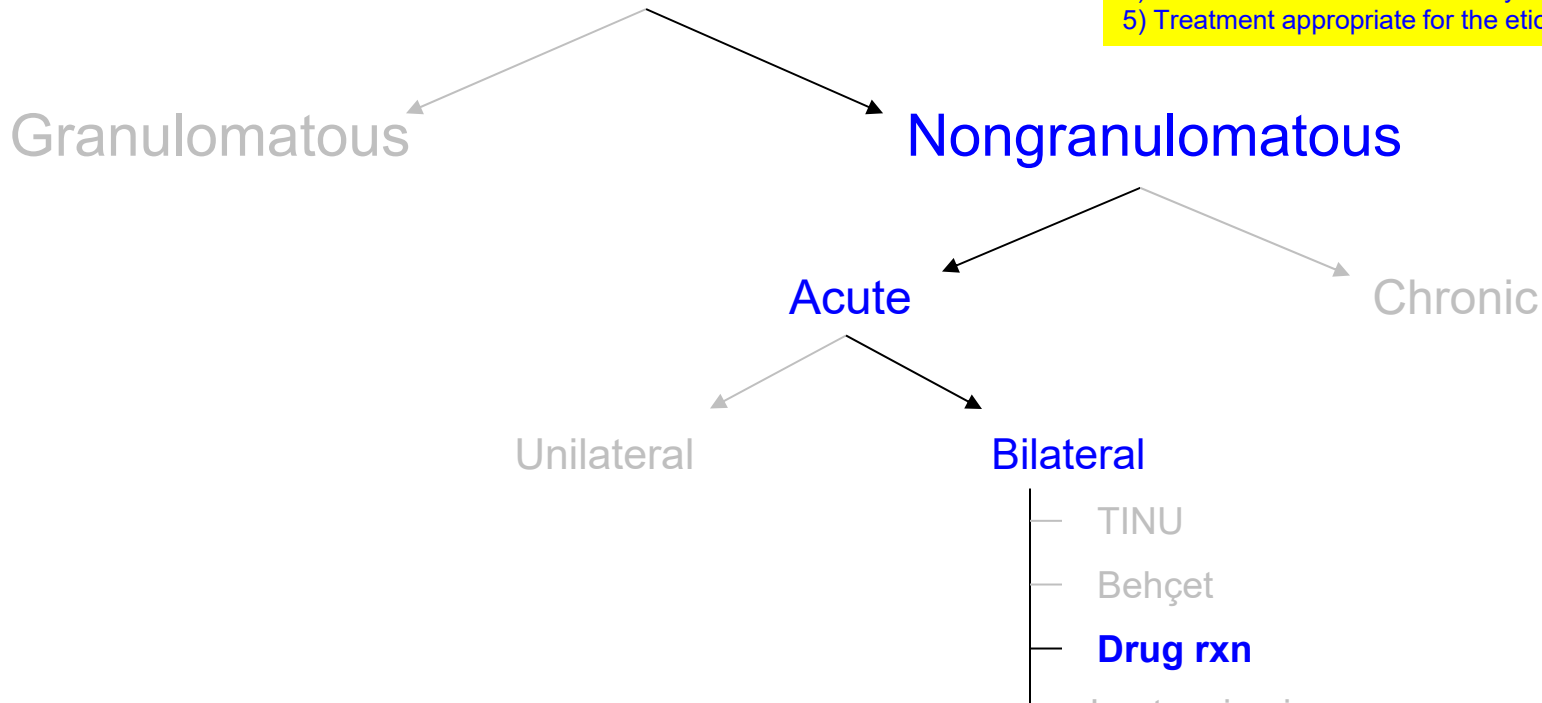
For more on SJS, see slide-set K8

Many systems...
What are...
--Rifabutin
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Of the following drug-delivery routes, which have been associated with drug-reaction uveitis?

- Systemic
- Topical
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Many systemic drugs have been implicated in causing uveitis, but four are notorious for doing so. What are they?

- Rifabutin
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Because of its potential nonocular side f/x, cidofovir is rarely given systemically anymore. (For this reason, we will cover it with the Intravitreals)

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Because of its potential nephrotoxicity, cidofovir is rarely given systemically anymore. (For this reason, we will cover it with the Intravitreals)

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--? **Hints forthcoming...**

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- a glaucoma drug not commonly prescribed in the US
- ?

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- a class of glaucoma drugs VERY commonly prescribed in the US

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Is anterior uveitis common among metipranolol pts?

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No, it is quite uncommon. Further, it was associated with a formulation no longer commercially available in the US.

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No, it is quite uncommon. Further, it was associated with a formulation no longer commercially available in the US.

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It is granulomatous, complete with mutton-fat KP and posterior synechiae

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Is anterior uveitis associated with drug-reaction uveitis?
No, it is quite different. It is a commercial product.

What other topical glaucoma med also causes a granulomatous uveitis (hint: It's not on the list above)?

What is unusual about the uveitis it induces?
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Is anterior uveitis associated with the use of topical glaucoma medications?

No, it is quite rare. However, some commercial glaucoma medications have been associated with uveitis.

What other topical glaucoma med also causes a granulomatous uveitis (hint: It's not on the list above)?

Brimonidine

What is unusual about the uveitis it induces?

It is **granulomatous** complete with mutton-fat KP and posterior synechiae

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Uveitis: *Anterior*

- 1) The uveitis is profiled
- 2) The profiled case is meshed
- 3) A differential diagnosis list is generated
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Granulomatous

Nongranulomatous

Acute

Chronic

Unilateral

Bilateral

- TINU
- Behçet
- **Drug rxn**

Of the following drug-delivery routes, which have been associated with drug-reaction uveitis?
--Systemic
--**Topical**
--Intravitreal

Many topical drugs have been i
What are they?
--Metipranolol
--**Prostaglandin analogues**

Is anterior uveitis a common complication of PGA use?
No; it occurs in only ~1% of pts

Is it associated with development of a hypopyon?

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--? **Hints forthcoming...**

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- a category of Ivit drugs VERY commonly employed in the US

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Which anti-VEGF agents have been implicated as causing uveitis?
Pretty much all of them: Ranibizumab, bevacizumab and aflibercept (pegaptanib too)

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Is the uveitis usually mild, or severe?

Which anti-VEGF agents are most likely to cause uveitis?

Which anti-VEGF agents are most likely to be associated with uveitis?

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 In rare cases only (and these likely represent contaminants)

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For more on drug-induced uveitis, see slide-set U29

--Intravitreal

*Many intravitreal drugs for...
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- Drug rxn
- **Leptospirosis**
- IBD/PA
- TB

While leptospirosis can present as an acute bilateral anterior uveitis, it is far more likely to present as a [redacted], and will be covered as such in the review slides.



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— TINU

— Behçet

— Drug rxn

— **Leptospirosis**

While leptospirosis can present as an acute bilateral anterior uveitis, it is far more likely to present as a **panuveitis**, and will be covered as such in the review slides.

— IBD/PA

— TB



Uveitis: *Anterior*

- 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



Granulomatous

Nongranulomatous

Acute

Chronic

Unilateral

Bilateral

How common is uveitis in inflammatory bowel disease?

- Syphilis
- **IBD/PA**
- TB

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How common is uveitis in inflammatory bowel disease?
Only 2-10% of IBD pts develop anterior uveitis.

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How common is uveitis in inflammatory bowel disease? In psoriatic arthritis?
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How common is uveitis in inflammatory bowel disease? In psoriatic arthritis?

Only 2-10% of IBD pts develop anterior uveitis. It is somewhat more common in PA, with a rate as high as 25%.

- Syphilis
- **IBD/PA**
- TB

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Only 2-10% of IBD pts develop anterior uveitis. It is somewhat more common in PA, with a rate as high as 25%.

What nonocular findings are common in psoriatic arthritis?

- Spondylitis
- **IBD/PA**
- TB

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How common is uveitis in inflammatory bowel disease? In psoriatic arthritis?
Only 2-10% of IBD pts develop anterior uveitis. It is somewhat more common in PA, with a rate as high as 25%.

What nonocular findings are common in psoriatic arthritis?
The name of the condition provides a helpful way to remember these:

- 'Psoriatic':
- 'Arthritis':

- Syphilis
- **IBD/PA**
- TB

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How common is uveitis in inflammatory bowel disease? In psoriatic arthritis?
Only 2-10% of IBD pts develop anterior uveitis. It is somewhat more common in PA, with a rate as high as 25%.

What nonocular findings are common in psoriatic arthritis?
The name of the condition provides a helpful way to remember these:

--'Psoriatic': Pts get a two words rash, along with nail changes

--'Arthritis':

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What nonocular findings are common in psoriatic arthritis?

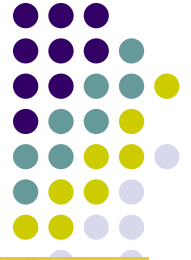
The name of the condition provides a helpful way to remember these:

--'Psoriatic': Pts get a scaly, erythematous rash, along with nail changes

--'Arthritis':

- Syphilis
- **IBD/PA**
- TB

Uveitis: *Anterior*



Psoriatic arthritis: Skin and nail changes

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What nonocular findings are common in psoriatic arthritis?
The name of the condition provides a helpful way to remember these:
--'Psoriatic': Pts get a scaly, erythematous rash, along with nail changes
--'Arthritis': The classic finding is two words -swelling of the distal interphalangeal joints

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What nonocular findings are common in psoriatic arthritis?

The name of the condition provides a helpful way to remember these:

--'Psoriatic': Pts get a scaly, erythematous rash, along with nail changes

--'Arthritis': The classic finding is **sausage digits**--swelling of the distal interphalangeal joints

- Syphilis
- **IBD/PA**
- TB

Uveitis: *Anterior*



Psoriatic arthritis: Sausage digits