Disclosures and Conflict of Interest

• Patrick Tednes and Heather Powell declare no conflicts of interest, real or apparent, and no financial interests in any company, product, or service mentioned in this program, including grants, employment, gifts, stock holdings and honoraria.

Pharmacist Objectives

At the conclusion of the program, the pharmacist will be able to:
1. Recognize risk factors for hyperuricemia
2. Describe the pathophysiology of hyperuricemia and subsequent gouty arthritis
3. Differentiate gout treatment goals between the ACR and ACP guidelines.
4. Choose pharmacologic treatment modalities for patients with an acute gouty arthritis attack and/or chronic gouty arthritis
5. Determine if a patient qualifies for uric acid-lowering therapy
6. Analyze the response and efficacy of a gout treatment regimen

Technician Objectives

At the conclusion of the program, the pharmacy technician will be able to:
1. Recognize risk factors for hyperuricemia
2. Describe the pathophysiology of hyperuricemia and subsequent gouty arthritis
3. Differentiate gout treatment goals between the ACR and ACP guidelines.
4. Recognize pharmacologic treatment modalities for patients with an acute gouty arthritis attack and/or chronic gouty arthritis
Pre-test Question 1

FS is a 64 yo M presenting to the ED this afternoon with intense pain (rated 6/10) in his left big toe that started last night. Upon examination, the doctor noted swelling, redness, and warmth around the affected site.

PMH: DM2, HFrEF, NSTEMI s/p PCI, Upper GI bleed (2 months ago)
CrCl 65 ml/min

Which treatment for an acute gout attack is most appropriate for FS?
   a) Prednisone 40 mg PO daily
   b) Colchicine 1.2 mg PO x1 dose, then 0.6 mg PO 1 hour later + indomethacin 50 mg PO TID
   c) Naproxen 750 mg PO x1 dose, then 250 mg PO Q8H
   d) Colchicine 1.2 mg PO x1 dose, then 0.6 mg PO 1 hour later

Pre-test Question 2

JP is a 59 yo F who presented to her PCP last week for her second acute gout attack (attacks were 2 years apart). She is acutely treated with naproxen, but is back for her follow-up visit. The physician is concerned that JP may need to be started on chronic gout therapy.

PMH: COPD, recurrent kidney stones, stage 3 CKD, atrial fibrillation
Labs: Uric acid 8.1 mg/dL

What chronic therapy do you recommend initiating in JP (in addition to gout flare prophylaxis)?
   a. No chronic therapy is indicated in JP
   b. Allopurinol 100 mg PO daily
   c. Febuxostat 40 mg PO daily
   d. Probenecid 250 mg PO BID + potassium citrate 60 mEq

Pre-test Question 3

MT is a 70 yo M who has been taking allopurinol 300 mg PO BID for 1 year. He continues to have sporadic gout attacks despite being compliant with his allopurinol regimen. PMH: HTN, asthma, osteoporosis, HFrEF, STEMI, kidney stones
Med: lisinopril, albuterol HFA, acetaminophen, aspirin, atorvastatin, and metoprolol XR. 

Which of the following medications changes are appropriate for MT at this time? Select ALL that apply.
   a. Change lisinopril to losartan while continuing allopurinol
   b. Add febuxostat 40 mg PO daily
   c. Add lesinurad 200 mg PO daily
   d. Discontinue allopurinol and start probenecid 250 mg PO BID
   e. Increase dose of allopurinol to 300 mg PO q AM, 200 mg PO q noon, 300 mg PO q PM

Pre-test Question 4

AK is a 62 year old Korean male who has chronic gout with stage 3 CKD. His physician is concerned about severe cutaneous adverse reactions with initiation of allopurinol. He decides to do genetic testing and it is determined that he is positive for the HLA-B*5801 allele. The physician asks for your recommendation in treating this chronic gout based on this result. You recommend:
   a. Initiate allopurinol 100 mg PO daily, titrated up to 300 mg PO daily
   b. Initiate pegloticase 8 mg IVPB over 120 minutes every 2 weeks
   c. Initiate allopurinol 100 mg PO daily + lesinurad 200 mg PO daily
   d. Initiate febuxostat 40 mg PO daily
Disease State Review

Gout
- Recurrent arthritic inflammatory attacks characterized by pain and swelling secondary to monosodium urate (MSU) crystal formation in the joints due to hyperuricemia.

Epidemiology
- More common in developed countries
  - “Disease of Kings”
- Prevalence:
  - 3-6% of men
  - 1-2% of women
  - Increases >10% for persons above 80 years old
- Annual cost of gout: ~$1 billion in U.S.

Uric Acid
- Waste product formed during the terminal step of purine degradation
- Hyperuricemia >6.8 mg/dL

- ATP depletion
- Degradation of nucleic acids
- AMP
  - Adenosine
  - Inosine
- GMP
  - Guanosine
- Uric acid
  - Uricase
  - Allantoin
  - Xanthine oxidase
  - Hypoxanthine
  - Xanthine
Etiology: Hyperuricemia

- **Underexcretion** (90% of cases)
  - GI Tract Excretion
    - (33%)
  - Renal Excretion
    - (66%)

- **Overproduction** (10% of cases)

**Hyperuricemia**

Uric Acid Overproduction

- Increased dietary purine consumption
  - Meat
  - Seafood
  - Alcohol (beef)
  - Fructose

- Endogenous purine synthesis
  - Malignancy
  - Tumor lysis syndrome

- Purine salvage
  - HGPRT deficiency
  - PRPS deficiency

- Purine breakdown
  - Glycogen storage disease

Uric Acid Underexcretion

- Urinary excretion
  - Medications
  - Renal failure

- Urinary reabsorption
  - Alcohol
  - Genetic defects
  - Lactate

Medications Decreasing Renal Excretion of Uric Acid

- Diuretics
- Nicotinic Acid
- Salicylates (<2gm/day)
- Ethanol
- Cytotoxic Drugs

- Anti-tubercular drugs
  - Pyrazinamide
  - Ethambutol

- Immunosuppressants
  - Cyclosporine
  - Tacrolimus
Hyperuricemia from Diuretics

- **Mechanisms:**
  - Increased urate reabsorption in the proximal tubule
  - Decreased urate secretion in the proximal tubule
  - Volume contraction
  - Result of disease state the diuretics were prescribed for?
- **Does potency of diuretics matter?**
  - Thiazides < Loop diuretics

---

Hyperuricemia from Nicotinic acid

- **Mechanisms:**
  - Purine biosynthesis stimulation
  - Interference with organic acid transporters (OAT) transport of uric acid from the serum into the urine

---

Hyperuricemia from Salicylates

- **Mechanisms:**
  - Doses 1-2 gm/day result in urate retention due to stimulation of renal urate transporter, URAT1

---

Hyperuricemia from Alcohol

- **Beer > Liquor > Wine**
  - Single serving of beer raises serum urate by 0.46 mg/dL (95% CI, 0.32-0.6)
  - Single serving of liquor raises serum urate by 0.29 mg/dL (95% CI, 0.14-0.45)
  - No statistically significant increase in serum urate from wine
Hyperuricemia from Immunosuppressants

- **Mechanisms:**
  - **Cyclosporine:**
    - Increased urate reabsorption in the proximal tubule
    - Decreased GFR due to afferent arteriole vasoconstriction
  - **Tacrolimus**
    - Reduced urate excretion

Hyperuricemia from Cytotoxic Drugs

- **Mechanism:**
  - Massive disruption of tumor cells

Hyperuricemia from Anti-tubercular Drugs

- **Mechanism:**
  - **Pyrazinamide**
    - Increased urate reabsorption in the proximal tubule
  - **Ethambutol**
    - Reduction in fractional excretion of uric acid

Risk Factors

**Non-modifiable**
- Increased age (>80 years old)
- Male Sex
- Family History

**Modifiable**
- Uric acid >6.8 mg/dL
- Obesity
- Diet
- Lifestyle
Foods to Avoid in Hyperuricemia

• Meat
  • Organ meats (liver, tongue, sweetbread)
  • Red Meat
  • Turkey
  • Bacon
  • Veal
  • Goose
• Alcohol
• Foods high in fructose

Pathogenesis of Acute Gout

Urate crystal formation in joints
1. Synovial fluid containing uric acid and water leaks from synovial membrane during weight-bearing exercise
2. Water redistribution back across the synovial membrane occurs faster than uric acid at rest
3. Increased uric acid concentration in joint space

Cell activation
1. Phagocytes engulf urate crystals in the synovial space
2. Activation of monocyte, neutrophils, and complement pathways

Inflammation/Tissue Injury
1. Mast cell histamine and IL-1 release → vasodilation and vascular permeability
2. TNF-alpha, various interleukins, proteases, free radical and prostaglandin production

Disease Progression Outline

Stage 1
Asymptomatic hyperuricemia

Stage 2
Acute gouty arthritis

Stage 3
Intercritical gout

Stage 4
Chronic tophaceous gout

Clinical Presentation: Signs & Symptoms

• Acute inflammatory monoarthritis
  o Typically in the first metatarsophalangeal joint (i.e. podagra)
• Fever
• Intense pain
• Erythema
• Warmth
• Inflammation
Clinical Presentation: Labs

- Serum uric acid >6.8 mg/dL
- MSU crystals from synovial fluid aspirate under microscopy
- Radiologic imaging (i.e. ultrasound or CT)

Diagnosis

- Must meet at least one of the following criteria:
  - MSU crystals in synovial fluid aspiration
  - Presence of a tophus
  - >6 American College of Rheumatology (ACR) Diagnostic Criteria for Gout criteria

ACR Diagnostic Criteria

- Hyperuricemia
- Joint redness
- Suspected tophus
- Attack of monoarticular arthritis
- Pain or redness in the first metatarsophalangeal joint
- Unilateral attack involving tarsal joint
- Unilateral attack involving first metatarsophalangeal joint
- Unilateral attack involving tarsal joint
- Asymmetric joint swelling on radiography
- Subcortical cyst without erosions on radiography
- Maximal inflammation development within 24 hours
- Culture of joint fluid negative for microorganisms during attack
- History of ≥1 acute attack

Goals of Treatment

**American College of Rheumatology**

- Treat to target urate level <6 mg/dL
  - May reduce goal to <5 mg/dL if symptom improvement is still needed

**American College of Physicians**

- Treat to avoid symptoms
Non-Pharmacologic Therapy

- Adequate hydration
- Weight loss
- Exercise
- Reduction or elimination of alcohol
- Reduction of purine-rich food intake
- Reduction in fructose containing foods/beverages
- Tart cherry consumption

Pharmacologic Therapy

Timing of Acute Flare Treatment

- Initiate pharmacologic therapy ASAP (ideally within 24 hours of flare onset)
- Treat for 7-10 days or until inflammation is eradicated
Pharmacologic Acute Flare Treatment

- Monotherapy or combination therapy
  - NSAIDs
  - Corticosteroids
  - Colchicine
- Topical ice therapy

Acute Flare Treatment

**Mild-Moderate Pain (<7): Monotherapy**
- NSAIDs
- Corticosteroids
- Colchicine

**Severe Pain (>7) or Polyarticular: Combination Therapy**
- Colchicine + NSAIDs
- Colchicine + Corticosteroids
- Intra-articular Steroids

**NSAID Mechanism of Action (MOA)**
- Reduction in prostaglandin production → reduction in inflammation and macrophage phagocytosis of urate crystal inhibition

Acute Flare Treatment: NSAIDs

<table>
<thead>
<tr>
<th>Drug</th>
<th>Dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Naproxen</td>
<td>750 mg PO once, then 250 mg PO q8h</td>
</tr>
<tr>
<td>Indomethacin</td>
<td>50 mg PO TID</td>
</tr>
<tr>
<td>Sulindac</td>
<td>200 mg PO BID</td>
</tr>
</tbody>
</table>
NSAID Clinical Pearls

- **Avoid** in:
  - Renal or hepatic disease
  - Patients with bleeding disorders
  - Congestive heart failure
- **Use caution** in history of GI bleed
  - Augment with PPI in patients at moderate to high risk of GI bleeds

Risk for GI Toxicity from NSAIDs

<table>
<thead>
<tr>
<th><strong>High Risk</strong></th>
<th><em><em>Moderate</em> Risk</em>*</th>
</tr>
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<tbody>
<tr>
<td>- History of previously complicated ulcer</td>
<td></td>
</tr>
<tr>
<td>- &gt;2 moderate risk factors</td>
<td></td>
</tr>
<tr>
<td>- Age &gt;65 years</td>
<td></td>
</tr>
<tr>
<td>- High-dose NSAID therapy</td>
<td></td>
</tr>
<tr>
<td>- A previous history of uncomplicated ulcer</td>
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<tr>
<td>- Concurrent use of aspirin (including low dose), corticosteroids, or anticoagulants</td>
<td></td>
</tr>
</tbody>
</table>

*C需 1-2 risk factors

Corticosteroid MOA

- Prevents formation of cyclooxygenase (COX) following cellular membrane disturbance and production of arachidonic acid → reduction in inflammation

Acute Flare Treatment: Corticosteroids

<table>
<thead>
<tr>
<th>Drug</th>
<th>Dose*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prednisone</td>
<td>0.5 mg/kg or 30-40 mg PO daily*</td>
</tr>
<tr>
<td>Prednisolone</td>
<td>0.5 mg/kg or 30-40 mg PO daily*</td>
</tr>
<tr>
<td>Methylprednisolone</td>
<td>0.5-2 mg/kg IV or IM daily, repeat as clinically indicated</td>
</tr>
</tbody>
</table>

* Treat until symptom resolution
* First flare: follow treatment with 7-10 day taper (or 14-21 day taper if multiple prior flares)
Corticosteroid Clinical Pearls

- Adverse Drug Reactions:
  - Hyperglycemia
  - Fluid retention
  - Mental status changes – insomnia
  - Agitation
- For single joint flares, can try intra-articular injections (i.e. triamcinolone)

Colchicine MOA

- Reduction in leukocyte migration and phagocytosis and free radical formation via reaction with tubulin to inhibit microtubule assembly (mitotic poison)

Acute Flare Treatment: Colchicine

<table>
<thead>
<tr>
<th>Drug</th>
<th>Dose</th>
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</thead>
<tbody>
<tr>
<td>Colchicine</td>
<td>1.2 mg PO once, then 0.6 mg PO 1 hour later</td>
</tr>
</tbody>
</table>

Colchicine Clinical Pearls

- Initiate within 12 hours of flare (if possible)
- Use alternative drug if more than 36 hours since flare initiation
- Adverse Drug Reactions:
  - GI (diarrhea, abdominal pain)
  - Neurotoxicity (seizures)
  - Blood dyscrasias
- Drug Interactions:
  - Decrease dose by 50% in patients on strong CYP3A4 or p-gp inhibitors
  - Do not repeat treatment within 14 days in patients with CrCl <30 mL/min
Choosing an Acute Treatment

**American College of Rheumatology**
- Choose based on patient specific factors

**American College of Physicians**
- Corticosteroids are first-line

Assessing Response to Acute Treatment

- 20% or greater pain reduction in <24 hours
  - OR -
- 50% or greater pain reduction in >24 hours

**Inadequate Response**
- Change therapy or try combination therapy

**Adequate Response**
- Continue current treatment plan

**Inadequate Response/Refractory Acute Gout**
- Anakinra 100 mg SubQ daily for 3 days (not FDA approved)
  - MOA: Biologic IL-1 inhibitor leading to decreased crystal-induced inflammation
  - Utilize in patients with contraindications or failures to all other acute gout treatments
  - Must be stored in refrigerator
  - Do not use in combination with other biologics
  - Adverse Drug Reactions:
    - Injection site reaction
    - Headache
    - Leukopenia

**Inadequate Response/Refractory Acute Gout**
- Canakinumab 150 mg SubQ once (not FDA approved)
  - MOA: Fully humanized monoclonal antibody inhibiting IL-1B leading to decreased crystal-induced inflammation
  - Utilize in patients with contraindications or failures to all other acute gout treatments
  - Do not use in combination with other biologics
  - Adverse Drug Reactions:
    - Headache
    - Leukopenia/Thrombocytopenia
    - Infection
    - Injection site reaction
    - GI upset
Chronic Treatment Options

Initiation of Chronic ULT

• Established diagnosis of gout AND at least one of the following:
  • Tophus or tophi by clinical exam or imaging
  • Frequent gouty arthritis attacks (2 or more per year)
  • Stage 2 CKD or worse
  • Past urolithiasis

Gout Flare Prophylaxis During ULT Initiation

• Why? Initiation of ULT is thought to cause remodeling of crystal deposits during dissolution
• How Long?
  • ACR & EULAR: >6 months
  • ACP: No specific recommendation beyond 8 weeks
• Which agents?
  • Colchicine 0.6 mg PO 1-2x/day
    o CrCl <50 mL/min, decrease dose by 50%
    o CrCl<30 mL/min, consider an alternative
  • NSAIDs
  • Corticosteroids not recommended (unless first-line contraindicated)

Xanthine Oxidase Inhibitors MOA

- ATP depletion
- Degradation of nucleic acids
- AMP Adenosine
- GMP Guanosine
- Inosine
- Hypoxanthine
- Xanthine
- Xanthine oxidase
- Allantoin
- Uric acid
- Uricase
ULT: Xanthine Oxidase (XO) Inhibitors

<table>
<thead>
<tr>
<th>Drug</th>
<th>Dose</th>
</tr>
</thead>
</table>
| Allopurinol | Initial: 100 mg PO daily  
            | Max: 800 mg daily                       |
| Febuxostat | Initial: 40 mg PO daily  
            | Max: 80 mg daily                        |

Allopurinol Clinical Pearls

• Non-selective inhibition of XO  
• Considered first-line ULT  
• Divide doses >300 mg  
• Requires renal dose adjustment  
• Adverse Drug Reactions:  
  • Mild rash  
  • Mild GI effects  
  • Hypersensitivity syndromes (SJS, TEN, vasculitis)  
• Test for HLA-B*5801 in select populations


Pharmacogenomic Recommendations for Allopurinol

• HLA-B*5801 allele leads to decreased clearance of oxybutol (active metabolite of allopurinol) and increased incidence of severe cutaneous adverse reactions (SCAR)  
• If HLA-B*5801 allele is detected the use of allopurinol is contraindicated  
• Obtain test prior to initiation in Koreans with stage 3 or worse CKD and all those of Han Chinese and Thai descent


Febuxostat Clinical Pearls

• Selective XO inhibition  
• Cleared hepatically and does not require a renal dose adjustment  
• Adverse Drug Reactions:  
  • Diarrhea, nausea  
  • Elevated LFTs  
  • Higher risk of gout flares when initiating  
• No cross-sensitivity to allopurinol  
• Increased CV risk compared to allopurinol


**Febuxostat CV Risk**

### CARES trial

**Objective**
Determine if febuxostat is non-inferior to allopurinol in terms of major CV events in patients with gout and existing CV disease

**Study Design**
Multicenter, double-blind, non-inferiority
Pre-specified non-inferiority margin of 1.3 for the hazard ratio (HR)

**Intervention**
All received colchicine 0.6 mg PO daily for gout flare prophylaxis
Allopurinol 300 mg PO daily, titrated to serum urate < 6 mg/dL or max of 600 mg PO daily (adjusted per renal function)
Febuxostat 40 mg PO daily, titrated to serum urate < 6 mg/dL or max of 80 mg PO daily

### CARES trial, cont.

**Outcomes**
Primary: Composite of CV death, nonfatal MI, nonfatal stroke, or unstable angina with urgent revascularization
Secondary safety: Composite of CV death, nonfatal MI, or nonfatal stroke as well as each individual component of the primary endpoint

**Enrollment**
6190 patients received febuxostat or allopurinol and were followed for a median of 32 months

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**Results**

- **Primary:** 335 (10.8%) of febuxostat and 321 (10.4%) of allopurinol patients (HR, 1.03, 98.5% CI, 1.23 (0.87-1.23); P=0.002)
- **Secondary:** CV death 134 (4.3%) of febuxostat and 100 (3.2%) of allopurinol patients (HR, 1.34, 98.5% CI, 1.34 (1.03-1.73); P=0.03)
- All cause mortality 243 (7.8%) of febuxostat and 199 (6.4%) of allopurinol patients (HR, 1.22, 98.5% CI, 1.22 (1.01-1.47); P=0.04)

**Conclusions**
- Febuxostat is non-inferior to allopurinol for rates of CV events in those with pre-existing conditions
- Febuxostat has higher all-cause and cardiovascular mortality compared to allopurinol

**Limitations**
- 45% of patients discontinued follow-up
- 56.6% of patients discontinued the trial regimen

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**ULT: Uricosuric Agents**

- **Probenecid MOA**
  - Block renal tubular reabsorption by inhibiting URAT1 and GLUT0 transport
  - All uricosurics are CI in patients with h/o nephrolithiasis

- **Lesinurad MOA**
  - Block renal tubular reabsorption by inhibiting URAT1/OAT4 transport
**Uricosuric Therapy**

<table>
<thead>
<tr>
<th>Drug</th>
<th>Dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Probenecid</td>
<td>Initial: 250 mg PO BID Max: 1000 mg PO BID</td>
</tr>
<tr>
<td>Lesinurad</td>
<td>200 mg PO once daily</td>
</tr>
</tbody>
</table>

**Uricosuric Clinical Pearls**

- Second line therapy in addition to or in place of a XO inhibitor
- Contraindicated in patients with history of nephrolithiasis

**Probenecid Clinical Pearls**

- Titrate every 4 weeks
- DDIs with aspirin, ketorolac, beta lactams, methotrexate
- Give with potassium citrate (60-80 mEq/day) to alkalize the urine and prevent stone formation
- Adverse Drug Reactions
  - Blood dyscrasias
  - Uric acid nephrolithiasis
- Renal Considerations:
  - Not recommended in CrCl <50 mL/min
  - Do not use CrCl <30 mL/min

**Lesinurad Clinical Pearls**

- Not approved for monotherapy
  - Must be used with allopurinol
- Adverse Drug Reactions:
  - Acute Kidney Injury/Kidney Failure (BBW)
    - Hold therapy when SCr >2x baseline
- Renal Considerations:
  - Use caution in CrCl <45 mL/min
  - Do not use in CrCl <30 mL/min
Safety Alert for Lesinurad

- Institute for Safe Medication Practices issues alert in October 2016 for lesinurad
- Risk of renal failure for patients taking lesinurad as monotherapy
- Lesinurad must be administered in conjunction with allopurinol

Pegloticase MOA

- Pegylated recombinant form of urate-oxidase enzyme (i.e., urase) which converts uric acid to allantoin (an inactive and water-soluble metabolite of uric acid)

ULT: Pegloticase

<table>
<thead>
<tr>
<th>Drug</th>
<th>Dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pegloticase</td>
<td>8 mg IVPB over 120 minutes q 2 weeks</td>
</tr>
</tbody>
</table>

Pegloticase Clinical Pearls

- Utilize in patients unable to achieve goal levels or symptoms relief on xanthine oxidase inhibitors
- DC oral antihyperuricemic agents prior to initiation
- Gout flare prophylaxis is recommended ~1 week before and for 6 months
- Pre-medicate with antihistamines and corticosteroids
- Do not reinitiate if therapy is interrupted or previously discontinued
- Contraindicated in G6PD deficiency
- Screen patients of African and Mediterranean decent
Pegloticase Clinical Pearls

- Adverse Drug Reactions:
  - Urticaria
  - Nausea
  - Bruising
  - Antibody development
  - Infusion-related reactions

Adjunctive ULT: Losartan +/- Fenofibrate

- Moderate uricosuric effects (have not reduced flares)
- Both are considered add-on therapy following XO inhibitor failure
- Consider losartan if patient has uncontrolled hypertension
- Consider fenofibrate if patient has hyperlipidemia

Duration of ULT Therapy

- Lifetime
- May consider DC in patients with urate <6 mg/dL over 5 years

Review!

- Asymptomatic hyperuricemia does not require treatment (unless there is a history of gout)
- NSAIDs, corticosteroids, and/or colchicine are effective for acute gouty arthritis and should be utilized based on patient-specific factors
- Utilize ULT in patients with gout who experience ≥2 gouty attacks per year, have ≥1 tophus, Stage 2 CKD or worse, or a history of urolithiasis
- NSAIDs, corticosteroids, and/or colchicine should be administered during the first 3–6 months of ULT to minimize risk of acute gouty attacks
- Allopurinol is first-line ULT
- Treat to both reduction of symptoms and serum urate < 6 mg/dL
Post-test Question 1

FS is a 64 yo M presenting to the ED this afternoon with intense pain (rated 6/10) in his left big toe that started last night. Upon examination, the doctor noted swelling, redness, and warmth around the affected site.
PMH: DM2, HFrEF, NSTEMI s/p PCI, Upper GI bleed (2 months ago)
CrCl 65 ml/min
Which treatment for an acute gout attack is most appropriate for FS?
- a) Prednisone 40 mg PO daily
- b) Colchicine 1.2 mg PO x1 dose, then 0.6 mg PO 1 hour later + indomethacin 50 mg PO TID
- c) Naproxen 750 mg PO x1 dose, then 250 mg PO Q8H
- d) Colchicine 1.2 mg PO x1 dose, then 0.6 mg PO 1 hour later

Post-test Question 2

JP is a 59 yo F who presented to her PCP last week for her second acute gout attack (attacks were 2 years apart). She is acutely treated with naproxen, but is back for her follow-up visit. The physician is concerned that JP may need to be started on chronic gout therapy.
PMH: COPD, recurrent kidney stones, stage 3 CKD, atrial fibrillation
Labs: Uric acid 8.1 mg/dL
What chronic therapy do you recommend initiating in JP (in addition to gout flare prophylaxis)?
- a. No chronic therapy is indicated in JP
- b. Allopurinol 100 mg PO daily
- c. Febuxostat 40 mg PO daily
- d. Probenecid 250 mg PO BID + potassium citrate 60 mEq
Post-test Question 3

MT is a 70 yo M who has been taking allopurinol 300 mg PO BID for 1 year. He continues to have sporadic gout attacks despite being compliant with his allopurinol regimen. PMH: HTN, asthma, osteoporosis, HFrEF, STEMI, kidney stones. Meds: lisinopril, albuterol HFA, acetaminophen, aspirin, atorvastatin, and metoprolol XR.

Which of the following medications changes are appropriate for MT at this time? Select ALL that apply.

a. Change lisinopril to losartan while continuing allopurinol  
b. Add febuxostat 40 mg PO daily  
c. Add lesinurad 200 mg PO daily  
d. Discontinue allopurinol and start probenecid 250 mg PO BID  
e. Increase dose of allopurinol to 300 mg PO q AM, 200 mg PO q noon, 300 mg PO q PM

Post-test Question 4

AK is a 62 year old Korean male who has chronic gout with stage 3 CKD. His physician is concerned about severe cutaneous adverse reactions with initiation of allopurinol. He decides to do genetic testing and it is determined that he is positive for the HLA-B*5801 allele. The physician asks for your recommendation in treating this chronic gout based on this result. You recommend:

a. Initiate allopurinol 100 mg PO daily, titrated up to 300 mg PO daily  
b. Initiate pegloticase 8 mg IVPB over 120 minutes every 2 weeks  
c. Initiate allopurinol 100 mg PO daily + lesinurad 200 mg PO daily  
d. Initiate febuxostat 40 mg PO daily
Resources & References

• Saag KG, Choi H. Epidemiology, risk factors, and lifestyle modifications for gout. Arthritis Care Res. 2013; 65(1):2-12
• Am J Gastroenterol 2009; 104:728–738; doi: 10.1038/ajg.2009.115; published online 24 February 2009