

# Recurrent Ankle Pain and Swelling in a 16-year-old

Hawai'i Academy of Family Physicians  
2025 Annual Spring Update

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# Disclosures

- none

# History of Present Illness

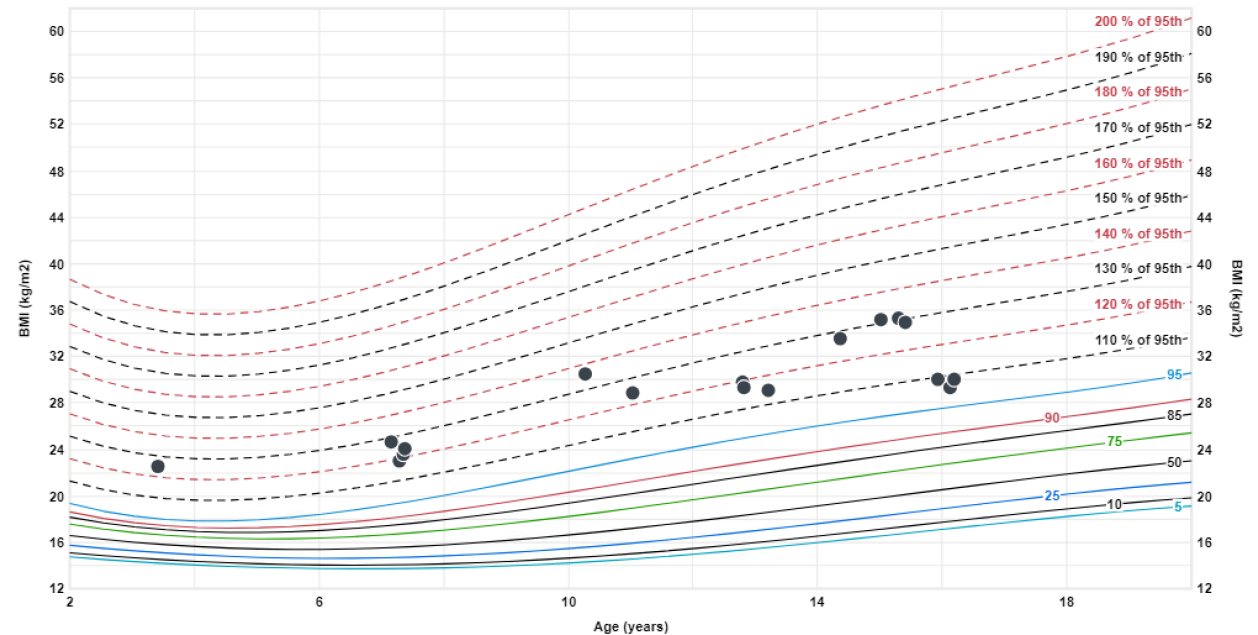
- 16-year-old male
  - Recurrent right ankle pain and swelling
  - Pain scale 4-6/10
  - Since age 6
  - Monthly "attacks" that lasts 2-4 days
  - No symptoms in between episodes
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- Aggravated with weight-bearing
  - Alleviated with OTC ibuprofen

# History of Present Illness-continued

- No fever, chills
  - No joint deformities
  - No overlying skin changes
  - No symptoms in other joints
  - No urogenital sx
  - No bleeding tendency/easy bruising
- 
- No clear triggers
  - No h/o blunt/penetrating trauma
  - No previous workup

# Past Medical History

- BMI 95%tile + since age 2
- BP >130/80, 95%tile + since age 13 (office BP 130-140s/80-90s)
- Mild intermittent asthma, last attack age 6
- No daily medications
- No h/o kidney stones



# Social History

- Never been sexually active
- Diet
  - Not on restrictive diet
  - Low vegetable intake
  - High processed food intake
- Lives with mother, father, siblings
- Native Hawaiian/Asian descent
- Attends high school, regular class
- No travel hx to continental US

# Family History

- Mother + father have metabolic syndrome
- No known FHx of joint disease, arthritis, autoimmune disease

# Physical Exam

- BP 139/91 (95%tile +)
- HR 93, Temp 37.1C, Ht 165cm, Wt 80kg, BMI 29.3 (95%tile +)
- NAD
- No dysmorphic features
- No conjunctival injection
- Antalgic gait
- Bilateral pes planus



# Physical Exam-continued

- Right ankle
  - Swelling in anterior right ankle joint
  - Slightly warm to touch
  - Slight erythema
  - No other overlying skin changes
  
  - Tenderness in anterior joint space
  - No tenderness in medial/lateral malleoli
  - ROM limited by pain
  
  - Normal 1st MTP joint

# Approach to arthritis

- Chronicity: acute, recurrent, chronic
- # of joints: mono-, oligo-, polyarthritis
- Size of joints: large, medium, small
- Etiology: traumatic, non-traumatic

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# Differential Diagnosis

childhood-onset, recurrent monoarthritis,  
mid-sized joint, non-traumatic

## **POSSIBLE**

- Gout
- Pseudogout
- JIA (juvenile idiopathic arthritis)

## **LESS LIKELY**

- Septic
- Gonorrhea, Chlamydia
- Lyme
- Reiter's/reactive
- Rheumatic fever
- Hemarthrosis
- Traumatic

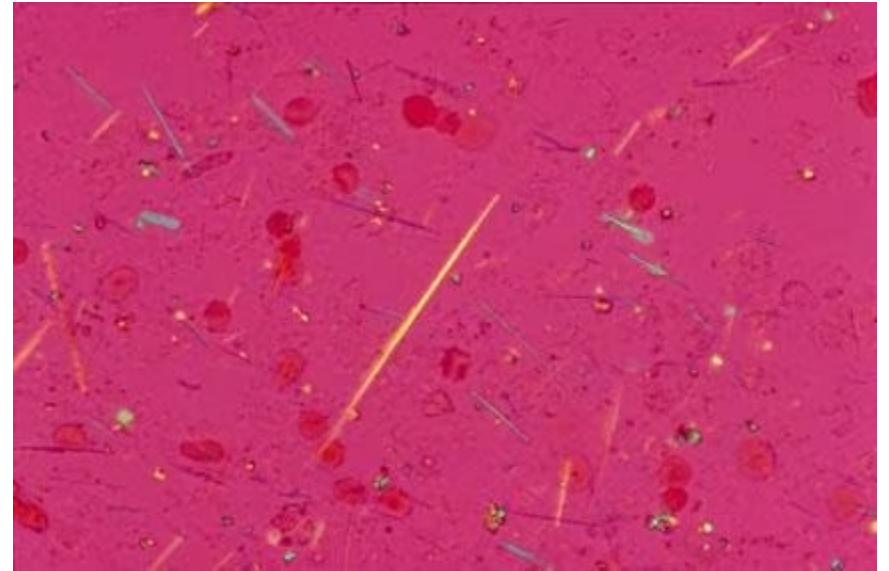
# In-office US-guided arthrocentesis

- Anterior approach
- Real-time US guided with linear probe
- Pocket of fluid without sludge
- 3cc of yellow, sl cloudy joint fluid



# Joint fluid analysis

- Cell count
  - WBC 34,370 /mL (95% PMNs)
  - RBC 3,000/mL
- Uric acid 8.0 mg/dL
- Crystal analysis
  - Intracellular negatively birefringent crystals

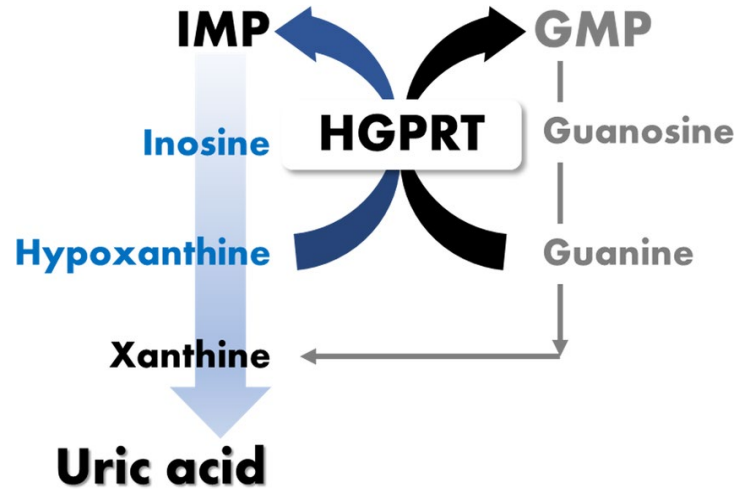


Medscape "Gout and Pseudogout Workup"

--> meets 2015 ACR/EULAR Dx criteria for gout

# Pathophysiology/Risk Factors for Gout

- Overproduction of uric acid
  - Lesch-Nyhan, Kelley-Seegmiller
  - Tumor lysis, leukemia
  - High purine diet
  - Beer
  - Polynesian, Native Hawaiian



Kim D, et al

- Underexcretion of uric acid
  - Kidney disease
  - Genetic
- Other
  - Obesity
  - High fructose corn syrup
  - Down syndrome

# Epidemiology of Gout

- Relatively rare among pediatric population
  - 9-20/100,000 adolescents
  - Higher in Native Hawaiian/Asian population



# Additional workup

- Ankle x-ray
  - No bony destruction
  - No joint deposit
- Serum uric acid
- BMP
- HLA-B\*5801



# Management

- Acute flare management
  - Colchicine + ibuprofen
  - +/- steroid
- Long-term management
  - Dietary modification, weight management
  - Avoid dehydration
  - Uric acid lowering therapy
    - Allopurinol as 1st line
    - HLA-B\*5801 to assess risk for DRESS syndrome
      - 6-8% prevalence among Southeast Asian. Also high in Black pts of African ancestry

# Lessons Learned

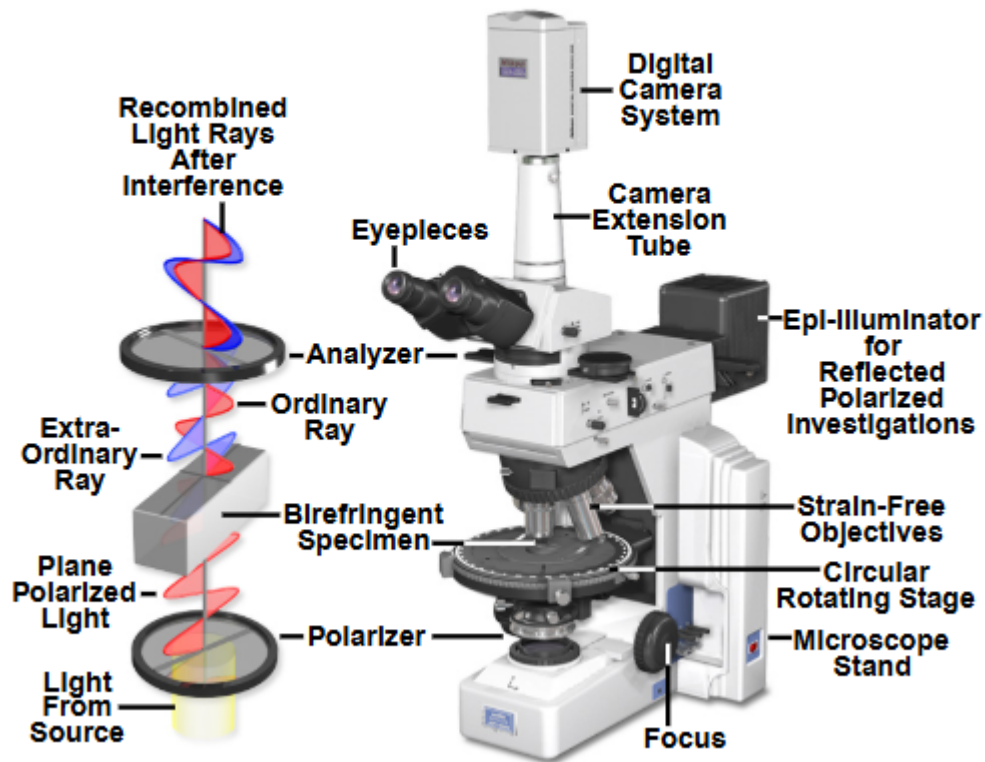
- Gout is relatively rare but can occur among children/adolescents
  - Obesity, HTN, Polynesian/Native Hawaiian
- Arthrocentesis can provide definitive Dx
- Consider HLA-B\*5801 testing before allopurinol Rx
  - Especially in Southeast Asian or African descent

# Resources

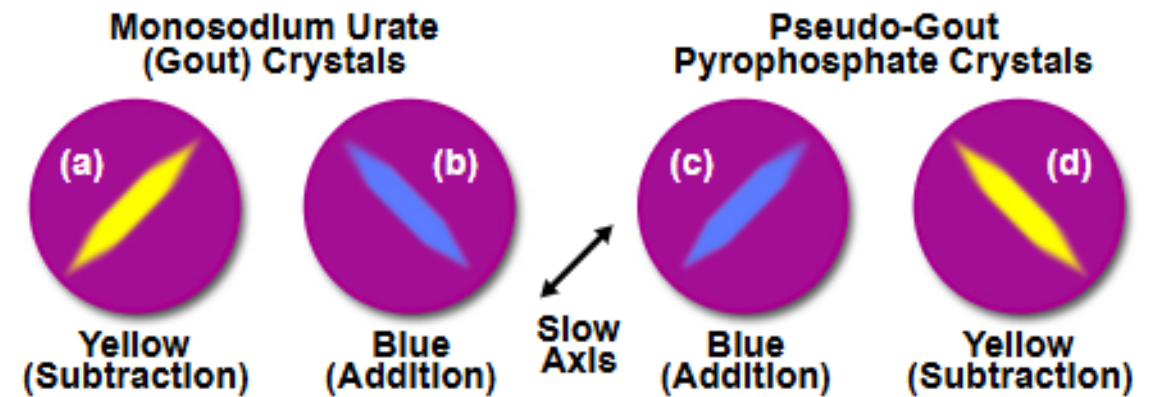
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- Kim, Dayoung et al. "Evaluation of purine-nucleoside degrading ability and in vivo uric acid lowering of *Streptococcus thermophilus* IDCC 2201, a novel antiuricemia strain". PLOS ONE. 19. e0293378. 10.1371/journal.pone.0293378.
- Kubota, Masaru. "Hyperuricemia in Children and Adolescents: Present Knowledge and Future Directions." *Journal of nutrition and metabolism* vol. 2019 3480718. 2 May. 2019, doi:10.1155/2019/3480718
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- Neogi, Tuhina et al. "2015 Gout classification criteria: an American College of Rheumatology/European League Against Rheumatism collaborative initiative." *Annals of the rheumatic diseases* vol. 74,10 (2015): 1789-98. doi:10.1136/annrheumdis-2015-208237
- Nikon Microscopy U "Polarized Light Microscopy" <https://www.microscopyu.com/techniques/polarized-light/polarized-light-microscopy>
- Pfenninger & Fowler's Procedures for Primary Care, 2nd Ed
- Roman, Youssef M. "The Daniel K. Inouye College of Pharmacy Scripts: Perspectives on the Epidemiology of Gout and Hyperuricemia." *Hawai'i journal of medicine & public health : a journal of Asia Pacific Medicine & Public Health* vol. 78,2 (2019): 71-76.
- Yeo, Siaw Ing. "HLA-B\*5801: utility and cost-effectiveness in the Asia-Pacific Region." *International journal of*

# Polarized Light Microscopy and Birefringence

*Figure 1 - Polarized Light Microscope Configuration*

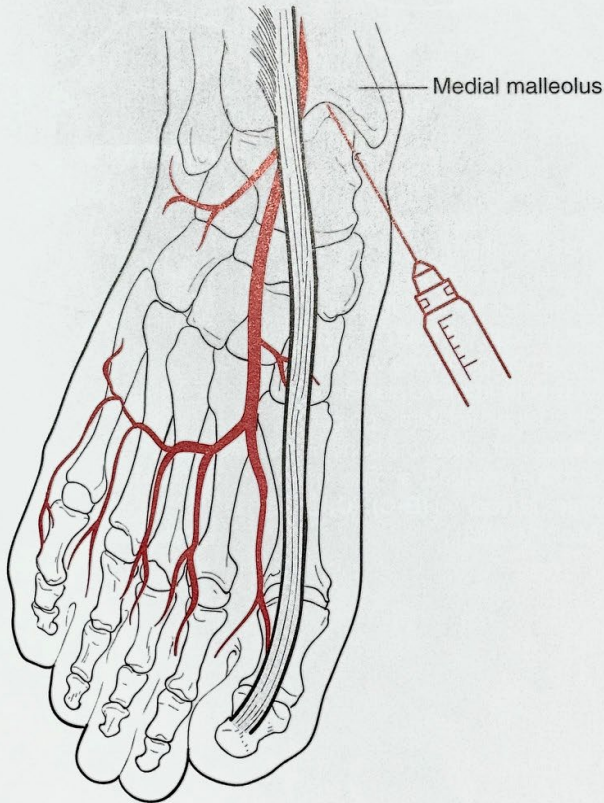


*Figure 6 - Interference Colors in Gout and Pseudo-Gout Crystals*



Source: Nikon Microscopy U "Polazied Light Microscopy"

# Ankle Arthrocentesis—anterior approach



**Fig. 194-24**

**Ankle joint.** Anteromedial approach is the easiest. Have the patient maximally dorsiflex the toe, accentuating the extensor tendon. Identify the hollow between the anterior medial malleolus and the long extensor tendon. This is the spot for injection. The needle must be inserted approximately 3 cm and directed slightly lateral.

# Glossary

- DRESS syndrome: Drug reaction with eosinophilia and systemic symptoms = drug-induced T-cell mediated cutaneous reaction
- HLA B\*5801: related with SCAR/DRESS by allopurinol
- Kelly-Seegmiller syndrome: partial Lesch-Nyhan. Minimal to no neuro sx
- Reiter's syndrome = reactive arthritis: triad of arthritis, urethritis, conjunctivitis. Genetic predisposition + immune response to infxn
- JIA = JRA: RA-like arthritis, onset < 16y, sx > 6w. +/- uveitis