

# Evidence Discussion: Hematuria with Urinary Tract Infection (AB-39.1)

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- An individual who is diagnosed with microscopic hematuria, defined by the American Urological Association guidelines as 3 or more RBC/HPF, and is found to have a concomitant urinary tract infection should have a repeat urinalysis to confirm resolution of the hematuria based on the AUA guidelines.
- If microscopic hematuria persists after treatment of the infection, the patient should undergo risk assessment based on the AUA guidelines which provide guidance on the use of advanced imaging

## References:

1. Ramchandani P, Kisler T, Francis IR, Casalino DD, et al. Expert Panel on Urologic Imaging. ACR Appropriateness Criteria® hematuria. American College of Radiology (ACR); 2014.
2. Cohen RA, Brown RS. Microscopic hematuria. New England Journal of Medicine, 2003; 348:2330-2338.
3. Coplen D. Diagnosis, Evaluation and Follow-Up of Asymptomatic Microhematuria (AMH) in Adults: AUA Guideline. Yearbook of Urology. 2013;2013:1-2. Reviewed and Validity Confirmed 2016 doi:10.1016/j.yuro.2013.07.019.
4. Georgieva MV, Wheeler SB, Erim D, et al. Comparison of the Harms, Advantages, and Costs Associated With Alternative Guidelines for the Evaluation of Hematuria. JAMA Internal Medicine. 2019;179(10):1352. doi:10.1001/jamainternmed.2019.2280.
5. Barocas D, Boorjian S, Alvarez R, et. al. Microhematuria: AUA/SUFU guideline. J Urol. 2020;204:778.

# Evidence Discussion: Asymptomatic Hematuria (AB-39.2)

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- Low-risk patients with microscopic hematuria may opt for a repeat urinalysis prior to proceeding to a workup. Intermediate-risk and high risk patients should undergo a workup with upper and lower tract imaging.
  - Upper tract imaging with renal ultrasound is the standard for low and intermediate patients given the overall low rate of malignancy detected in patients with microscopic hematuria. Renal ultrasound is noninvasive, readily available and carries no risk of ionizing radiation while demonstrating a high sensitivity for renal masses and hydronephrosis.
  - Upper tract imaging for high risk patients should include advanced imaging with urography (CT with/without contrast is preferred with associated 3D rendering if requested). MR urogram (MR abdomen and pelvis with/without contrast) can be performed if CT is contraindicated.
  - Patients with severe renal dysfunction, dye allergy, or other reasons where both CT and MRI are contraindicated should undergo renal ultrasound or noncontrast CT paired with retrograde pyelography
- Individuals with microhematuria with family history of renal cell carcinoma or known genetic renal tumor syndrome should undergo upper tract imaging (renal ultrasound, CT or MR urography) regardless of risk category.
- An individual with previous negative workup with persistent microscopic hematuria may undergo repeat upper tract imaging.

## References:

1. Ramchandani P, Kisler T, Francis IR, Casalino DD, et al. Expert Panel on Urologic Imaging. ACR Appropriateness Criteria® hematuria. American College of Radiology (ACR); 2014.
2. Cohen RA, Brown RS. Microscopic hematuria. New England Journal of Medicine, 2003; 348:2330-2338.
3. Kolbeck K, Ray C Jr, Lorenz J, et al. Expert Panel on Interventional Radiology. ACR Appropriateness Criteria® radiologic management of urinary tract obstruction. American College of Radiology (ACR); 2013.
4. Raman SP, Horton KM, Fishman EK. MDCT Evaluation of Ureteral Tumors: Advantages of 3D Reconstruction and Volume Visualization. American Journal of Roentgenology. 2013;201(6):1239-1247. doi:10.2214/ajr.13.10880.
5. Coplen D. Diagnosis, Evaluation and Follow-Up of Asymptomatic Microhematuria (AMH) in Adults: AUA Guideline. Yearbook of Urology. 2013;2013:1-2. Reviewed and Validity Confirmed 2016 doi:10.1016/j.yuro.2013.07.019.
6. Georgieva MV, Wheeler SB, Erim D, et al. Comparison of the Harms, Advantages, and Costs Associated With Alternative Guidelines for the Evaluation of Hematuria. JAMA Internal Medicine. 2019;179(10):1352. doi:10.1001/jamainternmed.2019.2280.
7. Barocas D, Boorjian S, Alvarez R, et. al. Microhematuria: AUA/SUFU guideline. J Urol. 2020;204:778.

# Evidence Discussion: Hematuria and Flank Pain (AB-39.3)

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- Individuals with flank pain presenting with either microscopic or gross hematuria should undergo advanced imaging with CT of the abdomen and pelvis
  - The choice of contrast is at the discretion of the provider and may differ for individuals with previous history or high risk of nephrolithiasis and individuals with a higher risk of malignancy
  - 3D reconstruction of CT urography may be performed as requested.
  - Alternatively, the provider may request abdominal or retroperitoneal ultrasound in lieu of a CT initially.

## References:

1. Ramchandani P, Kisler T, Francis IR, Casalino DD, et al. Expert Panel on Urologic Imaging. ACR Appropriateness Criteria® hematuria. American College of Radiology (ACR); 2014.
2. Cohen RA, Brown RS. Microscopic hematuria. New England Journal of Medicine, 2003; 348:2330-2338.
3. Kolbeck K, Ray C Jr, Lorenz J, et al. Expert Panel on Interventional Radiology. ACR Appropriateness Criteria® radiologic management of urinary tract obstruction. American College of Radiology (ACR); 2013.
4. Expert Panel on Urologic Imaging. ACR Appropriateness Criteria® acute onset flank pain - suspicion of stone disease (urolithiasis). American College of Radiology (ACR), 2015:11.
5. Raman SP, Horton KM, Fishman EK. MDCT Evaluation of Ureteral Tumors: Advantages of 3D Reconstruction and Volume Visualization. American Journal of Roentgenology. 2013;201(6):1239-1247. doi:10.2214/ajr.13.10880.

# Evidence Discussion: Hydronephrosis of Unexplained or Indeterminate Cause (AB-39.4)

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- A new diagnosis of hydronephrosis without a known cause should undergo further workup. Advanced imaging with CT urography with 3D reconstruction may be performed if requested to evaluate the course of the urinary tract for obstruction.
- Alternatively, the provider may request abdominal or retroperitoneal ultrasound in lieu of a CT initially.
- Patients with known chronic, uncomplicated hydronephrosis or patients with neurogenic bladder (spina bifida or other neurologic conditions) may undergo surveillance imaging with retroperitoneal ultrasound every 6-12 months to monitor for progression or development of hydronephrosis to prevent renal deterioration.

## References:

1. Kolbeck K, Ray C Jr, Lorenz J, et al. Expert Panel on Interventional Radiology. ACR Appropriateness Criteria® radiologic management of urinary tract obstruction. American College of Radiology (ACR); 2013.
2. Raman SP, Horton KM, Fishman EK. MDCT Evaluation of Ureteral Tumors: Advantages of 3D Reconstruction and Volume Visualization. American Journal of Roentgenology. 2013;201(6):1239-1247. doi:10.2214/ajr.13.10880.