



# Asymptomatic Microscopic Hematuria: Work-Up and Treatment



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**B**lood in the urine (hematuria) can originate from anywhere in the urinary tract or may be due to pathology outside the urinary tract and may be either gross or microscopic. The prevalence of asymptomatic microscopic hematuria (AMH) is 0.19% to 16.1%.<sup>1</sup> The majority of cases of microscopic hematuria are benign, however, 8.3% of men undergoing urologic evaluation for microscopic hematuria were found to have a genitourinary malignancy.<sup>2</sup> Of these malignancies, urothelial cancer is of greatest concern. The morbidity and mortality associated with urothelial cancers is quite significant. The five-year survival rate associated with bladder cancer ranges from 51% to 84%.<sup>3</sup> With the concern for a potential genitourinary malignancy, the question of who should be investigated for AMH has been raised.

Controversy exists about the optimal management of AMH. The Canadian Urological Association has recently formulated the Canadian guidelines for the management of AMH in adults.<sup>4</sup> The purpose of this review is to outline the key aspects of these guidelines.

**Q** *What is the definition of AMH?*

The definition of significant microscopic hematuria is greater than two red blood cells per high power field on at least two microscopic urinalysis without recent exercise, menses, sexual activity or instrumentation. If the patient's history reveals these contributing factors, a repeat microscopy, once factors have ceased, should be performed and if the next exam is negative, no further investigation is necessary.

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**Q** *Who warrants a nephrology consult?*

Those patients with the presence of proteinuria, red cell casts or dysmorphic red cells on their urinalysis or hematuria in combination with an

elevated creatinine may suggest a glomerular cause of their hematuria. These patients should be referred to a nephrologist for further evaluation.

**Q** *What is the basic work-up of a patient with AMH?*

For all patients with AMH in the absence of a contributing history, a urine cytology and upper urinary tract imaging are warranted. Upper urinary tract imaging can be in the form of ultrasound (US), CT or IV pyelography. There is no evidence that one modality is superior in the evaluation of AMH. As such, due to the safety, cost and availability, US is often the first-line modality. With a US, the majority of renal masses > 5 mm can be detected as well as other upper urinary tract abnormalities.<sup>5</sup>

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**Q** *Who warrants a cystoscopy?*

All the tests in the basic work-up for AMH are relatively non-invasive, however, the challenge lies in identifying those patients who require a

**Take-home message**


The new Canadian Urological Association guidelines on asymptomatic microscopic hematuria (AMH) have helped to identify those patients for whom investigations are warranted, either a basic work-up or a cystoscopy and those who can be surveyed. In particular, patients with significant risk factors for bladder cancer, including a strong smoking history, chemical or radiation exposure or irritable voiding symptoms warrant a urologic consultation for cystoscopy. Patients with features concerning for a nephrologic cause of AMH, in particular, proteinuria, abnormal urinary microscopic findings or an elevated creatinine, require a referral to a nephrologist. Follow-up for at least three years is necessary to rule out the development of features suggestive of bladder cancer or progressive renal impairment.

complete urologic evaluation inclusive of a cystoscopy. The role of a cystoscopy is to rule out a potential malignancy of the bladder. As such, we focus on those patients who possess risk factors for bladder cancer. These include those who are ≥ 40-years-old, those with an atypical or positive cytology, a history of smoking, occupational exposure to chemicals or dyes (such as benzenes or aromatic amines), analgesic abuse (including phenacetin), pelvic radiation, cyclophosphamide exposure or irritative voiding symptoms.

If the work-up for AMH, inclusive of cystoscopy, is negative, a small percentage of patients (1% to 3% within three years) have

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been reported to be diagnosed with a urologic malignancy.<sup>6,7</sup> As a result, follow-up is warranted, however, this can be carried out by the primary care physician. It is recommended that these patients be followed with a urinalysis, urine cytology and BP checks at six, 12, 24 and 36 months. A repeat urologic evaluation is warranted if the patient develops gross hematuria, a positive cytology or irritative voiding symptoms in the face of negative urine cultures. The development of hypertension, proteinuria, or finding of glomerular bleeding necessitates a referral to a nephrologist. 



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### References

1. Woolhandler S, Pels RJ, Bor DH, et al: Dipstick Urinalysis Screening Of Asymptomatic Adults For Urinary Tract Disorders. I. Hematuria and Proteinuria. *JAMA* 1989; 262(9):1214-9.
2. Messing EM, Young TB, Hunt VB, et al: Home Screening For Hematuria: Results Of A Multiclinic Study. *J Urol* 1992; 148(2 Pt 1):289-92.
3. Lynch CF, Cohen MB: Urinary System. *Cancer* 1995; 75(1 Suppl):316-29.
4. Wollin T, Laroche B, Psooy K: Canadian Guidelines For The Management Of Asymptomatic Microscopic Hematuria In Adults. *Can Urol Assoc J* 2009; 3(1):77-80.
5. Curry NS, Bissada NK: Radiologic Evaluation Of Small And Indeterminant Renal Masses. *Urol Clin North Am* 1997; 24(3):493-505.
6. Golin AL, Howard RS: Asymptomatic Microscopic Hematuria. *J Urol* 1980; 124(3):389-91.
7. Carson CC 3rd, Segura JW, Greene LF: Clinical Importance Of Microhematuria. *JAMA* 1979; 241(2):149-50.