

Haematuria in Adults

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Contents

Contents	1
Background	1
About haematuria	1
Assessment	2
 Practice Point	2
Investigate unexplained haematuria	2
History	2
Physical examination	2
Investigations	3
Management	3
Nephrotic syndrome	3
Referral	3
Information	4
For health professionals	4
Sources	4

Background

About haematuria

- *Haematuria may be:*
 - *macroscopic – visible blood in the urine.*
 - *microscopic – defined as 2 urine specimens containing > 10 red blood cells (RBC) per high-powered field on microscopy, not based on dipstick reading alone.*
- *The prevalence of urinary tract carcinoma in patients with macrohaematuria ranges between 3 to 6% but has been reported to be as high as 19%.¹*
- *The risk of malignancy as the cause of macroscopic haematuria increases with smoking, occupational exposure to toxins, prior cyclophosphamide use, chronic bladder infections, increasing age, previous upper renal tract malignancy, and pelvic radiation treatment.*
- *The prevalence of microhaematuria in asymptomatic individuals is 0.19 to 21.0%.²*
- *Microscopic haematuria not explained by benign causes such as cystitis, menstruation, vigorous exercise, trauma, or recent instrumentation, should be further evaluated.*



Practice Point

Investigate unexplained haematuria

- *Microhaematuria due to intrinsic renal disease is likely with the detection of dysmorphic red blood cells, proteinuria, cellular casts or impaired renal function. These findings should prompt a nephrological workup but should not preclude the need for urological evaluation.*
- *Microscopic haematuria detected in patients taking anticoagulants should be fully evaluated regardless of the type or level of anticoagulation.*

1. Take a **history**.

History

- *Consider whether painful or painless:*
 - *Flank pain suggests an upper tract cause e.g., renal calculi or collecting system lesion.*
 - *Dysuria and frequency usually suggests inflammation or infection, but can also occur with bladder malignancy.*
 - *Painless is more likely to be due to malignancy.*
- *Assess risk factors for malignancy, including smoking, occupational exposure to toxins, previous cyclophosphamide use, previous radiation, long-term catheterisation.*
- *Enquire about menstruation or trauma, including vigorous exercise or sexual activity within 24 hours.*
- *Ask about:*
 - *duration of haematuria*
 - *family history of renal disease*
 - *medications, especially aspirin, warfarin, NSAIDs, and novel anticoagulants*
 - *recent sore throat (glomerulonephritis)*
 - *other respiratory tract infection (IgA nephropathy)*
 - *systemic illness and signs of vasculitis.*

2. Perform **physical examination**

Physical examination

- *Males – abdominal or loin mass and digital rectal exam (DRE) prostate*
 - *Females – abdominal or loin mass and pelvic examination, also checking for genital or urethral lesions*
 - *All – blood pressure, oedema, and weight*
3. Arrange MSU, including red blood cell (RBC) morphology, because dipstick testing has a high false positive rate.
4. Arrange further **investigations** if:
- macroscopic haematuria not due to MSU-proven urinary tract infection.
 - microscopic haematuria > 10 RBC per high-powered field on repeated specimens.

Investigations

- CT intravenous pyelogram (IVP) is the gold standard in imaging but is contraindicated in renal impairment or with contrast allergy.
- Where CT IVP is contraindicated, renal tract ultrasound is required.
- Electrolytes, urea, creatinine and eGFR
- Urinary albumin-to-creatinine ratio (ACR)
- 3 urine cytologies (not in early morning)

Management

1. If cytology, ultrasound, or CT IVP suggests malignancy, arrange [urgent urology referral](#).
2. If infection is present, treat and review in 2 weeks with repeat urine microscopy, culture, and sensitivity.
3. Arrange [routine urology referral](#) if:
 - macroscopic haematuria.
 - microscopic haematuria:
 - > 10 RBC per high-powered field on repeated specimens, or
 - for which no benign cause has been found.
4. If microscopic haematuria ≤ 10 RBC per high-powered field, it is reasonable to observe in general practice with 6 monthly MSU and blood pressure.
5. Refer concurrently to a [renal physician](#) if intrinsic renal disease is likely as indicated by:
 - new hypertension > 140/90 mmHg.
 - eGFR < 60.
 - serum creatinine rising by ≥ 25%.
 - glomerular or dysmorphic pattern of erythrocytes on urine microscopy.
 - abnormal albumin-to-creatinine ratio or protein-to-creatinine ratio.
 - clinical **nephrotic syndrome**.

Nephrotic syndrome

- Characterised by:
- generalised oedema
- hypoalbuminaemia
- heavy proteinuria (> 3 g per day)
- hypercholesterolaemia.

Referral

- Refer for [urgent urology referral](#) if:
 - urinary tract ultrasound, CT IVP, or cytology shows a non-simple cyst mass lesion.
 - there is macroscopic haematuria not due to MSU-proven urinary tract infection.
- Refer for [routine urology referral](#) if microscopic haematuria detected:
 - > 10 RBC per high-powered field on repeated specimens, or
 - for which no benign cause has been found.
- If haematuria is confirmed and intrinsic renal disease is likely, refer concurrently to a [renal physician](#).

For health professionals

Australian Family Physician – [Macroscopic Haematuria: A Urological Approach](#)

Sources

References

1. O'Connor O, Fitzgerald E, Maher M. [Imaging of Hematuria](#). American Journal of Roentgenology. 2010;195(4):263-267.
2. Yeoh M, Lai NK, Anderson D, Appadurai V. [Macroscopic haematuria: A urological approach](#). Aust Fam Physician. 2013 Mar;42(3):123-6.

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Wollin T, Laroche B, Psooy K. [Canadian guidelines for the management of asymptomatic microscopic hematuria in adults](#). Canadian Urological Association Journal. 2009;3(1):77-80.

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