

## Haematuria: Diagnosis and Management in the ED

### Aim

To provide an evidence based guide to assist in the evaluation and management of haematuria in the Emergency Department.

### Definition of terms

ASO- Antistreptolysin O  
C3 C4- Complement C3, Complement C4  
C/S- Culture and Sensitivity  
ED- Emergency Department  
FBC- Full blood count  
HSP- Henoch- Schönlein purpura  
IgA- Immunoglobulin A  
IgG- Immunoglobulin G  
ITP- Immune/ Idiopathic Thrombocytopenic Purpura  
IV- Intravenous  
LFTs- Liver function tests  
OPD- Outpatients department  
SLE- Systemic Lupus Erythematosus  
UTI- Urinary tract infection  
U&E- Urea and electrolytes

### Target Patient Population

This guideline applies to the paediatric population presenting to the ED with haematuria. It does not deal with paediatric haematuria in the in-patient and OPD population.

### Target Users

This guideline is directed to the ED staff in the care of paediatric patients presenting to the ED with haematuria.

### Assessment

Haematuria is defined as the presence of at least 5 red blood cells per microliter of urine. In the emergency department, it is important in evaluating a child with haematuria to identify serious, treatable and progressive conditions.

- It is often benign and seen in fever.
- For isolated microscopic haematuria, repeated measurement is all that is required. This is best performed every 2 months and it should settle within the next 4-6 months. If no resolution occurs, referral to nephrology is appropriate.
- Urate crystals are commonly present in the urine of new-born babies. They can produce a red/pink discolouration of the nappy ("brick dust" appearance) which is sometimes mistaken for blood.
- When proteinuria is identified in addition to the haematuria, admission is likely to be required. Early morning urine (EMU) is the most accurate measure of protein leakage and spot samples for urinary protein: creatinine ratios can be taken. For definitive diagnosis, 24-hour collections may also be necessary (rare to perform in children).

- In the symptomatic group, investigation will be dictated by the symptoms. Renal symptoms (loin pain, abdominal pain, dysuria) will require urine c/s and may require renal imaging in the acute phase. Early morning urine for urinary calcium: creatinine and oxalate: creatinine ratios, should be included in any work-up for renal stones (note there is a separate stone evaluation set of investigations available).
- In those with systemic symptoms (rash, arthritis, diarrhoea, jaundice, oedema, heart failure, fever), a full examination and discussion with senior colleagues with appropriate investigations for underlying conditions is necessary.
- If there is macroscopic haematuria, frank red urine, and UTI has been excluded consider admission, if urgent OPD investigation (ultrasound) + follow up cannot be arranged.
- Recurrent macroscopic haematuria, not previously imaged requires urgent ultrasound

Red or brown urine does not always indicate haematuria (haemoglobinuria, rhabdomyolysis, myoglobinuria, medication, and food).

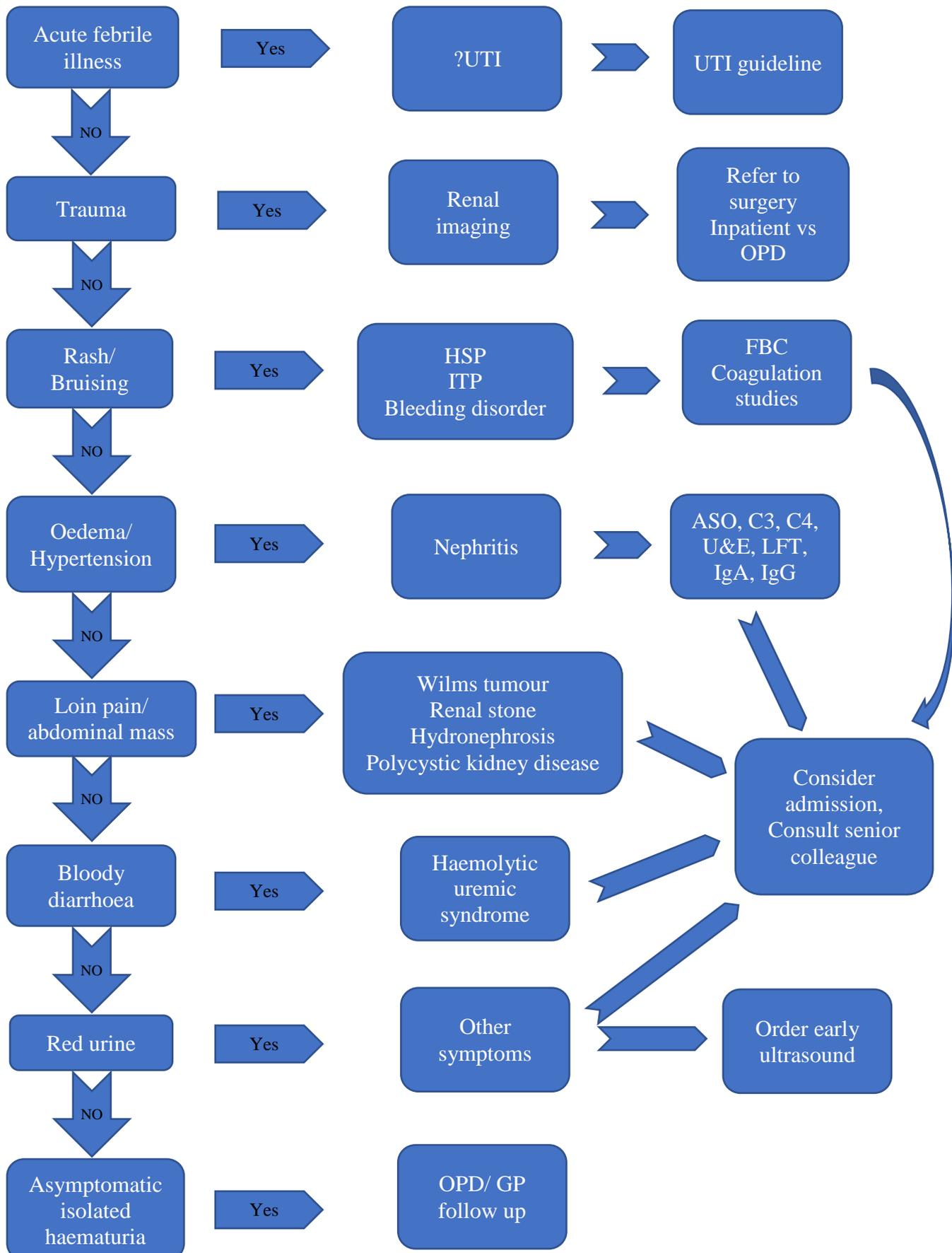
*Other causes of red urine.*

<b>Drugs</b> Chloroquine Desferrioxamine Ibuprofen Iron Sorbitol Metronidazole Nitrofurantoin Phenazopyridine Phenolphthalein Phenothiazines Rifampin Salicylates Sulfasalazine	<b>Food</b> Beets Blackberries Red food colouring Mushrooms Rhubarb  <b>Metabolites</b> Homogentisic acid Melanin Methaemoglobin Urates Porphyrin
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### Use of investigations

- Blood tests such as FBC, U&E, Coagulation studies, liver function tests, amongst others can aid diagnosis. These tests are useful in UTI, patients with haematuria presenting with bruising or rash, oedema or high blood pressure.
- Results of special tests such as ASO, C3 C4, IgA, IgG will not be readily available to the ED as they not processed on a daily basis, therefore use these investigations judiciously and ensure these has been a follow up arranged for the patient.
- In cases of haematuria presenting with trauma, abdominal pain/ mass, ultrasound is a useful aid to diagnosis, and first line radiological investigation when available. If timely radiological investigation is not available, admission may occasionally be necessary to facilitate diagnostic tests.

**MANAGEMENT (HAEMATURIA ALGORITHM)**



**Consider admission to hospital/ referral to in-patient teams if:**

- Uncontrollable hypertension
- Urolithiasis causing significant pain
- Oedema
- Significant proteinuria;  $\geq$  protein +++
- Acute intra-abdominal injury
- Oliguria with haematuria
- Red blood cell casts
- Signs of systemic disease
- Acute kidney injury
- Macroscopic haematuria- Differentiate between UTI and cystitis. For UTI, refer to UTI guideline.
- Goodpasture
- Patients presenting with lack of ability to follow up, family's comfort level, patients with social concerns
- Discuss with senior colleague and ensure safety net in case of discharge from ED for other patients

**Consider OPD referral if:**

- Hypercalciuria, urolithiasis. Urology consult for obstruction.
- Family history of hypercalciuria for metabolic work up
- Haemoglobinopathies with haematuria
- Haematuria due to systemic causes (e.g. History of SLE (emergency review if newly diagnosed), ITP
- Family history of renal failure or hearing loss
- Persistent haematuria of unknown aetiology
- Discuss with senior colleague to ensure safe discharge of these patients

**Consider consulting the urology team, following imaging if:**

- Urolithiasis
- Vascular abnormalities
- Anatomic abnormalities
- Tumour

**Companion Documents:**

[References](#)

[Parent Information Leaflet](#)

[Literature Search](#)