

FAQs about MSU (mid-stream urine)

- When to send MSU?
- When not to send MSU?
- How to interpret MSU?

When to send MSU?

- **over 65 y.o.** if symptomatic
- ?UTI in **men**
- **pregnancy**
- Suspect **pyelonephritis or sepsis**
- **failed antibiotic treatment or persistent symptoms**
- **recurrent UTI** (2 episodes in 6m or 3 in 12m)
- if prescribing antibiotic in someone with a **urinary catheter**
- **Infant under 3 months**
- **Child over 3 months with positive dipstick**
- Risk factors for **resistance**
- as advised by local microbiologist

Risk factors for resistance

- abnormalities of genitourinary tract⁸
- renal impairment
- care home resident
- hospitalisation for > 7 days in last 6m
- recent travel to a country with increased resistance
- previous UTI resistant

Microscopy - RBC

- Haematuria - *best detected by dipstick*
- Normally, a few RBCs are present in urine (0-5 RBCs per high power field, or see range on report)
- More that that may indicate:
 - Menstruation (contamination)
 - Infection
 - Urinary tract malignancy
 - Bladder/kidney stone
 - trauma

Microscopy - WBC

- WBCs in urine normally low (0-5 WBCs per high power field/0-10 WBC/mm³)
- Raised WBCs (or positive dipstick for leukocyte esterase) may indicate
 - Infection
 - inflammation

Microscopy - Epithelial cells

- usually reported as "few (+)" "moderate (++)" or "many (+++)" present per low power field (LPF)
- May indicate perineal contamination

Interpreting urine results - culture

- $>100\ 000$ colony forming units (cfu)/ml of a urinary pathogen is considered significant
- $10\ 000 - 100\ 000$ cfu/ml pure culture is probably significant (especially if the patient is drinking a lot of fluids as may be advised in ?UTI)

Sterile pyuria

- Elevated WBC with a negative culture
- Possible causes :
 - Recent treated UTI
 - Current antibiotics – even one dose
 - Chlamydial urethritis/ other infection e.g gonorrhoea
 - Prostatitis
 - Renal tract tuberculosis – consider in patients with fever, weight loss, night sweats, anorexia with no other obvious cause
 - Drugs – e.g. NSAIDS, steroids, cyclophosphamide, indinavir

Special cases

Age > 65

Asymptomatic bacteriuria
is common

Do not treat – does not
reduce mortality or
prevent symptomatic
episodes

Catheters

In CSU there will almost
always be growth

Only treat if systemic
evidence of infection eg
fever

Pregnant

Antibiotic treatment of
asymptomatic bacteriuria in
pregnancy reduces risk of upper
urinary tract infection and low birth
weight babies
Therefore women are screened ante-
natally

Interpreting urine reports: microscopy

- RBC
 - Infection
 - Urinary tract malignancy
 - Bladder/kidney stone
 - trauma
- WBC
 - inflammation/infection
- Epithelial cells
 - ?perineal contamination

**SEMI-AUTOMATED URINE ANALYSERS HAVE VARYING NORMAL RANGES
RESULTS MAY NOT BE REPORTED AS COUNTS PER HPF**

Useful guidance

<https://www.gov.uk/government/publications/urinary-tract-infection-diagnosis>

<https://phw.nhs.wales/services-and-teams/harp/urinary-tract-infection-uti-resources-and-tools/uti-downloads/primary-care-empirical-urinary-tract-infection-treatment-guidelines-all-wales-medicines-strategy-group-awmsg>

<https://www.nice.org.uk/guidance/ng113/resources/visual-summary-pdf-6599495053>

Main causes of UTI

Enterobacteriaceae

- *Escherichia coli*, *Klebsiella* sp
 - *Enterobacter* sp, *Serratia* sp, *Citrobacter* sp, *Morganella* sp
 - *Proteus* sp
-
- Also, enterococci, Group B streptococci, *Staphylococcus saprophyticus*