

Guide to interpretation of urine microscopy results

There is no set normal range for cells in urine, as it is not possible to account for all patient types or conditions. For example, a leukaemic or immunocompromised patient may have a low white cells count that may be regarded as normal in other patient groups etc. By giving a “normal range” this could be overlooked. As such, very few laboratories (if any) would report normal ranges for urine microscopy.

White Blood Cells

In terms of white blood cell counts (WBC) in urine, The [UK Standards for Microbiological Investigations](#) (published by Public Health England) for the investigation of urine suggest that a count of $<100/\mu\text{l}$ can be used as a level to help discriminate infection (whilst $<10/\mu\text{l}$ may also be used, this is frequently surpassed in healthy asymptomatic women). High white cell counts with a negative culture would suggest sterile pyuria and doctors should consider additional tests such as *Chlamydia trachomatis* and *Neisseria gonorrhoea* if appropriate. False negative cultures may arise if the patient is taking antibiotics prior to producing a urine sample. In summary, the suggested guidelines for WBCs in urine are:

<10 WBC/ μl Not significant (unless patient is immunocompromised in some way)

$10-100$ WBC/ μl Generally not significant but still requires to be reviewed in a clinical context.

>100 WBC/ μl Suggestive of infection

Red Blood Cells

There are no fixed national guidelines for the acceptable range for red blood cells (RBC) present in urine. This is primarily due to the number of factors that can cause transient haematuria that could be misleading, for example exercise trauma, anticoagulant treatment, or taking ibuprofen. For patients with a history of foreign travel, haematuria can suggest possible *Schistosoma sp* infection and doctors should consider submitting a sample for this. In accordance with the Urology Department at PCH the following can be used as a guideline for the presence of RBCs in urine samples:

$0-5$ RBC/ μl – equates to trace and can be ignored

$5-25$ RBC/ μl – equates to + and should be looked at in clinical setting but persistently > 5 can be considered as persistent microscopic haematuria

>25 RBC/ μl – is microscopic haematuria and regarded as such.

However, this should only be used as a guide due to the factors stated.

Epithelial Cells

Epithelial cells are not used as a sign of potential problems but as an indicator of the quality of the sample provided – the higher the number the poorer the quality. Again there is no national recommended range, though it is frequently suggested that a count of $>5/\mu\text{l}$ may indicate potential contamination of the sample.

The above are purely guidelines. Doctors must take into consideration the clinical picture of the patient (including any underlying clinical issues) and the culture result when interpreting the urine microscopy results.