



## URINE PROCESSING

At a recent laboratory accreditation inspection, it was suggested that routine manual microscopy in addition to automated urinalysis is not necessary for processing the vast majority of urines. We examined this further, undertaking a trial comparing our current method alongside new methodology using automated urinalysis and culture alone.

Please see the appendix for a summary of the trial.

We are satisfied that this study validates the use of automated urinalysis and culture alone. Therefore we plan to institute the new methodology on **Monday 1<sup>st</sup> March 2010**.

The main changes to the urine report that you receive will be in the way that white cells and red cells / haemoglobin are recorded. Instead of being an actual number these will be recorded semi-quantitatively according to the Clinitest urinalysis result. Below is the potential range of values you will see on the result:

- Leucocytes Negative, +, ++, +++
- Erythrocytes/Haemoglobin pigments Negative, +, ++, +++

We appreciate that there may be certain clinical circumstances where manual urine microscopy may be required and this will be performed on specific request.

For example:

- i) Examination for casts (indicated in suspected intrinsic renal disease)
- ii) Examination for dysmorphic red cells (indicated in suspected intrinsic renal disease). Fresh urine (<2hours old) is critical here as cells may undergo morphological changes or lyse, leading to false positive or negative results.
- iii) Crystals (indicated for some metabolic disorders)
- iv) Microscopic confirmation of haematuria. (Fresh urine is pre-requisite here as red cells lyse quickly and can give a false negative result. Please request "microscopic confirmation of haematuria required")

If any problems arise from the new urine methodology, please do not hesitate to feed back your concerns to us.

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## Appendix

### URINE METHOD COMPARISON – MICROSCOPY

On two consecutive days in February 2010 we looked at a total of 336 routine urine samples processed in our Microbiology Laboratory and compared the microscopy, Clinitest 10SG strip and culture results. The intention was to establish whether it was necessary to perform urine microscopy as part of a routine urine examination.

#### Current Method

All urines receive a dip strip colony count culture on Chrom Orientation agar and Clinitest 10SG analysis using a Clinitek Advantus.

If the 10SG strip has:

- $\geq 15$  WBC
- $\geq 10$  RBC
- Nitrate positive
- Protein  $\geq 1+$

Then a urine microscopy is performed using phase contrast microscopy.

After microscopy if any one or more of the following criteria are met:

- $\geq 50$  WBC
- Positive nitrate
- Bacteria seen
- Overall 'picture' suggestive of infection

Then additional culture on a Blood / MacConkey split plate and direct antibiotic susceptibilities are performed.

#### Proposed Method

All urines receive a dip strip colony count culture on Chrom Orientation agar and Clinitest 10SG analysis using a Clinitek Advantus.

If the 10SG strip has either:

- $\geq 70$  WBC (i.e. Leucocyte esterase ++)
- Nitrate positive

Then additional culture on a Blood / MacConkey split plate and direct antibiotic susceptibilities are performed.

No microscopy will be performed unless specifically requested.

Clinitest 10SG results will be reported as:

- Leucocytes Negative, +, ++, +++
- Erythrocytes/Haemoglobin pigments Negative, +, ++, +++
- Other parameters, no change

## Urine Trial

Total number of urines examined for leucocytes, nitrate, bacteria, and culture in trial was 336.

Total number of urines examined for erythrocytes / haemoglobin pigments was 109.

	Current method	Proposed method
<b>Total urines</b>	<b>336</b>	<b>336</b>
<b>Clinitest 10SG</b>	<b>336</b>	<b>336</b>
<b>Microscopy</b>	<b>243</b>	<b>0</b>
<b>Number of urines receiving additional culture + direct sens. test</b>	<b>136</b>	<b>165</b>
<b>Total positive cultures</b>	<b>78</b>	<b>78</b>
<b>Positive cultures from those receiving additional culture plate + direct sens. test</b>	<b>72</b>	<b>74</b>

There were 10 urines that had significant discrepancies in leucocyte results.

All 10 of these urines had culture results of; No growth or No significant growth.

<i>Microscopy 0 leucocytes, Clinitest 10SG &gt;= 70 leucocytes</i>	7
<i>Microscopy &gt;= 50 leucocytes, Clinitest 10SG = 0 leucocytes</i>	3

Of the 7 urines in the first group above:

- 1 had an incorrectly recorded microscopy.
- 1 on repeat 10SG was in agreement with microscopy.
- 4 on repeat microscopy had counts of 10 leucocytes, and/or epithelial cells present, which could have contributed to the Clinitest 10SG result of >= 70 leucocytes.
- 1 after repeat microscopy and Clinitest 10SG remained unresolved.

Of the 3 urines in the second group above:

- 1 missed getting repeat testing.
- 2 on repeat microscopy had lower leucocyte counts (10 & 15 leucocytes), plus moderate to large amounts of amorphous debris that may have interfered with the testing.

In the 109 urines examined for erythrocytes/ haemoglobin pigments there was 1 discrepant result – *Microscopy 20 erythrocytes, Clinitest 10SG 0 erythrocytes/Hb pigments*.

- Repeat testing, microscopy 10 erythrocytes, Clinitest 0 erythrocytes/Hb pigments. There was however epithelial cells and large amounts of amorphous debris present that may have interfered with the testing.

## Conclusions

Overall there was very good correlation between microscopy and the Clinitest 10SG strip results, with only 3% of urines having a reasonable leucocyte discrepancy. After review and retesting the leucocyte discrepancy rate was found to be <1%. All of these urines had negative cultures. No significant positive cultures would have been missed using the proposed method.

There was <1% of urines with a discrepancy in erythrocytes.