Dignity Health Central Coast Service Area

**SUBJECT**: Urinalysis Microscopic Routine

**ORIGIN**: Clinical Laboratory

**NUMBER**: 7500. U.FH.09

| **Document Category:** | | | |
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| ☐ Policy | ☒Procedure | ☐Standardized Procedure | ☐Other: |

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| **Applies to:** | | |
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| **☐** Santa Maria Campus,  Marian Regional Medical Center | **☐** Arroyo Grande Campus,  Marian Regional Medical Center | **☒** French Hospital Medical Center |
| **☐** St. John’s Pleasant Valley Hospital | **☐** St. John’s Regional Medical Center | |

# PURPOSE:

To provide a standard operating procedure for the microscopic examination of urine sediment in the event the automated analyzer is not functioning.

# principle:

The morphologic assessment of urine sediment yields valuable clues to the Physician when determining the health of a patient. The microscopic analysis should correlate with the findings of the chemistry strip tests (RBCs for blood, WBCs for leukocyte esterase, casts for protein) or an explanation is needed to determine causation, i.e. interfering substances.

# calibration: N/A

# Specimen Collection:

| Sample Type | Container | Use | Storage Temperature | Stability |
| --- | --- | --- | --- | --- |
| Urine | Sterile Cup | UA, chemistries and cultures | Room temperature | 2 hours |
| Urine | Sterile Cup | UA, chemistries and cultures | Refrigerated | 24 hours |
| Urine | Red/yellow tube | Urinalysis only | Room temperature or refrigerated | 72 hours |
| Urine | Grey tube | Cultures only | Room temperature or refrigerated | 48 hours |

# Materials:

* Microscope
* Slides
* Coverslips
* KOVA polystyrene tubes
* KOVA Petter pipette
* Centrifuge at 1500 RPMs for 5 minutes

# quality control:

There is no manual quality control for microscopic analysis. Although manual correlations with the automated microscopic instrument are performed every 6 months.

# Procedure:

Microscopic analysis is dependent upon the results of the chemistry dipstick tests and/or the Physician’s orders. The following criteria is used to determine if further testing is warranted.

| **Test Ordered** | **Results of urinalysis** | **Microscopic analysis** |
| --- | --- | --- |
| Urinalysis dipstick (macroscopic) | N/A | No |
| Urinalysis with microscopic | N/A | Yes |
| Urinalysis with reflex | Positive for one or more of the following:   * Protein ≥ Trace * Positive Leukocyte Esterase * Positive Nitrite * Blood ≥ Trace | Yes |

## If indicated, 12mL of urine is centrifuged at 1500 RPMs for 5 minutes and the urine sediment is examined microscopically to identify and quantify both normal and abnormal elements. Note: If a refrigerated specimen is received, it should be brought to room temperature before testing. If less than 1mL is received, comment in the LIS.

## Decant the supernatant into the sink leaving approximately 1mL of sediment in the tube with the KOVA Petter. If amorphous crystals are present (orange/pink sediment), warm the tube under warm water to dissolve.

## Vortex and mix the specimen to fully resuspend all the sediment and add one drop with the KOVA Petter to a clean glass slide. Cover with a coverslip.

## The urine sediment should be examined first under low power field or lpf (10x). Make sure the condenser is dropped to best scan and quantitate casts, crystals, cellular clumps, and mucous.

## Switch to high power field or hpf (40x) to scan and quantitate any epithelial cells, leukocytes, erythrocytes, bacteria, yeast, Trichomonas, or parasites.

| **Elements** | **Reported in LIS** | **Quantitation by Microscopy** |
| --- | --- | --- |
| Squamous epithelial cells | None seen  Few  1+  2+  3+  >15 | 0/lpf  0-1/lpf  2-5/lpf  5-8/lpf  9-15/lpf  >15/lpf |
| Renal epithelial cells  Tubular epithelial cells  Transitional epithelial cells | None seen  Occasional  Few  1+  2+  3+  4+ | 0/ hpf  0-2/hpf  2-5 /hpf  5-10/ hpf  10-25/ hpf  25-50/ hpf  >50/hpf |
| Leukocytes (WBC) and  Erythrocytes (RBC) | None seen  0  5  10  20  30  50  100  TNTC | 0/ hpf  0-5/hpf  5-10/hpf  10-20/hpf  20-30/hpf  30-50/hpf  50-100/hpf  >100/hpf  Too numerous to count |
| Bacteria, Yeast, and Parasites | None seen  Occasional  Few  1+  2+  3+  4+ | 0/hpf  0-1/hpf  1-5/hpf  5-10/hpf  10-20/hpf  20-50/hpf  >50/hpf |
| Casts | None seen  0  2  5  10  20  30  50  100 | 0/lpf  0-2/lpf  2-5/lpf  5-10/lpf  10-20/lpf  20-30/lpf  30-50/lpf  50-100/lpf  >100/lpf |
| Mucous and Crystals | None seen  1+  2+  3+  4+ | 0/lpf  2-5/lpf  5-10/lpf  10-50/lpf  >50/lpf |
| Amorphous crystals | None seen  1+  2+  3+  4+ | 0/hpf  Cellular structures are clearly visible.  Cellular structures still visible, the background is partially obscured.  Cells are barely visible.  Granules completely obscure the field, cells are difficult to identify. |

## All unidentifiable cells are referred to the pathologist.

# result reporting

## The underlined analytes are required in Cerner even if they are not seen during the microscopic examination. All other elements are optional entry if seen during the exam and should be reported if present or requested by the provider.

| **Analyte** | **Normal** | **Reportable Range** |
| --- | --- | --- |
| WBC | None seen or 0-5 | None seen, 0 to >100/hpf |
| RBC | None seen or 0-5 | None seen, 0 to >100/hpf and TNTC (Too numerous to count) |
| Bacteria | None seen | None seen, 1+ to 4+ |
| Epithelial Cells | None seen or 0-5 | None seen, 0 to >15/hpf |
| NSE (Transitional, Renal) | None Seen | None seen, 0 to >15/hpf |
| Mucous | None seen | None seen, 1+ to 4+ |
| Crystals | None seen | None seen, 1+ to 4+ |
| Spermatozoa | Males only: Few | None seen, 1+ to 4+ |
| Yeast | None seen | None seen, Few, 1+ to 4+ |
| Trichomonas | None seen | None seen, Few, 1+ to 4+ |
| Casts | None seen | None seen, 0 to >100/lpf |

# Limitations of procedure:

## Some cellular elements are hard to visualize using light microscopy. Oval Fat Bodies are best identified using a polarizing microscope and exhibit a characteristic maltese cross pattern.

## Urine should be tested within 2 hours after collection unless in a preservative tube. Prolonged testing delay may result in increased bacteria and decreased counts for WBCs, RBCs, casts and/or crystals.

# References:

Commission on Laboratory Accreditation, Laboratory Accreditation Program. Urinalysis Checklist for Hematology. College of American Pathologists, Northfield, IL, Edition 2017.

iQ200 Operator’s Manual

King-Stransinger, Susan K., Urinalysis and Body Fluids, Sixth Edition, F.A. Davis Publisher, 2014, pages 100-146.

Kova Products insert, 2017