KAISER PERMANENTE®

DOCUMENT NUMBER:	RIV-PPP-1145
DOCUMENT TITLE:	Manual Microscopic Urinalysis
DOCUMENT NOTES:	

LOCATION:	RIV-rel	**VERSION:**	01
DOC TYPE:	RIV PPP	**STATUS:**	Release

EFFECTIVE DATE:	03 Jan 2024	**NEXT REVIEW DATE:**	03 Jan 2026
RELEASE DATE:	03 Jan 2024	**EXPIRATION DATE:**	

AUTHOR:		**PREVIOUS NUMBER:**	
OWNER:		**CHANGE NUMBER:**	RIV-CR-0347

Manual Microscopic Urinalysis

Purpose or Principle or Introduction

The purpose of this procedure is to give directions for performing a manual urine microscopic analysis across all SCAL laboratories performing UA microscopy.

Principle

Examination of urine sediment is performed to detect the presence of abnormal constituents to aid in the diagnosis of urinary tract infections as well as other disorders.

Scope

Medical Laboratory Technicians (MLT) and Clinical Laboratory Scientists (CLS) may perform microscopic urine analysis of formed elements.

Policy

- All urine with a positive leukocyte esterase, blood, nitrate, or protein beyond trace on urinalysis chemistry portion must have a microscopic performed on the sediment part of the urine.
- It is the MLT's/CLS's responsibility to correlate the microscopic and macroscopic results (ex: positive nitrates with presence of bacteria, positive blood with presence of red blood cells, positive leukocyte esterase with presence of white blood cells).
- Manual microscopic exam will be completed for all specimens needing a microscopic when the automated method is not available. This can also be due to low volume of specimen; error run of instrument caused by turbidity, clogs, bloody specimens, or interfering substances; or when instrument is out of order.
- Quality Controls are performed at least once each calendar day of use or as needed.

Continued on next page

Manual Microscopic Urinalysis, Continued

Specimen sources

Acceptable urine specimen

- freshly voided clean catch (< 2 hours since collection)
- catheterized
- bladder tapped

Minimum Volume Requirement

- 2 mL
- For specimens lower than 2 mL where microscopy is performed manually without centrifugal concentration, follow protocol in "Urinalysis Specimen Handling". Complete results with the comment template LVU.
    - The templated comment expands to say the following: Microscopic exam performed on unspun urine due to submitted volume being less than 1 mL. Minimum required specimen volume is 1 mL for adequate cellularity and ideally 2 mL or more. Urine formed elements may be falsely decreased.

Specimen Stability

- Unpreserved: < 2 hours at room temperature, 2 to 24 hours refrigerated
- Preserved samples up to 72 hours at room temperature

Specimen rejection

The following are potential causes for specimen rejection:

- Beyond acceptable stability for applicable urine collection and storage status
- Improper urine to additive ratio when urine preservative tube is used
- Follow local protocol for specimen rejection on specimen identification integrity.
- Urines that are visibly contaminated with stool or fecal specimen
- Improperly sealed urines leading to possible contamination

Materials and supplies

The following materials and supplies are needed:

- Clean glass slides, plain
- Cover slips
- Glasstic slide 10-count
- Transfer pipettes

Continued on next page

Manual Microscopic Urinalysis, Continued

Equipment

A. Centrifuge
B. Microscope, 10X objective (low power) and 100X objective (oil immersion)
   - Document preventative maintenance of microscope for the corresponding microscope.
   - Bi-annual preventative maintenance of microscope is done by McBain.

Safety/ Special Safety Precautions

- Standard precautions should be used when handling all specimens, reagents, and controls.
- Appropriate personal protective equipment should be used when testing patient samples or performing scheduled maintenance.
- Personal Protective Equipment (PPE) includes gloves, laboratory coat, and eye protection while handling any urine specimens and reagent materials.
- Always wash your hands before and after handling any biological materials.
- Dispose of sharps according to policy and procedures.

Refer to the safety manual for general safety requirements.

Quality Control

Quality Control (QC) must be documented.
Two levels of controls are done each day of test performance.

Continued on next page

Manual Microscopic Urinalysis, Continued

Preparing Specimen for Microscopic Analysis

Follow the steps below in preparing the urine specimen for microscopic analysis.

Step	Action
1	After completing the urinalysis chemistry portion, determine if a urine manual microscopic analysis is indicated based on policy.
2	Centrifuge the urine specimen needing manual microscopic analysis at 1500-2200 rpm (400-450 RCF) for 5 minutes, or at validated speed and time for the equipment.
3	Decant the supernatant, leaving about 0.5 to 1.0 mL to resuspend the sediment pellet. Mix well with a transfer pipet.
4	Aspirate a small amount of resuspended urine using a disposable transfer pipet.
5	Proceed to charging a drop on your viewing platform. 1. If using a plain glass slide, place a drop of the resuspended urine sediment, then cover with a coverslip. 2. For a glasstic 10-count slide, place a small drop of resuspended urine sediment in the corner of the well to be used, so that the urine is drawn under the preformed cover slip.
6	Proceed to microscopic analysis of the urine for formed elements.

Microscopic Analysis

Follow the steps below in preparing the urine specimen for microscopic analysis.

Step	Action
	A. Microscopic analysis on low power objective (LPO)
1	Place the slide under the microscope with the low power objective (10x lens).
2	Observe at least ten (10) fields and note for the presence of casts. Take the average number of casts seen for each type.
3	Enter results from the numerical category drop down on Cerner ARE screen.
	B. Microscopic analysis on high power objective (HPO)
4	Switch to high power objective (40x lens) to observe the sediment for the presence of white blood cells (WBCs), red blood cells (RBCs), epithelial cells, bacteria, crystals, yeast, and others.
5	Scan at least ten (10) fields and take the average per field for each type of formed element observed.
6	Enter results from the numerical category drop down on Cerner ARE screen.

Continued on next page

Manual Microscopic Urinalysis, Continued

Reporting

The UA Micro Exam test order have required analytes and optional analytes to be reported.
The following bolded analytes listed below require a result entry during the microscopic resulting process even if they are not seen during the microscopic exam.

- Mandatory components for UA Micro to be completed in Cerner:
  - **UA WBC, UA RBC, UA Bacteria, UA Squam Epithelial.**
  - Report 0, 0-2, 0-3, or "None" as indicated.
- All other analytes are optional entry if seen during the microscopic exam.

Reference Range and Reportable Range

The following are the formed elements that can be observed and reported under the UA Microscopic test report.
In bold is the report component in Cerner LIS for each formed element.

Analyte/Unit of Measure	Reference Intervals ALL AGES	Reportable Range:
Observe under high power field		
UA WBC/HPF	0-5/HPF	0, 0-2, 3-5, 6-10, 11-25, >25
UA RBC/HPF	0-3/HPF	0, 0-3, 4-10, 11-25, 26-50, >50
UA Bacteria/HPF	None/HPF	None, Trace, Few, Moderate, Many
UA Squam(ous) Epithelial Cells/HPF **UA Renal Epi(thelial) Cells/HPF**	None	None, Few, Moderate, Many
UA Yeast/HPF **UA Mucous/HPF** **UA Trichomonas/HPF**	None	None, Present

Continued on next page

Manual Microscopic Urinalysis, Continued

Reference Range and Reportable Range, continuation

The following are the formed elements that can be observed and reported under the UA Microscopic test report.
In bold is the report component in Cerner LIS for each formed

Analyte	Reference Intervals: ALL AGES	Reportable Range:
Observe under high power field		
UA Crystals **TPO4 Crys(tals)** **CaOx Crys(tals)** **CaPhos Crys(tals)** **CaCB Crys(tals)** **Uric Crys(tals)** **Amorphous Crys(tals)** **NH4 Biur Crys(tals)** **Chol Crys(tals)** **Fat**	None	None, Few, Moderate, Many
Protein Crystals **Leuc Crys(tals)** **Cyst Crys(tals)** **Tyrosine Crys(tals)**	None	None, Positive
Trans(itional) Epi(thelial) Cells	None	None, Few, Moderate, Many
Oval Fat	None	None, Present
Hyphae Yeast	None	None, Present

Continued on next page

Manual Microscopic Urinalysis, Continued

Reference Range and Reportable Range

The following are the formed elements that can be observed and reported under the UA Microscopic test report.
In bold is the report component in Cerner LIS for each formed element.

Analyte/Unit of Measure	Reference Intervals ALL AGES	Reportable Range:
Observe under low power field		
UA Hyaline Cast/LPF	0-4/LPF	0, 0-4, 5-10, 11-20, >20
UA Granular Cast **UA Waxy Cast** **UA WBC Cast** **UA RBC Cast**	0-2/LPF	0, 0-2, 3-5, 6-10, 11-20, >20
Epi Casts **Cell Casts** **Broad Casts** **Fatty Casts**	0-2/LPF	0, 0-2, 3-5, 6-10, 11-20, >20

Controlled Documents

The following controlled documents support this policy. Locally approved versions will have a different document number.

Document Number	Title
SCPMG-LIS-0038	Process_Urinalysis Resulting
SCPMG-LIS-0039	Job Aid_Urinalysis
SCPMG-PPP-0520	Urinalysis Specimen Handling

Authors

- SCPMG Hematology Urinalysis Working Group, UA Subgroup

Regional Parent Document Reference Number: SCPMG-PPP-0569 Rev: 01

Signature Manifest

Document Number: RIV-PPP-1145 **Revision:** 01
Title: Manual Microscopic Urinalysis
Effective Date: 03 Jan 2024

All dates and times are in Pacific Standard Time.

Manual Microscopic Urinalysis

Operations Director Approval

Name/Signature	Title	Date	Meaning/Reason
Annaleah Raymond (Q741709)	Laboratory Operations Director	25 Dec 2023, 09:48:07 PM	Approved

Medical Director Approval

Name/Signature	Title	Date	Meaning/Reason
Mark Taira (P161328)	CLIA Director	02 Jan 2024, 04:26:22 PM	Approved

Signature Manifest

Document Number: RIV-PPP-1145
Revision: 01
Title: Manual Microscopic Urinalysis
Effective Date: 03 Jan 2024

All dates and times are in Pacific Standard Time.

Manual Microscopic Urinalysis

Operations Director Approval

Name/Signature	Title	Date	Meaning/Reason
Annaleah Raymond (Q741709)	Laboratory Operations Director	25 Dec 2023, 09:48:07 PM	Approved

Medical Director Approval

Name/Signature	Title	Date	Meaning/Reason
Mark Taira (P161328)	CLIA Director	02 Jan 2024, 04:26:22 PM	Approved