Procedure: SH.CP.AU.uri.0008
Document Title: Specific Gravity by Refractometer

Author	Effective Date:	Supersedes Procedure #
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Allan Courtright	11/10/17	

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Auto Lab G-1625 Urinalysis area	**1**	**QC G-1547**	**1**

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Allan Courtright	11/10/17		0008.0003	Added Calibration section

I. PURPOSE

The purpose of this procedure is to provide information on how to use the refractometer.

II. PRINCIPLE

The refractometer measures the refractive index of a liquid and its content dissolved in solids. The degree of refraction is proportional to the density of the solution. The refractometer has the special advantage of requiring only one drop of urine to determine the specific gravity.

III. SCOPE

This procedure will be used by the University of Rochester Medical Center, Clinical and Pathology Laboratories.

IV. RESPONSIBILITIES

A. Department and functional responsibilities are defined in the table below:

Roles	Responsibilities
Quality	Ensure that procedure is followed when testing S.G.
Medical Director	Ensure that procedure is followed when testing S.G
Management	Ensure that procedure is followed when testing S.G.
Employees	Follow procedure when testing S.G.

V. SPECIMENS

Urine

Body fluids, ex: CSF, Serous

VI. CALIBRATION

A. Calibration check is performed annually

B. There are 2 levels:

1. Distilled water should read 1.000, adjust set screw if necessary

2. 5% NaCl should read 1.022 ± 0.001

C. Document calibration check on maintenance sheet

VII. QUALITY CONTROL

A. QC is run on an as needed basis when a test is ordered.

B. There are 3 levels of controls

1. Water for the low range.

2. Urine 1 for the medium range, available from the QC lab.

3. Urine 2 for the high range, available from the QC lab.

C. After obtaining results, enter into Soft QC, print and file.

VIII. SPECIAL SAFETY PRECAUTIONS

All patient specimens should be considered potentially infectious and must be handled with precautions used for human blood, as described in CBC (Center for Disease Control) recommendations and in compliance with the Federal OSHA (Occupational Safety and Health Administration) Blood-borne Pathogen Standard, 29 CFR (Code of Federal Regulations) part 1910.1030. Follow specimen handling as outlined by Laboratory Safety Policy, (SH.CP.AU.0005.0001).

IX. MATERIALS

A. Refractometer

B. Transfer pipets

C. Kim wipes

X. PROCEDURE

A. With the refractometer in a horizontal position, place one drop of urine at either end of the cover plate using a plastic transfer pipette.

B. The sample will be drawn across the measuring prism by capillary action. Be sure to add a large enough drop to cover the entire cover plate.

C. Tilt the refractometer down towards the light source and read the result from the left hand side of the scale.

D. Wipe the prism after each use with a Kimwipe. Incomplete removal of the sample may cause erroneous readings on following samples.

E. Turn off the light.

F. Record the result on the SUMAN log sheet and in the LIS under the SUMAN template.

Normal Range: 1.002-1.030

XI. LIMITATIONS

The linearity of the Refractometer is 1.035. If a reading is higher than that, a dilution must be made.

XII. CALCULATIONS

To obtain a reportable reading on a SG that is outside the linearity of the refractometer, use a 1:2, 1:3 or whatever dilution is needed to bring the reading into the normal range. Whatever result is obtained, multiply the last two numbers of the specific gravity by the dilution factor.

Ex: A dilution of 1:2 gives a SG of 1.024. Multiply 24 by a factor of 2 to get 48. The reported specific gravity would be 1.048.

XIII. INTERPRETATION

Higher readings, usually >1.035, indicate abnormal solutes or X-ray dye.
Low Reading may indicate excess hydration of urine, possibly a concentrating defect.

XIV. RESULT REPORTING

Results are always reported with the 1.000 being the constant. The last two numbers are the only ones that change.

XV. TRAINING

Training Needed	Role
Knowledge Check	Management
Knowledge Check	Designated Employees

XVI. REFERENCES

a. Clinical Diagnosis by Laboratory Methods, Davidson & Henry, 15th Ed. (1974).

B. Miles Diagnostics.

C. A Handbook of Routine urinalysis, Sister laurine Graff, J.B Lippincott Co. 1983.