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Document Contact	Colette Kessler: Mgr, Division Laboratory
Area	Laboratory-Chemistry
Applicability	Royal Oak

Glucose in Urine (Multistix 10 SG) - Royal Oak

Document Type: Procedure

I. PURPOSE AND OBJECTIVE:

A. The test is based on a double sequential enzyme reaction. One enzyme, glucose oxidase, catalyzes the formation of gluconic acid and hydrogen peroxide from the oxidation of glucose. A second enzyme, peroxidase, catalyzes the reaction of hydrogen peroxide with a potassium iodide chromogen to oxidize the chromogen to colors ranging from green to brown.

B. This test is specific for glucose. No other substance excreted in urine is known to give a positive result. The reagent area does NOT react with lactose, galactose, fructose, nor reducing metabolites of drugs (e.g. salicylates and nalidixic acid).

C. This document describes the steps for this procedure to assist technologists.

II. SPECIMEN COLLECTION AND HANDLING:

A. Fresh, well-mixed, uncentrifuged urine. It is recommended that testing be done within one hour after voiding. Otherwise immediately refrigerate the specimen and return to room temperature before testing.

III. REAGENTS:

A. Siemens Multistix 10 SG (#2161)

B. 2.2% weight for weight (w/w) glucose oxidase (1.3 IU)

C. 1.0% w/w peroxidase (3300 IU)

D. 8.1% w/w potassium iodide

E. 69.8% w/w buffer

F. 18.9% w/w nonreactive ingredients

IV. QUALITY CONTROL (QC):

A. Both Normal and Abnormal Kova-Trols are run and results are recorded:
    1. at the beginning of each shift
    2. whenever a new lot number of reagent strips is opened
    3. whenever a new shipment of strips is received
    4. whenever troubleshooting warrants it

V. PROCEDURE:

A. Briefly dip the test area of the strip in fresh, **well-mixed** uncentrifuged urine.

B. While removing the strip, run the edge against the rim of the urine container to remove excess urine. Hold the strip in a horizontal position to prevent mixing of chemicals from adjacent reagent areas and/or contaminating the hands with urine.
    1. If reading visually, compare the **GLUCOSE** reagent area to the corresponding Color Chart on the bottle label at **30 seconds**. Hold strip close to color blocks and match carefully.
    2. If reading instrumentally, follow directions given in the Clinitek Advantus procedure.

VI. REPORTABLE RANGE:

The color comparison chart has **SIX** color blocks ranging from turquoise through brown. These represent glucose as negative or present in increasing amounts. To maintain consistency of reporting between visual and instrumental reads, blocks 5 and 6 will be combined so that results will be reported as follows:

Negative	
Trace	100 mg/dL
1+	250 mg/dL
2+	500 mg/dL
3+ or greater >	1000 mg/dL

VII. REFERENCE RANGE:

A. Negative

B. Small amounts of glucose are normally excreted by the kidneys. These amounts are usually below the sensitivity of the test.

VIII. SENSITIVITY:

A. 75-125 mg/dL glucose

B. In dilute urines containing < 5 mg/dL ascorbic acid, as little as 40 mg/dL glucose may produce a color change that could be interpreted as positive.

IX. LIMITATIONS/INTERFERING SUBSTANCES:

A. Moderately high ketone levels (40 mg/dL) may cause false negatives for specimens containing small amounts of glucose (75-125 mg/dL) but the combination of such ketone levels and low glucose levels is metabolically improbable in screening.

B. Ascorbic acid concentrations of 50g/dL or greater may cause false negatives for specimens containing small amounts of glucose (75-125 mg/dL)

C. Reactivity of the glucose test decreases as urine specific gravity increases

D. Reactivity may vary with temperature.

X. REFERENCES:

A. Multistix 10 SG. Miles, Inc. Diagnostic Division, Elkhart, IN 46515, rev. 04/99

B. Henry, J.B., Clinical Diagnosis and Management by Laboratory Methods, 20th edition, Philadelphia, W.B. Saunders Co., 2001 p. 376-378.

C. Hundley, J.M. and Fleming, J.K., Urine Analysis American Society of Clinical Pathologists Workshop, Dearborn MI, 1991.

Approval Signatures

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