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Bilirubin In Urine (Multistix 10 SG) - Royal Oak

Document Type: Procedure

I. PURPOSE AND OBJECTIVE:

A. Bilirubin is derived from the degradation of hemoglobin and other heme containing proteins. It is conjugated in the liver by the enzyme glucuronyl transferase to a water-soluble form. This conjugated bilirubin can be excreted via the kidneys, and thus can appear in the urine. Bilirubinuria occurs in intra-and extra hepatic obstructive jaundice, acute/chronic hepatitis, cirrhosis, and Dubin-Johnson and Rotor syndromes. The urine is dark (amber) and may have a yellow foam. Bilirubinuria is associated with elevated serum bilirubin (conjugated).

B. The Multistix test is based on the coupling of bilirubin with diazotized dichloroaniline in a strongly acid medium. The intensity of the tan color produced increases with increasing concentration of bilirubin.

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

II. SPECIMEN COLLECTION AND HANDLING:

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. 0.4% weight for weight (w/w) 2,4-dichloroaniline diazonium salt

C. 37.3% w/w buffer

D. 62.3% 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 reagent 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 **BILIRUBIN** 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.

C. NOTE: The Clinitek Advantus appears to over-read the Bilirubin test pad giving false positives especially in the presence of brown colored urine.

VI. REFERENCE RANGE:

A. Negative

B. Normal adult urine contains about 0.02 mg bilirubin/dL. This is not detectable in urine by the usual methods. Even trace amounts of detectable bilirubin are sufficiently abnormal to require further investigation.

VII. SENSITIVITY:

The test pad on the Multistix reagent strip is sensitive from 0.4 – 0.8 mg/dL for bilirubin.

VIII. REPORTABLE RANGE:

Multistix 10SG (backup) has a color comparison chart with **FOUR** color blocks of various tan shades. These represent bilirubin as negative or present in increasing amounts. Results are reported as follows:

Negative	Negative
1+	Positive
2+	Positive
3+	Positive

IX. LIMITATIONS/INTERFERING SUBSTANCES:

A. Drug metabolites that color the urine red/orange (e.g. Indican) either give false positive results or mask the presence of bilirubin.

B. Metabolites of Lodine (etodolac) may cause positive or atypical results.

C. Ascorbic acid concentrations > 15 mg/dL may cause false negatives.

D. Oxidation of bilirubin in specimens that have stood too long, especially when exposed to light, will yield false negative findings.

X. REFERENCES:

1. Multistix 10 SG. Miles, Inc. Diagnostic Division, Elkhart, IN 46515, rev. 04/99
2. Henry, J.B., Clinical Diagnosis and Management by Laboratory Methods, 20th edition, Philadelphia, W.B. Saunders Co., 2001 p. 376-378.
3. Hundley, J.M. and Fleming, J.K., Urine Analysis American Society of Clinical Pathologists Workshop, Dearborn MI, 1991.

Approval Signatures

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