



September 2017

Causes for Urinalysis Discrepancies

Routine urinalysis remains a fundamental tool to alert healthcare providers to the presence of renal damage and/or urinary tract disease. However, discrepancies between routine urinalysis and microscopy or patient history may occur due to physiological factors, medications, or collection issues. In an effort to assist with the interpretation of routine urinalysis results, the table below lists some circumstances when false-positive and false-negative results may occur. In all cases, results must be correlated with patient history and other clinical information.

Causes of False-Positive and False-Negative Routine Urinalysis Results		
Dipstick test	False positive	False negative
Glucose	Alkaline urine (pH>9), strong oxidizing agents (e.g. bleach), peroxide contaminants	High specific gravity, ascorbic acid, high ketones, improperly stored specimens (i.e. glycolysis) or in the presence of acetylcysteine, captopril, mesna, curcuma
Bilirubin	Highly coloured substances that mask results such as phenazopyridine (Pyridium), indican-indoxyl sulfate (indicans), large quantities of chlorpromazine metabolites or Lodine metabolites	Ascorbic acid, acetylcysteine, boric acid, hypochlorite, captopril, mesna, curcuma, citric acid, chlorhexidine, oxalic acid, high nitrite concentrations, improper storage or light exposure (oxidizes bilirubin)
Ketones <i>Detects acetoacetate, does not react with acetone or beta hydroxybutyrate.</i>	Free-sulfhydryl drugs (e.g. Mesna, captopril, N-acetylcysteine), highly pigmented urines, atypical colours with phenylketones and phthaleins, large quantities of levodopa metabolites, curcuma, imipenem, or hydrochlorothiazide	Delay in examination of urine or improper storage (bacterial breakdown), in the presence of boric acid, formalin, hypochlorite, meropenem, or Lodine
Specific Gravity	Dextran solutions, IV radiopaque dyes, proteinuria,	Falsely low if alkaline urine

Dipstick test	False positive	False negative
	ketoacidosis	(pH≥6.5)
Blood <i>Detects hemoglobin peroxidase-like activity from either intact or lysed erythrocytes (RBCs). Lysed erythrocytes may produce apparent discrepancies between positive dipstick and negative microscopic results. Equally specific for hemoglobin and myoglobin.</i>	Peroxidases (e.g. microbial), strong oxidizing agents	Captopril (Capoten) and other compounds containing sulfhydryl groups, high specific gravity, ascorbic acid (high vitamin C concentration), formalin, high nitrite, acetylcysteine, quinidine, cefoxitin, levodopa, mesna, Keflin, curcuma, Lodine, hydrochlorothiazide, metformin, chlorhexidine, or chloroquine
pH	No interferences known; unaffected by protein concentration. Bacterial growth may cause a marked alkaline shift (pH>8.0) because of urea conversion to ammonia.	
Protein	Highly buffered or alkaline urine (pH>9), such as alkaline drugs, improperly preserved specimen, contamination with quaternary ammonium compounds, highly coloured substances that mask results, such as drugs (phenazopyridine) or beet ingestion, antiseptic agents, chlorhexidine or in the presence of quinidine, chloroquine, or Lodine	Primary protein is not albumin (e.g. Bence-Jones protein), in the presence of curcuma
Urobilinogen	Elevated nitrite levels, phenazopyridine, any other Ehrlich's reactive substance (e.g. porphobilinogen, indicans), atypical colours caused by sulfonamides, <i>p</i> -aminobenzoic acid, <i>p</i> -aminosalicylic acid, highly coloured substances that mask results, such as drugs (phenazopyridine) or beet ingestion, methyldopa,	Formalin, improper storage, resulting in oxidation to urobilin, acetylcysteine, captopril, hypochlorite, mesna, Tagamet, curcuma, Lodine, sulfamethoxazole, chlorhexidine, glucose, hydrochlorothiazide, lactose, meropenem, or nitrofurantoin

Dipstick test	False positive	False negative
	procaine, chlorpromazine	
Nitrites	Highly coloured substances that mask results, such as drugs (phenazopyridine), curcuma or beet ingestion, improper storage with bacterial proliferation	High specific gravity, ascorbic acid, oxalic acid, Lodine, formalin, chlorhexidine, various factors that inhibit or prevent nitrite formation despite bacteriuria (e.g. nitrate reductase-negative bacteria, lack of urine nitrate, presence of antibiotics, insufficient time for bacteria to reduce nitrate, or large quantities that convert nitrite to nitrogen)
Leukocyte esterase <i>Detects esterase activity from either intact or lysed granulocytic leukocytes; lymphocytes do not produce a positive reaction. Lysed granulocytic leukocytes may produce apparent discrepancies between positive dipstick and negative microscopic results.</i>	Highly coloured substances that mask results (e.g. drugs [phenazopyridine], beet ingestion), vaginal contamination of urine, formalin or curcuma	High specific gravity, glycosuria, ketonuria, proteinuria, oxalic acid, ascorbic acid, boric acid, strong oxidizing agents, quinidine, Tagamet, glycine, chloroquine, sulfamethoxazole, chlorhexidine, nitrofurantoin, Lodine, drugs such as tetracycline, gentamicin, and cephalosporins

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