

## Appendix A: Point of Care Urine Dipstick - Expected Values & Limitations

<b>Chemstrip 10A Test Strip expected values and test limitations</b>					
<b>Note:</b> For diagnostic purposes, the results should always be assessed in conjunction with the patient's medical history, clinical examinations and other findings. Knowledge of the effects of drugs or their metabolites upon the individual tests is not yet complete. In doubtful cases, it is therefore advisable to repeat the test after discontinuing a particular drug.					
<b>Specimen:</b> Fresh urine, not centrifuged, tested within 2 hours of collection. Mix before testing.					
<b>Collection Container:</b> Clean, well rinsed collecting vessel. Residues of strong, oxidizing disinfectants in the collection vessel give false positives for blood & glucose.					
<b>Test Strip</b>	<b>Manual Read</b>	<b>Expected Values</b>	<b>Result Values</b>	<b>Falsely Decreased</b>	<b>Falsely Elevated</b>
<b>SG</b>	>60 sec	1.016-1.022	1.000 -1.030	If pH > 7, add 0.005 for manual read	with 1-5g/L protein or ketoacidosis
<b>Ph</b>	>60 sec	4.8-7.4	5 – 9		
<b>LEU</b>	60-120 sec	NEG (<10 Leuk/uL)	NEG, 25, 100, 500/uL	Protein >5g/L; glucose >112mmol/dL Cephalexin & Gentamicin (high doses).	Formaldehyde, imipenem, meropenem, clavulanic acid, bilirubin, nitrofurantoin, humidity
<b>NIT</b>	>60 sec	NEG	NEG, POS	Urine retention in bladder < 4-8 hrs	If pH<7 – red dyes. Humidity.
<b>PRO</b>	>60 sec	NEG (<0.1 g/L)	NEG, 0.25, 0.5, 0.75, 1.5, 5.0 g/L		Chlorhexidine disinfectant or quaternary ammonium disinfectants. Polyvinylpyrrolidone Infusion-blood substitute. If pH<7 – red dyes.
<b>GLU</b>	>60 sec	NORM (<1.7 mmol/L)	NORM, 3, 6, 17, 56 mmol/L		
<b>KET</b>	>60 sec	NEG (<0.5 mmol/L)	NEG, 0.5, 1.5, 5, 15 mmol/L		Captopril, mesna(2-Mercaptoethanesulfonic acid sodium salt)
<b>UBG</b>	>60 sec	<17 umol/L	NORM, 17, 68, 135, 200 umol/L	Elevated Nitrites (or formaldehyde). Sunlight - oxidation of urobilinogen.	If pH<7 – red dyes.
<b>BIL</b>	>60 sec	NEG (<3.4 umol/L)	NEG, 17, 50, 100 umol/L	Large amounts of ascorbic acid. Sunlight - oxidation of urobilinogen.	If pH<7 – red dyes.
<b>ERY</b>	>60 sec	NEG (0-5 Ery/uL)	NEG, 10, 25, 50, 150, 250/uL		Significant amounts of hemolysis. Myoglobin

### PURPOSE

For the semi-quantitative determination of specific gravity, pH, leukocytes, nitrite, protein, glucose, ketone bodies, urobilinogen, bilirubin and blood in urine either with a manual urine dip, or with the semi-quantitative Urisys 1100 Urine Dipstick Analyzer

### STORAGE AND STABILITY

Medical Approval: Dr Benjamin Jung  
 Version: 1.2  
 Folder Name: CW\Point of Care\Urine Dipstick

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Store at 2 – 30°C. The test strips are stable up to the expiration date specified on the box, when stored in the original container.

### **SPECIFIC GRAVITY**

Detects the ion concentration of the urine. In the presence of cations, protons are released by a complexing agent to produce a color change in the indicator bromthymol blue from blue via blue-green to yellow. On visual read – add 0.005 if pH>7.0. Increase in SG due to glucose > 56 mmol/L is not indicated by this test.

### **PH**

Indicators methyl red, phenolphthalein and bromthymol blue and reacts specifically with H<sup>+</sup> -ions. The most frequent pH values of fresh urine from healthy subjects lie between 5 and 6.

### **LEUKOCYTES**

Both intact and lysed leukocytes are detected. Reveals the presence of granulocyte esterases. These esterases cleave an indoxyl ester. Liberated indoxyl reacts with diazonium salt to produce a violet dye. Bacteria, trichomonads or erythrocytes are non-reactive.

### **NITRITE**

Based on the principle of the Griess test and is specific for nitrite. The reaction reveals the presence of nitrite and indirectly nitrite-forming bacteria in the urine by pink-to-red coloration of the test patch. A slight pink coloration is indicative of significant bacteria.

### **PROTEIN**

Based on the principle of the protein error of a pH indicator. It is particularly sensitive to albumin. Quinine, quinidine, chloroquine, tolbutamide and elevated pH (<9) have no effect.

### **GLUCOSE**

Based on the specific glucose-oxidase/oxidase reaction (GOD/POD method). The test is independent of pH and specific gravity. Ketone bodies have no effect on the test.

### **KETONE BODIES**

Based on the principle of Legal's test. Is more sensitive to acetoacetic acid than to acetone.

### **UROBILINOGEN**

A stable diazonium salt reacts almost immediately with urobilinogen to give a red azo dye. The test is specific for urobilinogen and is not susceptible to the interfering factors known to affect the Ehrlich's test.

### **BILIRUBIN**

Coupling of bilirubin with a diazonium salt to give an azo dye. Slightest pink coloration is positive – pathologic. Other constituents can produce a yellow discoloration.

### **ERYTHROCYTES**

The peroxidase-like action of hemoglobin and myoglobin catalyzes the oxidation of the indicator (tetramethylbenzadine) with an organic hydroperoxide to give a blue-green color. Significant hemolysis may give higher values than that for the corresponding values for intact cells.

**COMPENSATION AREA**

This white area, which is not impregnated with reagents, allows instrumental compensation for the intrinsic color of the urine while testing leukocytes, nitrite, protein, glucose, ketone bodies, urobilinogen and bilirubin.

**REVISION & APPROVAL LOG**

Version	Revision Type	Description of Change	Revision Date	Technical Approval	Medical Approval
1.0		New document		Elvira Kozak	Dr. Cathy Halstead
1.1	Minor	Document title and number change. Upload to QMS document control	28 Dec 2016		Dr. Benjamin Jung
1.2	Minor	Removed reference to ER. Reformatted.	Mar 10, 2020	Calvin Lee	

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