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**Lab Dept:** Urine/Stool

**Test Name:** URINALYSIS (UA)

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***General Information***

**Lab Order Codes:** UA

**Synonyms:** Urinalysis, Routine

**CPT Codes:** 81001 - Urinalysis, automated with microscopy  
81003 - Urinalysis, automated without microscopy

**Test Includes:** Bilirubin, blood, clarity, color, glucose, ketones, leukocyte esterase, nitrite, pH, protein, specific gravity, and urobilinogen

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***Logistics***

**Test Indications:** A screen for abnormalities of urine; diagnosing and managing renal diseases, urinary tract infections, urinary tract neoplasms, systemic diseases, inflammatory or neoplastic diseases adjacent to the urinary tract and dehydration.

**Lab Testing Sections:** Urinalysis

**Phone Numbers:** MIN Lab: 612-813-6280

STP Lab: 651-220-6550

**Test Availability:** Daily, 24 hours

**Turnaround Time:** 2 hours

**Special Instructions:** Send to lab within 30 minutes of collection.

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***Specimen***

**Specimen Type:** Urine

**Container:** Urine cup

**Draw Volume:** Prefer 10 mL urine (Minimum: 2-4 mL may limit extent of testing)

**Processed Volume:** Entire volume submitted

**Collection:** A specimen collected by catheterization is optimal; however, a clean-catch or mid-stream specimen is also acceptable. Random, voided specimens will be accepted, but are the least desirable and are **not** recommended if a urine culture is also being requested. In all cases, a first morning specimen is most desirable. If testing will be delayed for more than one hour, refrigerate upon collection, stable for up to 24 hours.

**Special Processing:** N/A

**Patient Preparation:** Collect a clean-catch urine specimen as follows:

**Males:** Clean glans with soap and water. Rinse area with wet gauze pads. While holding foreskin retracted, begin voiding. After several mLs have passed, collect midstream portion without stopping flow of urine. Place the cap on the cup and **tighten securely**. Send to the lab immediately, or refrigerate specimen until it can be sent.

**Females:** Thoroughly clean urethral area with soap and water. Rinse area with wet gauze pads. While holding labia apart, begin voiding. After several mLs have passed, collect midstream portion without stopping the flow of urine. Place the cap on the cup and **tighten securely**. Send to the lab immediately, or refrigerate specimen until it can be sent.

**Note:** Indicate type of specimen (catheterized or void) and time of collection on the label.

**Sample Rejection:** Contamination with feces; urine in cotton balls; specimen decomposition; bacterial overgrowth; mislabeled or unlabeled specimens; specimens not refrigerated within one hour of collection (verified by the laboratory); specimens >24 hours old

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### ***Interpretive***

**Reference Range:**

<b>Urine Chemistries:</b>	
<b>Blood:</b>	Negative
<b>Bilirubin:</b>	Negative
<b>Clarity:</b>	Clear to slightly hazy
<b>Color:</b>	Light yellow to amber
<b>Glucose:</b>	Negative
<b>Ketones:</b>	Negative
<b>Leukocyte esterase:</b>	Negative
<b>Nitrite:</b>	Negative

<b>pH:</b>	5 - 8 pH units	
<b>Protein:</b>	Negative	
<b>Specific gravity:</b>	0 – 1 yr:	1.002 – 1.006
	>1 year:	1.001 – 1.030
<b>Urobilinogen:</b>	0.1 – 1.0 Ehrlich Units	
<b>Microscopic:</b>		
<b>RBC:</b>	0 – 3 /HPF	
<b>WBC:</b>	0 – 5 /HPF	
<b>Epithelial cells:</b>	Few (Squamous Only)	
<b>Casts:</b>	0 - 2 hyaline casts/LPF	
<b>Crystals:</b>	Few Calcium oxalate; few amorphous urates or phosphates	
<b>Mucus:</b>	None to slight	
<b>Bacteria:</b>	None to few/hpf (none for catheterized specimens)	
<b>Yeast:</b>	None	

**Critical Values:**

N/A

**Limitations:**

Insufficient volume, <2 mL, may limit the extent of procedures performed. Metabolites of Pyridium® may interfere with the dipstick reactions by producing color interference. High Vitamin C intake may cause an underestimate of glycosuria, or a false-negative nitrate test. Survival of WBC's is decreased by low osmolality, alkalinity, and lack of refrigeration. Formed elements in the urine including casts disintegrate rapidly; therefore, the specimen should be analyzed as soon as possible after collection. Specific gravity is affected by glycosuria, mannitol infusion, or prior administration of iodinated contrast material for radiologic studies. False-positive tests for protein can also be due to contamination of the urine by an ammonium-containing cleansing solution.

Because the pH of freshly excreted urine does not reach a pH of 9 in normal or abnormal conditions, a pH of 9.0 is associated with an improperly preserved specimen and indicates that a fresh specimen should be obtained to ensure validity of the results. If a pH is found to be above 9.0, the follow comment will be appended to the result, "Specimen quality is questionable due to high pH, suggest recollect."

**Methodology:**

AUTION Sticks 9EB on the Aution Max AX-4030 utilizing reflectance spectroscopy, OR, Multistix® SG and light microscopy

**References:**

Howaritz PJ, et al (1977) Timeliness of Urinalysis, Arch Path Lab Medicine, Vol 121: 667-671

Strasinger S (1989) Urinalysis and Body Fluids 2<sup>nd</sup> ed, FA Davis Company

Brunzel N (1994) Urine and Body Fluid Analysis, WB Saunders Company

Ringsrud K, et al (1995) Urinalysis and Body Fluids: A Color Text and Atlas, Mosby

**Updates:**

1/26/2006: Preferred volume changed from 5 mL to 10 mL.

6/13/2012: Reference range update. Expanded ages and upper limit for ≥1 year. Upper limit previously listed as 1.035.

9/23/2015: Updated reference ranges for Ur Specific Gravity, Ur WBC, Ur RBC, Epithelial cells.

4/3/2019: Specimens with pH >9.0 will be resulted with comment, specimen stability info updated, specimens >24 hrs old will be rejected.

3/20/24: New instrumentation and volume requirements (2-4 mL min.)