MAYO CLINIC LABORATORIES

# Test Definition: PHU_

pH, Random, Urine

## Overview

### Useful For

Assessment of patients with metabolic acidosis

Assessment of crystalluria

Monitoring the effectiveness of alkalinization or acidification of urine for certain medical conditions (eg, treatment of uric acid nephrolithiasis)

### Method Name

pH meter

### NY State Available

Yes

## Specimen

### Specimen Type

Urine

### Specimen Required

**Supplies:** Urine Tubes, 10 mL (T068)
**Container/Tube:** Plastic, 10-mL urine tube
**Specimen Volume:** 10 mL
**Collections Instructions:** Collect a random urine specimen.

### Specimen Minimum Volume

1 mL

### Reject Due To

All specimens will be evaluated at Mayo Clinic Laboratories for test suitability.

### Specimen Stability Information

| Specimen Type | Temperature | Time | Special Container |
|---|---|---|---|
| Urine | Refrigerated (preferred) | 7 days | |
| | Frozen | 7 days | |

## Clinical & Interpretive

### Clinical Information

Urine pH is a measure of the acidity/alkalinity of urine and, by itself, usually provides little useful information. Under normal conditions its value is influenced by the type of diet (some diets: eg, diets rich in meat-having more acid content than others, eg, vegetarian diets). Assessment of urine pH may be useful in the evaluation of systemic acid-base disorder. For example, the normal response during metabolic acidosis is a lowering of the urine pH to less than 5. If it is greater than 5, then a defect in urine acidification should be considered. Often a urine pH above 8 is suggestive of infection of a urea splitting organism such as *Proteus mirabilis*. Monitoring of urine pH may also be helpful during therapeutic interventions to either alkalinize the urine (such as for treatment of uric acid nephrolithiasis) or acidify the urine. Finally, when assessing crystalluria, noting the urine pH may be helpful since some crystals have a propensity to form in alkaline urine while others form in relative acidic urine.

### Reference Values

4.5 to 8.0

### Interpretation

Dependent on clinical condition.

### Cautions

A pH greater than 8 suggests the presence of urinary tract infection with a urea splitting organism.

### Clinical Reference

1. Menezes CJ, Worcester EM, Coe FL, Asplin J, Bergsland KJ, Ko B: Mechanisms for falling urine pH with age in stone formers. Am J Physiol Renal Physiol. 2019 Jul 1;317(7):F65-F72. doi: 10.1152/ajprenal.00066.2019
2. Ilyas R, Cho K, Young JG: What is the best method to evaluate urine pH? A trial of three urinary pH measurement methods in a stone clinic. J Endourol. 2015 Jan;29(1):70-4. doi: 10.1089/end.2014.0317
3. Davidsohn I, Henry JB: Todd-Sanford Clinical Diagnosis by Laboratory Methods; 15th ed. Elsevier; 1974:43-44
4. Free AH, Free HBS: Urodynamics, concepts relating to urinalysis. Ames Co; 1974;57-61
5. Kaplan LA, Pesce AJ: Clinical Chemistry: Theory, Analysis, Correlation. 3rd ed. Mosby-Year Book Inc; 1996:823

## Performance

### Method Description

The pH meter is composed of a glass electrode, calomel electrode and voltmeter. The glass electrode has a fixed acid concentration, yielding a corresponding voltage. The calomel electrode is the reference electrode. Its voltage is independent of the H+ ion concentration. The two electrodes constitute a galvanic cell whose electromotive force is measured by the voltmeter. The meter is calibrated to read in pH units, reflecting the H+ ion concentration. The meter is used to determine pH in 0 to 14 range.(Instruction manual: Fisher Scientific accumet Basic (AB) Benchtop Meters. Fisher Scientific; 68x613601.0 07/2012)

### PDF Report

No

### Day(s) Performed

Monday through Sunday

### Report Available
Same day/1 day

### Specimen Retention Time
2 days

### Performing Laboratory Location
Mayo Clinic Laboratories - Rochester Main Campus

## Fees & Codes

### Fees
- Authorized users can sign in to Test Prices for detailed fee information.
- Clients without access to Test Prices can contact Customer Service 24 hours a day, seven days a week.
- Prospective clients should contact their account representative. For assistance, contact Customer Service.

### Test Classification
This test has been cleared, approved, or is exempt by the US Food and Drug Administration and is used per manufacturer's instructions. Performance characteristics were verified by Mayo Clinic in a manner consistent with CLIA requirements.

### CPT Code Information
83986

### LOINC® Information

| Test ID | Test Order Name | Order LOINC® Value |
|---|---|---|
| PHU_ | pH, Random, U | 2756-5 |

| Result ID | Test Result Name | Result LOINC® Value |
|---|---|---|
| PHU_ | pH, Random, U | 2756-5 |