

## Overview

### Useful For

Assessing nutritional status (protein malnutrition)

Assessment of protein nutrition and nitrogen balance in hospitalized patients

Evaluating protein catabolism

Determining nitrogen balance, when used in conjunction with 24-hour fecal nitrogen measurement

### Special Instructions

- [Urine Preservatives-Collection and Transportation for 24-Hour Urine Specimens](#)

### Method Name

Dumas Combustion

### NY State Available

Yes

## Specimen

### Specimen Type

Urine

### Necessary Information

**24-Hour volume (in milliliters) is required.**

### Specimen Required

**Supplies:** Urine Tubes, 10 mL (T068)

**Container/Tube:** Plastic, 10-mL urine tube

**Specimen Volume:** 10 mL

#### Collection Instructions:

1. Collect urine for 24 hours.
2. No preservative. Refrigerated is the preferred preservation method.

**Specimen Stability Information:** Frozen 3 years

**Additional Information:** See [Urine Preservatives-Collection and Transportation for 24-Hour Urine Specimens](#) for multiple collections

### Urine Preservative Collection Options

**Note:** The addition of preservative or application of temperature controls **must occur within 4 hours of completion** of

the collection.

|                      |           |
|----------------------|-----------|
| Ambient              | OK        |
| Refrigerate          | Preferred |
| Frozen               | OK        |
| 50% Acetic Acid      | OK        |
| Boric Acid           | No        |
| Diazolidinyl Urea    | No        |
| 6M Hydrochloric Acid | OK        |
| 6M Nitric Acid       | No        |
| Sodium Carbonate     | OK        |
| Thymol               | OK        |
| Toluene              | No        |

### Specimen Minimum Volume

2 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 |                   |
|               | Ambient                  | 7 days |                   |
|               | Frozen                   |        |                   |

## Clinical & Interpretive

### Clinical Information

Nitrogen is a key component of proteins. Nitrogen balance is the difference between the amount of nitrogen ingested and the amount excreted in the urine and feces. A majority of nitrogen is excreted as urea in the urine; however, fecal nitrogen can account for 30% to 50% of total nitrogen excretion.

A patient who is in negative nitrogen balance is catabolizing muscle protein to meet the metabolic requirements of protein catabolism; therefore, urine and fecal nitrogen concentrations may be increased due to stress, physical trauma, surgery, infections, burns, and 11-oxysteroid or thyroxine use. Testosterone and growth hormone have anabolic effects on protein synthesis and may decrease urine and fecal nitrogen levels.

In the course of chronic progressive pancreatitis, as the pancreas is destroyed, serum amylase and lipase may revert to normal. However, excessive fecal nitrogen levels persist and are used as an indicator of pancreatic atrophy.

### Reference Values

<16 years: Not established

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> or =16 years: 4-20 g/24 hours

**Interpretation**

Urinary nitrogen excretion levels within the normal range are indicative of adequate nutrition.

Slightly abnormal excretion rates may be a result of moderate stress or complications, such as infection or trauma.

Significantly abnormal excretion rates may be associated with severe stress due to multiple traumas, head injury, sepsis, or extensive burns. The goal with therapy for a depleted person is a positive nitrogen balance of 4 to 6 g nitrogen/24 hours.

**Cautions**

Measurement of both urine and fecal nitrogen is necessary for the accurate determination of nitrogen balance.

During nitrogen balance studies, nitrogen lost from exuding wounds, such as burns, and from copious sputum must be included in the patient's evaluation.

Urine samples with visible blood may exhibit a positive bias for nitrogen due to the contribution of nitrogens present within hemoglobin.

**Clinical Reference**

1. Morse MH, Haub MD, Evans WJ, Campbell WW. Protein requirement of elderly women: nitrogen balance responses to three levels of protein intake. *J Gerontol A Biol Sci Med Sci.* 2001;56(11):M724-730
2. Phinney SD: The assessment of protein nutrition in the hospitalized patient. *Clin Lab Med.* 1981;1:767-774
3. Konstantinides FN, Kostantinides NN, Li JC, Myaya ME, Cerra FB. Urinary urea nitrogen: too insensitive for calculating nitrogen balance studies in surgical clinical nutrition. *J Parenter Enteral Nutr.* 1991;15(2):189-193
4. Borowitz D, Konstan MW, O'Rourke A, Cohen M, Hendeles L, Murray FT. Coefficients of fat and nitrogen absorption in healthy subjects and individuals with cystic fibrosis. *J Pediatr Pharmacol Ther.* 2007;12(1):47-52.  
doi:10.5863/1551-6776-12.1.47
5. Dickerson RN: Nitrogen balance and protein requirements for critically ill older patients. *Nutrients.* 2016;8(4):226.  
doi:10.3390/nu8040226

**Performance****Method Description**

The nitrogen analyzer utilizes the Dumas combustion method of determining total nitrogen in urine.(Unpublished Mayo method)

**PDF Report**

No

**Day(s) Performed**

Friday

**Report Available**

1 to 8 days

**Specimen Retention Time**

7 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 was developed and its performance characteristics determined by Mayo Clinic in a manner consistent with CLIA requirements. It has not been cleared or approved by the US Food and Drug Administration.

**CPT Code Information**

84999

**LOINC® Information**

| Test ID | Test Order Name    | Order LOINC® Value |
|---------|--------------------|--------------------|
| NITU    | Nitrogen, Total, U | 2660-9             |

| Result ID | Test Result Name    | Result LOINC® Value |
|-----------|---------------------|---------------------|
| DUR8      | Collection Duration | 13362-9             |
| TOTV      | Specimen Volume     | 28009-9             |
| 17418     | Nitrogen, Total, U  | 2660-9              |