



# Test Definition: A\_CR

Albumin/Creatinine Ratio

## Overview

### Useful For

Calculating the albumin concentration per creatinine

Assessing the potential for early onset of nephropathy in diabetic patients using random urine specimens

### Method Name

Only orderable as part of a profile. For more information see:

ALBR / Albumin, Random, Urine

RALB / Albumin, Random, Urine.

Calculation

### NY State Available

Yes

## Specimen

### Specimen Type

Urine

### Specimen Required

Only orderable as part of a profile. For more information see:

ALBR / Albumin, Random, Urine

RALB / Albumin, Random, Urine.

### 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	7 days	

## Clinical & Interpretive

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**Clinical Information**

Diabetic nephropathy is a complication of diabetes and is characterized by proteinuria (normal urinary albumin excretion is <30 mg/day; overt proteinuria is >300 mg/day). Before overt proteinuria develops, albumin excretion increases in those diabetic patients who are destined to develop diabetic nephropathy. Therapeutic maneuvers (eg, aggressive blood pressure maintenance, particularly with angiotensin-converting enzyme inhibitors; aggressive blood sugar control; and possibly decreased protein intake) can significantly delay, or possibly prevent, development of nephropathy. Thus, there is a need to identify small, but abnormal, increases in the excretion of urinary albumin (in the range of 30-300 mg/day, ie, microalbuminuria).

The National Kidney Foundation guidelines for the management of patients with diabetes and microalbuminuria recommend that all type 1 diabetic patients older than 12 years and all type 2 diabetic patients younger than 70 years have their urine tested for microalbuminuria yearly when they are under stable glucose control.(1)

The preferred specimen is a 24-hour collection, but a random collection is acceptable. Studies have shown that correcting albumin for creatinine excretion rates has similar discriminatory value with respect to diabetic renal involvement. The albumin:creatinine ratio from a random urine specimen is also considered a valid screening tool.(2) Several studies have addressed whether the specimen needs to be a fasting urine, an exercised urine, or an overnight urine specimen. These studies have shown that the first-morning urine specimen is less sensitive, but more specific.

Studies also have shown that microalbuminuria is a marker of generalized vascular disease and is associated with stroke and heart disease.

**Reference Values**

Only orderable as part of a profile. For more information see:

ALBR / Albumin, Random, Urine

RALB / Albumin, Random, Urine.

Males: <17 mg/g creatinine

Females: <25 mg/g creatinine

**Interpretation**

In random urine specimens, normal urinary albumin excretion is below 17 mg/g creatinine for males and below 25 mg/g creatinine for females.(3)

Microalbuminuria is defined as an albumin:creatinine ratio of 17 to 299 for males and 25 to 299 for females.

A ratio of albumin:creatinine of 300 or higher is indicative of overt proteinuria.

Due to biologic variability, positive results should be confirmed by a second, first-morning random or 24-hour timed urine specimen. If there is discrepancy, a third specimen is recommended. When 2 out of 3 results are in the microalbuminuria range, this is evidence for incipient nephropathy and warrants increased efforts at glucose control, blood pressure control, and institution of therapy with an angiotensin-converting-enzyme (ACE) inhibitor (if the patient can tolerate it).

**Cautions**

Urine collected during menses may contain excess albumin due to blood contamination. Collection during this time

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should be avoided.

Heavy exercise may increase albumin excretion and should be avoided during collection. Normal values apply to a non-exercised state.

Bilirubin at 20 mg/dL reduces creatinine by 15% to 20%.

### Clinical Reference

1. Bennett PH, Haffner S, Kasiske BL, et al: Screening and management of microalbuminuria in patients with diabetes mellitus: recommendations to the Scientific Advisory Board of the National Kidney Foundation from an ad hoc committee of the Council on Diabetes Mellitus of the National Kidney Foundation. *Am J Kidney Dis.* 1995 Jan;25:107-112. doi: 10.1016/0272-6386(95)90636-3
  2. Krolewski AS, Laffel LM, Krolewski M, Quinn M, Warram JH: Glycosylated hemoglobin and the risk of microalbuminuria in patients with insulin-dependent diabetes mellitus. *N Engl J Med.* 1995 May 11;332:1251-1255. doi: 10.1056/NEJM199505113321902
  3. Zelmanovitz T, Gross JL, Oliveira JR, Paggi A, Tatsch M, Azevedo MJ: The receiver operating characteristics curve in the evaluation of a random urine specimen as a screening test for diabetic nephropathy. *Diabetes Care.* 1997 April;20:516-519. doi: 10.2337/diacare.20.4.516
  4. Miller GW, Bruns DE, Hortin GL, et al: Current issues in measurement and reporting of urinary albumin excretion. *Clin Chem.* 2009 Jan;55:1(24-38). doi: 10.1373/clinchem.2008.106567
- Lamb EJ, Jones GRD: Kidney functions tests. In: Rifai N, Horvath AR, Wittwer CT, eds. *Tietz Textbook of Clinical Chemistry and Molecular Diagnostics.* 6th ed. Elsevier; 2018:480-488
6. Sacks DB: Diabetes mellitus. In: Rifai N, Horvath AR, Wittwer CT, eds. *Tietz Textbook of Clinical Chemistry and Molecular Diagnostics.* 6th ed. In: Elsevier; 2018:1197-1199

## Performance

### Method Description

This test calculates the albumin concentration per creatinine. This calculation is performed in the Laboratory Information System, SCC Soft.

### PDF Report

No

### Day(s) Performed

[Monday through Sunday](#)

### Report Available

1 day

### Specimen Retention Time

7 days

### Performing Laboratory Location

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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

Not Applicable

### LOINC® Information

Test ID	Test Order Name	Order LOINC® Value
A_CR	Albumin/Creatinine Ratio	9318-7

Result ID	Test Result Name	Result LOINC® Value
A_CR	Albumin/Creatinine Ratio	9318-7