Test Definition: C4

Complement C4, Serum

Overview

Useful For

Investigating an undetectable total complement (CH50)

Confirming hereditary angioedema (with low C1 inhibitor)

Assessing disease activity in systemic lupus erythematosus, proliferative glomerulonephritis, rheumatoid arthritis, and autoimmune hemolytic anemia

Method Name

Nephelometry

NY State Available

Yes

Specimen

Specimen Type

Serum

Specimen Required

Collection Container/Tube:
Preferred: Serum gel
Acceptable: Red top
Submission Container/Tube: Plastic vial
Specimen Volume: 1 mL
Collection Instructions: Centrifuge and aliquot serum into a plastic vial.

Forms

If not ordering electronically, complete, print, and send a Renal Diagnostics Test Request (T830) with the specimen.

Specimen Minimum Volume

0.5 mL

Reject Due To

Gross hemolysis	OK
Gross lipemia	Reject
Gross icterus	OK

Specimen Stability Information

Specimen Type	Temperature	Time	Special Container
Serum	Refrigerated (preferred)	7 days	
	Frozen	28 days	
	Ambient	72 hours	

Clinical & Interpretive

Clinical Information

The complement system is an integral part of the immune defenses. It can be activated via immune complexes (classic pathway) or by bacterial polysaccharides (alternative pathway). The classic complement pathway consists of recognition, (C1q, C1r, C1s), activation (C2, C3, C4), and attack (C5, C6, C7, C8, C9) mechanisms with respect to their role in antibody-mediated cytolysis. C4 is one of the activation proteins of the classic pathway.

In the absence of C4, immune complexes will not be cleared by C3 activation peptides, but bacterial infections can still be defended via the alternative pathway.

C4 may be decreased in systemic lupus erythematosus, early glomerulonephritis, immune complex disease, cryoglobulinemia, hereditary angioedema, and congenital C4 deficiency.

Reference Values

14-40 mg/dL

Interpretation

C4 levels will be decreased in acquired autoimmune disorders, in the active phase of lupus erythematosus, and in rheumatoid arthritis.

An undetectable C4 level (with normal C3) suggests a congenital C4 deficiency.

Levels will be increased in patients with autoimmune hemolytic anemia.

Cautions

The results are dependent on appropriate specimen transport.

Clinical Reference

1. Willrich MAV, Braun KMP, Moyer AM, Jeffrey DH, Frazer-Abel A: Complement testing in the clinical laboratory. Crit Rev Clin Lab Sci. 2021 Nov;58(7):447-478. doi: 10.1080/10408363.2021.19072972
2. Wong EKS, Kavanagh D: Diseases of complement dysregulation-an overview. Semin Immunopathol. 2018 Jan;40(1):49-64. doi: 10.1007/s00281-017-0663-8
3. Prohaszka Z, Kirschfink M, Frazer-Abel A: Complement analysis in the era of targeted therapeutics. Mol Immunol. 2018 Oct;102:84-88. doi: 10.1016/j.molimm.2018.06.001
4. Brodszki N, Frazer-Abel A, Grumach AS, et al: European Society for Immunodeficiencies (ESID) and European Reference Network on Rare Primary Immunodeficiency, Autoinflammatory and Autoimmune Diseases (ERN RITA) Complement Guideline: Deficiencies, Diagnosis, and Management. J Clin Immunol. 2020 May;40(4):576-591. doi:

10.1007/s10875-020-00754-1

Performance

Method Description

C4 is measured by immunonephelometry. Antiserum to C4 is mixed with patient serum, the light scatter resulting from the antibody interaction with C4 is measured, and the signal is compared to standard concentrations of C4.(Instruction manual: Siemens Nephelometer II Operations. Siemens, Inc; Version 2.4, 07/2019; Addendum to the Instruction Manual 2.3, 08/2017)

PDF Report

No

Day(s) Performed

Monday through Friday

Report Available

1 to 2 days

Specimen Retention Time

14 days

Performing Laboratory Location

Rochester

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

86160

LOINC® Information

Test ID	Test Order Name	Order LOINC® Value

C4	Complement C4, S	4498-2

Result ID	Test Result Name	Result LOINC® Value
C4	Complement C4, S	4498-2