

Complement Testing

Indications for Ordering

Individuals with recurring infections and/or symptoms of autoimmune and antigen complex diseases

Test Description

Complement Activity Enzyme Immunoassay, Total

- Semiquantitative enzyme-linked immunosorbent assay

Complement Activity, Alternative Pathway (AH50)

- Semiquantitative radial immunodiffusion

Mannose Binding Lectin

- Quantitative enzyme-linked immunosorbent assay

Tests to Consider

Primary tests

Initial screening for functional ability of the complement system

[Complement Activity Enzyme Immunoassay, Total 0050198](#)

- Tests for defects in the classical complement pathway

[Complement Activity, Alternative Pathway \(AH50\) 2005373](#)

- Tests for defects in the alternative complement pathway

[Mannose Binding Lectin 0051692](#)

- Tests for defects in the lectin complement pathway

Related tests

The following tests should be ordered based on presentation, initial test results, and clinical suspicion for deficiency

- [Complement Component 2 – 0050148](#)
- [Complement Component Level 3a – 2003304](#)
- [Complement Component Level 4a – 2003180](#)
- [Complement Component 5 – 0050156](#)
- [Complement Component Level 6 – 0099072](#)
- [Complement Component 7 – 0099073](#)
- [Complement Component 8 – 0099074](#)
- [Complement Component 9 – 0099076](#)
- [Complement Factor B – 0051720](#)
- [Complement Factor H Level \(B-1H\) – 2009416](#)
- [Complement Factor I – 2009382](#)

Disease Overview

Prevalence and/or incidence – complement deficiency accounts for ~2% of immunodeficiency, autoimmune, and immune complex syndromes

Symptoms

- Recurring infections, predominantly with pyogenic organisms
 - *H. influenza*
 - *S. pneumoniae*
 - *Neisseria* spp.
 - Endocarditis
- Immune complex diseases
 - Acute glomerulonephritis
 - Membranoproliferative glomerulonephritis
 - Systemic lupus erythematosus (SLE)
 - Serum sickness
 - Chronic hepatitis
 - HBV
 - HCV

Physiology

- Complement system
 - Plays a role in host defense and inflammation response
 - Controls microbial infections
 - Prevents immune complex diseases
- Plasma enzymes, regulatory proteins, and other proteins are activated in cascading fashion, leading to
 - Lysis of cell membranes
 - Subsequent cell death of infectious agent
- Complement cascade activation can occur with several activating mechanisms via 3 pathways
 - Classical pathway
 - Alternative pathway
 - Lectin pathway
- All 3 pathways converge into a final terminal pathway
- Deficiencies of any of the proteins within these pathways will alter complement functionality
 - Often leads to recurring infections, or autoimmune or immune complex diseases

Test Interpretation

Results

Complement Activity Enzyme Immunoassay, Total

- Normal – 60-144 CAE units
- Low – ≤59 CAE units
 - Suspect defect in classical or terminal complement pathway

Complement Activity, Alternative Pathway (AH50)

- Normal – ≥59% of control
- Abnormal – <59% of control
 - Suspect defect in alternative or terminal complement pathway

Mannose Binding Lectin

- Normal – 60-144 CAE units
- Low – ≤59 CAE units
 - Suspect defect in lectin complement pathway
- High – ≥145 CAE units

Limitations

- Does not evaluate individual components of the alternative pathway
- Complement activation can occur during blood draw
 - Rare

Interpretation of Combined Testing		
Complement pathway screening results*	Complement pathway likely affected	Suggested follow-up testing for levels and/or function
<ul style="list-style-type: none"> • CAE – low or absent • AH50 – normal • MBL – normal 	Classical	C1, C2, C4, depending on clinical presentation
<ul style="list-style-type: none"> • CAE – low or absent • AH50 – low or absent • MBL – normal 	Terminal	C3, C5-C9, factors H and I, depending on clinical presentation
<ul style="list-style-type: none"> • CAE – normal • AH50 – low • MBL – normal 	Alternative	Factors B and D, properdin, depending on clinical presentation
<ul style="list-style-type: none"> • CAE – normal • AH50 – normal • MBL – low or absent 	Lectin	N/A
* Available testing CAE = Complement Activity Enzyme Immunoassay, Total, AH50 = Complement Activity, Alternative Pathway (AH50), MBL = Mannose Binding Lectin		