

Calprotectin, Fecal by Immunoassay

Inflammatory bowel disease (IBD) represents a spectrum of chronic disorders that affect the gastrointestinal (GI) tract. Crohn disease (CD) and ulcerative colitis (UC) are the major IBD disorders.¹ Fecal calprotectin is a marker of gut inflammation with good sensitivity for detecting IBD.¹ Fecal lactoferrin, an iron-binding protein, is another useful marker of intestinal inflammation in IBD,² but more clinical evidence is available for fecal calprotectin.³

Disease Overview

Prevalence

IBD: 286/100,000 in United States⁴

Physiology

- Calprotectin is a calcium-binding protein² and accounts for 60% of soluble protein in neutrophils³
- Calprotectin concentration in feces is proportional to the level of inflammation in patients with UC³; the relationship is more variable in patients with CD⁵
- Calprotectin is stable in stool samples³

Diagnostic Issues

- IBD symptoms may be vague and similar to those of irritable bowel syndrome (IBS) (eg, diarrhea, abdominal pain)
 - IBS is much more prevalent than IBD
- Differentiation of IBD from IBS may require invasive procedures
- Calprotectin testing may be useful as a screen for differentiating IBS and IBD,² reducing the necessity of invasive procedures

Monitoring Issues

- Monitoring by endoscopy is invasive
- Calprotectin measurement can be used to help differentiate quiescent from active IBD³
- Mucosal healing is associated with sustained remission and is the goal of IBD treatment²
- Calprotectin levels correlate with endoscopic scoring systems that are used to assess mucosal healing and may be useful in evaluating mucosal healing³

Featured ARUP Testing

Calprotectin, Fecal by Immunoassay 3002859

Method: Quantitative
Chemiluminescent Immunoassay (CLIA)

- Aids in differentiation of IBD from IBS and other functional disorders of the GI system
 - Not specific for IBD
- Aids in monitoring IBD and prediction of relapse

Test Interpretation

Clinical Validation

Screening performance for IBD

- Sensitivity: 93% in adults; 92% in children⁶
- Specificity: 96% in adults; 76% in children⁶
- More sensitive and specific than serum inflammatory markers^{3,7}
- Individuals with high pretest probability of IBD (>75%) should be referred directly to endoscopy due to the risk of false-negative calprotectin results^{6,8}
- Screening for elevated fecal calprotectin in individuals with low pretest probability for IBD may result in cost savings by reducing need for unnecessary procedures⁸
 - Confirm positive results by endoscopy and follow negative result clinically

Results

Results	Range	Clinical Significance
Normal	≤50 µg/g	Likely to rule out IBD in adults with <75% prior probability
Borderline	51-120 µg/g	Reevaluation in 4-6 weeks is recommended
Abnormal	≥121 µg/g	Supports diagnosis of IBD

Limitations

- Calprotectin is not specific for IBD and is also elevated in:
 - GI infections
 - Colorectal cancer
 - Celiac disease
 - Mild elevations may be seen with nonsteroidal anti-inflammatory drug or aspirin use
- Calprotectin concentration alone is not diagnostic for IBD
- Calprotectin does not distinguish celiac disease from UC
 - Results may fluctuate as disease activity fluctuates
 - GI bleeding can cause mild increases in fecal calprotectin concentrations
- Concentrations of fecal biomarkers may vary in different stool samples from a single patient⁹

References

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Related Information

Inflammatory Bowel Disease - IBD

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