

FREQUENCY OF C-ANCA, P-ANCA, MPO & PR-3 ABS IN VASCULITIS				
DISEASE CATEGORY	C-ANCA	P-ANCA	ANTI-MPO	ANTI-PR3
WEGENER'S GRANULOMATOSIS Active - generalized Active - limited	3-4+ 2-3+	1+ Occasionally	1+ <1+	3-4+ 2-3+
Idiopathic Necrotizing and Crescentic Glomerulonephritis without Immune deposits (Pauci-Immune)	Rare	4+	3-4+	Rare
Microscopic Polyarteritis	1+	2-3+	2-3+	1+
Churg-Strauss Syndrome	1+	2+	2+	1+
Classic Polyarteritis Nodosa Polyangitis Overlap Syndrome	Rare 1+	Rare 1+	Rare 1+	Rare Rare
INFLAMMATORY BOWEL DISEASE Ulcerative Colitis Crohn's Disease	Absent Absent	2-4+ 1+	Absent Absent	Absent Absent
GRADING SYSTEM: 1+(15-25%); 2+(26-50%); 3+(51-75%); 4+(76-100%)				

Combined ANCA IFA testing with ELISA assays for Anti-PR3 and Anti-MPO are the preferred assays in evaluating these disorders.

## GUIDE TO INTERPRETATION

### **C-ANCA**

- C-ANCA are present in ~90% of patients with active generalized Wegener's Granulomatosis (WG). Sensitivity decreases to 60-67% with inactive or limited WG. A negative C-ANCA, therefore, does not exclude a diagnosis of WG.
- Serial ANCA titers can be useful in monitoring disease activity in modest proportion of patients, but therapeutic decisions based solely on changes in ANCA titers are not generally recommended in the majority of patients.
- C-ANCA are seen in only a minority of patients with Microscopic Polyarteritis and Idiopathic Necrotizing and Crescentic Glomerulonephritis (without immune deposits), which are possibly related to WG.
- Although the majority of WG patients have C-ANCA and most patients with ANCA-associated Glomerulonephritis without systemic manifestations have P-ANCA, there is some overlap.
- C-ANCA can also be seen in SBE and Invasive Amoebiasis.

### **Anti-Proteinase 3 Antibodies**

- C-ANCA in WG are primarily due to anti-Proteinase 3 antibodies (anti-PR-3) [80-90% sensitive; 97% specific], but other target antigens are identified.
- 90% of anti-PR-3 positive sera are also C-ANCA positive.

### **P-ANCA**

- P-ANCA are a useful marker for Vasculitis-Associated Crescentic Glomerulonephritis and Idiopathic Pauci-immune Crescentic Glomerulonephritis.
- In patients with ANCA-associated Glomerulonephritis, ~90% of P-ANCA are secondary to anti-MPO abs.
- P-ANCA can be seen in 60-75% of Microscopic Polyarteritis and 75% of Churg-Strauss Syndrome, mainly secondary to anti-MPO Abs.
- Positive predictive value of ANCA positivity in Rapid Progressive Glomerulonephritis approaches 98%.
- P-ANCA are occasionally present in a minority of patients with WG.
- P-ANCA are present in ~10% of Systemic Lupus Erythematosus patients.
- False positive P-ANCA can be caused by ANA's, hence, concurrent ANA testing is performed on P-ANCA positive sera.
- Atypical P-ANCA are commonly seen in Ulcerative Colitis, Sclerosing Cholangitis and Type I Autoimmune Hepatitis, but are unrelated to anti-MPO antibodies.

**Guide continued on back**

**GUIDE TO INTERPRETATION** CONT'D.**P-ANCA**

- P-ANCA can be seen in 10-30% of patients with Goodpastures Syndrome.
- P-ANCA can be seen in many CTD, including SLE, RA, DM/PM, Sjogren's Syndrome and others directed against a variety of intracellular neutrophil cytoplasmic antigens.
- Anti-elastase, anti-cathepsin G, anti-lactoferrin and anti-lysozyme antibodies can cause a P-ANCA pattern, but lack clinical utility.

**Anti-Myeloperoxidase (Anti-MPO) Antibodies**

- Most P-ANCA occurring in Systemic Necrotizing Vasculitis (90%) are due to anti-MPO.

**Drug Induced ANCA Associated Vasculitis**

- Several drugs have been implicated in ANCA-associated Vasculitis including PTU, minocycline, hydralazine, and are directed against various cytoplasmic neutrophil antigens.

**Infections Associated with ANCA**

- SBE
- Invasive Amoebiasis
- Cystic Fibrosis
- HIV
- Some Respiratory Infections
- Chromomycosis
- Acute Malaria
- Hepatitis C