

Alloimmune Neonatal Neutropenia



Alloimmune Neonatal Neutropenia (ANN) is a potentially critical disorder of the neonate and young infant. This disease is caused by the passive transfer of neutrophil specific maternal IgG antibodies across the placenta during pregnancy. These antibodies subsequently bind to fetal neutrophils in utero which may result in severe neutropenia. Severe bacterial and fungal infections may result shortly after birth when the neonate is exposed to a plethora of pathogens.

INDICATIONS

Shortly after birth the neonate may demonstrate an abnormally low Absolute Neutrophil Count (ANC) along with such symptoms as skin infections, omphalitis, otitis, fever, and respiratory or urinary tract infections. Often the bacterial infections are mild, however, serious infections do occur with a mortality rate of approximately 5%. Neutrophil specific antibodies: HNA-1a, HNA-1b and HNA-2a, are detected in over 50% of cases involving ANN. Other neutrophil specific antibodies such as HNA-1c, HNA-3a and HNA-4a have also been implicated in this disorder. The incidence of transplacental immunization is estimated to be as high as 0.2% of live births, and is involved in 1.5% of all admissions to a neonatal special care unit.

TESTING WORK-UP

Neutrophil Antibody Screen:

The mother's serum is screened for neutrophil specific antibodies against a panel of cells typed for characteristic neutrophil antigens by the Granulocyte Agglutination (GA) and Granulocyte Immunofluorescence (GIF) assays.

HLA (PRA) Antibody Screen:

An HLA antibody screen will be performed on the mother's serum if the neutrophil antibody screen is positive.

Optional Testing:

- **Monoclonal Antibody Immobilization of Neutrophil Antigen Assay (MAINA)** is available to differentiate HLA from neutrophil specific antibodies when both are positive.
- **Neutrophil Crossmatching** can be used to determine if antibody in the mother's serum reacts with the father's neutrophils. The neonate inherits paternal antigens that may cause maternal antibody formation.
- **Neutrophil genotyping/phenotyping** can be performed to establish the presence of the antithetical gene/antigen if a specific neutrophil antibody has been identified.

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SHIPPING ADDRESS

North Central Blood Services
Neutrophil Serology Laboratory
100 Robert Street South
St. Paul, Minnesota 55107-1489

For further information
please call the Neutrophil
Serology Laboratory
at 651-291-6797 or the
laboratory supervisor
at 651-291-6758.

CLIA License Number:
24D0651229

SPECIMEN REQUIREMENTS

1. Neutrophil and HLA (PRA) Antibody Testing:

- 2 to 3 mL of serum or plasma from the mother.
- *Optional:* 1 to 2 mL of serum or plasma from the neonate.
- Collect blood in either a red top or EDTA tube. Separate serum or plasma from the red cells as soon as possible and store at 2° to 8°C up to 48 hours after collection. If testing is delayed, store frozen and ship on dry ice.

2. Neutrophil Crossmatch and Phenotyping:

- 14 to 28 mL whole blood collected in EDTA from the mother and father.
- **DO NOT** separate plasma from the red cells. Ship overnight at room temperature in a well insulated container. Contact the laboratory before collecting specimens as testing must begin within 24 hours of venipuncture.

3. Neutrophil Genotyping:

- 5 to 7 mL whole blood collected in citrate or EDTA from the mother, father and baby.
- Ship overnight at room temperature in a well insulated container.

TEST RESULTS

Final results will be reported within 10 days. Results can be faxed and/or mailed.

PRICE

Refer to current fee schedule.

CPT CODE

TEST	CPT CODE
Neutrophil Antibody Screen	86021 x 2
HLA Antibody Screen	86807
MAINA	86021 x 3
Neutrophil Crossmatch	86021 x 2
Neutrophil Antigen Phenotyping.	86021 x 3
Neutrophil Genotyping (HNA-1a, -1b, -1c)	83890, 83898 x 3
.	83894, 83912

