Lab Dept: Transfusion Services

Test Name: DIRECT COOMBS TEST

General Information

Lab Order Codes:	DAT or DCAS (includes Direct Coombs and Antibody Screen, Indirect) or ABDC (includes Direct Coombs, ABO and Rh)
Synonyms:	Coombs Test; Direct, DAT; Coombs, Direct; Direct Antiglobulin Test
CPT Codes:	86880 – Antihuman globulin test (Coombs), Direct
Test Includes:	Direct antiglobulin testing with polyspecific anti-human globulin serum. It may include use of monospecific (anti-IgG, anticomplement) when indicated.

Logistics

Test Indications:

Useful for the detection of immunoglobulins (IgG) or complement adsorbed onto red cells. Used to detect autoimmune hemolytic anemias caused by antibody and/or complement components being bound to the patient's red cells (including drug induced), transfusion reaction and erythroblastosis fetalis (hemolytic disease of the newborn). Coated red cells are said to be "sensitized".

In a DAT (Direct Antiglobulin/Coombs Test), the test is for antibody attached to the patient's red cells in vivo. In an Antibody Screen (Indirect Antiglobulin Test), the antigen-antibody reaction occurs in vitro and one tests patient's serum for antibody with reagent cells (the antigen).

Refer to Direct Coombs/Antibody Screen or Type and Direct Coombs for alternative test combinations.

Lab Testing Sections: Transfusion Services

Phone Numbers:

Minneapolis:	612-813-6824
Saint Paul:	651-220-6558

Test Availability: Daily, 24 hours

Turnaround Time: 30 minutes, up to 4 hours if positive

Special Instructions:	Provide diagnosis, transfusion history, and pertinent medications to the laboratory. Additional specimen may be requested if elution studies are indicated.

Specimen

Specimen Type:	Whole blood
Container:	Lavender top tube (EDTA)
Draw Volume:	0.5 mL blood (small EDTA) or 2 mL blood (large EDTA)
Collection:	All specimens submitted to the Transfusion Service must be appropriately labeled at the bedside with the time and date of collection, and the signature of the individual collecting the specimen. A completed order, either through the HIS or general requisition must accompany each specimen. It is not always necessary to collect a new sample prior to the provision of blood for patients. Consult with the Transfusion Service prior to collecting additional samples if the status is unknown.
Special Processing:	Lab Staff: Refrigerate specimen
Patient Preparation:	Refer to Collection of Patient Specimens for full details. The patient must be positively identified when the specimen is collected. The label on the blood specimen must correspond with the identification on the patient's Medical Record wrist or ankle band (or ED ID) and on the physician's/practitioner's orders. The specimen must be timed, dated and signed by the phlebotomist at the bedside.
Sample Rejection:	Gross hemolysis; sample placed in a serum separator tube; specimen tube not properly labeled

Interpretive

Reference Range: Negative

Additional Information: Drugs, including the penicillins and cephalosporins, α-methyldopa, levodopa, quinidine, insulin, mefenamic acid, sulfonamides, tetracycline, and others may cause positive direct antiglobulin/Coombs tests. Many positive direct antiglobulin tests are due to methyldopa. Methyldopa antibodies are predominantly IgG; about 1% of patients on methyldopa develop hemolytic anemia, but as many as 15% develop a positive DAT. Although drugs and alloantibodies may cause a positive direct antiglobulin test, the majority of patients have no such association. It is unusual to find a significant antibody in the eluate from a positive direct antiglobulin test. Broad spectrum or polyspecific antisera contain both anti-IgG and anti-C3d. Anti-IgG may be used to determine if the cells are coated with IgG. If indicated, red cell elutions and/or an indirect antiglobulin test (antibody screen) and antibody identification are included in the work-up of a positive direct antiglobulin test. In case of Hemolytic Disease of the Newborn or autoimmune hemolytic anemia, an eluate from the patient's red cells sometimes shows antibody specificity.

Limitations: False-positives may occur with cold autoagglutinins and when the serum contains large amounts of paraprotein. Use of red top tubes or serum separator tubes may cause false-positive reactions, particularly if tubes have been refrigerated. Newborn's cells may have a negative direct antiglobulin test in ABO hemolytic disease. Wharton's jelly from cord samples can cause false-positives. 2 – 4% of patients with clinical autoimmune hemolytic anemia have a negative Direct Coombs test.

Methodology: Hemagglutination Antiglobulin test

References:

Bator S, Litty C, Dignam C, et al (1994) Current utilization of the direct antiglobulin test investigation: results of a hospital survey. Transfusion 34(5):457-8

Canadian Red Cross Society (1980) Serological and Immunological Methods of the Canadian Red Cross Blood Transfusion Service, 8th ed, Toronto, Canada. The Canadian Red Cross

Freedman J (1979) False-positive antiglobulin tests in healthy subjects and in hospital patients. J Clin Pathol 32:1014-18

Huh YO, Lui FJ, Rogge k, et al (1988) Positive direct antiglobulin test and high serum immunoglobulin G values. Am J Clin Pathol 90(2):197-200