ANIMAL BLOOD BANK®

"Blood Banking for Every Hospital" Series

Title: **BLOOD CROSS MATCH**

Lessons in Lifesaving
1-800-2 HELP K9
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Purpose:
A blood cross match (BCM) is performed to detect serological incompatibility. Since cats have naturally occurring alloantibodies and may experience a severe reaction to their first transfusion, a BCM should be performed prior to any blood transfusion. Some literature indicates that dogs, lacking naturally occurring alloantibodies, may be transfused without a BCM prior to their first transfusion. ***Although immediate transfusion reactions involving first transfusions in canines are rare, we recommend crossmatching before any transfusion if the situation permits, especially in cases involving autoimmune problems and where background information may not be complete or does not include prior transfusions or blood typing.*** All dogs that have received transfusions more than 4-7 days previously must be cross matched before receiving any additional transfusions. This is especially important when the blood types of the donor and recipient were or are unknown.

Procedure: This is the description of an in-house method of major and minor crossmatch.
1). Collect blood into an EDTA tube from recipient and possible donor(s) [or take one segment from the donor blood bag and place blood in tube without anticoagulant].
2). Centrifuge tube(s) at 1000 x 9 for 5 min. to separate plasma from red blood cells (RBCs).
3). Remove plasma from each sample with a clean pipette and transfer to clean, labeled glass or plastic tubes.
4). Wash RBCs 3 times with a normal saline solution; resuspend to make a 3-5% RBC suspension (1 drop RBC:20 drops saline).
5). Prepare for each donor 3 tubes labeled with Major, Minor, and Recipient control. Add to each tube 2 parts of plasma and 1 part of RBC suspension as follows:

Major BCM:	recipient plasma + donor cells
Minor BCM:	donor plasma[1] + recipient cells
Recipient control:	recipient plasma + recipient cells

6). Mix gently and incubate for 15 min. at room temperature.
7). Centrifuge for 15 sec. at 1000 x 9.
8). Examine supernatant for hemolysis.
9). Gently resuspend button of cells by tapping tube with a finger and examine for macroscopic agglutination.
10). If macroscopic agglutination is not observed, transfer a small amount onto a glass slide and examine for microscopic agglutination. Rouleaux is not an indication of incompatibility

Interpretation:
An autocontrol with recipient red cells and plasma is included because some recipients have immune mediated hemolysis with autoagglutination interfering with BCM. Any hemolysis and/or agglutination in the major or minor BCM but not in the control indicates an incompatibility and the need to choose a new donor. If control is weakly positive and test sample is strong, results may be valid; if both are equal, no conclusions as to compatibility can be drawn. A compatible BCM does not prevent sensitization or delayed transfusion reactions. It simply indicates that **at the present time** there are no significant antibodies against the red cells. In order to prevent sensitization, the red cells would have to be typed.

ABB Footnotes and Comments:
1. A minor cross match cannot be done when using donor red cells preserved in red cell nutrient (Nutricel or similar product) as the plasma has been removed and replaced with the nutrient solution.
2. Some laboratories recommend incubating canine blood for 30 minutes.
3. If time and equipment permit, it is also recommended that tubes be prepared and incubated at 4 degrees and 37 degrees C.

Crossmatching is not a substitute for blood typing. All donors should be blood typed and crossmatching should be done even when blood types are known. Strong reactions between like blood types have been observed in situations of multiple transfusions, various protein, fibrin and non-erythrocyte antigen reactions, and/or certain disease processes, especially when chronic (i.e. kidney failure). In dogs a blood type cannot be presumed from a crossmatch, although this can be done with a fair amount of accuracy in cats. In cats, if a known blood type (example type A) is used as the donor for purposes of a major crossmatch and there is no reaction with the recipient, the recipient can be assumed to be the blood type of the donor.

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