

- Welcome
- In the Trenches: *Characterizing Anemia*
- Coming Conferences
- Events of Note
- VetScan News & Special Offers
- In Your Opinion

Volume 3,
June 2002

a bi-monthly electronic newsletter for the veterinary community

WELCOME!

Welcome to the June 2002 edition of VetCom. Our clinical, *In the Trenches*, discussion this month focuses on characterization of anemia. The eminent Dr. Charles Sodikoff provides the overview. Further discussion of veterinary diagnostics by Dr Sodikoff may be found in his text "Laboratory Profiles of Small Animal Diseases" (Mosby). The scheduled feature: **Rimadyl and Liver Enzyme Monitoring** will be delayed until the August issue as a result of the author's conflicting commitments. Dr Brent Hoff, veterinary pathologist and toxicologist from the University of Guelph will be reviewing findings from a recent NSAIDS study and offering recommendations for monitoring liver enzyme levels for Rimadyl-treated dogs. It should be an interesting and useful piece! I am introducing a new feature to

In the Trenches

Charles Sodikoff, DVM

Anemia is the most commonly diagnosed red cell disorder. The three primary causes of anemia are blood loss (hemorrhage), cell destruction (hemolysis) and decreased production. The laboratory identifies anemia by low values for the PCV, hemoglobin and RBC count. We add to these counts clinical history, blood smears, and RBC indices to classify anemia by response and cause. By using an automated hematology analyzer, such as the VetScan[®] HMT, we speed up the identification and classification of an anemic patient to aid with treatment

The Red Blood Count (RBC), hemoglobin (Hgb) and hematocrit (Hct) when combined with measures of hydration (i.e. serum

VetCom that may be of particular interest to subscribers with relatively new laboratory capability, or those who encounter perplexing laboratory results. The new **ASK THE LAB** feature will be your opportunity to query a veterinary reference laboratory owner with 20 years veterinary experience preceded by 15 years of clinical laboratory expertise. Carl Schellenberg offers a wealth of experience and expertise spanning a multitude of methods, technology and species. Your questions are welcome and encouraged...please send them to me at:

pamconboy@abaxis.com

Guerilla Marketing's Golden Rule #20



protein) determine if a patient is anemic. The red blood cell indices such as the *mean corpuscular volume (MCV)*, *mean corpuscular hemoglobin (MCH)*, *mean corpuscular hemoglobin concentration (MCHC)*, *red cell distribution width (RDW)* and the *RBC histogram* determine the type of anemia present in the patient. Blood analyzers often have a built-in function that measures some of these indices and then automatically calculates the remaining indices. This automated RBC determination is a rapid method of diagnosing and classifying anemia. Thus present-day automated hematology analyzers, such as the VetScan HMT, often can diagnose and classify anemia without a blood smear analysis.

RBC Measurements Anemia Determination

Marketing is not really an expense, it's an investment-if you do it right. Aggressive cost-effective marketing is the key:

Consider smaller, consistent advertisements in cost-effective media (yellow pages, local newspapers, "welcome wagon" and co-op/direct to consumer coupon pack mailings)

Obtain free market research by means of a client questionnaire

Stick with one marketing campaign/image

Write timeless advertisement and brochures (no reference to #yrs in business, not staff photos, etc)

Reprint any local publicity your practice may receive and use it forever

The two biggest mistakes in marketing are spending too little and spending too much!

Guerilla Marketing Excellence, Levine, Houghton Mifflin Co

RED BLOOD COUNT (RBC) the number of red blood cells in a cubic millimeter of blood. In anemia, the red blood cell count falls. With altitude adaptation, the red blood cell count rises.

HEMOGLOBIN (Hgb) the amount of oxygen carrying compound, hemoglobin, measured in grams per 100 cubic centimeters of blood. It indicates oxygen carrying capacity of the blood. It decreases in anemia and increases with altitude adaptation.

Cont'd on page 2

In this Issue

Welcome	1
In the Trenches	
Characterizing Anemia	2
Coming Conferences	2
Events of Note	2
VetScan News & Offers	3
In Your Opinion	3
Abaxis Contact Info	3
VetScan Authorized	4
Distributors	

HEMATOCRIT (Hct) the percentage of a blood sample occupied by cells. In present-day automated hematology analyzers this value is usually calculated from the size of the RBC and the RBC count.

RBC Indices
Anemia Classification

MEAN CORPUSCULAR VOLUME (MCV) is the size of a red blood cell measured in cubic microns. It decreases in microcytic anemia and increases in macrocytic anemia.

MEAN CORPUSCULAR HEMOGLOBIN (MCH) is the amount of hemoglobin in each red blood cell. It is calculated by dividing hemoglobin by the red blood cell count. It decreases in microcytic and normocytic anemia and increases in macrocytic anemia.

MEAN CORPUSCULAR HEMOGLOBIN CONCENTRATION (MCHC) is the percentage of a red blood cell which is hemoglobin. It is calculated by dividing the hemoglobin by the hematocrit and reported as a percentage. It decreases in microcytic anemia.

Note: high values indicate erroneous conditions such as hemolysis.

RED CELL DISTRIBUTION WIDTH (RDW) is the amount of variation in the size of the red blood cells. While the MCV measures the average size of the cell, the RDW measures the range of cell sizes. For example, increased numbers of spherocytes and reticulocytes will cause an increased RDW. In some instances, the RDW is the first test result to increase with changes in red cell population sizes.

HISTOGRAMS OF MCV present-day automated hematology analyzers, such as the VetScan[®] HMT, can provide an accurate, direct measure of MCV, group the cells by size, and create a histogram (a continuous graph) that shows the mode (highest frequency of a cell size) and the range of the cell variation. This diagram can clearly demonstrate extremely small cells such as occur with spherocytosis, large cells such as occur with reticulocytosis and normal sized cells. If multiple peaks occur, variable populations of cells may be demonstrated and these can be monitored over time.

NONREGENERATIVE ANEMIA is diagnosed when there is a low to normal MCV correlated with a normal RDW. This indicates a lack of reticulocytes with no masking effects from very small red blood cells. During the first 2-3 days post hemorrhage or hemolysis, anemia may be non-regenerative. Anemia of disease are also non-regenerative. When no response is seen for several days, a primary or a secondary bone marrow disorder is indicated.

REGENERATIVE ANEMIA is indicated by a high MCV that is associated with increased polychromasia and reticulocytosis. In some cases a high RDW may suggest a high MCV that is masked by concurrent small cells such as spherocytes. This regenerative (or responsive) anemia occurs when the bone marrow is actively responding to anemia by increasing production of RBCs. The presence of regeneration suggests blood loss or RBC destruction. Regenerative anemia also denotes that: 1) sufficient time (2-3 days) has elapsed for regeneration to occur 2) there are adequate blood-forming elements (iron, appropriate vitamins, protein) for regeneration 3) there are enough erythrocytic colonies in the bone marrow, and 4) there is adequate kidney function to form erythropoietin.

cont'd on page 4

Anemia

the most commonly diagnosed RBC disorder

rapid characterization aids in timely and effective treatment

Coming Conferences
We'll See You There!

ICE
(International Conference on Exotics)
Key West, FL
June 19-21, 2002

North Carolina VMA
Charlotte, NC
June 20-23, 2002

Events of Note

A Practitioner's Approach to a Successful In-Clinic Wellness Program & The Benefits of In-Clinic Testing
Craig Tockman, DVM

AVMA
Nashville, TN
July 13-16, 2002

PA VMA
Hershey, PA
August 8-11, 2002

CVC
Kansas City, MO
August 16-20, 2002

AAV
(Association of Avian Vets)
Monterey, CA
August 27-29, 2002

CO VMA
Keystone, CP
September 8-10, 2002

Chicago VMA
Chicago, IL
September 11, 2002

Marriott Marquis Hotel
New York City

June 26, 2002

Contact John Nelson
for information
800 822-2947, ext. 1505

Local Abaxis Representatives are available to present a one-hour presentation on the topic of the benefits of in-clinic wellness testing for local veterinary meetings.

The program offers a review of veterinarian approaches to wellness and senior testing, published relevant literature and 1 hour of RACE continuing education credit

VetScan® News & Special Offers

Abaxis is pleased to announce the June availability of our new

T-4/Cholesterol Rotor

- Broad T-4 dynamic range (0.5 – 8.0 µg/dl) provides an excellent screening and monitoring tool for canine hypothyroidism as well as feline hyperthyroid disease.
 - Inclusion of cholesterol improves screening utility for canine hypothyroid disease.
 - Superior assay precision and accuracy
(calibrated to and recovers traceable to the MI State Univ RIA method)
 - Exceptional Value
(same price as T-4 only rotor)
- for performance information email: pamconboy@abaxis.com

In Your Opinion

Each month we will ask a clinical, or practice management related question of our subscribers.

June is *Mosquito Madness* Month

All VetScan Canine Heartworm purchased and shipped in the month of June will be billed at \$2.99 per Test 100 test minimum No Additional Rebates or Discounts Apply

- Simple 2-Step Procedure
(1 drop blood, 2 drops buffer)
- Room Temperature Storage
12 Month Shelf-Life
- Clear, Concise Result Lines
- 95% sensitivity
(1 female worm, McCall et al, UGA)
- 100% specificity

Place your order through your authorized VetScan distributor or contact Abaxis for more info

Survey

Thank all of you who participated in our customer survey. By now, you should have received you 10-rotor Thank You for completion of the 8-page survey. If you have completed and submitted the survey, but have not received your rotors, please email pamconboy@abaxis.com

April's Question:

In Your Opinion,

Should dogs treated with Rimadyl have their liver enzyme levels monitored regularly?

If so, how often and what analytes should be tested?

Abaxis Practice Builder CD Package

Provides templates to create your own personalized educational pamphlets, appointment reminders, authorization forms and more! A \$199.00 value, **FREE** to VetScan customers!

Laboratory Testing Volume Getting Out of Hand?

Abaxis offers a number of very attractive acquisition programs for additional instrumentation, based on your current testing volume* with no incremental expense to your practice. Contact us for additional details at:

1 800-822-2947

pamconboy@abaxis.com

**minimum rotor volume required*

Exotic Practitioners Special ICE Show Offer- Key West

Purchase or lease a VetScan Chemistry Analyzer and receive a free box of avian-reptilian rotors with each box of rotors purchased.

up to 5 free boxes thru Dec 02

Watch for further discussion of this topic in next month's In the Trenches

Got a Question for the Lab? Send it in....

Email me with your replies and queries: pamconboy@abaxis.com

Abaxis Contact Information

1-800-822-2947

VetCom Issues

subscribe, unsubscribe questions, comments
Pam Conboy, ext. 6604
pamconboy@abaxis.com

Technical Service EXT 2
technical issues, training rotor credits, software queries
Linda Lang, Manager

Customer Service EXT 3
direct orders, local representative and VetScan distributor information
Valerie Campbell, Manager

SALES

Eastern Area Sales Director
Marty Mulroy, ext. 1500

Western Area Sales Director
Randy Knick, ext. 1509

VetScan Canine Heartworm
\$3.50 per test
in June

Authorized VetScan® Distributors

<u>Distributor</u>	<u>Telephone</u>
AVSC-American Veterinary Supply	800-869-2510
Barber	800-552-5698
DVM Resources	877-828-1026
IVESCO-Iowa Veterinary Supply	800 831-4828
Merritt	800-845-0411
Miller Veterinary Supply	800-880-1920
Nelson	800-843-3322
Penn Vet	800 233-0210
TW Medical	888 787-4483
VMS-Veterinary Medical Supply	800-533-8674
Vetpo	800-253-7280
Western Medical Supply	800-242-4415



Note: Reticulocyte counts quantify the degree of erythropoiesis associated with a regenerative anemia. While a manual slide review is the best method for evaluating the presence of these cells, estimated may be made with automated hematology analyzers. Analyzers which utilize laser optics offer a means to provide automated reticulocyte counts, but they are not entirely reliable, particularly in cats, because of interference with Heinz bodies. An increased MCV or an increased RDW which is readily available as a standard parameter with impedance hematology analyzers such as the VetScan HMT are good screens for reticulocytes and may be confirmed with a manual slide evaluation.

MACROCYTIC HYPOCHROMIC ANEMIA is characterized by abnormally large RBCs containing subnormal amounts of hemoglobin. It is seen after acute blood loss. This type of anemia indicates marked RBC regeneration, but several days must elapse before this response is noted. Production of reticulocytes in response to anemia contributes to pallor, increased MCV and decreased MCHC.

MICROCYTIC HYPOCHROMIC ANEMIA is characterized by abnormally small RBCs containing subnormal amounts of hemoglobin. It is caused by iron deficiency, impaired iron metabolism, or iron depletion from chronic blood loss. Rarely,

portosystemic shunts and chronic inflammation cause this type of anemia.

In conclusion, the thorough and thoughtful utilization of complete RBC data provides the clinician with ample information for diagnosis and classification of anemia. Additionally, in-clinic automation, such as the VetScan HMT, provides this critical data in minutes allowing the veterinarian to assess the situation and initiate appropriate therapy immediately.

The VetScan HMT Histograms and RBC Indices

Useful Tools in Anemia Characterization

The VetScan HMT Analyzer provides the user with graphic depictions, or histograms, of the three basic cellular populations: erythrocytes, leukocytes and thrombocytes. The histogram illustrates the distribution of cells within these populations by height or, amplitude (Y-axis) indicating the number of cells, and width (X-axis) indicating the size of the cells measured.

Compared with an expected "normal" histogram pattern, patient results can be visually scanned for gross abnormalities resulting from disease, incorrect sample collection and handling or instrument malfunction. The actual cell counts and distributions

are also printed and should be referenced. A repeat blood draw and analysis as well as a manual smear may be indicated for samples demonstrating abnormal histogram results.



example of a normal RBC histogram

RBC indices are also provided for each sample which provide useful classification information.

Additional Reading:

A Guide to Hematology in Dogs & Cats, Rebar, A, et al, Teton New Media, 2002.

Hematology Techniques & Concepts, Voight, G, Iowa State Univ Press, 2000.

Laboratory Profiles of Small Animal Diseases, A Guide to Laboratory Diagnosis, Sodikoff, C, Mosby, 1995.

Automated Blood Counts and Differentials, A Practical Guide, Bessman, D, Johns Hopkins Univ Press, 1986.