Spring 2024

AVHTM Newsletter

A 501(c)(3) nonprofit professional association

Volume 8, Issue 2

Special Events of Interest:

EVECC Congress
Gothenburg Sweden
May 30 - Jun 1, 2024

ACVIM Forum
Minneapolis MN
Jun 6 - 8, 2024
AVHTM lectures and AVHTM special interest group (SIG) on Jun 7 (see page 3) for info

IVECC Symposium
Saint Louis MO
Sep 7 - 11, 2025
AVHTM member discount available

Welcome to the Spring AVHTM Newsletter

Welcome to the spring / summer 2024 AVHTM newsletter. We have information regarding relevant upcoming courses including our AVHTM-track for the upcoming ACVIM Forum. We also will be hosting our special interest group (SIG) dinner at the ACVIM Forum which will focus on novel transfusion products – we hope you will be able to join us! We have our usual round-up of the recent hematology literature. Additionally, we have a report from Dong Xia about his and his collaborators' recent publication looking at the fecal microbiota in dogs with immune-mediated disease. This is a fascinating area that probably many of us have never considered. We also have an article from Umer Farooq, describing the use of the dried blood spot for diagnostics when resources are limited, also a very thought-provoking piece. We hope you enjoy the read.

AVHTM wants to thank this year's SIG sponsors

A huge shout-out and thank you to this year's sponsors of AVHTM's annual SIG in Minneapolis MN! Your support makes our meeting possible.

Alvedia Alice Veterinary Diagnostic

HemoSolutions

IAS Innovative Animal Supplies

Nine Lives Blood Services

Join us for our Annual SIG at the ACVIM Forum 2024

June 07 2024, 6:30 - 9: 30 pm Central

Brit's Pub

1110 Nicollet Mall

Minneapolis Minnesota

AVHTM at the ACVIM Forum

We have the following lectures in our AVHTM stream:

On Demand:

- **Plasma: Everything Old is New Again: New Formulations and Applications of a Long-Trusted Transfusion Product**. Tom Edwards, DVM, MS, DACVECC US Army Institute of Surgical Research / Texas A&M School of Veterinary Medicine

In person on Thursday, June 6:

- 13:45-14:45: **Diagnosing Ineffective Hematopoiesis: PIMA, IMN, and Beyond**. Cynthia Lucidi, DVM, PhD, DACVP (Clin Path) Michigan State University.
- 15:00-16:00: **Management of Ineffective Hematopoiesis**.
  Ari Jutkowitz, VMD, DACVECC Animal Ultrasound Services
- 16:30-18:00: **Translational Opportunities for Treating ITP and IMHA: How Human Medicine Could Inform Veterinary Advancements**.
  Marshall Mazepa MD University of Minnesota

Our SIG meeting is at Brit's Pub & Eating Establishment, 1110 Nicollet Mall, Minneapolis MN 55403 on **Friday, June 7, 2024**, 18:30 - 21:30 pm (Central). We are thankful to Alvedia Laboratories, HemoSolutions, Innovative Animal Supplies, and Nine Lives Blood Bank for their generous support of the evening.

Participating in the AVHTM Google Group is a benefit of membership. Members whose memberships have lapsed have a 30-day grace period to renew their membership before they are removed from the group. Be sure to keep your membership active to continue participating in our interactive online discussions!

Click here to ➡ JOIN/RENEW

Hope to see you!

June 7, 2024

RSVP here

AVHTM SIG at the ACVIM Forum
June 7, 2024 6:30 - 9:30 pm

We are very pleased to say that we will be joined by Dr. Tom Edwards DVM, MS, DACVECC whose talk is entitled '**Bark to the Future: Advancements in Canine Transfusions**'. He will focus on the changing transfusion practices in human healthcare and how these relate to veterinary medicine, including the use of chilled whole blood for use in trauma resuscitation. The lecture will also review recent trends in human transfusion medicine including the use of chilled platelets, freeze-dried plasma and liquid plasma. The presentation will discuss recent research into resuscitation from hemorrhagic shock using shelf stable canine blood products to include canine freeze-dried plasma and lyophilized canine platelets.

This SIG is exclusively available for AVHTM members and includes dinner and drinks. There are still a few spaces left so book quickly. There is a charge of $45 (or $10 for trainees), but attendance will mean that your AVHTM membership renewal cost (current or future depending on your membership status) is decreased by the same amount, essentially meaning a free dinner with excellent company!

Immune-mediated hematological disease in dogs is associated with alterations of the fecal microbiota: a pilot study

P.-Y. Liu, D. Xia, K. McGonigle, A. B. Carroll, J. Chiango, H. Scavello, R. Martins, S. Mehta, E. Krespan, E. Lunde, D. LeVine, C. L. Fellman, R. Goggs, D. P. Beiting & O. A. Garden

A recent study published in "Animal Microbiome," titled "*Immune-mediated hematological disease in dogs is associated with alterations of the fecal microbiota: a pilot study*" sheds light on the intricate relationship between gut microbiota and immune-mediated hematological diseases (IMHD), an important cause of morbidity and mortality in dogs. The study focuses on two common IMHDs in dogs, immune-mediated hemolytic anemia (IMHA) and immune thrombocytopenia (ITP), and is the first to examine the fecal microbiota of dogs with these diseases.

The inclusion of 21 affected dogs in the study – 17 with IMHA and four with ITP – along with 13 healthy control dogs, offers initial insight into alterations of microbiota associated with IMHD. The researchers employed 16S rRNA gene sequencing to profile the fecal microbiota of dogs affected by these conditions at different stages: at presentation and following treatment for 2 and 8 weeks.

One of the most striking findings was the significant change in the composition of fecal microbiota in diseased dogs compared to healthy controls. The study identified a decrease in the relative abundance of beneficial microbes like Treponema spp. (close to the pathogen of syphilis, but nonpathogenic) and an increase in pathobionts like Clostridium septicum and Escherichia coli in affected dogs. Moreover, the study highlights that novel combinations of fecal microbes belonging to Ruminococcaceae UCG-009 and Christensenellaceae R-7 group could potentially predict the risk of developing IMHA/ITP, an intriguing result that could have implications in the diagnosis and management of these diseases.

This study points to an association between IMHD in dogs and fecal dysbiosis, suggesting that specific bacterial genera could serve as biomarkers for the disease. This opens new avenues for research into diagnostic tools and therapeutic strategies, including potential microbial targets.

The full article is available at: https://animalmicrobiome.biomedcentral.com/articles/10.1186/s42523-023-00268-2

Dried Blood Spot Technique: Advancing Diagnostics in Resource-limited Settings

Maryam Chaudhary, Prof. Dr. Umer Farooq, Dr. Musadiq Idris, Dr. Mushtaq Hussain Lashari
The Islamia University of Bahawalpur

The dried blood spot (DBS) technique is an approach for collecting and storing blood/serum samples on filter paper for later analyses. It is especially effective in resource-limited settings of the developing/undeveloped countries where standard blood/serum collection and transportation methods may be challenging to access. This procedure involves applying a small amount of blood (usually a drop) onto an absorbent paper after being drawn through a capillary prick or from a vein. The biochemical components of the blood are preserved on the filter paper when the blood sample dries out and can be analyzed later on.

The DBS offers both notable advantages and disadvantages in diagnostics/prognostics. Many of its advantages include minimally invasive sample collection, reduced discomfort for patients and stress for animals, and cost-effectiveness in resource-limited areas, as it simplifies sample transport and storage. More often, it enables high-throughput screening and facilitates large scale epidemiological studies. However, there are also certain limitations of this technique. It may yield lower analyte concentrations compared to venipuncture, potentially affecting sensitivity, specificity and accuracy of the tests. Factors like hematocrit levels and blood viscosity can influence the sample quality, require careful consideration and may potentially lead to variability in results as well. Specialized training is needed for proper sample collection and analysis using this technique.

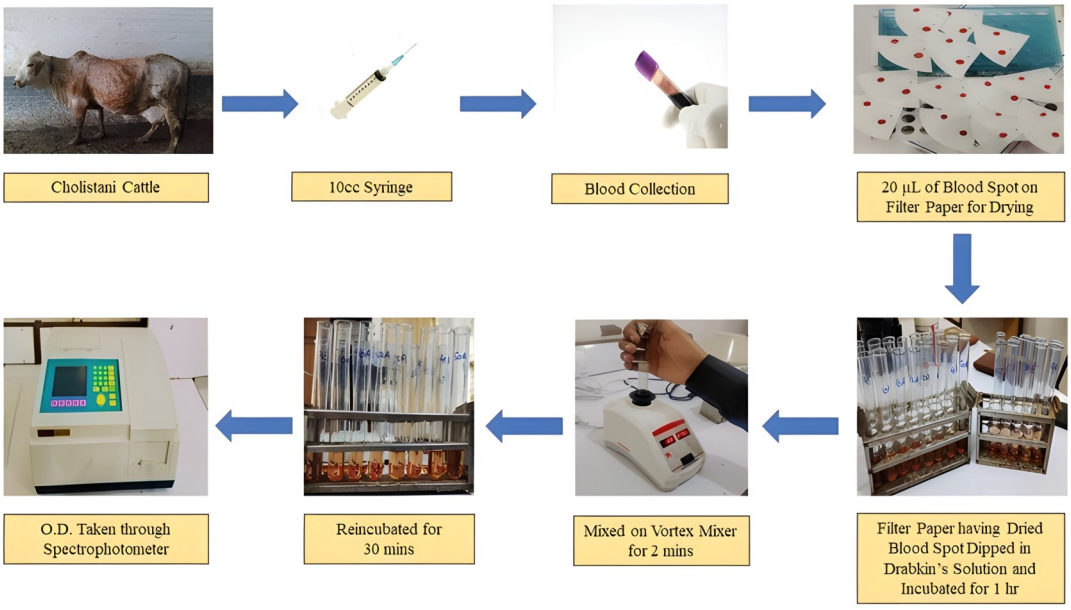
In rural or resource-poor settings of the world, the DBS technique offers crucial advantages. Firstly, it requires minimal equipment and infrastructure, making it accessible even in areas with limited healthcare resources. It reduces the need for proper storage and transportation, as the DBS samples are easier to handle making them an ideal option for resource-poor settings. In addition, DBS enables distant sample collection by eliminating the need for patients to travel long distances for blood draws, which might be burdensome in remote/distant areas. This makes it easier for the individuals to get screened and improves healthcare access for under-privileged populations.
In human medical science, the DBS technique is a versatile technique being used for various purposes such as in newborn screening of Phenylketonuria and hypothyroidism, and hemoglobin estimation. Furthermore, it is also being used as a diagnostic/prognostic approach for various viral diseases such as AIDS, SARS and hepatitis. Its implication has been validated in forensic toxicology for the screening of drugs and toxins in cases of poisoning or overdoses. In an array of clinical scenarios, DBS is an essential tool for effective, least invasive sample collection and processing.

Regarding veterinary medical science, the DBS technique has enabled disease screening for conditions like canine parvovirus and feline leukemia, as well as for monitoring the therapeutic drug levels to ensure optimal dosage and efficacy. Additionally, DBS technique has allowed for hormonal profiling, aiding in reproductive health assessment and diagnosis of endocrine disorders. However, there is still scanty work reported for the use of DBS in estimation of various hemato-chemical analytes in the resource-poor settings of the globe. If validated appropriately, this technique can be of pivotal advantage to those animals/herds which are being reared at far flung areas away from the laboratories. In addition, this sampling technique could also be utilized as point-of-care testing method in near future.

Continued on page 5

Continued from page 4

Dried Blood Spot Technique: Advancing Diagnostics in Resource-limited Settings



Graphical Abstract of Hemoglobin Estimation using Filter Papers through Dried Blood Spot Technique

The Department of Physiology, The Islamia University of Bahawalpur, Pakistan has lately been working on allied aspects of hematological validations for the livestock being reared under pastoralism in the Cholistan desert of Pakistan. In this perspective, we have earlier reported devising and validation of various hematological formulae and serum color charts for Cholistani livestock. Very recently, we have validated the DBS technique by using various filter papers, for estimation of hemoglobin in Cholistani cattle blood. And the research work is currently under review in an international peer-reviewed journal. In future, we aim to incorporate estimation of other hematochemical analytes by using DBS technique as well. By collaborating with animal healthcare providers, we aim to integrate the DBS technique into routine diagnostics/prognostics, particularly in under-developed areas such as the Cholistan desert of Pakistan. A positive critique and collaboration in any form is always welcome.

Relevant Articles

- Farooq et al. (2023). Investigating the potential of packed cell volume for deducing hemoglobin: Cholistani camels in perspective. *Plos One* 18(5): e02080659.
- Sharma et al. (2014). Dried blood spots: concepts, present status, and future perspectives in bioanalysis. *Drug testing and analysis*, 6(5), 399-414.
- Samsonova et al. (2022). Dried Blood Spots technology for veterinary applications and biological investigations: technical aspects, retrospective analysis, ongoing status and future perspectives. *Veterinary Research Communications*, 46(3), 655-698.

Recently Published Articles

- **Equine Platelet-Rich Plasma**. McCarrel TM. Vet Clin North Am Equine Pract. 2023 Dec;39(3):429-442. doi: 10.1016/j.cveq.2023.06.007. Epub 2023 Aug 5. PMID: 37550126 Review
- **Lower centrifugation speed and time are positively associated with platelet concentration in a canine autologous conditioned plasma system**. Goodale MB, Phelps HA, Barnhard JA, Shoben AB, Brunke MW. J Am Vet Med Assoc. 2023 Aug 4;261(11):1-6. doi: 10.2460/javma.23.04.0218. Print 2023 Nov 1. PMID: 37541674
- **Evaluation of hemostatic derangements associated with canine anaphylaxis and the relationship to syndrome severity**. Smith MR, Wurlod VA, Liu CC. J Vet Emerg Crit Care (San Antonio). 2023 Nov-Dec;33(6):648-655. doi: 10.1111/vec.13345. Epub 2023 Nov 14. PMID: 37962436
- **Evaluation of platelet additive solution for prolonging storage of functional canine platelet concentrate**. Arjoonsingh A, Haines JM, Hwang JK, Guess SC, Wardrop KJ. J Vet Emerg Crit Care (San Antonio). 2023 Nov-Dec;33(6):656-664. doi: 10.1111/vec.13335. Epub 2023 Aug 28. PMID: 37639315
- **Assessment of ethynylestradiol-3-sulfate on coagulation, metabolism, and survival in pigs with traumatic hemorrhage**. Martini WZ, Xia H, Le TD, Cap AP. J Trauma Acute Care Surg. 2023 Nov 1;95(5):746-754. doi: 10.1097/TA.0000000000004031. Epub 2023 Jul 11. PMID: 37431975
- **Therapeutic applications of canine platelets and their derivatives: a narrative review**. Bharti D, Ajith Y, Sharun K, Banu SA, Kumar A, Bhardwaj A, Sidar SK, Dhaleshwari. Top Companion Anim Med. 2024 Jan-Feb;58:100840. doi: 10.1016/j.tcam.2023.100840. Epub 2023 Nov 17. PMID: 37979613 Review
- **Major crossmatch compatibility of rabbit blood with rabbit, canine, and feline blood**. Dannemiller NG, Ozawa SM, Petritz OA, Musulin SE. J Vet Emerg Crit Care (San Antonio). 2024 Mar-Apr;34(2):116-122. doi: 10.1111/vec.13362. Epub 2024 Feb 26. PMID: 38407442
- **Effect of leukoreduction on the metabolism of equine packed red blood cells during refrigerated storage**. Miglio A, Rocconi F, Cremonini V, D'Alessandro A, Reisz JA, Maslanka M, Lacroix IS, Tiscar G, Di Tommaso M, Antognoni MT. J Vet Intern Med. 2024 Mar-Apr;38(2):1185-1195. doi: 10.1111/jvim.17015. Epub 2024 Feb 26. PMID: 38406982 Free PMC article
- **Discordance between ABC blood phenotype and genotype in a domestic short-haired cat**. Ginoudis A, Canard B, Kehl A, Giger U, Koutinas C, Christoforaki S, Smyroglou E, Polizopoulou Z, Mylonakis ME. J Vet Intern Med. 2024 Jan-Feb;38(1):358-362. doi: 10.1111/jvim.16927. Epub 2023 Nov 3. PMID: 37921544 Free PMC article
- **Transfusion-associated hyperkalaemia in an anaesthetized dog following infusion of packed red blood cells**. Felisberto R, Tayari H. Vet Anaesth Analg. 2023 Nov;50(6):532-534. doi: 10.1016/j.vaa.2023.09.001. Epub 2023 Sep 16. PMID: 37838580 No abstract available
- **Nondomestic Felid *ABC* Blood Phenotyping, Genotyping, and Crossmatching**. Parkinson L, Kuder H, Kehl A, Koenig A, Good J, Hausmann J, Giger U. J Zoo Wildl Med. 2024 Mar;55(1):143-154. doi: 10.1638/2023-0025. PMID: 38453497
- **Effect of leukoreduction on the omics phenotypes of canine packed red blood cells during refrigerated storage**. Miglio A, Rocconi F, Cremoni V, D'Alessandro A, Reisz JA, Maslanka M, Lacroix IS, Di Francesco D, Antognoni MT, Di Tommaso M. J Vet Intern Med. 2024 Mar 29. doi: 10.1111/jvim.17031. Online ahead of print. PMID: 38553798

Recently Published Articles - continued

- **Development and Implementation of a Standard Operating Procedure for Military Working Dog Blood Collection, Storage, and Transport.** Evernham EL, Fedeles BT, Knuf K. J Spec Oper Med. 2024 Mar 13:BLVF-5C1M. doi: 10.55460/BLVF-5C1M. Online ahead of print. PMID: 38360026
- **Safety evaluation of a buffer used in the lyophilization of canine platelets: type I hypersensitivity reaction in dogs caused by bovine serum albumin**. Choi HJ, Kim MY, Han HJ. Front Vet Sci. 2024 Feb 12;11:1344037. doi: 10.3389/fvets.2024.1344037. eCollection 2024. PMID: 38410739 Free PMC article
- **Retrospective evaluation of admission total plasma protein as a predictor of red blood cell transfusion requirement in dogs diagnosed with traumatic and nontraumatic hemoabdomen: 90 dogs (2009-2019)**. Buseman M, Blong AE, Yuan L, Mochel JP, Walton RAL. J Vet Emerg Crit Care (San Antonio). 2024 Jan-Feb;34(1):76-80. doi: 10.1111/vec.13343. Epub 2023 Nov 13. PMID: 37961036
- **Evaluation of post-transfusion RBC alloimmunization in dogs using a gel-column crossmatch with and without anti-canine globulin enhancement**. Thomas-Hollands A, Hess RS, Weinstein NM, Fromm S, Chappini NA, Marryott K, Callan MB. J Vet Diagn Invest. 2024 Mar;36(2):213-221. doi: 10.1177/10406387231222895. Epub 2024 Jan 11. PMID: 38212878 Free PMC article
- **Prevalence of subclinical infectious agents in a blood donor population tested on every donation**. Correia B, Magalhães A, Rocha L, Cardoso I, Ferreira RRF, Mesa-Sanchez I. J Small Anim Pract. 2024 Mar;65 (3):176-180. doi: 10.1111/jsap.13698. Epub 2024 Jan 7. PMID: 38185815
- **An 18-µm microaggregate blood filter does not cause hemolysis during in vitro whole blood transfusions in sea turtles.** Dannemiller NG, Lynch AM, Christiansen EF, Harms CA. Am J Vet Res. 2024 Feb 15:1-8. doi: 10.2460/ajvr.23.12.0269. Online ahead of print. PMID: 38346384
- **Caprine whole blood appears sufficiently stable after 21 days in storage to be suitable for transfusion**. Neill HM, Scully CM, Liu CC, Baker RE. J Am Vet Med Assoc. 2024 Jan 3;262(3):391-396. doi: 10.2460/javma.23.08.0434. Print 2024 Mar 1. PMID: 38171086
- **Efficacy of therapeutic plasma exchange in a case of severe, generalised canine pemphigus foliaceus**. Edmonds KB, Her J, Langston C, Jennings R, Diaz S. Vet Dermatol. 2024 Apr;35(2):247-251. doi: 10.1111/vde.13218. Epub 2023 Dec 4. PMID: 38044720
- **Extreme erythrocytosis in a cat reverts after short-term treatment with hydroxyurea and the cat remains healthy for years**. Billström-Saxon J, Giger U. J Am Vet Med Assoc. 2024; 7:13. https://doi:10.2460/javma.23.11.0659. PMID: 38452480
- **Delayed haemolytic transfusion reaction in a Lhasa Apso with Dal- blood type**. Walton JE, Euler CC, Giger U, Tappin S, Hale AS. Vet Rec Case Rep. 2024; e850. https://doi.org/10.1002/vrc2.850
- **Increased susceptibility to Mycobacterium avium complex infection in miniature Schnauzer dogs caused by a codon deletion in CARD9**. Mizukami, K., Dorsey-Oresto, A., Raj, K., Eringis A, Furrow, E., Martin,E., Yamanaka, D., Kehl, A., Kolicheski, A., Jagannathan, V., Leeb, T., Lionakis, M.S., Giger, U. Sci Rep 14, 10346 (2024). https://doi.org/10.1038/s41598-024-61054-x

AVHTM
ASSOCIATION OF VETERINARY HEMATOLOGY AND TRANSFUSION MEDICINE

We're on the web!

www.avhtm.org

AVHTM

PO Box 1234
Sahuarita AZ 85629-1004

AHVTM is an IRS approved 501(c)(3) nonprofit professional association composed of veterinarians, hematologists, academics, veterinary technicians, blood bankers, and interested public who desire to further scientific advances in transfusion medicine and veterinary hematology.

We engage in veterinary research, promote industry standards, develop guidelines for canine and feline blood collection and processing, and publish scientific research in peer-reviewed publications.

Visit us online to learn more about AVHTM!

MEMBERSHIP BENEFITS

As an AVHTM member, you are eligible for the following:

- Reduced IVECCS registration fee (veterinarians save $100 and technicians save $25!)
- Access the a "Members Only" section of the AVHTM website, which includes access to:
  - Other AVHTM profiles
  - PubMed articles
  - Forum for posting questions, cases, and research
- Ability to ask and answer questions posted to the AVHTM members-only Google group.

Please feel welcome to share this newsletter with interested colleagues and encourage them to become an AVHTM member!