

DoveLewis[®]
**Third Thursday
Rounds**

August 19, 2021

**Hemostasis: A Review of
Inherited Disorders**

Presented by

Barbara Davis, DVM, DACVIM

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Virtual Third Thursday: Attendee FAQ's

Do I need to create my own Zoom account to attend?

No. You can access the webinar through the link in your confirmation email. Click the link that says, "Click Here to Join" at the time of the lecture.

Is there someone to help if I have trouble accessing the lecture?

Yes. Please reach us at contact@dovelewis.org if you're experiencing difficulties joining the meeting. During the lecture, you can use the "Raise Hand" function and someone will be able to help you.

Is attendance tracked?

Yes. As you register for the Zoom meeting, you will be asked to enter your information. Attendance is tracked for RACE records.

Is this lecture RACE approved?

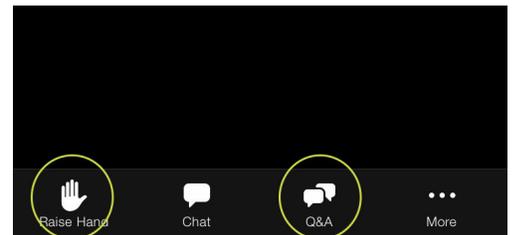
Yes. This lecture is RACE-Approved for one Interactive-Distance CE credit. You will receive an emailed certificate of attendance within one business day after the event.

Will I be able to ask questions?

Yes. If you have questions during the lecture, please use the Q&A function to submit your question. We will save questions for the end of the lecture.

Will I be able to talk?

No. All attendees will be in listen-only mode. If you have a question or need help, the Q&A or Raise Hand function.



Will the presenter or other attendees be able to see me?

No. All attendees will only have the capability to listen to the presenter.

How will I get my certificate?

You must register by using the Zoom link to prove attendance. You will receive an emailed certificate of attendance within one business day after the event.

Do I have to answer the poll questions?

No. The poll questions are optional, but we encourage you to try!

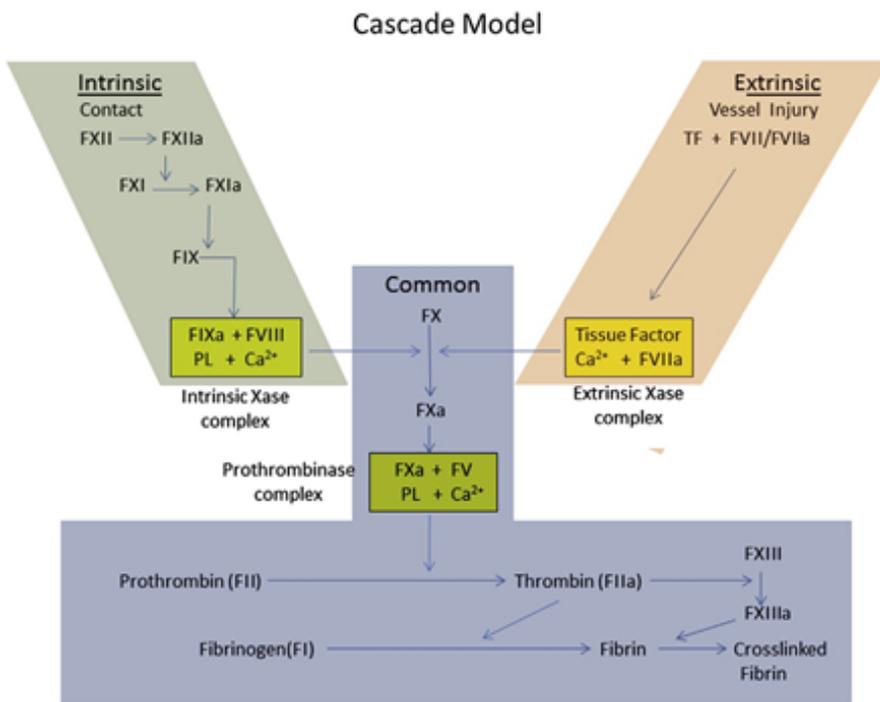
Can I record the lecture?

No. The lecture will only be recorded by DoveLewis, and will likely be available on atdove.org at a later date.

For more support, please email contact@dovelewis.org

Review of hemostasis – 3 phases

- Primary – platelet/vascular phase
- Secondary – clotting factor phase
- Fibrinolysis



Brooks MB, Catalfamo JL. Current Diagnostic Trends in Coagulation Disorders Among Dogs and Cats, Vet Clin Small Anim 43 (2013) 1349-1372

Approach to bleeding patient:

- A complete history and physical examination should be performed.
- Sites of bleeding can help differentiate what phase of bleeding is affected (see chart below).
- Perform a CBC, chemistry and urinalysis to start followed by specific testing for hemostatic disorders such as BMBT, clotting times, etc.

Primary hemostatic disorders

- Petechiae common
Thrombocytopenia usually
- Mucosal bleeds
Thrombopathia usually
- Hematomas rare
- Prolonged bleeding from cuts

Secondary hemostatic disorders

- Petechiae rare
- Bleeds into joints, muscle, cavities
- Hematomas common
- Bleeding may be delayed at onset, or stop and start again.

Testing for hemostatic disorders:

- Primary: BMBT (< 4minutes normal for dog), platelet aggregate testing, genetic testing, vWF assays
- Secondary: Clotting times (PT/PTT) and clotting factor activity assay
 - PT assess the extrinsic and common pathways
 - PTT assess the intrinsic and common pathways

Inherited bleeding disorders:

Primary hemostatic disorders are more common than secondary hemostatic disorders.

The most common inherited bleeding disorder is von Willebrand disease. The most common secondary bleeding disorder is hemophilia A, followed by hemophilia B.

It isn't as important to remember all the inherited disorders as is it to be able to reference a list of disorders and breeds associated with the particular disorder.

Please note that the as time goes on and genetic testing improves, the list continues to grow so literature searches are also important.

Inherited Primary Bleeding Disorders:

Disorder	Defect	Definitive Test	Breeds
vWD Type I	Low VWF concentration; residual protein has normal structure and function	vWF:Ag assay	Numerous breeds: Airedale, Akita, Bernese mountain dog, Dachshund, Doberman pinscher, German shepherd, Golden retriever, Greyhound, Kerry blue terrier, Manchester terrier, Mini pinscher, Papillon, Pembroke Corgi, Poodle, others
vWD Type II	Low VWF concentration; selective loss of largest multimers	vWF:Ag assay + collagen binding assay OR Multimer analysis	German shorthaired and wirehaired pointers
vWD Type III	Complete lack of vWF	vWF:Ag assay	Dutch kooiker, Scottish terrier, Shetland sheepdog, Border collie, Chesapeake retriever, Cocker spaniel, Labrador retriever, Maltese, Pomeranian
P2Y12 receptor mutation	ADP receptor mutation causing PLT aggregation defect	Genetic testing at Auburn University	Greater Swiss Mountain Dogs
Procoagulant Deficiency (Scott's Syndrome)	Failure of phosphatidylserine externalization which promotes thrombin formation	Flow Cytometry	German Shepherds
Glanzmann's thrombosthenia	Deficiency of the glycoprotein receptor IIb-IIIa. Aggregation defect	Genetic testing at Auburn University	Great Pyrenees, Otterhounds
Thrombopathia	Impaired glycoprotein receptor IIb-IIIa function. Aggregation defect	Genetic testing at Auburn University	Basset hound, Landseer, Spitz
Storage Pool Disorder	Aggregation defect	Increased ATP:ADP ratio	American Cocker Spaniel
Macrothrombocytopenia	NO DEFECT. Low platelet numbers. Large platelets.	Genetic testing at Auburn University	Cavalier King Charles Spaniel. Other breeds: Norfolk terriers, Cairn terriers, chihuahua, Labrador, poodle, shih tzu, etc

Inherited Secondary Bleeding Disorders:

Disorder	Defect	Definitive Testing	Breeds
Hemophilia A	Factor 8 deficiency	Factor analysis	Mostly male. German Shepherd. Many other breeds.
Hemophilia B	Factor 9 deficiency	Factor analysis	Mostly male Many breeds
Factor XI deficiency	Factor XI deficiency	Factor analysis	Kerry Blue terrier, Springer Spaniel, Great Pyreneese, Weimaraner
Factor XII deficiency	No clinical bleeding	Factor analysis	Most common disorder in cats!

Treatment:

- Avoidance of rough play, unnecessary trauma, optimal dental hygiene, and non-essential surgical procedures are important preventative measures.
- Avoidance of antiplatelet drugs and non-steroidal anti-inflammatory drugs or weaning well before any elective surgeries is an important part of prevention.
- Blood products primarily – pre-emptively prior to surgery OR for severe hemorrhage
 - Thrombopathia patients will need platelet transfusions
 - vWD and coagulopathy patients will need one of the blood products listed below in the chart
- No cures at this time
- Gene therapy has been performed in dogs with Hemophilia A which minimizes/decreases spontaneous bleeding episodes but this is not a cure

Table 2
 Blood products and their use in selected coagulation disorders

Product	Dose	Disease Indication
Fresh-frozen plasma	10-20 mL/kg	All factor deficiencies, DIC, vWD
Frozen plasma	10-20 mL/kg	Vitamin K antagonist poisoning (replace all factors except V, VIII, and vWF)
Cryoprecipitate	1 unit/10 kg	Hemophilia A, vWD, hypofibrinogenemia
Cryosupernatant	10-20 mL/kg	Hemophilia B, factor II, VII, IX, X, XI deficiency
Recombinant human factor VIIa	35-120 µg/kg	Factor VII deficiency, to augment therapy in DIC, hemophilia A or B

Barr JW, McMichael M. *Inherited Disorders of Hemostasis in Dogs and Cats. Top An Comp*, 27 (2012) 53-58.

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My Lecture Notes

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DoveLewis Veterinary Emergency & Specialty Hospital
1945 NW Pettygrove St. Portland, OR | P 503-228-7281 F 503-228-0464 W dovelewis.org

VetWrap

Volume 15, Issue 2

Stabilizing Thoracic Limb Fractures

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04 How to Get What You Need

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12 Blocked: Urethral Obstructions in the Male Cat

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WHAT WE BRING

HUMAN STORIES IN VETMED

ATDOVE.ORG'S NEW PODCAST HIGHLIGHTS THE HUMANS BEHIND THE ANIMALS WE CARE FOR

This past year has had a unique impact on the veterinary industry as we all have had to adjust to new protocols, increased patient counts, and more.

Our new podcast, *What We Bring*, offers an inside look at the stories and experiences of people who care for our pets. We hope you'll join us!

ABOUT THE SHOW

When we walk onto the floor for our shift, we all bring with us our own unique stories. *What We Bring* examines the human experiences of those working in veterinary medicine, from the front desk to the O.R. Join DoveLewis Veterinary Well-Being Director Debrah Lee, LCSW, as she explores the real human stories behind the animals we care for.

We hope this podcast will shine a light on the experiences (good and bad) we bring with us to the clinic, and help move us towards greater openness and understanding as an industry. We know that not every lesson can be found in textbooks and training plans, so we're turning to each other to connect, listen, learn, and grow.



WHERE TO FIND US

Click [here](#) to listen to the first episode where we explore imposter syndrome, client compassion, and more with emergency CVT Kara.



MEET HOST DEBRAH LEE, LCSW

Debrah Lee, LCSW, joined the DoveLewis team in 2020 as the Veterinary Well-Being Program Director. Coming from a background in human healthcare, Debrah has long had an interest in how emotionally-demanding medical settings affect both patients and providers. Debrah brings a compassionate presence and deep appreciation for the human experiences that connect us, and she is eager to learn more from veterinary professionals about their experiences within the world of veterinary medicine.



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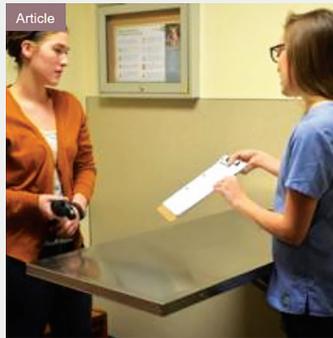
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