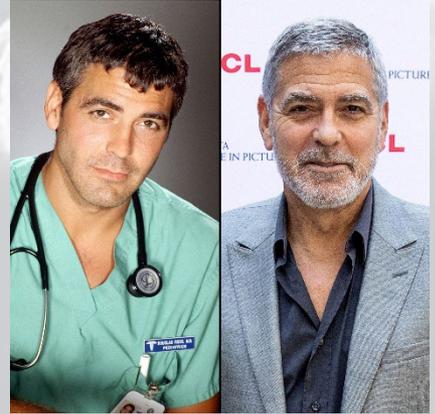


**Something Wicked  
This Way comes...**

*Bleeding and Poisoned  
Patients  
From Recent Case Files*



**Heidi Houchen, DVM  
VCA Northwest Veterinary Specialists  
Clackamas, OR 97015**



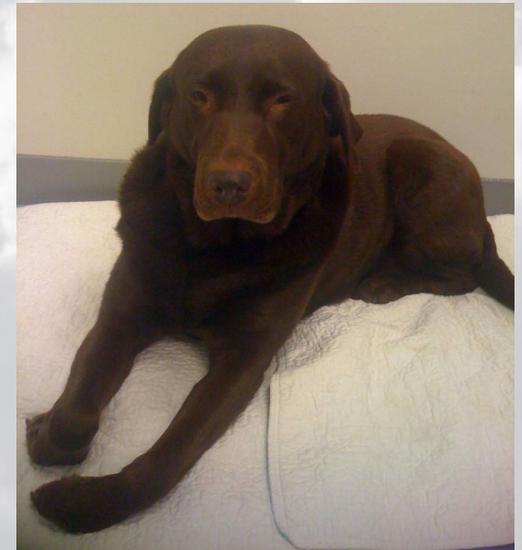


*“Small team dynamics in a high pressure situation”*



# Molly walks into the hospital...

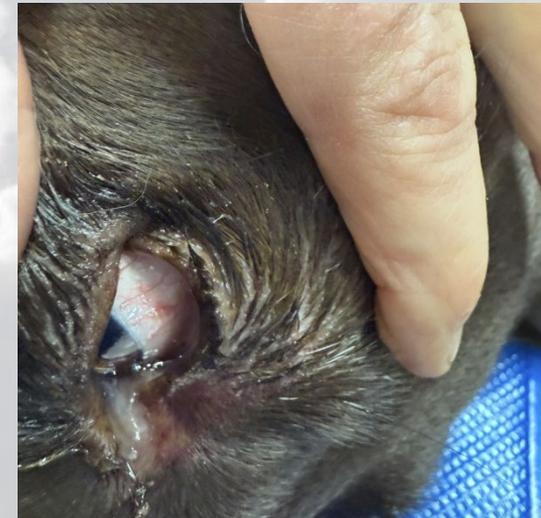
- 8 yr F/S Chocolate lab
- Lives on a farm with access to livestock, wildlife, forest, and water
- At home: 3 day hx of anorexia, intermittent vomiting—blood tinged, bloody gelatinous diarrhea
- Primary Care DVM on 4<sup>th</sup> day: Enlarged lymph nodes. Lethargic, anorexic, pyrexia at 105.4. Fecal Negative.
- Given fluids, started on oral antibiotics, and sent home on supportive care (O declined hospitalization)
- Three days at home (Day 7) no improvement – to ER



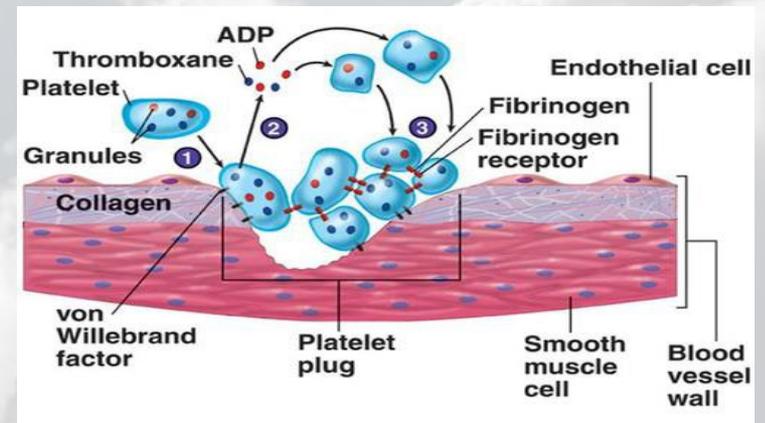
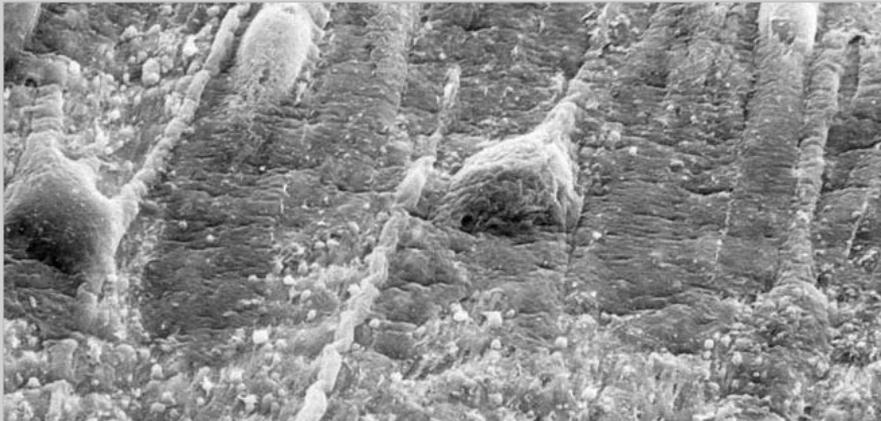
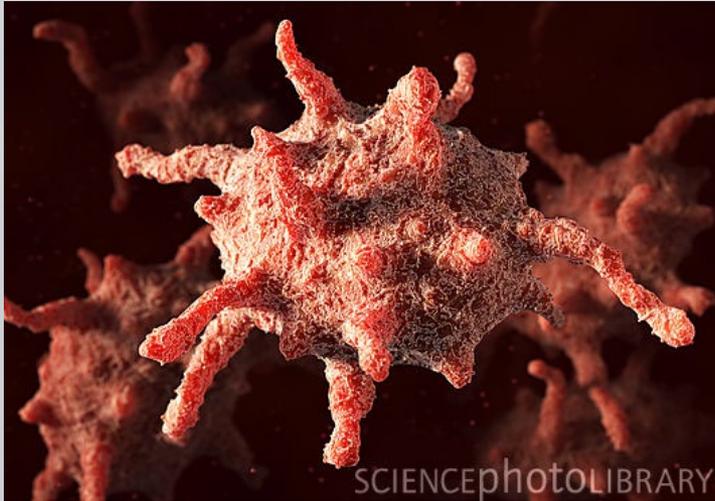
# PE:



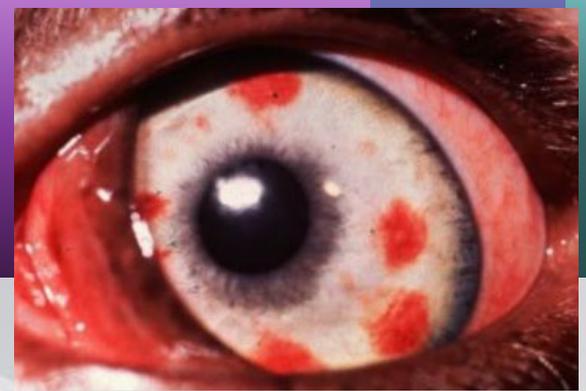
- Depressed, weak, lethargic, dehydrated, anorexic, regurgitating
- HR 160
- Bloodwork show mild neutrophilia, mildly elevated liver enzymes, and (thrombocytopenia of 44,000)
- Fecal negative
- Ultrasound showed fluid filled loops of bowel, ileus
- Hospitalized for intensive fluid resuscitation, treatment of clinical signs, and supportive care, and potentially more diagnostics.



# Primary Hemostasis: Phase of interaction between platelets and the blood vessel wall.



# Primary Hemostatic Abnormalities



- Vascular Disorders: rare – r/o other causes
- Thrombocytopenia
- Thrombopathy (Platelet dysfunction)



- **Petechiae**
  - These can “ooze together” and form an ecchymosis (bruise)
- **Epistaxis**
- **Oral and gingival bleeding**
- **Hematemesis**
- **Hematuria**
- **Melena**
- **Hematochezia**

# Considering Molly's Hx, PE, Labwork:

Thrombocytopenia, bloody stool, vomiting, dehydrated, pyrexia, enlarged lymph nodes...

## *Thoughts?*

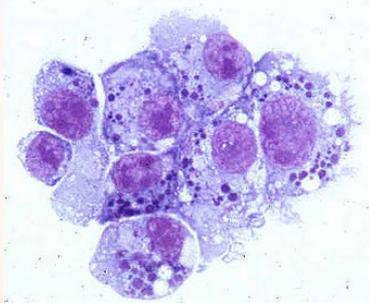
- Rule-Outs?

- *Degenerative*
- *Anomalous (developmental)*
- *Metabolic*
- *Neoplastic (cancer/nutritional)*
- *Infectious/Inflammatory/Immune/Iatrogenic/Idiopathic*
- *Traumatic/Toxic*
- *And Vascular..... sometimes*

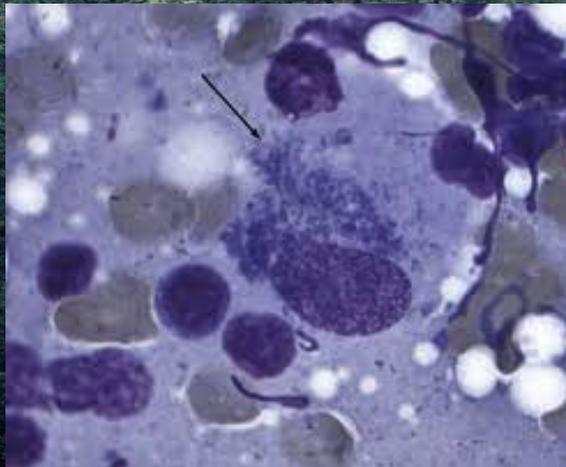
# Salmon Poisoning Disease



What is the “poison” in salmon poisoning?



The organism *Neorickettsia helminthoeca*, which embeds with *Nanophyetus salmincola*, a fluke present in raw fish, is what causes salmon poisoning disease.



Lymph node aspirate showing histiocyte with the gram negative pleomorphic obligate intracellular *Neorickettsia helminthoeca*

Illustration: Sykes: Salmon poisoning in dogs  
Chapter 31 Canine and Feline Infectious Diseases

And how did it get from the fish to the dog?



Glad you asked 😊

*Hold on as this is an "E" ticket ride in Parasitology Land...*

# The Coolest Parasitic Life Cycle EVER

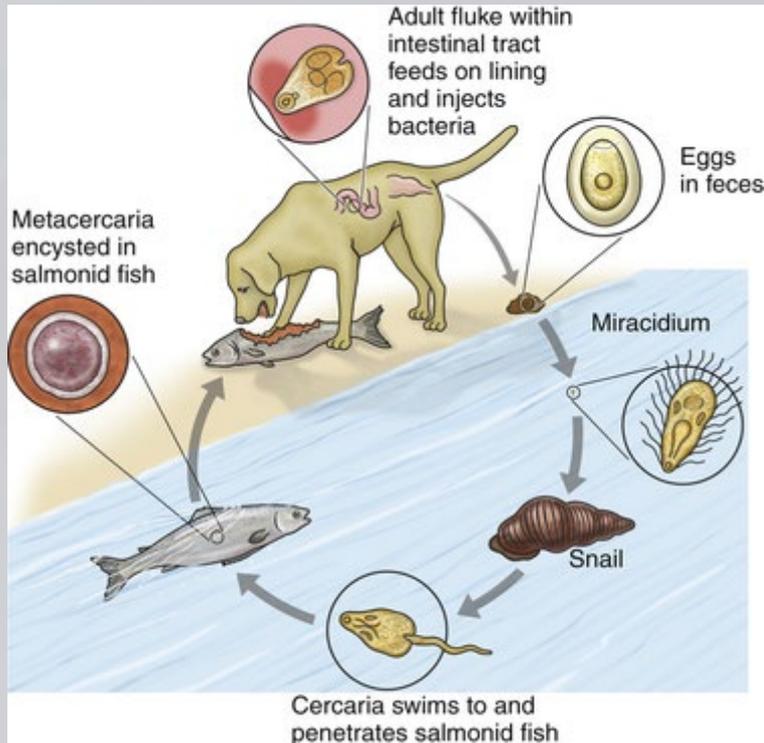


Illustration: Sykes: Salmon poisoning in dogs  
Chapter 31 Canine and Feline Infectious Diseases

The host (there are 32 known hosts- birds and mammals) defecates the eggs of a fluke (*Nanophyetus salmincola*) into water.

The flukes hatch.

The flukes infect a snail (first host) (*Juga plicans*).

The flukes mature, leave the snail & enter the water.

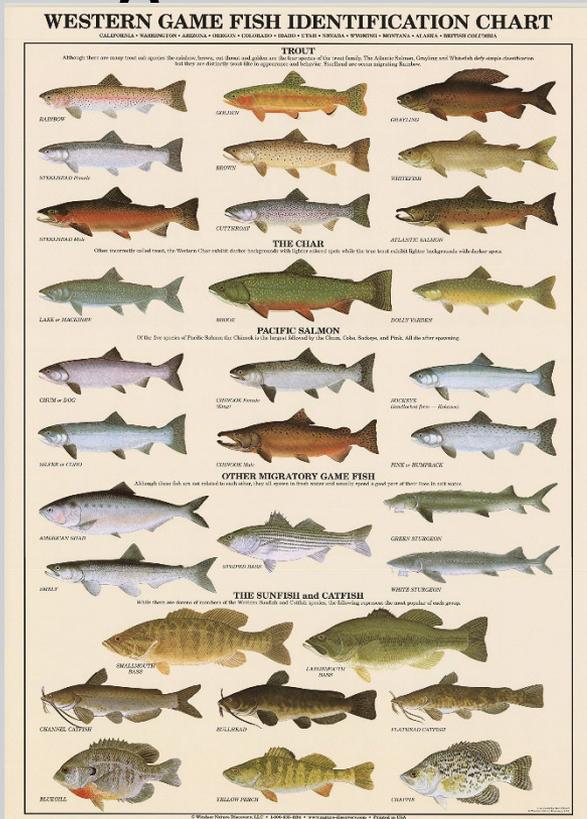
The flukes infect a fish (second host).

The fish (infected with the fluke) is eaten by a bird or mammal (third host).

The fluke lays eggs in the digestive tract to be defecated, completing the life cycle.

If the third host is a canine (fox, coyote, wolf, or dog), the bacteria (*Neorickettsia helminthoeca*) that is present in the fluke throughout its lifecycle, attacks the lymph nodes.

# Who are the fish, that the dogs eat, that makes them sick?



Salmonid fish such as salmon, trout, steelhead, sturgeon and perhaps other fish such as the lamprey, sculpin, reddsider shiner, and shad who spend their lives in coastal streams and rivers in the Pacific Northwest can be infected with the organism *Neorickettsia helmonthoeca*.



# Where is this place...that harbors the fish... that the dogs eat....that make them sick?

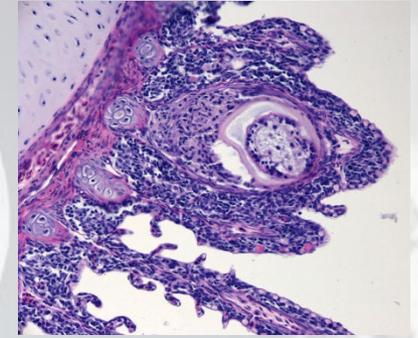


What lives in this place ... that carries this fluke.....that carries the disease...that makes the dog very sick when it eats the fish? ?

Illustration: Sykes: Salmon poisoning in dogs  
Chapter 31 Canine and Feline Infectious Diseases



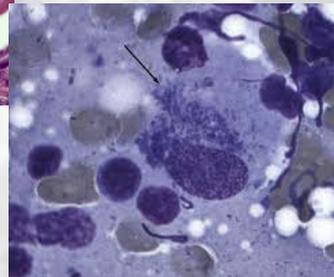
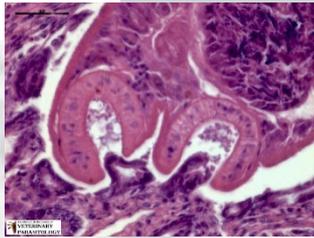
What do the flukes look like.... that live in the fish... that lives in this place ...  
that carries the disease...that makes the dog very sick?



In the tissues of the fish, the parasite forms cysts (metacercaria)--- small black spots.

If there are millions of the flukes, entire organs can appear black.

How does this dog...  
that eats the nasty fish...  
that ate the nasty snail...  
that was infected by the nasty fluke ... get sick?



# In a nutshell... (or a fish scale...)

- Fluke is ingested and attaches via rostral and ventral suckers to GI villi
- The bacteria (*Neorickettsia helminthoeca*) is then “injected”/ gains access to histiocytes (“wandering macrophages”) via an incompletely understood mechanism
- *Neorickettsia* attach to membrane receptors on the surface of target cells
- *Neorickettsia* then spreads via lymphatic vessels to the regional lymph nodes and also hematogenously throughout the body and **infect mainly endothelial cells**, but also to a lesser extent, macrophages, in the skin, lungs, brain, liver, gastrointestinal tract, kidneys, heart, and other organs.
- *And although the mechanisms responsible for cell injury and vascular denudation remain poorly understood...*
- Rickettsiae infiltrate both the vascular wall and perivascular space leading to increased vascular permeability: Hemorrhage, edema, hypovolemia, hypotension, reduced perfusion of organs, ARDS, and CNS abnormalities.

# What does this illness look like....that happens after the dog eats the nasty fish... that ate the nasty snail... that was infected by the nasty fluke?



- The first clinical sign is pyrexia; body temp can return to normal or sub normal in 4-8 days



- Anorexia
- Vomiting
- Lymphadenopathy
- Diarrhea (orangish, bloody, can progress to liquid)
- Weakness
- Dehydration
- Weight Loss
- Other findings: periocular edema and or discharge







Place IV catheter, draw blood for CBC/Chemistry, obtain fecal sample  
 Fluid resuscitation as necessary for shock/dehydration : often significant fluid loss secondary to diarrhea & vomiting

If vomiting (or nauseous):

- Maropitant , Dolasetron, Ondansetron

If diarrhea is severe, consider:

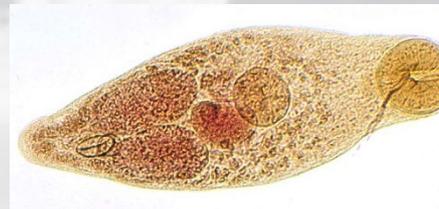
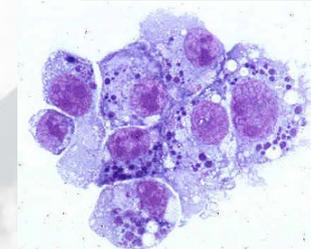
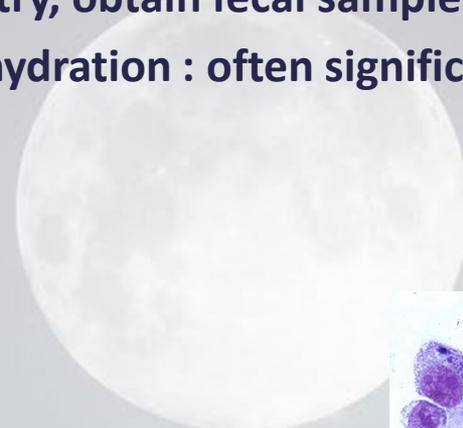
- Metronidazole IV or PO

For Rickettsia:

Doxycycline 10 mg IV BID, then PO when able, usually 5-7 day course is effective

Deworming for fluke (Nanophytetus salmincola):

- Praziquantal



# Treatment: Complications/Considerations



**Hypovolemia, hypoproteinemia, anemia secondary to volume or blood loss secondary to vomiting and diarrhea: treatment with plasma, red blood cells, canine albumin, or synthetic colloids.**



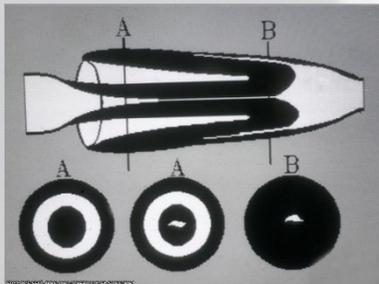
**Vomiting and anorexia unresponsive to antiemetics : partial parenteral nutrition or placement of a feeding tube may be needed.**





# Treatment : Complications and Considerations

Intussusception –monitor throughout hospitalization; requires surgical intervention.



# “Dolly”



- **“Dolly” Doberman Pinscher 3 Yr F/S**
- **Diagnosed with Salmon Poisoning**
- **3-5 days signs – then to Primary Care Vet**
- **Treated with Doxycycline**
- **Came back with encephalitis signs**
- **Referred to Neurologist –placed in ICU**
- **Treated supportively and continued ab’s**
- **Responded and in ICU 3 days**
- **Went home – did well for two days at home**
- **Came back acutely collapsed with stroke –like signs and was euthanized**

# Our Girl Molly:

- IV Fluids
- Maropitant
- Ondansetron
- Visbiome
- Propectalin
- Doxycycline
- Cisapride
- Entyce
- Metoclopramide
- Gabapentin
- Methadone
- Praziquantel
- Continued palpation of GI tract
- AUS
- NG tube placement – aspiration and feeding
- Continued intensive fluid support
- Discharged after 5 days of ICU care

# Prevention: What to Counsel Owners:



1. DO NOT let dogs eat any salmon carcasses while out on walks along streams and river
2. DO LEASH your dog at the beach or river so you can monitor its activities
3. DO NOT feed salmon to your dog or let your dog consume any parts of a salmon from the Pacific Northwest of the United States.
4. DO NOT feed any raw or undercooked salmon to your dog.
5. DO COOK your salmon to an internal temperature of 150°F in order to kill the fluke and bacteria.
6. DO FREEZE your fillets to -4°F for at least 7 days may also kill the fluke and bacteria (cooking to high temperature is more reliable).
7. DO PROPERLY WRAP AND DISCARD of all salmon scraps after gutting and cleaning your fish

# Points to Ponder ...

1. Polka Dots don't lie ...
2. Consider where you live  
(i.e., in the PNW, when you hear a pounding noise, think swimbladders and not hoofbeats.)
3. Profiling is good in dogs, bad in people  
(labs gonna be labs)

.....SO... treat early and aggressively if you suspect salmon poisoning



# Text:

Mon, Nov 17 at 9:38 PM

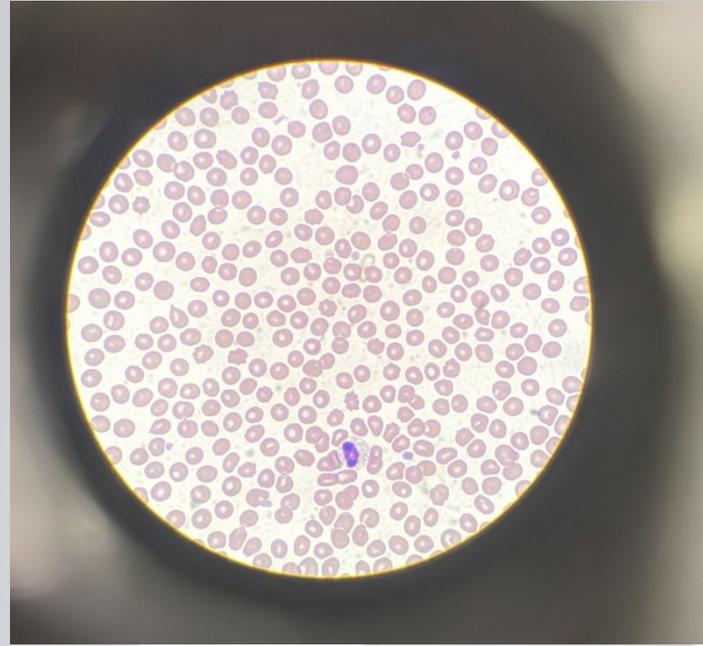
I think I have a rattlesnake  
ebvenlmatoln



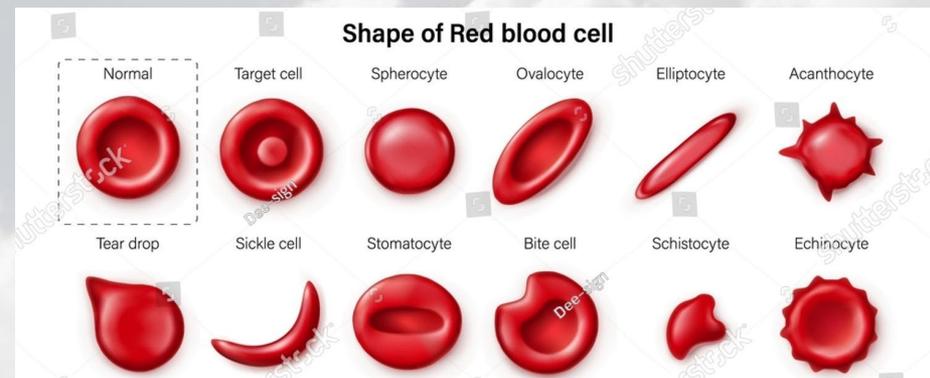
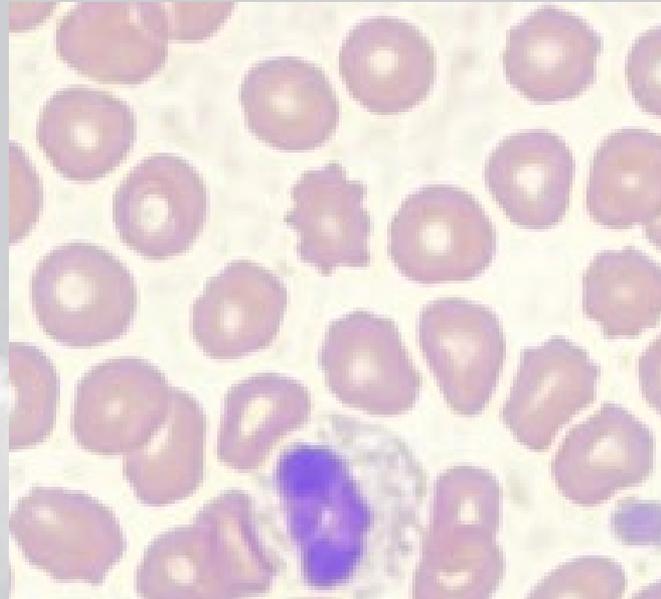
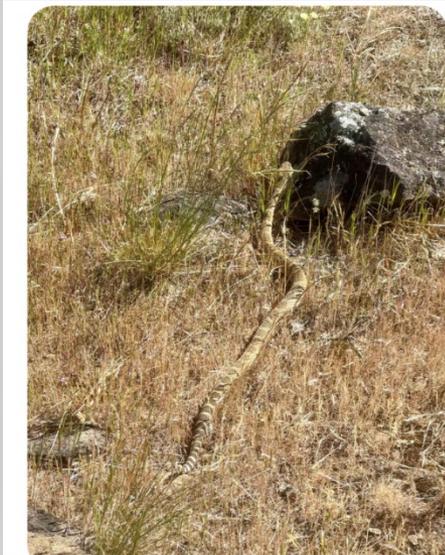
# Matilda

- Hx: 5 year old F/S Australian Shepherd
- No prior medical history of issues
- Hiking north of Bend – high desert area
- Came back from off trail excursion slightly subdued
- Noticed an hour later at home, nose swelling up
- Wound on edge of the nose and bleeding
- Bleeding not profuse but: ***did not stop***

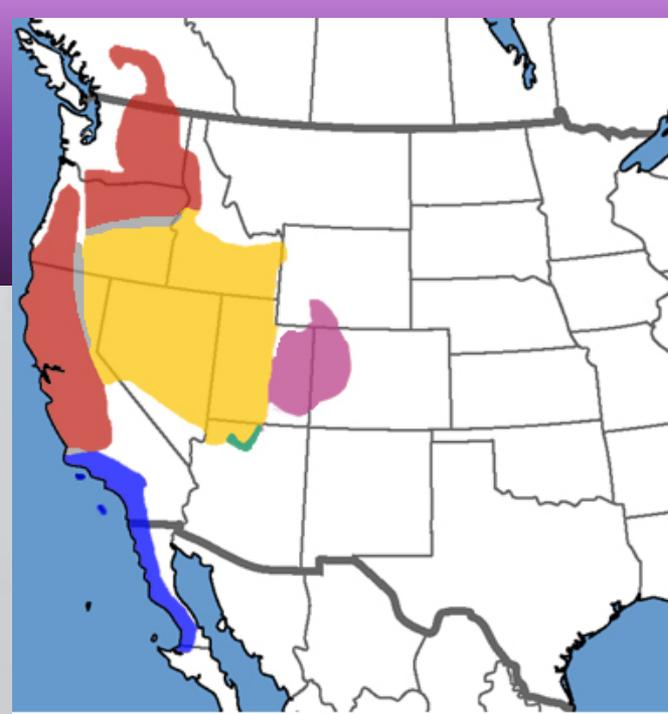
*Thoughts?*



# Snakes even scare the RBC's



# One pit viper in Oregon: West slope Cascades N. California through WA.



Approximate Distribution of *Crotalus oreganus* - Western Rattlesnake

- *C. o. abyssus* - Grand Canyon Rattlesnake
- *C. o. concolor* - Midget Faded Rattlesnake
- *C. o. helleri* - Southern Pacific Rattlesnake
- *C. o. lutosus* - Great Basin Rattlesnake
- *C. o. oreganus* - Northern Pacific Rattlesnake
- Intergrades

Climate Change Effects on Venomous Snakes: Distribution and Snakebite Epidemiology

April 2022

DOI:10.4018/978-1-6684-5678-1.ch066

In book: Research Anthology on Ecosystem Conservation and Preserving Biodiversity (pp.1381-1396)

**Triangular head, heat sensing depression “pit”**

**Pit viper venom contains toxins that damage blood vessels, red blood cells, alter clotting + cause a large amount of tissue destruction.**

**Swelling at the envenomation site, a drop in blood pressure, fluid in the lungs, bleeding, changes in heart + kidney function can occur.**

**Dogs more commonly affected – head/limbs**

# ENVENOMATION



Weakness, high heart rate, drooling nausea/vomiting, bruising, bleeding from puncture sites, mouth or nose + pain at the puncture sites.

When a pet has been bitten by an unidentified snake, it is always safest to assume that the snake is poisonous.

## What to do?

- Keep the bitten area below the heart level (if possible)
- Keep the patient (and the human) calm
- Transport ASAP
- Do not apply ice or tourniquets
- Do not attempt to capture snake
- Do not “slash or suck out” venom
- Do not administer medications – especially NSAIDS!
- Antivenin

# ENVENOMATION

- Use of polyvalent crotalid antivenin is the mainstay of therapy for moderate to severe envenomation ; there are at least two antivenin approved for pit viper snakebites.
- Antivenin is an animal serum (typically horse or sheep) that contains antibodies which bind and neutralize snake venom
- Most useful if antivenin is given within 4 hours but as there are likely circulating toxins in a victim's blood stream for several days, may be effective much longer.
- Typically administered in 1-200 mls saline, no filter, over 1-2 hours (max). Redose in 6-8 hours as needed dependent on severity or recurrence of signs.



# For our Waltzing Matilda...



- Fluids
- Pain meds
- Antivenin
- Responded well – home in 48 hours
- *In General: MONITOR:*
- Bite wound infxn; 3<sup>rd</sup> Gen Cephalosporins
- Coagulopathy and renal failure can be delayed--- monitor for 3 weeks
- Persistent coagulopathy requires antivenin
- Blood Products as indicated
- Corticosteroids – not indicated

# Points to Ponder



Keep looking under the microscope...it is fun and you never know what you will find that will be extremely helpful, be it fluke or weird cell.

Consider your location, but also that the times, they are a'changin (climate, that is) and keep snakebite on your list for longer in the year now. Educate clients on this also!

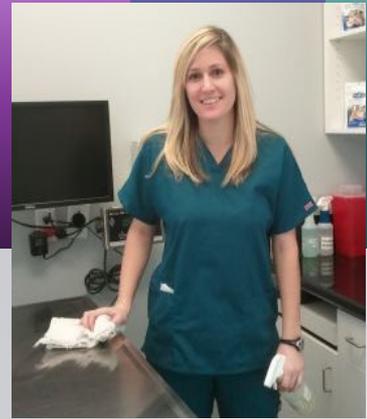
If you don't carry antivenin, that's ok – just know the closest clinic that does..... and advise giving what works best, soonest.

# *A Kitten's Tale...*

- Rushed to the back
- 3 months old
- Covered in Fleas
- Unable to get temp, HR 80
- Dehydrated
- Comatose
- PCV 5%
- BG 23
- Lactate 9

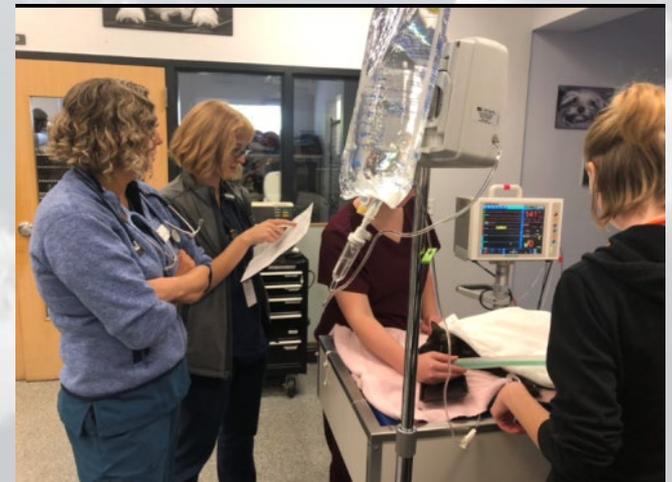


# *A Kitten's Tale...*



What first?

- Catheter access
- Fluids
- Warmth
- Dextrose
- BLOOD
- .....Questions to ask yourself while you are trying to keep the wee creature alive



# The Wee One



- How important is it to know the exact weight?
- How important is it to have two catheters?  
(one for blood and one for IV fluids and dextrose)
- Blood is important BUT how important is the blood type OR crossmatching when patient is on the verge of dying?
- How important to treat those nasty, revolting fleas?

# FELINE BLOOD GROUPS

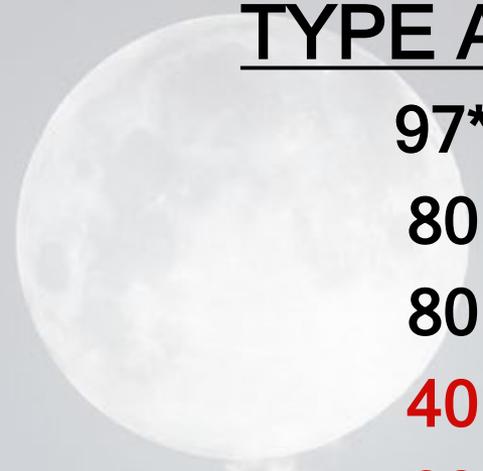
- Three blood types: A, B, AB
    - Type A ~ 95%
    - Type B ~ 4%
    - Type AB ~0.5%
  - Type A have a low titer of anti-B antibodies, but .....
  - **TYPE B HAS A VERY HIGH TITER OF ANTI- A ANTIBODIES**
- 
- A full moon is visible in the upper right quadrant of the slide, set against a background of white, fluffy clouds. The sky is a pale, hazy blue. The moon is bright and appears slightly overexposed.

- TYPE "A" BLOOD TO A TYPE "B" CAT

# DEATH



# FELINE BREEDS AND BLOOD TYPES



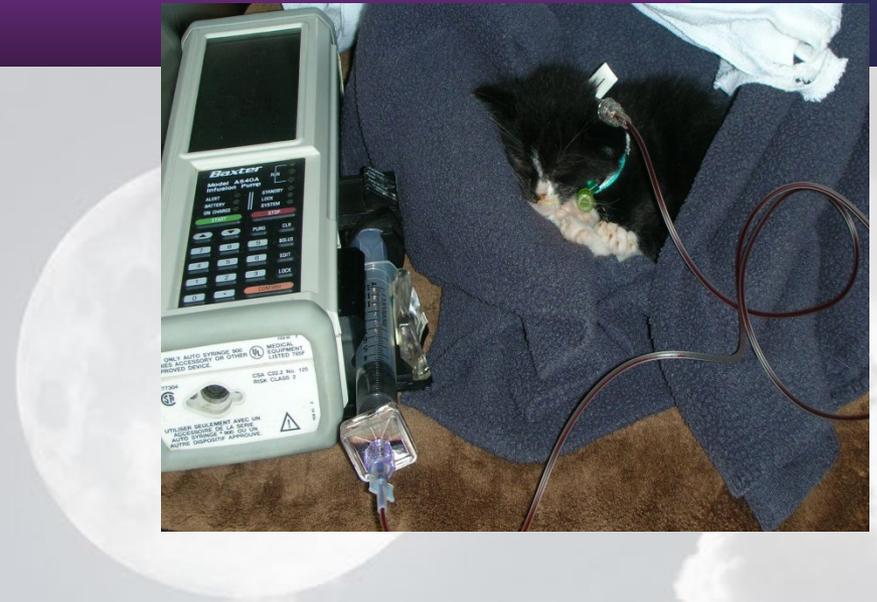
| <u>BREED</u> | <u>TYPE A (%)</u> |
|--------------|-------------------|
| DLH/DSH      | 97*               |
| ABYSSINIAN   | 80                |
| BIRMAN       | 80                |
| BRITISH SH   | 40                |
| DEVON REX    | 60                |
| HIMALAYAN    | 80                |
| PERSIAN      | 76                |
| OTHERS       | 80                |

# \*\*FROM OUR PERSPECTIVE...



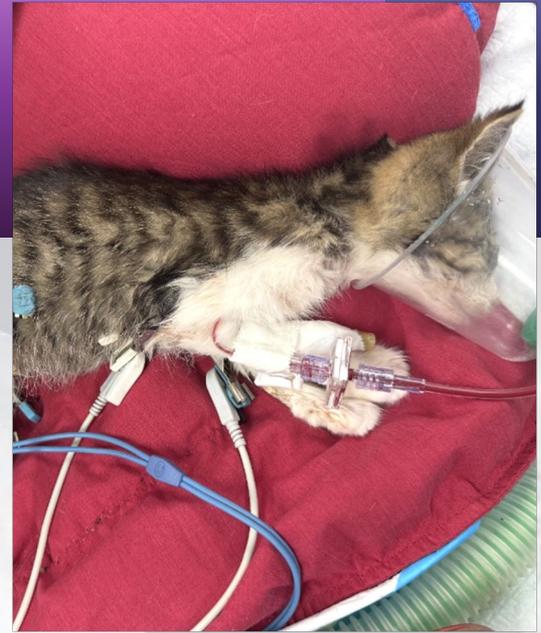
*THE PACIFIC NORTHWEST HAS A HIGHER  
PERCENTAGE OF DSH/DLH "B" CATS  
COMPARED TO THE REST OF THE US: 6-10%*

# *Always Type Before You Transfuse!*



# Exact weight?

- Getting a critical kitten's exact weight is vital because tiny weight errors drastically affect:
  - medication doses
  - fluid needs
  - anesthesia levels
  - equipment choices
  - RISK: ineffective treatment, toxicity, or organ failure, as kittens have very narrow safety margins, making precise dosing crucial for survival and recovery. **Small math error can be lethal.**
- Our Wee One: after IV Cath, need glucose bolus, on dextrose, and need blood. All require accurate weight.



# How much **blood**?

Weight is 0.544 kg or 1.2 pounds



## Packed Red Blood Cells and Whole Blood :

### Calculation #1

$$\text{Donor RBC (mL)} = 80 \text{ (dog) } \times \text{BW (kg)} \times \frac{\text{Desired PCV} - \text{Recipient PCV}}{\text{PCV Transfused Blood}}$$

(in anticoagulant) (60 for cat)

## Packed Red Blood Cells

### Calculation #2

Rules of Thumb: 1 mL/kg of PRBC's will raise the PCV 1%  
10-15 mls/kg of PRBC's will raise the PCV 10%

## Whole Blood

### Calculation #2

Rules of Thumb:

2-3 mls/kg of whole blood will raise the PCV by 1%  
20 mls/kg of whole blood will raise PCV 10%

**A target PCV for ongoing hypovolemic blood loss would be in the range of 25-30%, increasing the PCV to 20-25% in a stable anemic patient and to 20% in a more chronic anemia patient would be adequate**

# • Calculations and Considerations for the Wee one...

- One blood volume is 40-60 mls/kg in a cat--- 21-32 mls is this kitten's blood volume
- If you want to raise by 10 percent, then you would give 10-15 mls/kg
- .....at 10-15 mls/ 0.544 kg .....
- **is 5-8 mls of Packed Red blood cells given over 4 hours...**



- Now you know how much.....can you give in the line with the dextrose drip?
- What are your issues?
- Solution..... for potentially incompatible solutions?

# Flea tx recommendations Moribund Neonates

- Capstar rectally
- Flea comb gently and thoroughly
- Spray onto a towel and hold kitten in towel
- Revolution – depending on the age and stability of the kitten



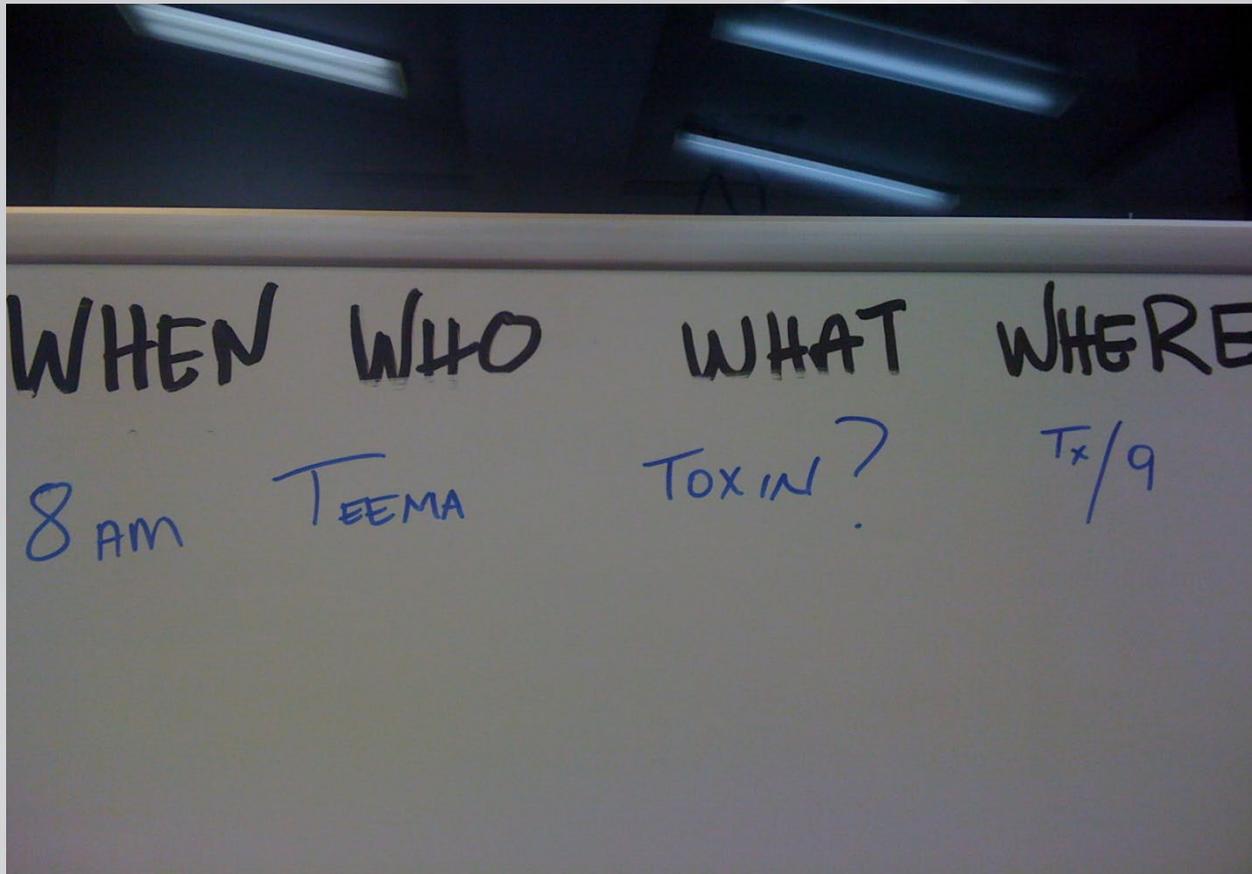
# Points to Ponder

- 1) Much like “grape or grain but never the twain” when it comes to mixing alcohols
  - .....know what can go together in an IV and what cannot ...
  - For example: “Dextrose and blood makes mud” or something like that
- 2) THERE IS NO UNIVERSAL CAT DONOR OR RECIPIENT. THERE ARE NO FREE PASSES IN CAT TRANSFUSIONS. A blood to a B cat KILLS. (\* You get the point )
- 3) NOTHING replaces an accurate and thorough physical exam, TPR, and an accurate WEIGHT. And nothing replaces continued monitoring of vital stats.  
Nothing, not even AI, replaces YOU.

The Basis of all treatment starts here.

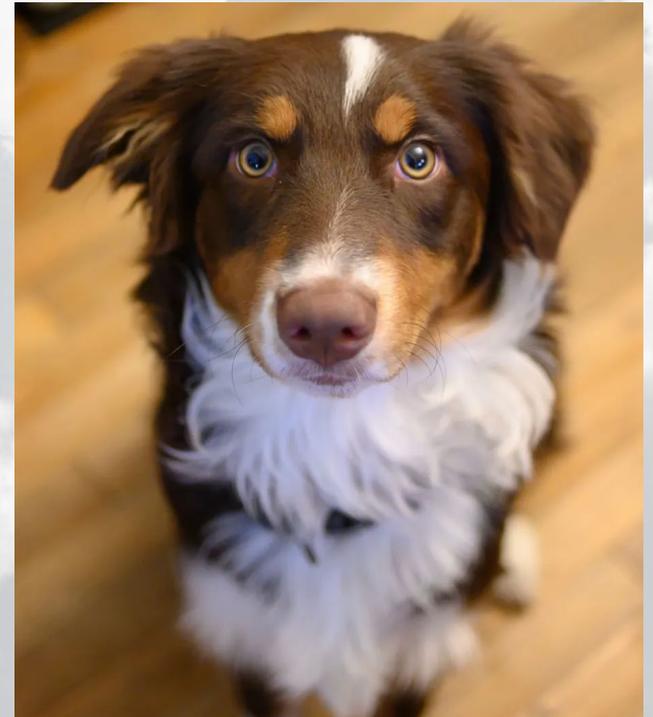


*Toxicities account for 20-30% of ER admissions,  
depending on where you live in the U.S.*



# Phone call about “Cleo”

- Owner calling, going to bring their pet in...
- Australian Shepherd 1.5 yr old F/S
- No Hx of Medical Problems
- Brought into ER for eating “rat bait” – a single block from an old box
- Greenish-blue in color
- Questions?





- Color?
- Amount?
- Type?



# Collateral Damage



**California has imposed a moratorium on most first and second-generation anticoagulant rodenticides after widespread contamination of wildlife; Oregon hasn't imposed one (yet) but has shifted to stricter controls on anticoagulants and moved toward cholecalciferol as an alternative starting in 2023.**

# Cholecalciferol

- Cholecalciferol rodenticide baits -- also known as Vitamin D3.
- Vitamin D3:
  - metabolized by the liver to calcitriol, which promotes hypercalcemia.
  - This leads to renal failure and to mineralization of the kidneys, GI tract, liver, blood vessels and the myocardium.
- Clinical signs seen within the first 24 hours
  - include PU/PD, anorexia, vomiting, hypersalivation, constipation or diarrhea, weakness, melena, hematemesis, arrhythmias.
  - within 2-4 days post-ingestion, acute renal failure is often evident.



# Cholecalciferol Treatment



- As ingestion was in last few hours:
- Induce Emesis
  - Does this completely empty the stomach?
- GI Decontamination:
  - Activated Charcoal --- with sorbitol?
  - If you need a second dose, do you give the bottle with sorbitol again?
- Baseline Bloodwork: Full Chem (Calcium, Renal Values, Phosphorous)
- Once this baseline tx and bloodwork established, --this was the treatment in the past:

# Cholecalciferol Treatment



Inducing emesis, hospitalize, and repeat doses of activated charcoal every 6-8 hours for 24 hours.

Monitor Bloodwork Q 24 hours and...

- If Ca, P, BUN and creatinine normal, then monitor for 4 days and if Ca continues to be normal, stop monitoring.
- If abnormal bloodwork and/or clinical signs:
  - Bind phosphorous: aluminum hydroxide
  - Promote calcium excretion through IV saline diuresis, furosemide and corticosteroids (dexamethasone or prednisone)
  - If Calcium still unresponsive:
    - Manage hypercalcemia through decreased bone resorption
      - Biphosphonate pamidronate disodium (Aredia; Novartis)
      - Salmon calcitonin (Micalcin by Sandoz; Salmonine by Lennod)

# Cholestyramine: New Kid on the Block



- Anion Exchange Resin – Powder binds to bile acids
- Used in human medicine --high cholesterol and really high bile acids –risk of CV events
- Humans got great idea – can it be used for toxins that need to be bound to bile acids for reabsorption ?
- Those that undergo enterohepatic recirculation....such as Digitoxin piroxicam methotrexate blue green algae amiodarone sago palm toxicity naproxen
- Use **Cholestyramine** to break up the cycle
- *Changed Vet med tx – no longer need to have multiple doses of activated charcoal and hospitalization*
- Cholestyramine binds with bile acids, prevents reabsorption and prevents enterohepatic recirculation.
- Dose is 300 mg/kg to 1 gram/kg TID for several (typically 4 days)
- 240 grams is ~ 50-80\$

# Fortunately for Cleo ...

- One dose of activated charcoal with sorbitol
- Second dose given 12 hours later
- First dose of Cholestyramine given 4 hours after each of these charcoal doses
- Then Sent Home on cholestyramine every 8 hours for 4 days
- Came in to recheck bloodwork every day with the plan:
- Calcium, phosphorous, renal values:
- **NORMAL:** So she had daily cholestyramine and bloodwork and finished her 4 days.
- (if she hadn't been normal, then the program of aggressively promoting calcium excretion would have been instigated.....and perhaps even lipid therapy)

# Take home message with regards to all baits:



- It is essential to determine what kind of “ratbait” an owner saw the animal ingesting:
  - Always have them identify the box or package (or call the exterminator service that put out the bait).
  - Call poison control if you have any questions about the trade name of the product.
- Treat early and aggressively.
- Most importantly, like everything in medicine (as in life), a pint of client education is worth a pet’s weight in treatment at the ER.

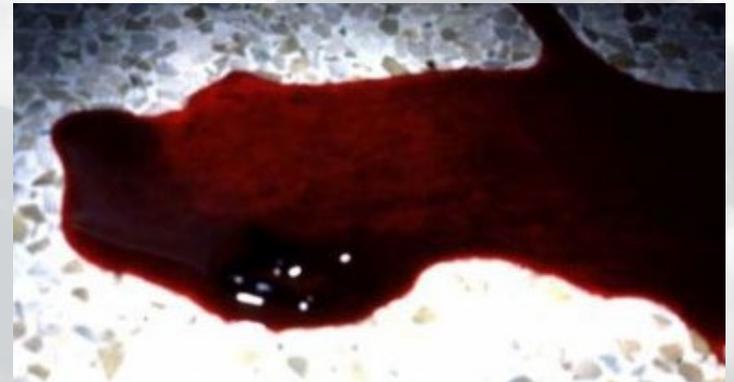
# The “Final Girl”



# “Laurie”

August:  
9 week old Puppy  
Swarmed by Yellowjackets  
Collapsed enroute to hospital  
Weak, bradycardic  
PT/PTT too high to read  
Brick red mm's  
BG 37  
ALT too high to read

Hematemesis and Hematochezia:  
 (“vomited and pooped blood when placing IV catheter”)



# Quick Review of the Venom

2 specific classes of order Hymenoptera:

Apidae (bees)

Vespidae (wasps, hornet + yellowjackets)

Bee + wasp venom > over 30 known components

Injection of these components into a pet  
4 types of reactions:

- small local
- large local
- systemic allergic (anaphylactic)
- systemic toxic.



# Bee/Wasp Venom

## Small local :

Swelling and pain at the sting site but no other clinical signs.

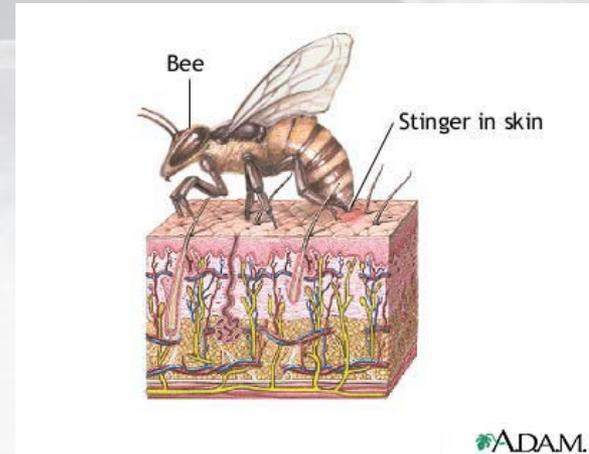
Remove the stinger, clean the site, apply topical anesthetic spray or solution.

## Large local reactions:

Swelling of the face, a limb or “hives” over the trunk.

Keep the dog quiet and calm and transport them to a veterinary facility immediately.

If several hours or longer from a veterinary facility---consult a vet by phone as per diphenhydramine and dose.



# Concerns, I have a few:

## Anaphylaxis:

- Severe, life-threatening, systemic allergic reaction induced by chemical mediators as a result of an antibody mediated response

## Toxic envenomation: 30 + components

- Melittin, Phospholipase A and the gang:  
Cause hemolysis, endothelial damage, initiate the coag cascade and induce platelet aggregation directly (ie membrane damage) and through releasing triggering tissue factors.



## Treatment aimed at:

- Treating anaphylaxis
- Stabilizing Patient—Intensive Supportive Care
- Controlling Kidney and Liver Damage

# Treatment Plan: *The Kitchen Sink*

- First rule: Phone call
  - Then – IN hospital:
  - IV catheter access
  - IV fluids – hypovolemia
  - Oxygen – respiratory distress
  - Corticosteroids
  - Histamine receptor blockers
  - Gastroprotectants
  - BLOOD PRODUCTS
  - Provide Analgesia
  - Feeding tubes and nutritional support
  - Other therapies (i.e., bronchodilators, vasopressors)
- 
- A large, bright full moon is centered in the upper right portion of the slide. The background is a light blue sky filled with soft, white, fluffy clouds. The overall aesthetic is clean and professional.

# Our Little Laurie

Treatment for severe toxic envenomation and anaphylaxis

Hypotension, hepatopathy, coagulopathy, lethargy, regurgitation, vomiting/diarrhea, hypoglycemia

IV fluid therapy with dextrose

Plasma

Cerenia

Diphenhydramine

Unasyn

Visbiome

Baytril

N-Acetylcysteine

Ondansetron

Metoclopramide

Vitamin K

Erythromycin

Propectalin

Fentanyl

Nasogastric Tube --- aspiration and nutritional support

AUS

Bloodwork daily – glucose, electrolytes, renal, liver, coag, pcv/ts

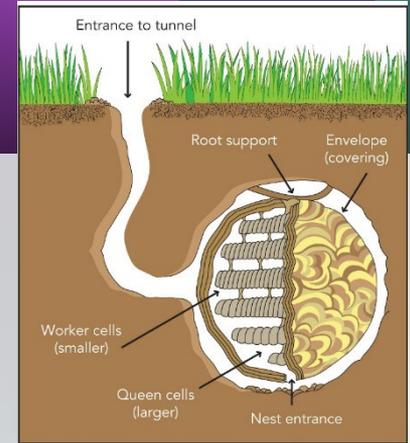
Hospitalized for six days of intensive care:

Four days of plasma CRI until coags stabilized

Started to eat on 5<sup>th</sup> day and held food down

Owner elected to take home on 6<sup>th</sup> day—

LE not completely normal so home on liver supportive meds, GI meds, and antibiotics.



***To reduce the risk to your pets, experts recommend:***

- **Inspect your property** in early spring for potential nesting sites (ground holes, wall voids, under eaves) Catch queens before colonies grow large.



- **Keeping outdoor pet food covered** Pick up fallen fruit or pet waste

- **Using covered trash cans** with tight-fitting lids.

- **Placing yellow jacket traps** at the perimeter of your yard to draw them away from high-traffic areas.

- **Avoiding DIY nest removal** once a colony is established, as this can provoke mass attacks. Instead,

- **Contact a licensed pest control professional**

# In all truth...



- Examples of Cases ... of what you are going to see more of in the future...

# Sneaky way to get “Part II” of Climate

- More Salmon poisoning: changes in salmon runs, water temperatures, increased fish stocking can impact parasite prevalence. Also, the snail at the heart of the matter has been seen in Southern California and further inland. Perhaps more species of fish and amphibians will be involved in future?
- More Snakebites: The snakes are altering their range as well as staying active longer in the season. Perhaps even changes to venom will be noted? drier in places just outside our emerald city realm and they are staying out longer. Keep it on your “unknown trauma, puncture, bleeding list” later now into the season
- More flea illnesses: Milder winters and warmer, wetter weather all around favors this pest.
- Many, many more wasps and yellowjackets; hotter, drier summers favors these aggressive guys. Milder winters – more queens survive, nests get a foothold sooner and they get bigger. Drought conditions make food scarce and so yellowjackets forage further from home –very aggressive in fall when food sources scarce
- More pests, more bait; and more of the Vit D3 kind. Bait poisonings going to go up due to increased warmer weather longer, increased urbanization leads to an increased rodent population; people trying to control rodents