
JaVECCS
2025 TOKYO
Japanese Veterinary Emergency and Critical Care Society
日本獣医救急集中治療学会 2025年国際シンポジウム
外傷の外科
Surgery for Trauma
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JASMINE

Conflict of Interest

I herewith declare that with respect to the topics of the event

☑ No conflict of interests exists.

このセミナーに関し，開示すべきCOI関係にある企業等はありません.

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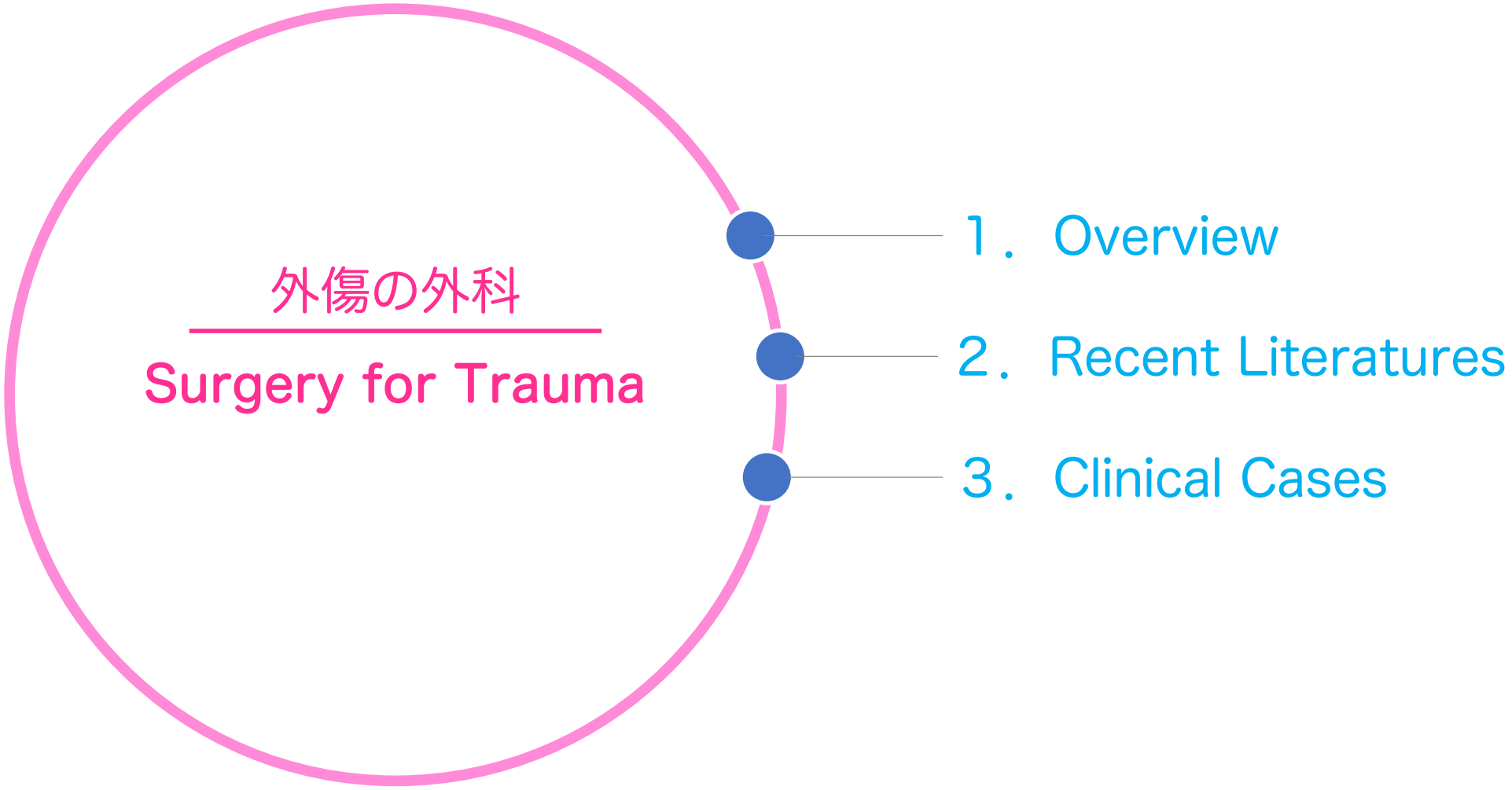


Type of Trauma

- ❑ Blunt trauma
- ❑ Penetrating trauma
- ❑ Falling trauma
- ❑ Dog bite/fight
- ❑ Combined

Type of Trauma

- Blunt trauma
  - commonly associated with thoracic and abdominal bleeding, organ rupture, fx, neurologic injuries
- Penetrating trauma
  - typically localized to the path of the penetrating object
  - rarely a straight line

Type of Trauma

- Falling trauma
  - fx of long bone and facial bone
  - thoracic and abdominal injuries
- Dog bite/fight
  - deep-penetrating bite wounds
  - spinal injures
  - major cervical, abdominal, and thoracic trauma
  - tracheal rupture

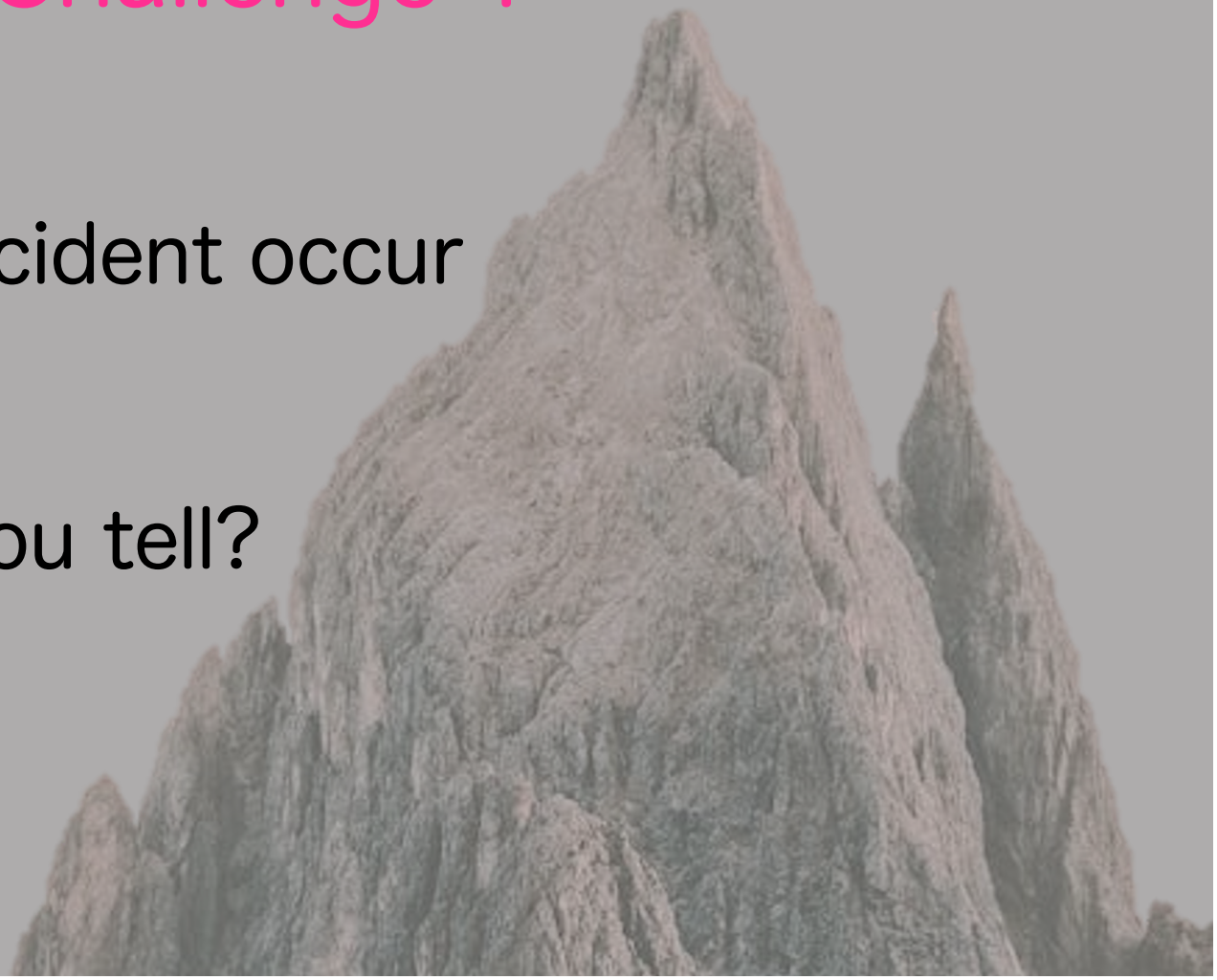
Causes of Trauma

- ❑ HBC, Car accident
- ❑ Animal attack
- ❑ Gunshot/weapon
- ❑ Being hit, kicked or struck
- ❑ Major falls
- ❑ Stepping on a sharp object
- ❑ Bee stings or insect bites

Big Challenge 1

May not see an accident occur

How would you tell?



Sign of Trauma

- ❑ Unexplained vomiting
- ❑ Bleeding
- ❑ Apparent dizziness
- ❑ Unexplained fatigue
- ❑ Whimpering or groaning
- ❑ Growling, hissing, etc

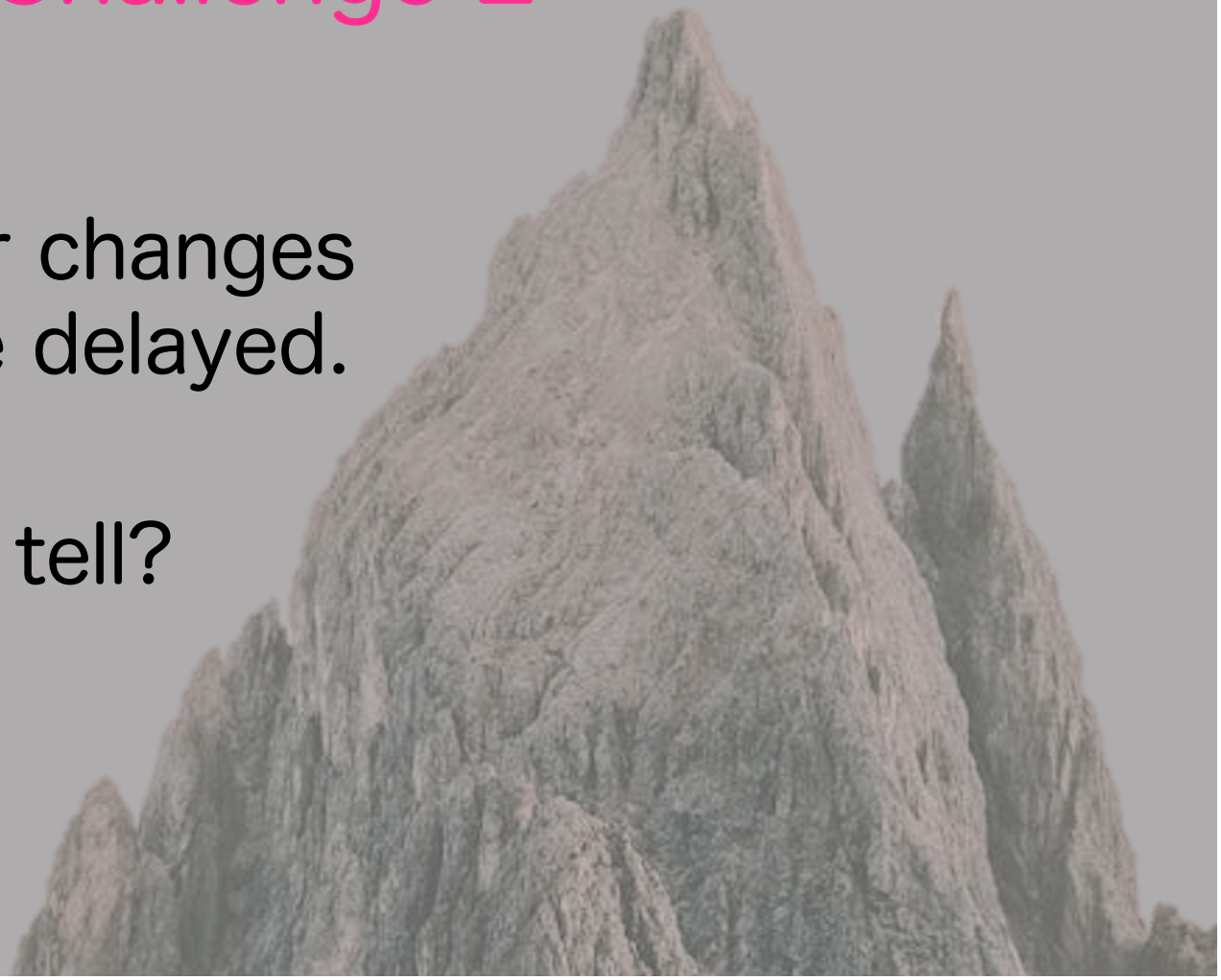
Diagnosis

- depends on the injuries of the individual
- Radiograph, Bloodwork, Ultrasound
- CT or MRI
- etc

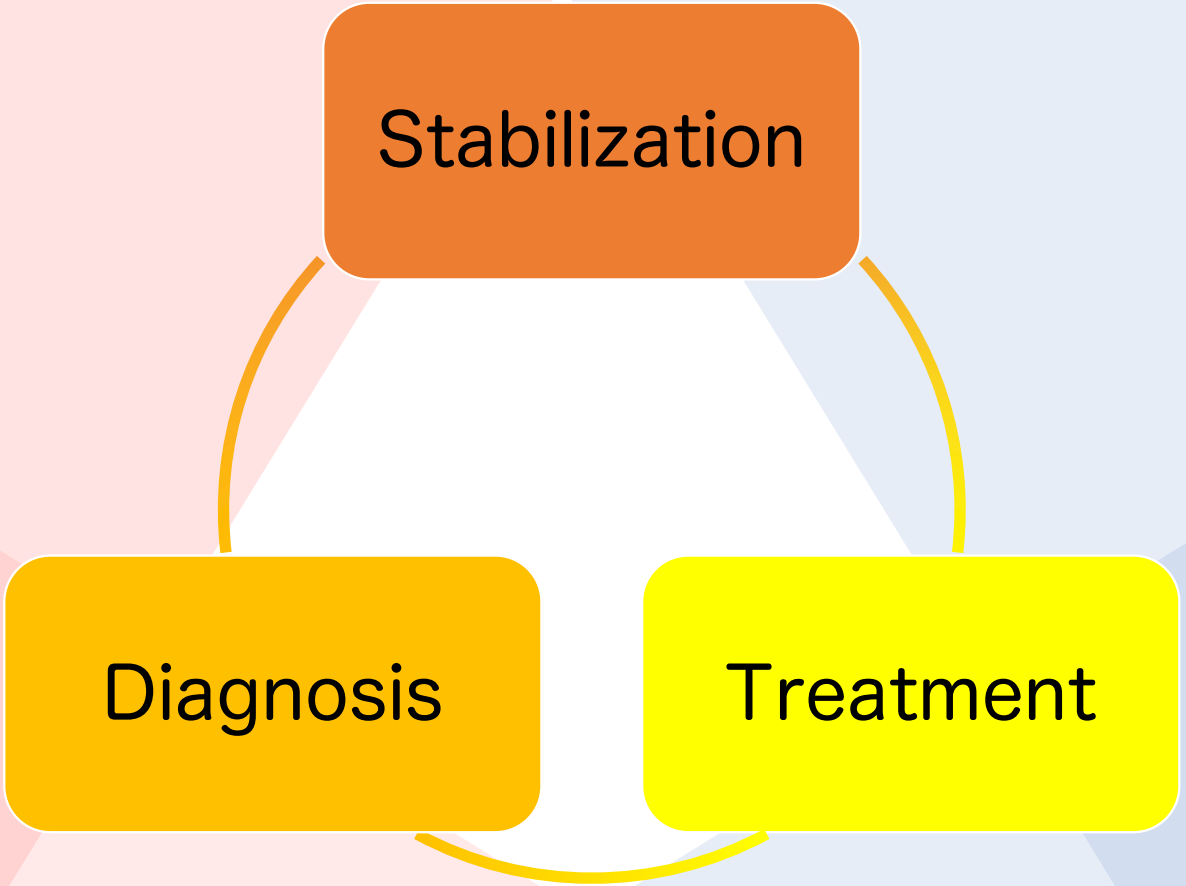
Big Challenge 2

Clinical symptoms or changes
in blood test may be delayed.

How would you tell?



What would you do?



What would you do?

- Mentation
- Physical exam, TPR
- Neurological exam

Assessment

- IVF
- Pain control
- Sedation
- Anesthesia
- Medical Tx
- Sx

Stabilization/ Treatment

Diagnosis

- minimum database
- CBC/Chem
- blood gas
- fluid analysis
- diagnostic imaging

In majority of cases

The key to achieve

Assessment

Diagnosis

Tx/Stabilization

- ❑ Teamwork
- ❑ Communication
- ❑ Individual abilities

Teamwork

Assessment

Diagnosis

Tx/Stabilization

- ❑ Urgent Care
- ❑ ICU, CCU
- ❑ Anesthesia
- ❑ SAIM, Sx, DI, etc

Individual Abilities

- Surgery aspect
  - Anatomy, Physiology
  - Skill, technique, experience
  - Post op monitoring/care

Assessment

Diagnosis

Tx/Stabilization

Initial assessment

- The animal should be approached as if multiple injuries are present.

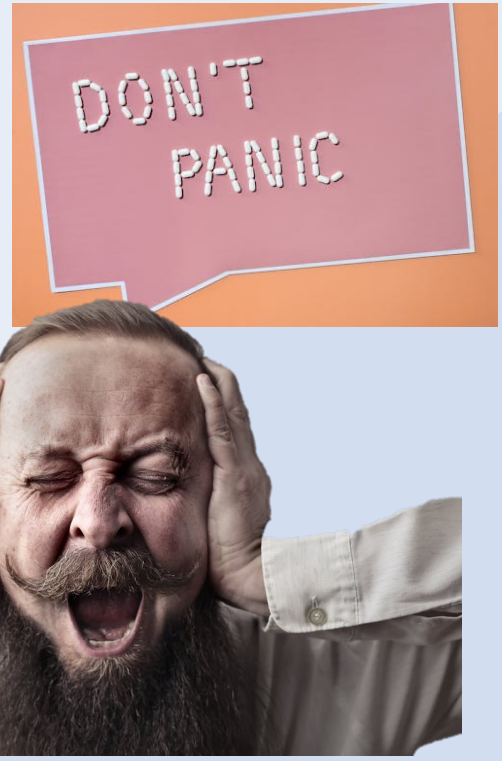
Diagnosis

Assessment

Tx/Stabilization

Do as usual

Be a multitasker more than usual



Triage

- the process of categorising and prioritizing patients based on their severity of condition

- The ABC of Triage

A	Does the patient have a patent airway?
B	Is the patient breathing? Is the breathing appropriate? Is intubation required?
C	Does the patient have a heartbeat? What is the heart rate? Can you palpate pulses? Are the pulses synchronous with the heartbeat?

Animal Trauma Triage Scoring System

Grade	Perfusion	Respiratory	Eye/Muscle Integument	Skeletal	Neurological
0~3	MM CRT Rectal temp Femoral pulse	HR Rhythm	RR Respiratory sounds	Weight bearing Fracture/ joint laxity	Central Peripheral

J Vet Emerg Crit Care (San Antonio). 2018 May ; 28(3): 192–200. doi:10.1111/vec.12717.

Modified Glasgow Coma Scale

Small Animal Coma Scale

Motor activity	
Normal gait, normal spinal reflex	6
Hemiparesis, tetraparesis, or decerebrate activity	5
Recumbent, intermittent extensor rigidity	4
Recumbent, constant extensor rigidity	3
Recumbent, constant extensor rigidity with opisthotonus	2
Recumbent, hypotonia of muscles, depressed or absent spinal reflexes	1

Brain stem	
Normal pupillary light reflexes and oculocephalic reflexes	6
Slow pupillary light reflexes and normal to reduced oculocephalic reflexes	5
Bilateral unresponsive miosis with normal to reduced oculocephalic reflexes	4
Pinpoint pupils with reduced to absent oculocephalic reflexes	3
Unilateral, unresponsive mydriasis with reduced to absent oculocephalic reflexes	2
Bilateral, unresponsive mydriasis with reduced to absent oculocephalic reflexes	1

J Vet Emerg Crit Care (San Antonio). 2018 May ; 28(3): 192–200. doi:10.1111/vec.12717.

Modified Glasgow Coma Scale

Level of consciousness	
Occasional periods of alertness and responsive to environment	6
Depression or delirium, capable of responding but response may be inappropriate	5
Semicomatose, responsive to visual stimuli	4
Semicomatose, responsive to auditory stimuli	3
Semicomatose, responsive only to repeated noxious stimuli	2
Comatose, unresponsive to repeated noxious stimuli	1

Total score	
3-7	Grave
8-13	Poor to Guarded
14-18	Fair to Good

J Vet Emerg Crit Care (San Antonio). 2018 May ; 28(3): 192–200. doi:10.1111/vec.12717.

VetCOT


ORIGINAL STUDY

Development of a veterinary trauma score (VetCOT) in canine trauma patients with performance evaluation and comparison to the animal trauma triage score: A VetCOT registry study

Colin Chik BS | Galina M. Hayes PhD, DACVECC | Julie Menard DVM, DACVECC

- A newer veterinary trauma score
- blood iCa and plasma Lac within 6 hours of admission, presence or absence of head and/or spinal trauma
- further validation studies are needed for this scoring system.

Published in final edited form as:
J Vet Emerg Crit Care (San Antonio). 2018 May ; 28(3): 192–200. doi:10.1111/vec.12717.

Performance evaluation and validation of the animal trauma triage (ATT) score and modified Glasgow coma scale (mGCS) with suggested category adjustment in dogs - a VetCOT Registry study

Kristian Ash, BVMS, Galina M Hayes, BVSc, DACVECC, DACVS, PhD, Robert Goggs, BVSc, DACVECC, DECVECC, PhD, Julia P Sumner, BVSc, DACVS

- ❑ Observational cohort study
- ❑ 9 veterinary hospitals
- ❑ 3,599 dogs

Published in final edited form as:
J Vet Emerg Crit Care (San Antonio). 2018 May ; 28(3): 192–200. doi:10.1111/vec.12717.

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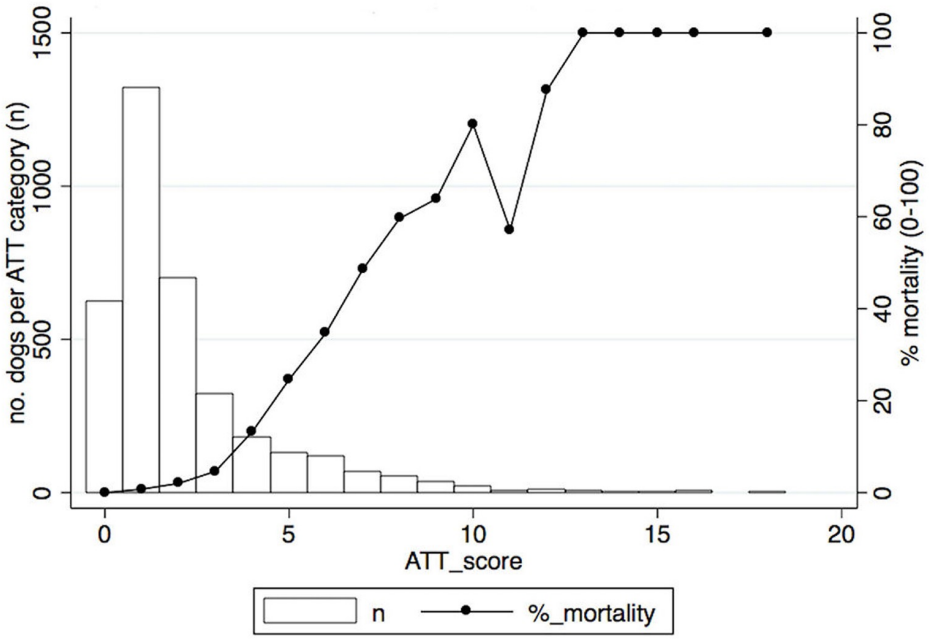

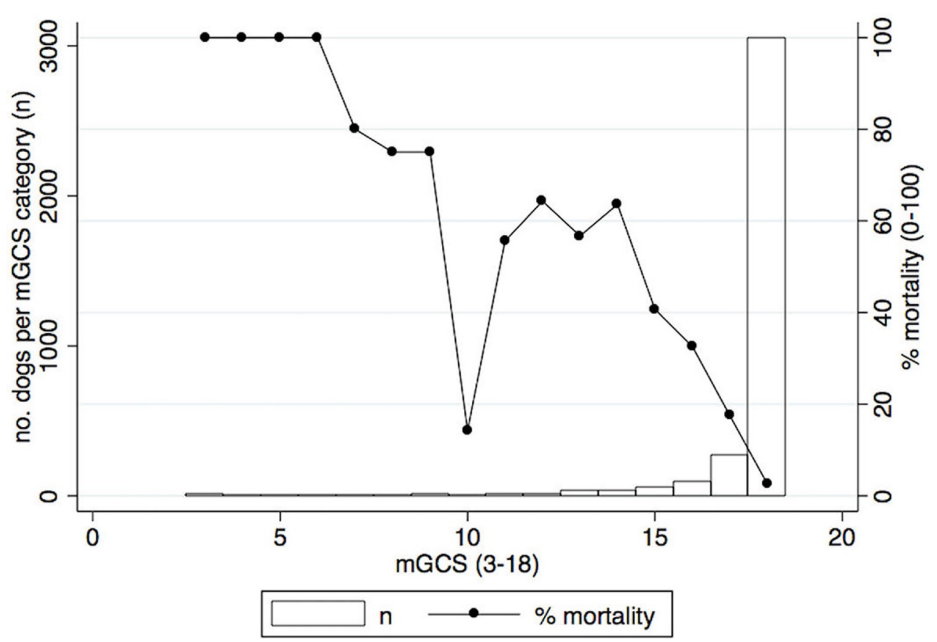

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- The ATT score showed a linear relationship with mortality risk.
- Each ATT score increase of 1 point was associated with an increase in mortality odds of 2.07
- The mGCS showed good performance overall, but performance improved when restricted to head trauma patients

JAVMA

AVMA

Animal Trauma Triage Score, Modified Glasgow Coma Scale, age, and weight were associated with outcome in feline bite wounds (1,065 cases): a VetCOT registry study

Ashlei T. Tinsley, VMD*; Mark A. Oyama, DVM, DACVIM; Erica L. Reineke VMD, DACVECC

- ❑ 1,650 cats with bite wounds
- ❑ ATT and MGCS scores were associated with nonsurvival
- ❑ For every 1 year of age, odds of nonsurvival increased by 7%
- ❑ For every 1 kg of body weight, odds of nonsurvival decreased by 14%
- ❑ Odds of dying increased with lower MGCS and higher ATT scores
- ❑ Odds of dying decreased by 84% ($P < .001$) in cats that underwent Sx vs. those that did not.

3yo, MC, mix, 34kg

- ❑ dog fight
- ❑ Non-weight bearing

Open Fracture Classification

Type 1		Open Fx with a wound <1cm
Type 2		Open Fx with a wound >1cm
Type 3	A	An open fracture with adequate soft tissue coverage of the fractured
	B	An open fracture with extensive soft tissue loss, periosteal stripping, and bone exposure

Johnston & Tobias 2018

Big Challenge 3

Then,

When to go SURGERY?

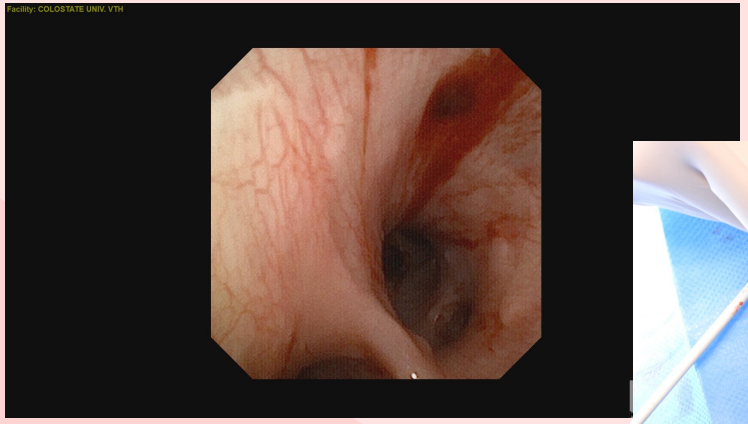
6yo, MC, Mix, 19.5

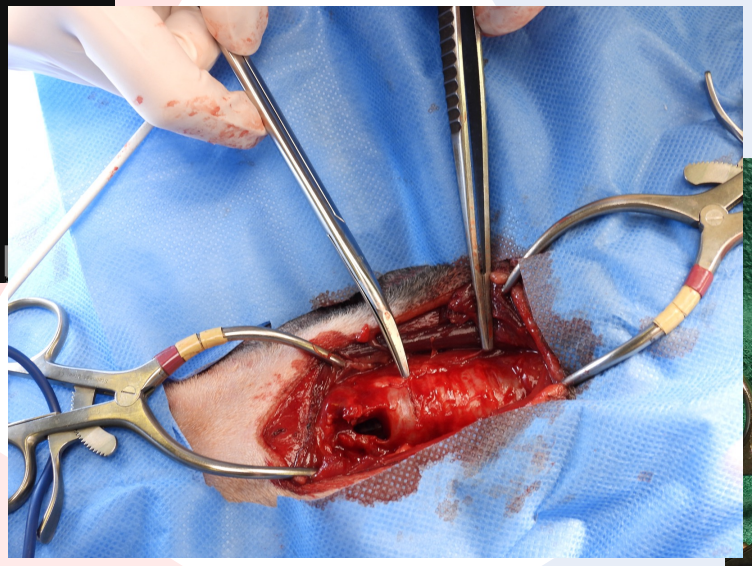
- ❑ dog fight
- ❑ puncture wound on the neck
- ❑ severe SQ emphysema, respiratory difficulty

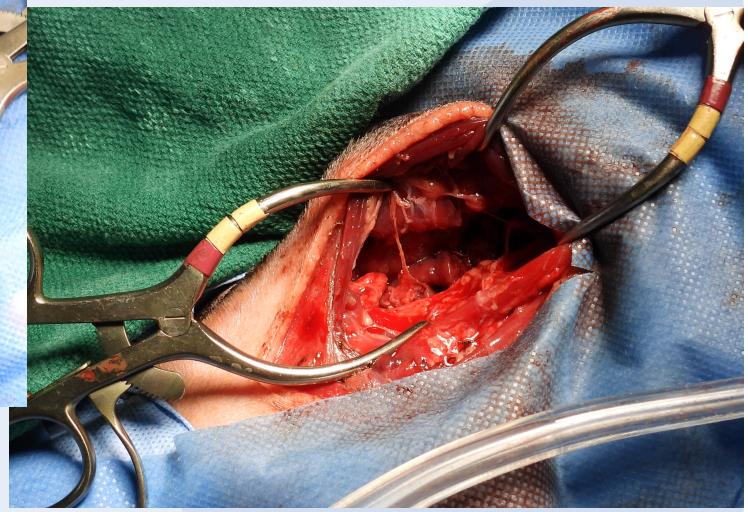
What would you do?

Tracheal trauma

- 6yo, MC, Mix, 19.5kg







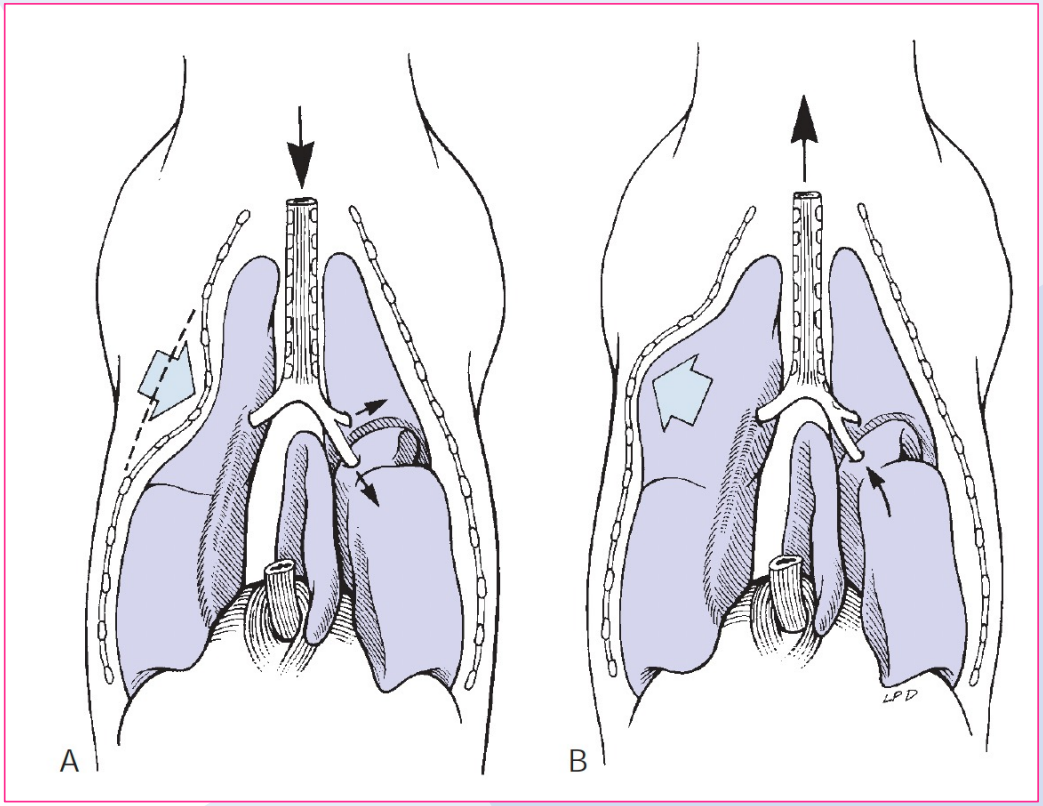
8yo, FS, mix, 6.5kg

- ❑ bitten by a larger dog
- ❑ Thoracic trauma

What would you do?
When to go sx?

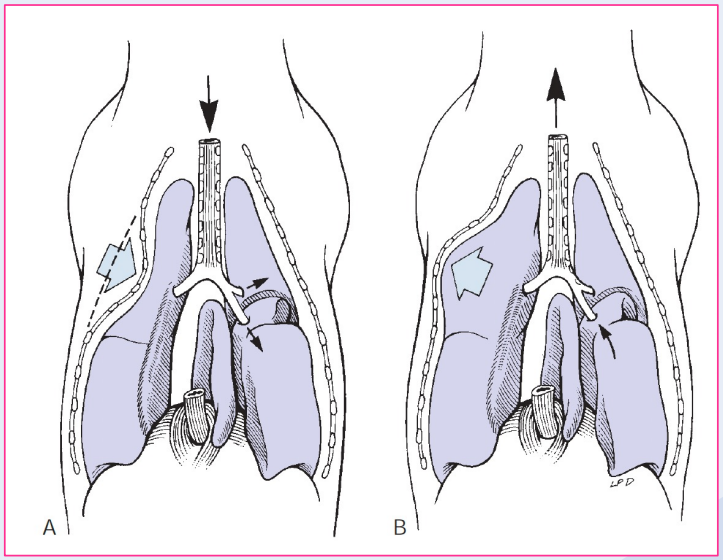
Flail Chest

- ipsilateral multiple rib fractures
- Paradoxical movements of the chest wall during inspiration
  - Inspiration : inward
  - Expiration : outward



Fossum, Small Animal Surgery 4th ed.

Flail Chest



- Paradoxical movements of the chest wall during inspiration
  - Inspiration : inward
  - Expiration : outward

→ failure or breathing and ventilation?

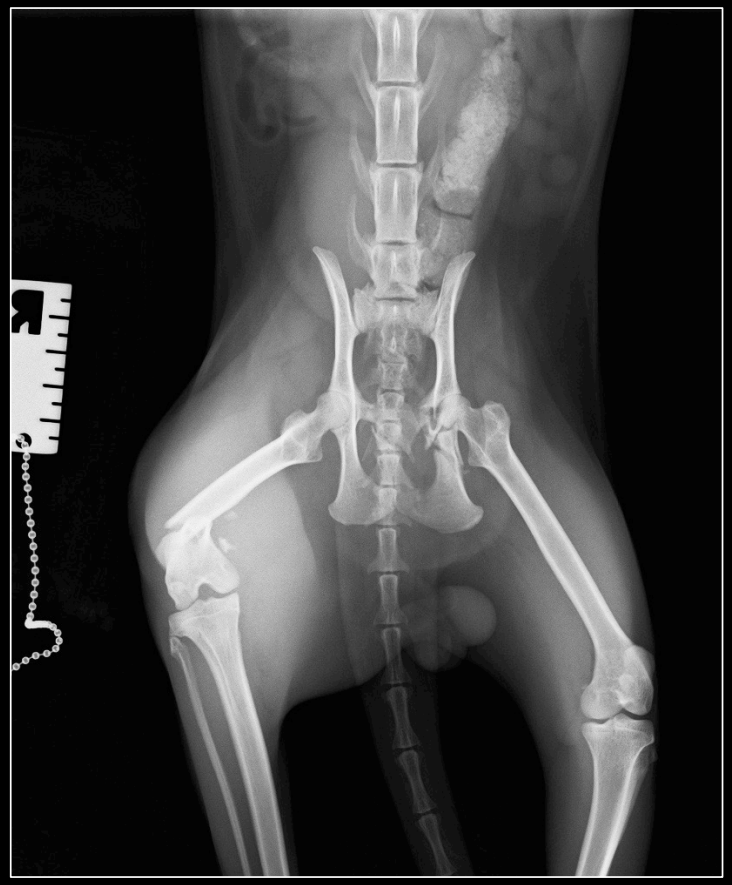
hypoxemia from lung damage or pain is more important factor

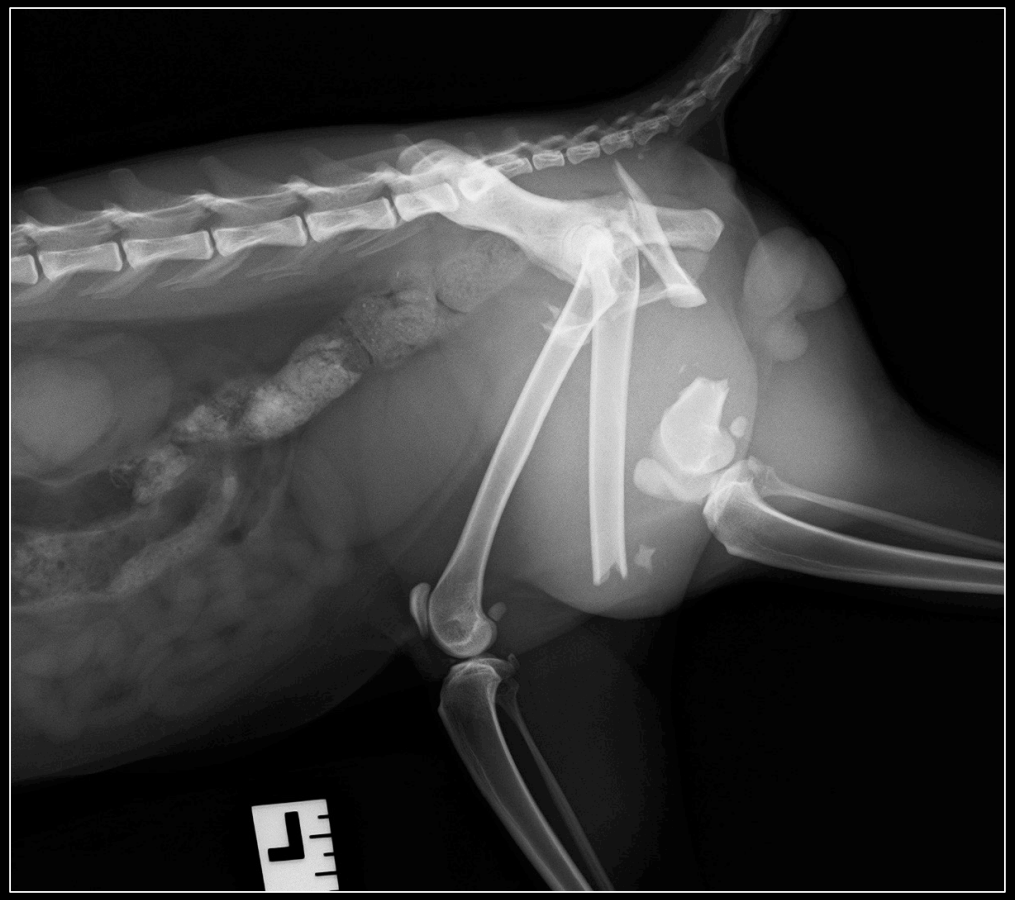
Perioperative mortality rate and risk factors for death in dogs undergoing surgery for treatment of thoracic trauma: 157 cases (1990–2014)

Cat, mix, 3y2m, MC, 4.5kg

- ❑ unable to stand up
- ❑ The event was not seen

Cat, mix, 3y2m, MC, 4.5kg





Cat, mix, 10y8m, MC, 5.0kg

- ❑ frequent vomiting, decreased appetite after falling from a cat tower yesterday
- ❑ presented to an emergency clinic
  - ❑ increased WBC, renal value, ALT
  - ❑ shock vital at an emergency clinic
  - ❑ slightly improved with IVF

Cat, mix, 10y8m, MC, 5.0kg

- ❑ depressed mentation, MM pink
- ❑ HR 170, BT 37.0℃, RR 40/min

WBC	13,800/uL
RBC	380 x10^4 /uL
HGB	5.8 g/dL
HCT	16.8 %
PLT	13.2 x10^4 /uL

GLU	178 mg/dL
BUN	44.4 mg/dL
CRE	1.57 mg/dL
TP	5.3 g/dL
ALB	2.1 g/dL
TBIL	0.8 mg/dL

PT	10.5 sec
APTT	53.6 sec
Fib	220.0 mg/dL

Cat, mix, 10y8m, MC, 5.0kg

- abdominocentesis

Ascites

WBC	10,500 /uL
RBC	314 x 10^4 /uL
HGB	5.0 g/dL
HCT	14.0 %
PLT	2.3 x 10^4 /uL

Blood

WBC	13,800 /uL
RBC	380 x10^4 /uL
HGB	5.8 g/dL
HCT	16.8 %
PLT	13.2 x10^4 /uL

Cat, mix, 10y8m, MC, 5.0kg

	初診日（Day 1）	Day2, 7:00AM	Day2, 3:00PM
WBC	13,800 /uL	20,400 /uL	21,400 /uL
RBC	380 x10^4 /uL	355 x10^4 /uL	197 x10^4 /uL
HGB	5.8 g/dL	5.9 g/dL	3.2 g/dL
HCT	16.8 %	16.8 %	9.4 %
PLT	13.2 x10^4 /uL	11.2 x10^4 /uL	10.7 x10^4 /uL

blood transfution 40mL


What would you do?

Cat, mix, 10y8m, MC, 5.0kg

① Transfusion→CT→Transfusion→OPE

② Transfusion→exploratory laparotomy

③ Transfusion only

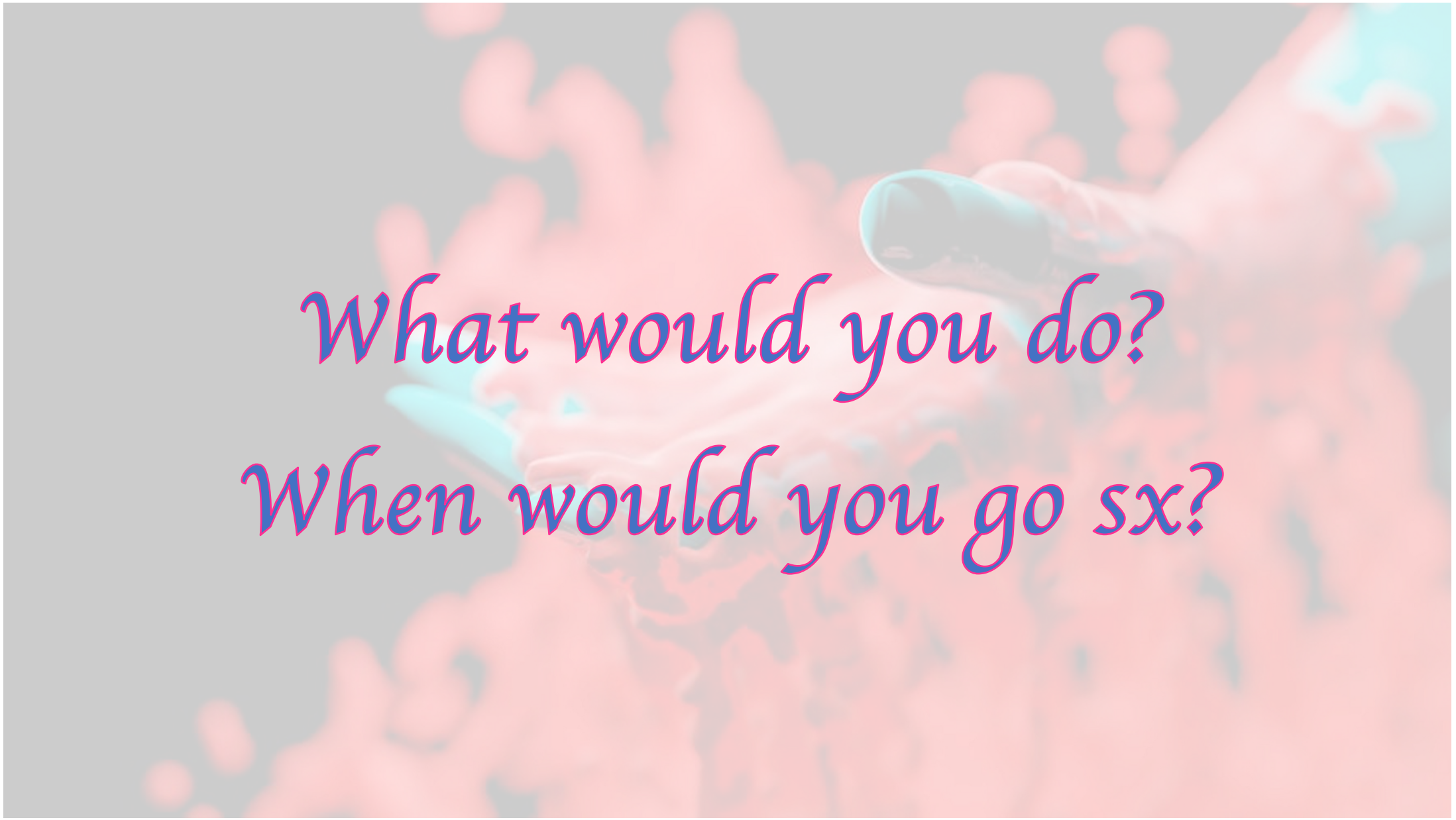
④ None

5yo, MC, Labrador Retriever, 28kg

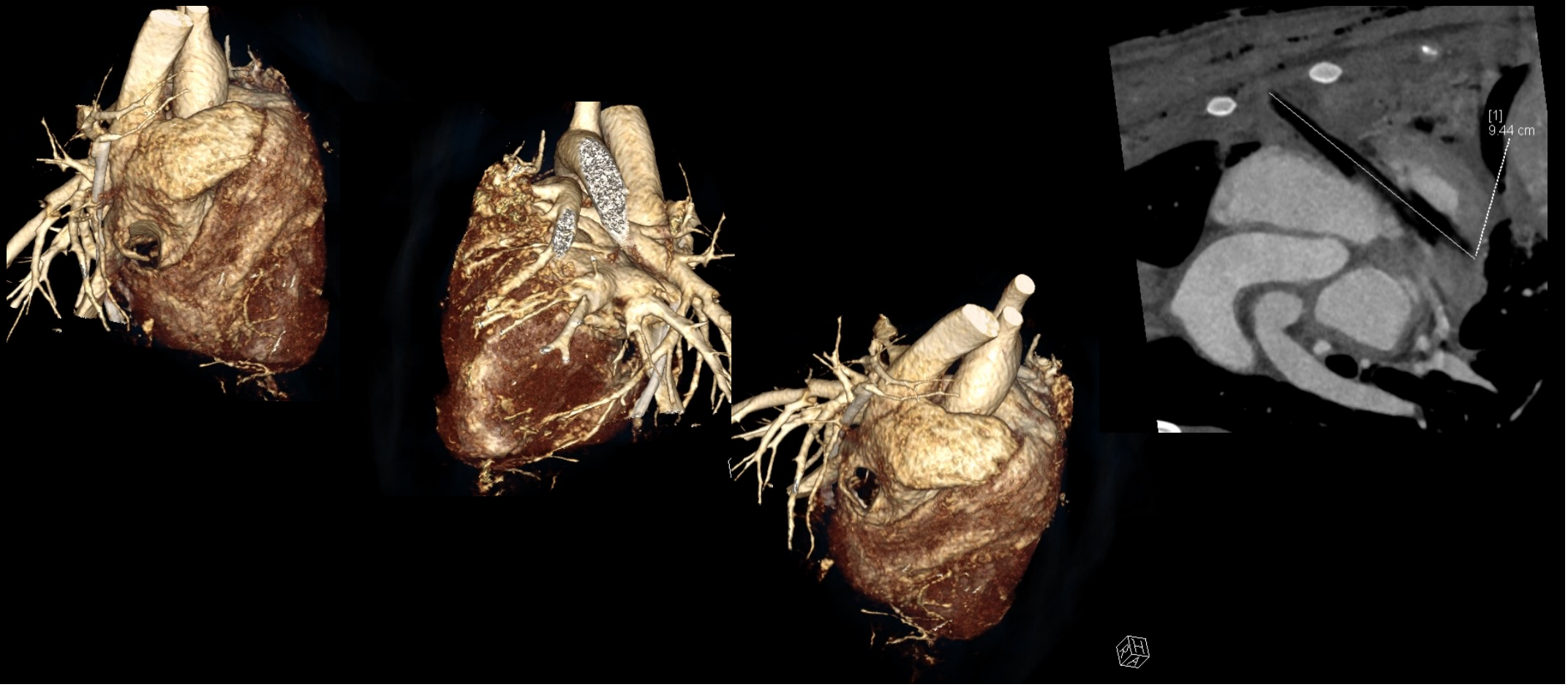
- ❑ thoracic trauma during hiking
- ❑ brought into Urgent Care immediately

- ❑ HR 186 beats /min
- ❑ MM: tachy
- ❑ CRT: <2sec

- ❑ a tree stick was stuck in the chest!!


What would you do?
When would you go sx?

5yo, MC, Labrador Retriever, 28kg



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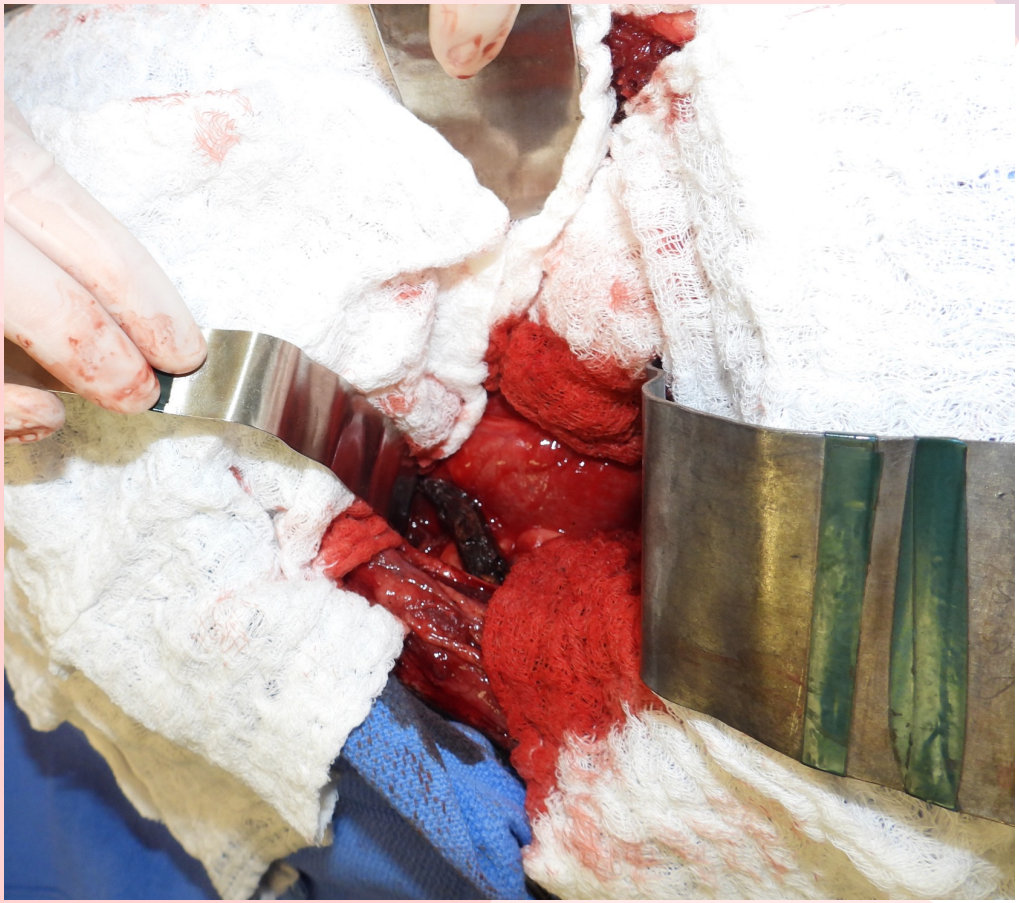
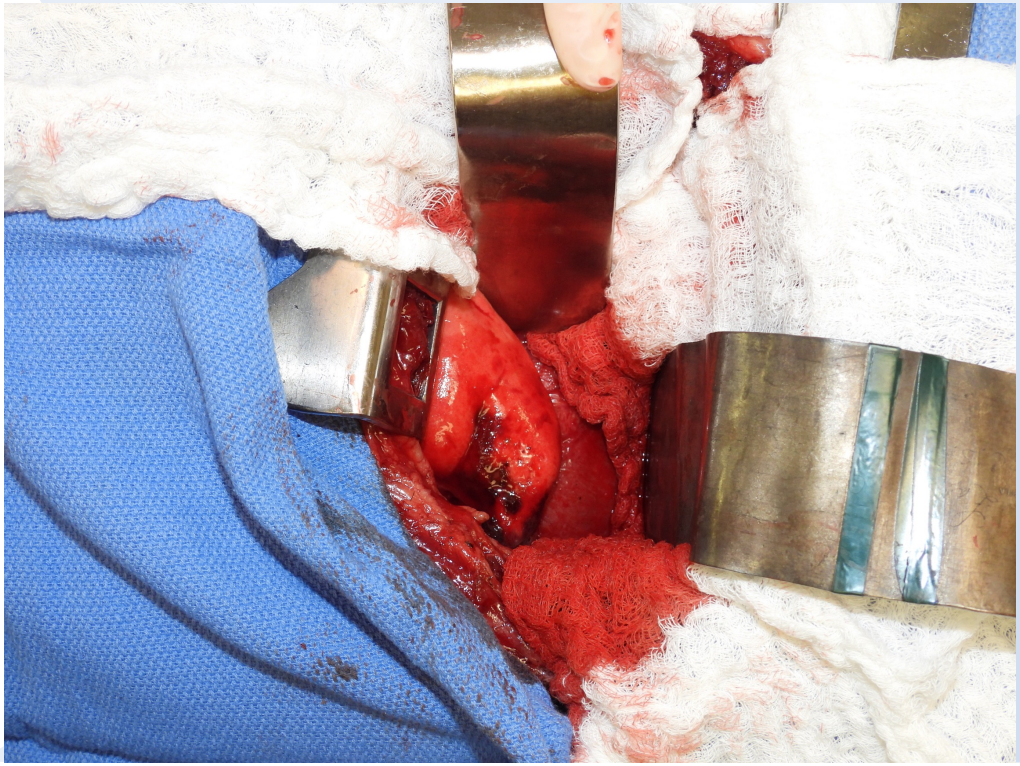
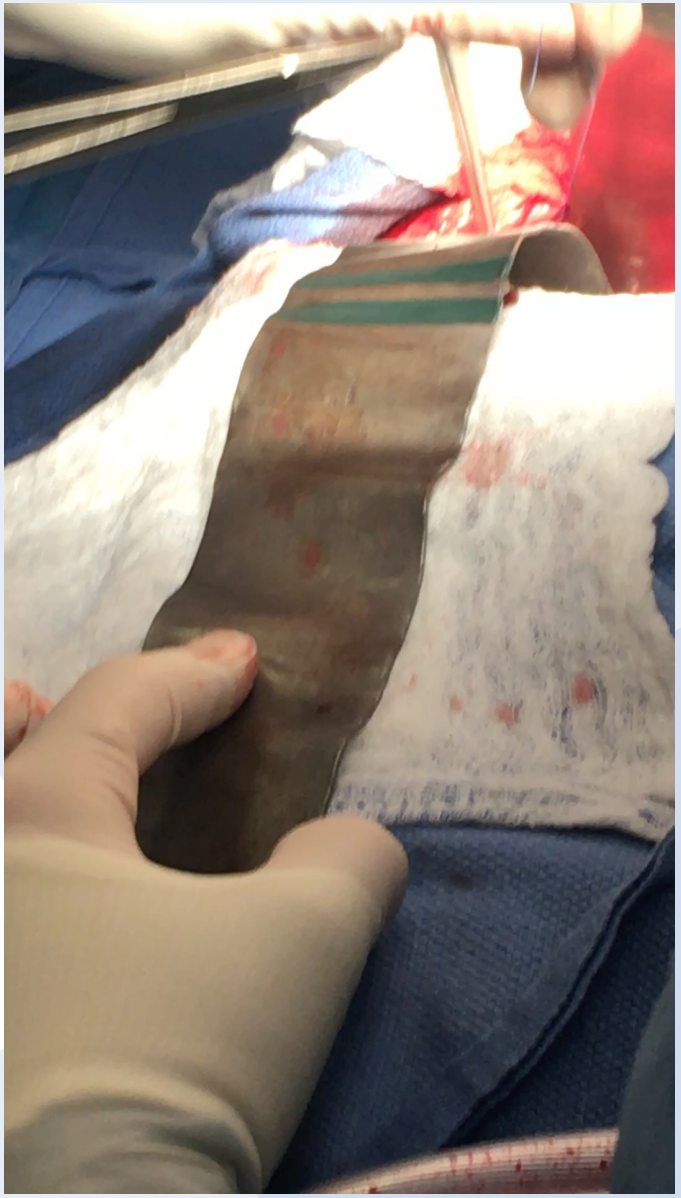




5yo, MC,
Labrador Retriever,
28kg



Stay or Go?

JOURNAL OF
Veterinary Emergency
AND Critical Care

State of the Art Review

Journal of Veterinary Emergency and Critical Care **00**(0) 2015, pp 1–13
doi: 10.1111/vec.12279

The impact of surgical timing and intervention on outcome in traumatized dogs and cats

Nathan W. Peterson, DVM, DACVECC; Nicole J. Buote, DVM, DACVS and James W. Barr, DVM, DACVECC

Take Home Message

- ❑ Traumatic event may not be seen
- ❑ Clinical signs or blood test findings can be obscure
- ❑ Be a multitasker with NO panic.
- ❑ Teamwork and communication is the key
- ❑ The timing of proceeding with surgery is based upon multiple factors.

JaVECCS 2025 TOKYO

Any Questions?

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