



A Human-Veterinary Trauma Research Network: Advancing the Care of Human Warfighters & Military Working Dogs

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Disclosures

1. Funded grants:
 - a. W81XWH-20-R-0001 “Clinical Trial in Support of Trauma Indications for Lyophilized Canine Blood Products”
 - b. PR240463 “Multifunctional Medical Foam (MF) to Enhance Acute Wound Management In Situ”
2. Veterinary Advanced Trauma and Life Support (VetATLS), Co-Lead
3. Veterinary Committee on Trauma (VetCOT), Executive Director

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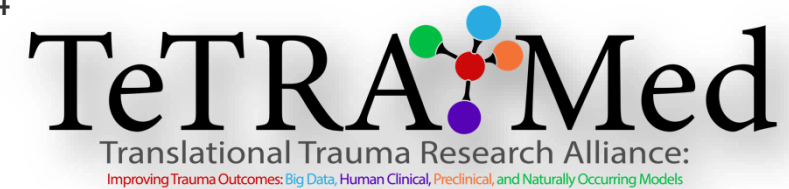
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Veterinary Advanced Trauma Life Support

'Lab to Labrador': CU Anschutz-CSU Collaboration on Trauma Research Points to Better Treatments for People and Dogs

Investigators at both universities say cross-species studies can help bring medical discoveries to human and animal patients more quickly and less expensively.

6 minute read

by [Mark Harden](#) | February 23, 2026



Translational opportunities

1. Austere environments (definitive care delays)
 - a. Attenuation of bleeding
 - b. Wound care
2. Hemorrhagic shock
 - a. Markers (identification)
 - b. Resuscitation
 - Species agnostic interventions
3. Injury scoring (type and severity)
4. Implementation (Teamwork/checklists)

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**Bench to Bedside
Lab to Labrador**

Common Problems: Common Solutions



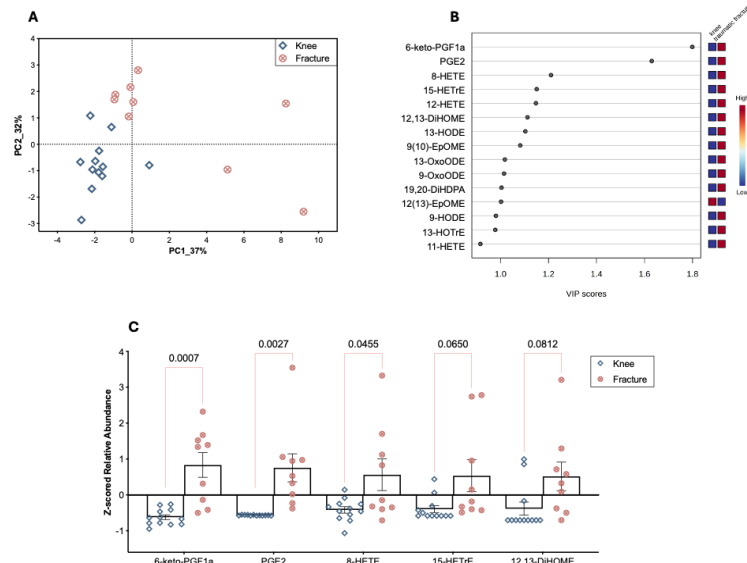
Sidestream dark field imaging and biomarker evaluation reveal minimal significant changes to the microcirculation and glycocalyx in a canine hemorrhagic shock model

Jenna H. Cardillo, DVM; Jordan D. Tarbutton, DVM; Julien Guillaumin, Doct Vet, DACVECC, DECVECC; Tracy L. Webb, DVM, PhD; Kelly E. Hall, DVM, MS, DACVECC; Claire D. Tucker, DVM; Amanda Cavanagh, DVM, DACVECC; Kristin M. Zersen, DVM, MS, DACVECC*

Feasibility and temporal dynamics of endothelial glycocalyx biomarkers in dogs sustaining traumatic injury

Jordan D. Tarbutton, DVM ; Claire D. Tucker, MPH, DVM, DACVECC ; Tracy L. Webb, DVM, PhD ; Kelly E. Hall, DVM, MS, DACVECC* 

Translational investigation of metabolite signatures in long bone injury patients: a lipidomics approach for identification of novel therapeutic-immune targets



SCIENCE TRANSLATIONAL MEDICINE | RESEARCH ARTICLE

TRAUMA

Multiomic analyses of longitudinal plasma samples identify thromboinflammation endotypes and trajectories in patients with trauma

Mitchell J. Cohen^{1†}, Christopher B. Erickson^{1,2†}, Ian S. Lacroix², Margot Debot¹, Monika Dzieciatkowska², Sanchayita Sen¹, Terry R. Schaid¹, Lauren T. Gallagher¹, William M. Hallas¹, Otto N. Thielen¹, Alexis L. Cralley¹, Benjamin W. Stocker¹, Benjamin J. Ramser¹, Ava Mokhtari¹, Huma Baig¹, Christopher Sublette¹, Franklyn Iheagwam², Alyssa Caldwell-McGee¹, Jamie Cole¹, Kelly Nash¹, Marissa Pokharel¹, Jessica C. Cardenas¹, Anirban Banerjee¹, Ernest E. Moore^{1,3}, Christopher C. Silliman^{1,4,5,6}, Alan Hubbard⁷, Angelo D'Alessandro^{2*}, Kirk C. Hansen^{2*}

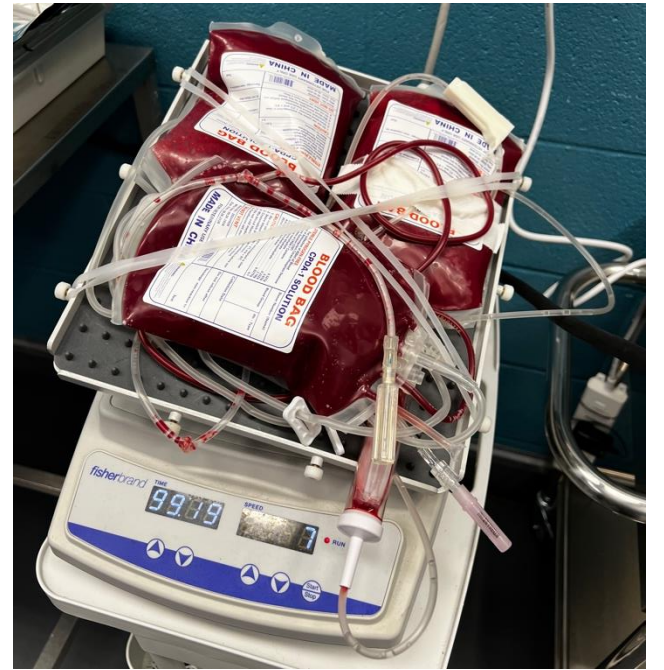
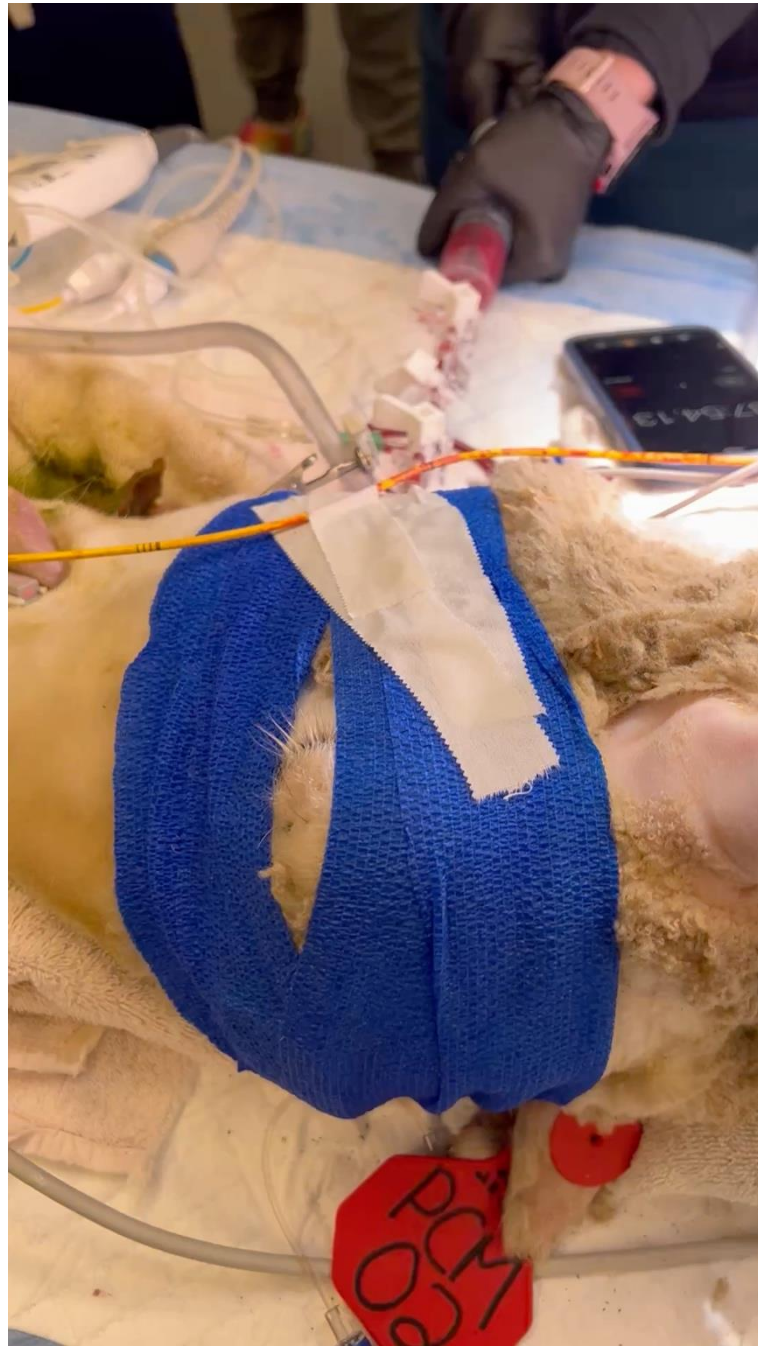
Comparing Tissue Injury and Injury Severity in Severely Traumatized Humans and Dogs Using Translational Multi-omics



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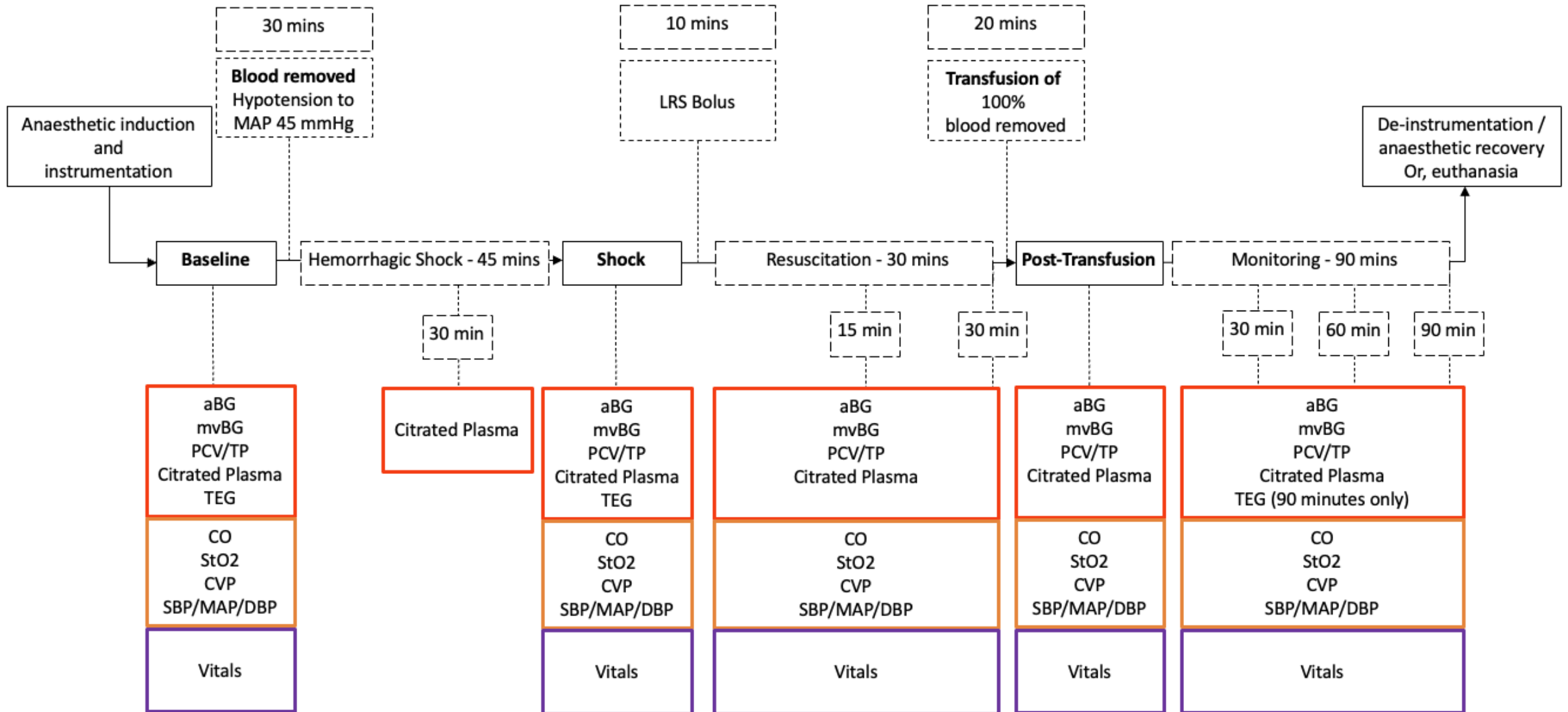
Clinical Scenario:

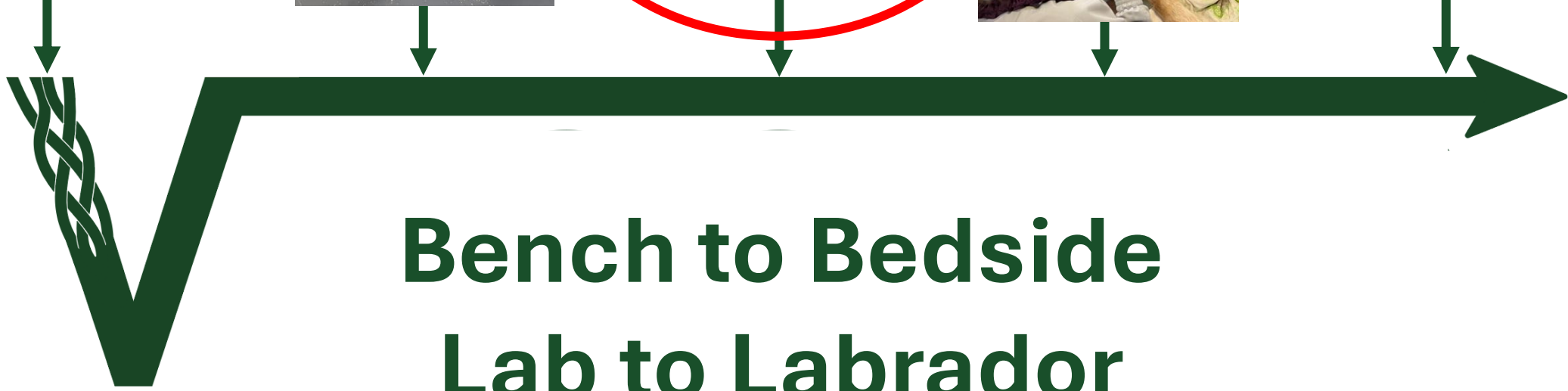


→ To Triage/Primary Care

→ To Trauma Center

Trauma Center Treatment





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Common Problems: Common Solutions



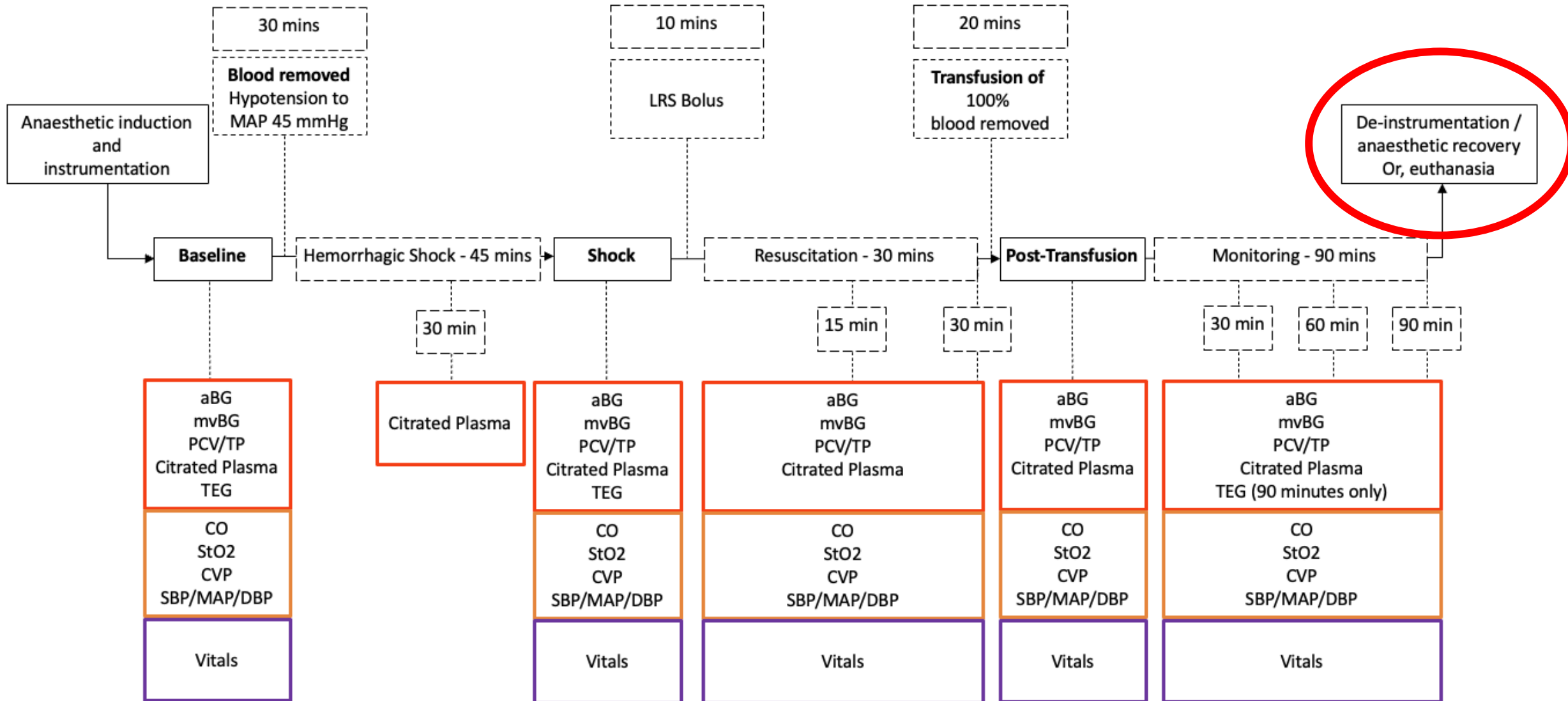
Clinical Scenario:



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Trauma Center Treatment



Point of care ultrasound measurement of paralumbar caudal vena cava diameter and caudal vena cava to aortic ratio in hypovolemic dogs

Jenna H. Cardillo, Kristin M. Zersen and Amanda A. Cavanagh*

Shock index is positively correlated with acute blood loss and negatively correlated with cardiac output in a canine hemorrhagic shock model

Charles T. Talbot, BVSc, PGDip, MRCVS¹; Kristin M. Zersen, DVM, DACVECC¹; Ann M. Hess, PhD²; Kelly E. Hall, DVM, MS, DACVECC^{1*}

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Tissue oxygen saturation is positively correlated with oxygen delivery and cardiac output in a canine hemorrhagic shock and resuscitation model

Taylor N. Baird, DVM¹; Charles T. Talbot, BVSc, PGDip(VCP), MRCVS¹; Kelly E. Hall, DVM, MS, DACVECC¹; Ann M. Hess, PhD²; Kristin M. Zersen, DVM, MS, DACVECC^{1*}

Point-of-care viscoelastic coagulation monitoring device shows promise for informing resuscitation strategies in a canine hemorrhagic shock model

Taylor N. Baird, DVM ; Kristin M. Zersen, DVM, MS, DACVECC ; Julien Guillaumin, Doct Vet, DACVECC, DECVECC* 

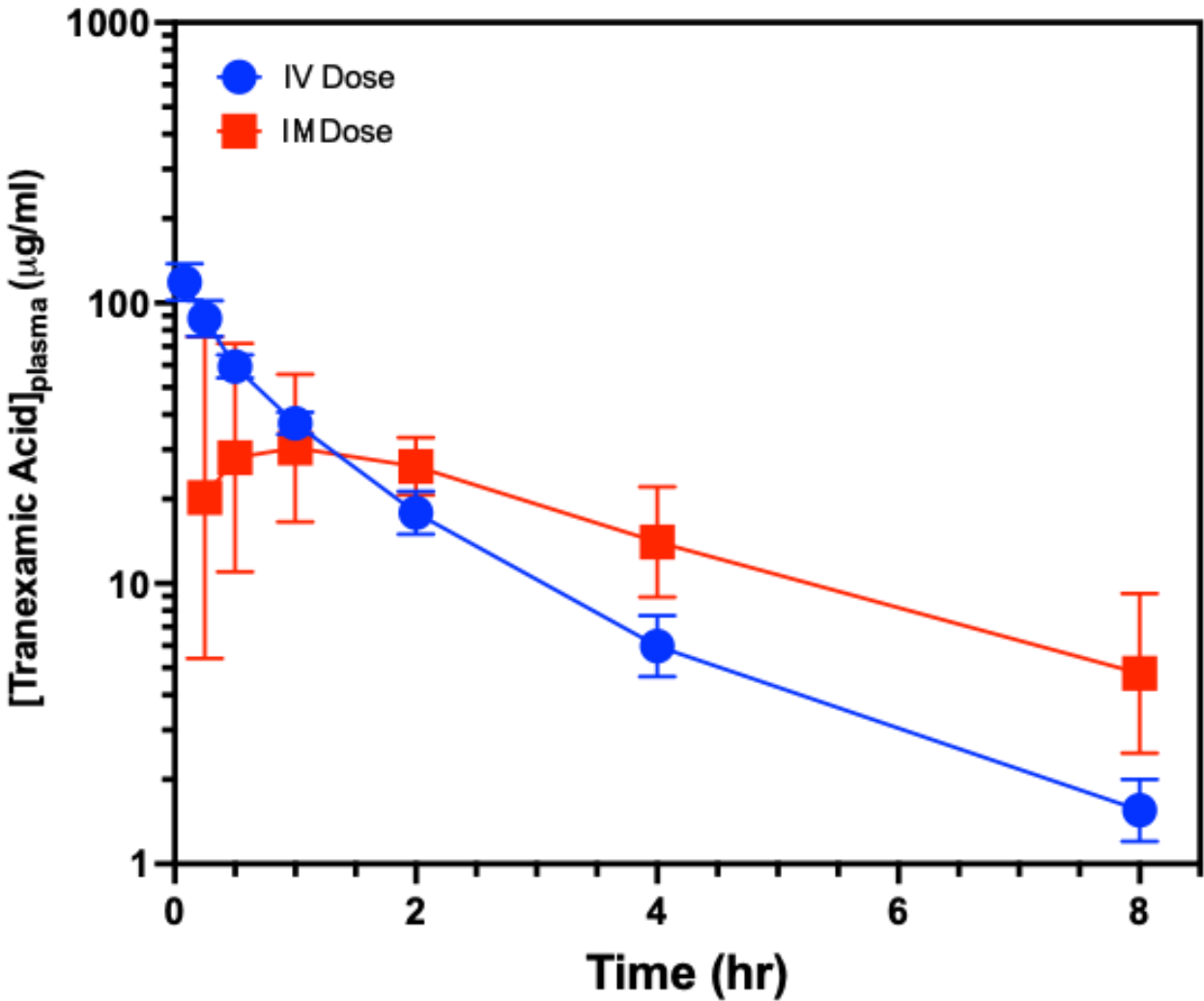
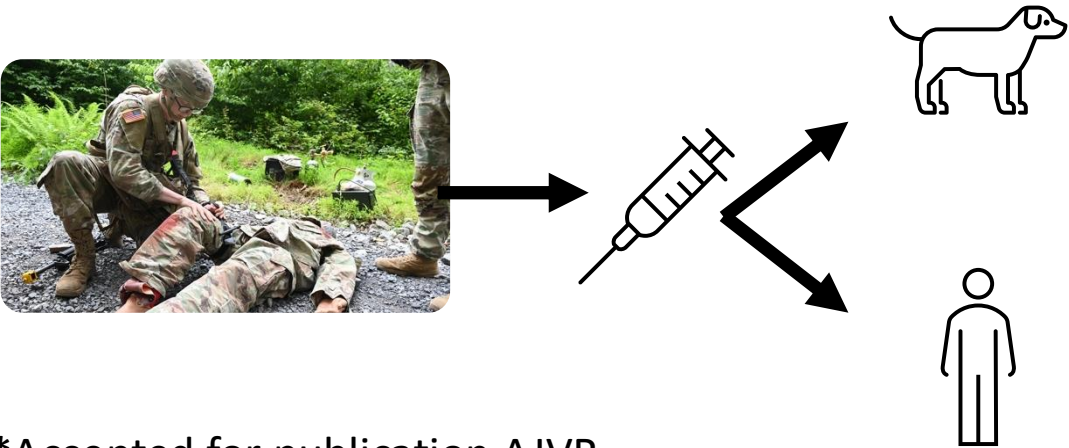
The Edwards Acumen IQ system using peripheral arterial catheter-based waveforms to estimate cardiac output is not accurate as compared to thermodilution in dogs

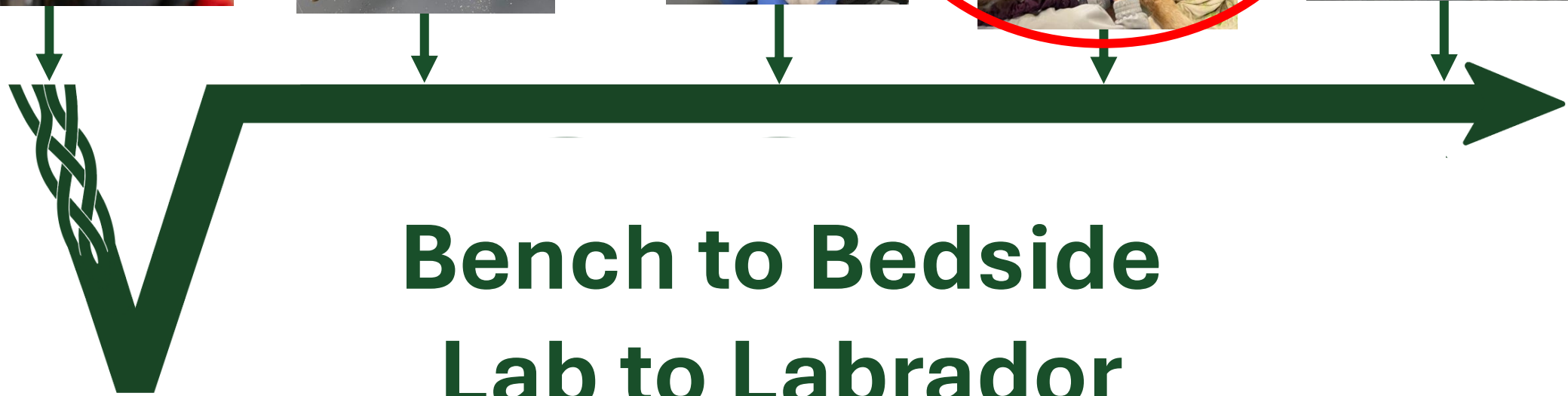
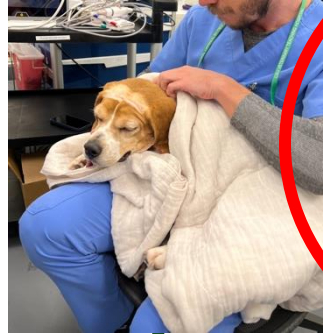
Kristin M. Zersen, DVM, MS, DACVECC*; Gregg M. Griffenhagen, DVM, MS, DACVAA; Eric L. Monnet, DVM, PhD, DECVS, DACVS

Intramuscular tranexamic acid results in lower peak plasma concentrations but comparable systemic absorption to intravenous administration in healthy dogs

EunJi Kwak, Kristin Zersen, Claire Tucker, Casey Lavender, Charles Talbot, Dan Gustafson, Tara Hendry-Hofer, Kelly Hall

Pharmacokinetic Parameter	IM Dosing	IV Dosing
C _{max} (mcg/mL)	46.8 ± 26.6	119.8 ± 17.6
AUC _{0-8h} (mcg/ml x hr)	146.9 ± 19.3	138.5 ± 9.2
AUC _{inf} (mcg/ml x hr)	173.8 ± 25.0	143.3 ± 10.5
T _{max} (hr)	1.6 ± 1.4	-
T _{1/2} (hr)	2.8 ± 2.1	2.1 ± 1.8
F (%)	120.9 ± 10.0	-





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LoVLETR

clinical trial



**THE OHIO STATE
UNIVERSITY**

COLLEGE OF
VETERINARY MEDICINE

Tufts
UNIVERSITY

Cummings School of
Veterinary Medicine

**Foster Hospital
for Small Animals**



**JAMES L. VOSS
VETERINARY TEACHING
HOSPITAL**

Cornell University
Veterinary Specialists



LSU

School of
Veterinary Medicine



AUBURN
VET MED

LOVLETR

LOW VOLUME LYOPHILIZED EARLY TRAUMA RESUSCITATION
RANDOMIZED CONTROLLED TRIAL

ELIGIBLE DOGS HAVE THE FOLLOWING:



Severe trauma



Bleeding



Shock



Minimal prior treatment

Dogs will be randomized to one of four resuscitation groups:



Lyophilized plasma +
Lyophilized platelets



Lyophilized platelets
+ Crystalloid fluids

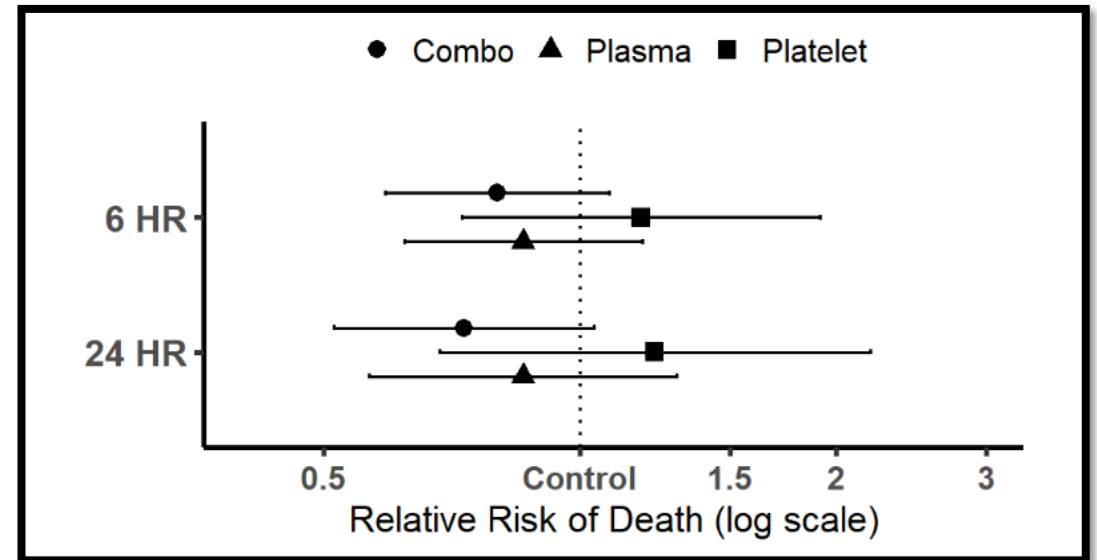


Lyophilized plasma



Crystalloid fluids

Median time injury → first dose of
randomized treatment: **90 min**



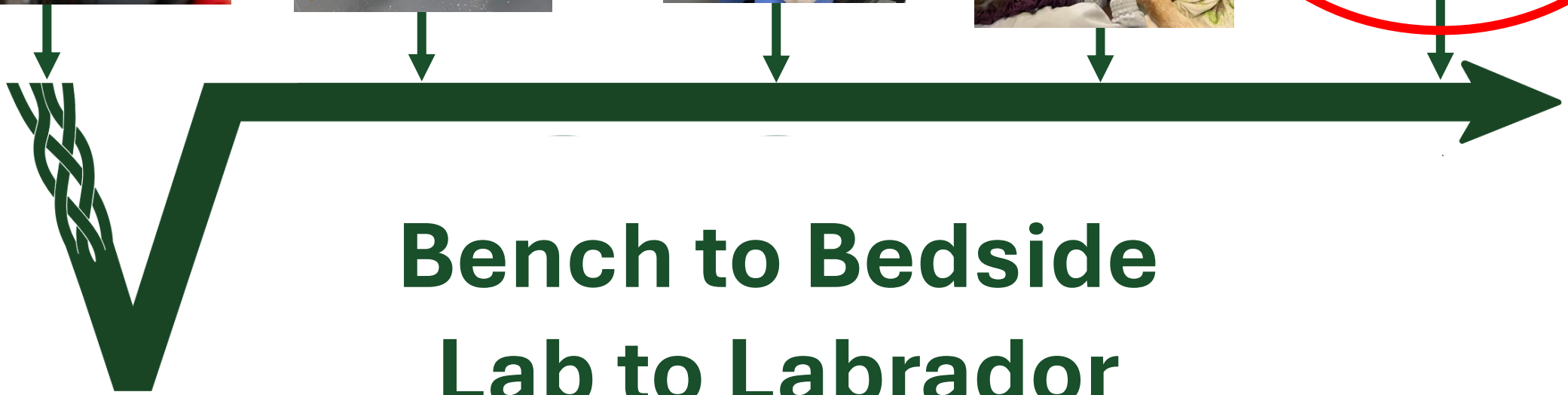
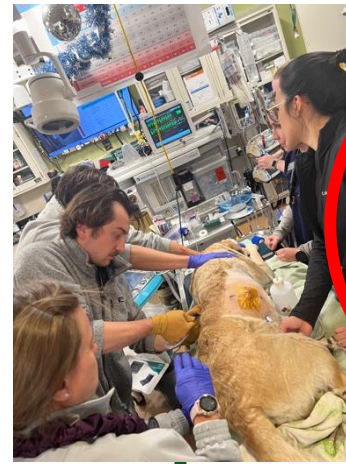
	6-hours		24-hours		30-days	
	Dead; n (%)	Alive; n (%)	Dead; n (%)	Alive; n (%)	Dead; n (%)	Alive; n (%)
Plas+	1 (4.3)	22 (95.7)	2 (8.7)	21 (91.3)	7 (30.4)	16 (69.6)
Plas-	7 (26.9)	19 (73.1)	9 (34.6)	17 (65.4)	14 (53.8)	12 (46.2)
P value		.052		.042*		.149

*Unpublished data



FDA completes risk review of freeze-dried plasma for treatment of hypovolemia and control of hemorrhage in dogs

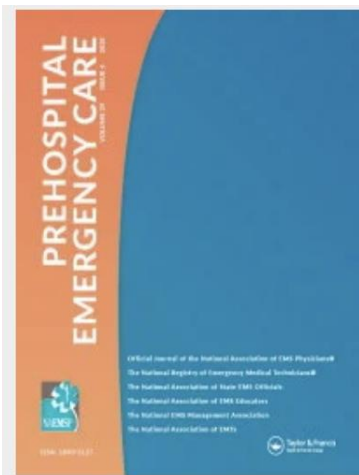




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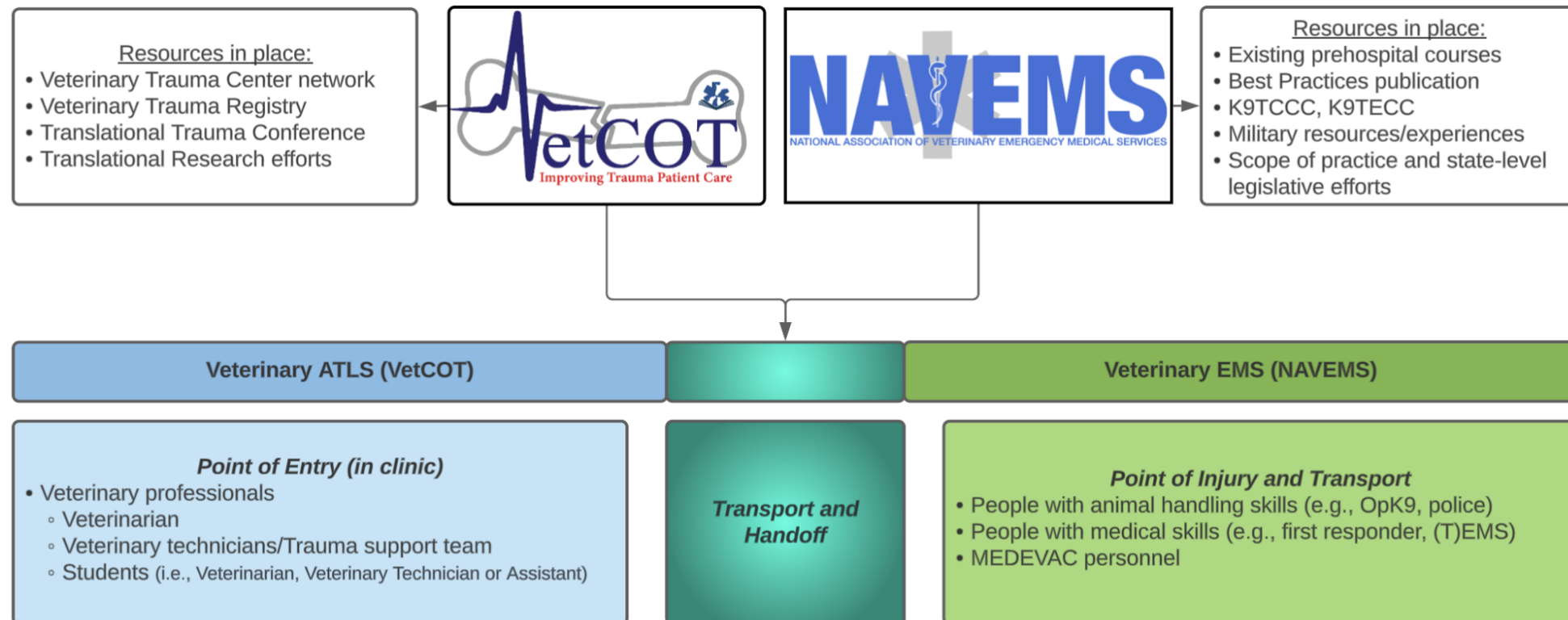
Position Paper

Care of the Operational Canine in the Prehospital Environment – A joint position statement and resource document of NAEMSP, NAVEMS, and VetCOT

Kate D. Zimmerman  , Lee Palmer , Kelly E. Hall , Rita M. Hanel , Kevin F. Jura , Richard D. Maricle , Esther I. Hwang , Jonathan D. Shecter , Rama Heyratifar  & Allen Yee  ...show less

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OPK9 CONTINUUM OF CARE: EDUCATION AND TRAINING RESOURCES



THE CODING SYSTEM

- Eight-digit alpha-numeric code
- More than 1,400 unique codes
- Last digit indicates injury severity

V-AIS Severity	Description
1	Minor
2	Moderate
3	Serious
4	Severe
5	Critical
6	Maximal
9	Unknown

Veterinary AIS Code Designation	Body Region	Type of Anatomic Structure	Specific Anatomic Structure	Level	Injury Severity
V	1	5	0 4	0 8	4

EXAMPLES:

V751272.3	open comminuted humeral shaft fracture
V161002.4	severe traumatic brain injury; mGCS 8-13
V541628.5	hilum avulsion of the kidney
V610230.6	complete cervical spinal cord transection injury

UK Validation Study
perform interrater reliability & code validation

Vehicle Injury Study
analyze canine vehicle crash injury to improve safety

OpK9 Injury Pattern Study
identify line of duty injury and survival patterns

Designing the Future of Trauma Clinical Guidance

Key Takeaways
from the Third Design for
Implementation Conference



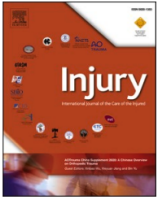


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Injury

journal homepage: www.elsevier.com/locate/injury



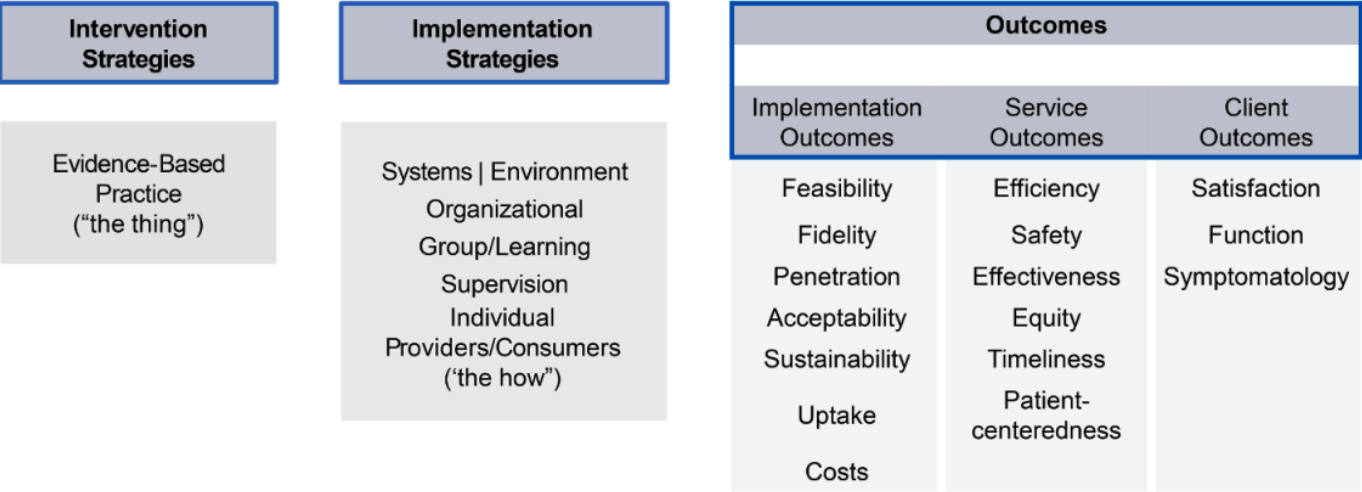
Editorial

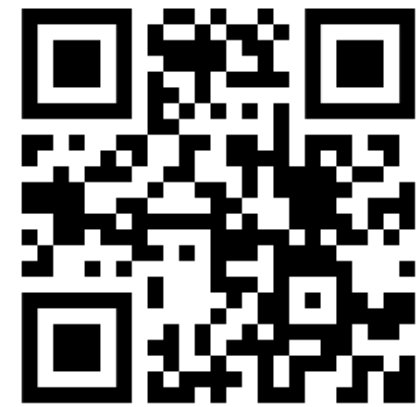
Dissemination and Implementation Science for the Trauma Provider: What you need to know to start doing and/or undoing the thing



Implementation Logic Models

Relating interventions & strategies to outcomes





VetATLS website

Veterinary Advanced Trauma Life Support

Be Ready When It Matters Most.

VetATLS



Primary Survey

Identify & treat immediate life threatening injuries

- X eXsanguinating hemorrhage
- A Airway
- B Breathing
- C Circulation
- D Disability
- E Exposure



Secondary Survey

- Complete head- to- toe exam
- Identify the extent of injuries
- Reassess effectiveness of interventions
- Ensure pain addressed



Tertiary Survey

- Evaluate adequacy of resuscitation
- Communicate with client recommended next steps
- Perform and review additional diagnostics (e.g., imaging)



Disposition

- Discharge
- Admit to facility
- Transfer for definitive care
 - Transport needs based on patient status
 - Establish client expectations
 - Communication with receiving facility



Hospital Readiness

- Secure resources (equipment, logistics)
- Recognize team roles
- Ensure client & team communication skills
- Create & maintain regional network

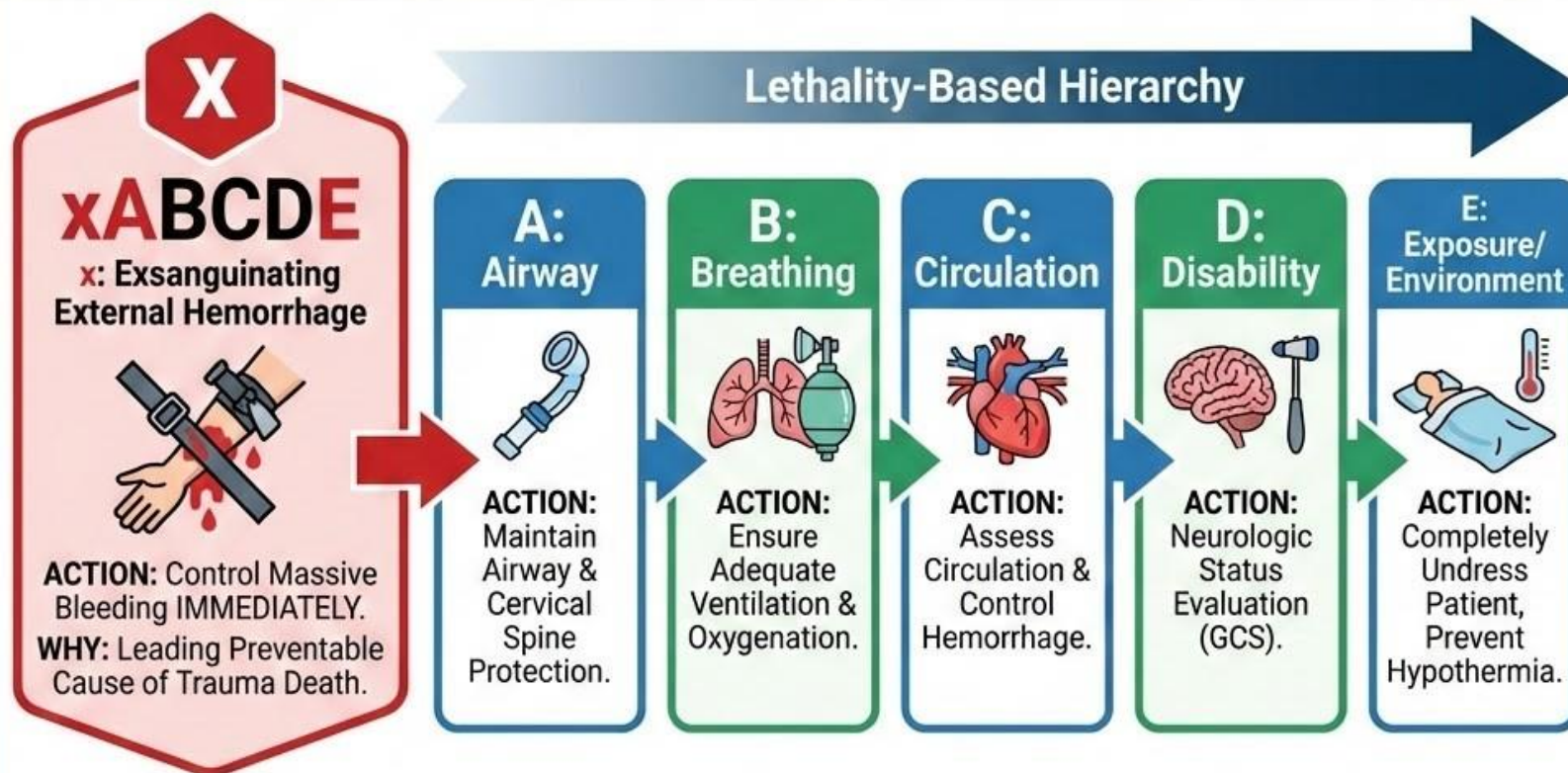


**Veterinary Advanced
Trauma Life Support**

ATLS 11th Edition: xABCDE Algorithm Update

Advanced Trauma Life Support 11th Edition

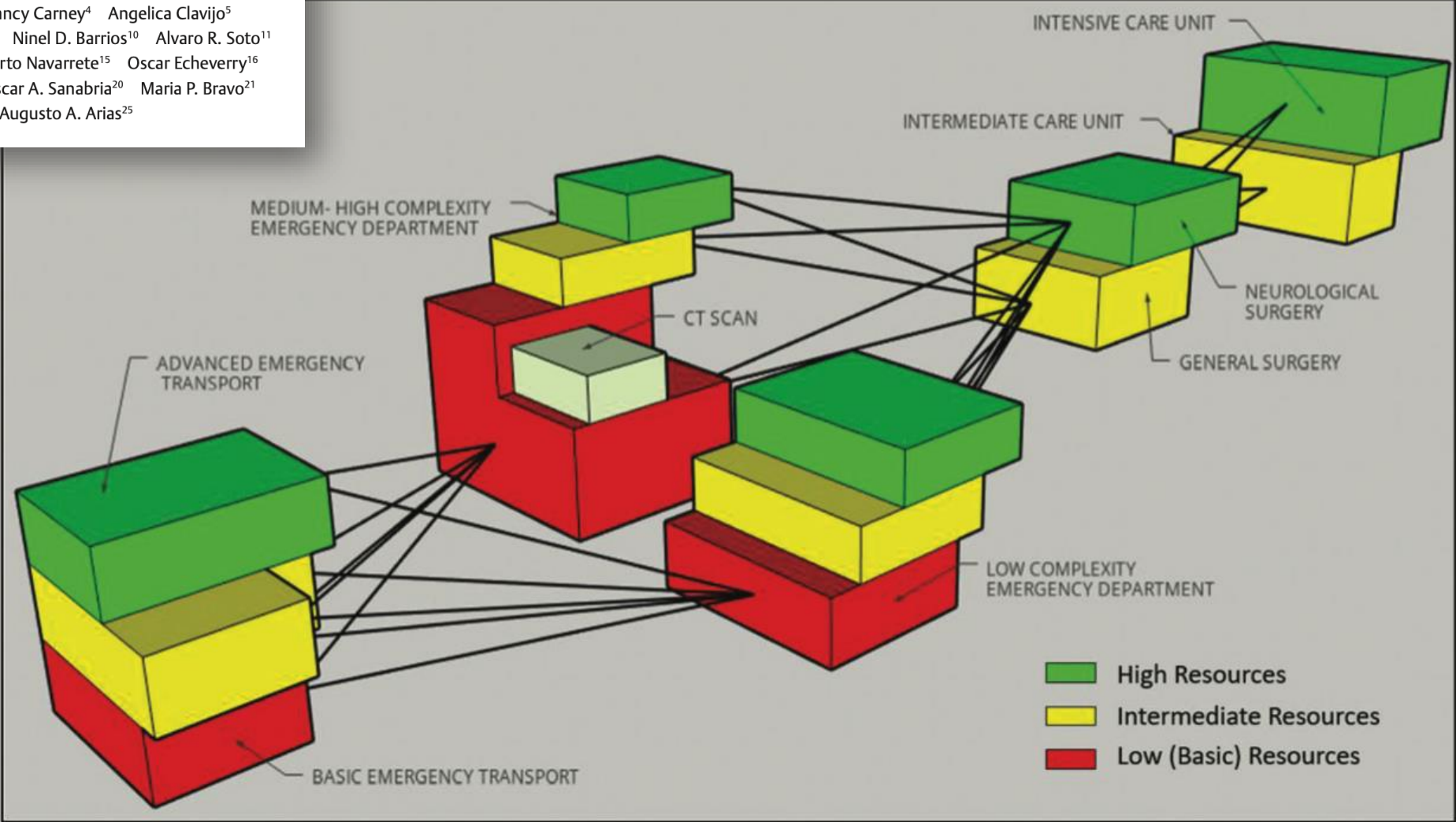
Significant Update: Prioritizing Exsanguinating External Hemorrhage



Goal: Stabilize Patient Effectively, Then Advance Systematically for Optimal Outcomes.

Recommendations of the Colombian Consensus Committee for the Management of Traumatic Brain Injury in Prehospital, Emergency Department, Surgery, and Intensive Care (Beyond One Option for Treatment of Traumatic Brain Injury: A Stratified Protocol [BOOTStraP])

Andres M. Rubiano¹ David S. Vera² Jorge H. Montenegro³ Nancy Carney⁴ Angelica Clavijo⁵
Jose N. Carreño⁶ Oscar Gutierrez⁷ Jorge Mejia⁸ Juan D. Ciro⁹ Ninel D. Barrios¹⁰ Alvaro R. Soto¹¹
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Mauricio Umaña¹⁷ Claudia M. Restrepo¹⁸ Jose L. Castillo¹⁹ Oscar A. Sanabria²⁰ Maria P. Bravo²¹
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Raul A. Echeverri²⁶ Jorge Paranos²⁷



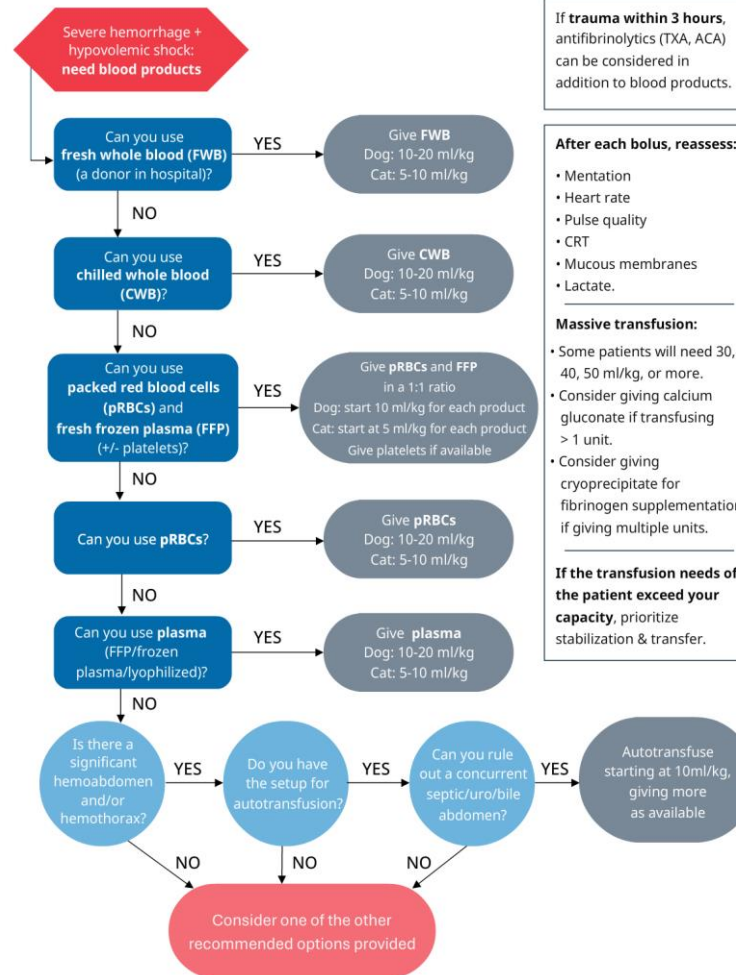
Transfusion Algorithm

Use this algorithm to support decision-making when you have diagnosed a trauma patient with severe hemorrhage and hypovolemic shock and are considering treatment with blood products.

To select a blood product or other option, start with the topmost blue box and ask:

- Is this product available?
- Is it financially viable?
- Is it without contraindications for this patient?

Select that product if you answer YES to all three questions. Otherwise, continue down to the next blue box. Repeat until you have identified a blood product you can use. If necessary, you can consider one of the other options listed on the back.



If there is a delay in getting blood products at ANY stage due to availability, finances, or other stabilizing procedures, crystalloids can be used.



Analgesia and Sedation

VetATLS Clinical Practice Guideline



VetCOT website



Veterinary Advanced
Trauma Life Support



Improving Trauma Patient Care



Improve Trauma Patient Outcomes in Pets and People



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Veterinary Advanced Trauma Life Support