

*THE PSA RE: TXA:  
IS THERE VALUE-ADDED BENEFIT OF  
TRANEXAMIC ACID FOR EMS?*

Drew Harrell, MD, FAEMS  
Medical Director, Albuquerque Fire Department  
UNM EMS Medical Direction Consortium



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# Questions to consider...

- 1- Rural, Suburban, or Urban Use?
- 2- Harm or Benefit?
- 3- But seriously...



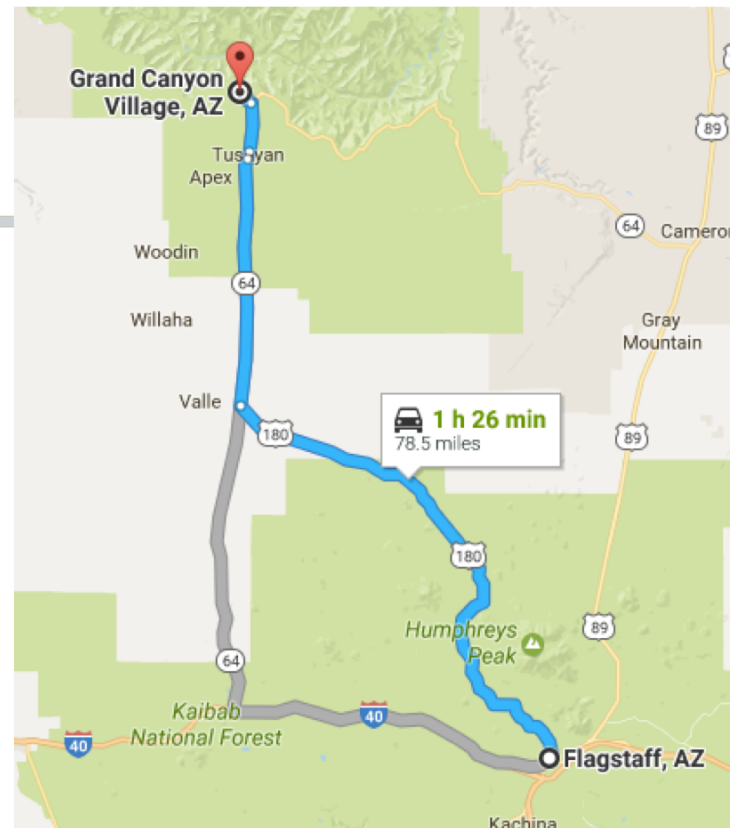


# The Flock...



- TXA use survey (43 responses)
- 77% (33/43)- NO
- 23% (10/43)- YES- either have been or rolling out soon.
- 1 site PATCH, 1 internal, 1 for years in use





# Effects of tranexamic acid on death, vascular occlusive events, and blood transfusion in trauma patients with significant haemorrhage (CRASH-2): a randomised, placebo-controlled trial

CRASH-2 trial collaborators\*

*Lancet* 2010; 376: 23–32

Published Online

June 15, 2010

DOI:10.1016/S0140-

6736(10)60835-5

**Methods** This randomised controlled trial was undertaken in 274 hospitals in 40 countries. 20 211 adult trauma patients with, or at risk of, significant bleeding were randomly assigned within 8 h of injury to either tranexamic acid (loading dose 1 g over 10 min then infusion of 1 g over 8 h) or matching placebo. Randomisation was balanced by centre, with an allocation sequence based on a block size of eight, generated with a computer random number generator. Both participants and study staff (site investigators and trial coordinating centre staff) were masked to treatment allocation. The primary outcome was death in hospital within 4 weeks of injury, and was described with the following categories: bleeding, vascular occlusion (myocardial infarction, stroke and pulmonary embolism), multiorgan failure, head injury, and other. All analyses were by intention to treat. This study is registered as ISRCTN86750102, Clinicaltrials.gov NCT00375258, and South African Clinical Trial Register DOH-27-0607-1919.

**Findings** 10 096 patients were allocated to tranexamic acid and 10 115 to placebo, of whom 10 060 and 10 067, respectively, were analysed. All-cause mortality was significantly reduced with tranexamic acid (1463 [14.5%] tranexamic acid group vs 1613 [16.0%] placebo group; relative risk 0.91, 95% CI 0.85–0.97;  $p=0.0035$ ). The risk of death due to bleeding was significantly reduced (489 [4.9%] vs 574 [5.7%]; relative risk 0.85, 95% CI 0.76–0.96;  $p=0.0077$ ).

**Interpretation** Tranexamic acid safely reduced the risk of death in bleeding trauma patients in this study. On the basis of these results, tranexamic acid should be considered for use in bleeding trauma patients.

**Original Article**

Feb 2012

# **Military Application of Tranexamic Acid in Trauma Emergency Resuscitation (MATTERs) Study**

Jonathan J. Morrison, MB ChB, MRCS; Joseph J. Dubose, MD; Todd E. Rasmussen, MD; et al Mark J. Midwinter, BMedSci, MD, FRCS

**Article Information**

*Arch Surg.* 2012;147(2):113-119. doi:10.1001/archsurg.2011.287

## **Abstract**

**Objectives** To characterize contemporary use of tranexamic acid (TXA) in combat injury and to assess the effect of its administration on total blood product use, thromboembolic complications, and mortality.

Association for Academic Surgery

# Tranexamic acid is associated with increased mortality in patients with physiological fibrinolysis



Hunter B. Moore, MD,<sup>a,\*</sup> Ernest E. Moore, MD,<sup>a,b</sup>  
Benjamin R. Huebner, MD,<sup>a</sup> Gregory R. Stettler, MD,<sup>a</sup>  
Geoffrey R. Nunns, MD,<sup>a</sup> Peter M. Einersen, MD,<sup>a</sup>  
Christopher C. Silliman, MD, PhD,<sup>a,c</sup> and Angela Sauaia, MD, PhD<sup>a,d</sup>

<sup>a</sup>Department of Surgery, University of Colorado Denver, Aurora, Colorado

<sup>b</sup>Department of Surgery, Denver Health Medical Center, Denver, Colorado

<sup>c</sup>Research Laboratory Bonfils Blood Center, Denver, Colorado

<sup>d</sup>University of Colorado School of Public Health, Aurora, Colorado

## ARTICLE INFO

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## ABSTRACT

**Background:** Tranexamic acid (TXA) administration after trauma has not been proven to improve survival in the United States. Trauma patients were presented to the hospital with a spectrum of fibrinolytic activity, in which physiological levels of fibrinolysis are associated with the lowest mortality. We hypothesize that trauma patients who present to the hospital





WILDERNESS & ENVIRONMENTAL MEDICINE, 28, S50–S60 (2017)

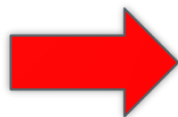
TACTICAL COMBAT CASUALTY CARE: TRANSITIONING BATTLEFIELD LESSONS  
LEARNED TO OTHER AUSTERE ENVIRONMENTS

## Tranexamic Acid Use in Prehospital Uncontrolled Hemorrhage



Benjamin R. Huebner, MD; Warren C. Dorlac, MD; Chris Cribari, MD

*From the Department of Surgery, University of Cincinnati, Cincinnati, OH (Dr Huebner); the University of Colorado Health, Loveland, CO and Volunteer Clinical Faculty, Department of Surgery, University of Cincinnati, Cincinnati, OH (Dr Dorlac); and the University of Colorado Health, Loveland, CO (Dr Cribari).*



Although the in-hospital care of trauma patients is shifting to TEG-based resuscitation, prehospital and field care of the injured patient do not have the same luxuries.

Andrew J Harrell - Outlook Web

PATCH-Trauma Study

Drew

Secure | https://www.patchtrauma.org

☆

⋮

Apps

Suggested Sites

Citrix XenApp - Appl...

Andrew J Harrell - O...

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join.me - Instant Scr...

WebPCR

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AFD ImageTrend

»



## PATCH-Trauma Study

The Pre-hospital Anti-fibrinolytics for Traumatic Coagulopathy & Haemorrhage Study

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### Goal

The PATCH-Trauma Study is an international multi-centre, randomised, double-blind, placebo-controlled trial of pre-hospital treatment with tranexamic acid for severely injured patients at risk of acute traumatic coagulopathy. The study aims to determine the effects of early administration of tranexamic acid on survival and recovery of severely injured patients treated within advanced trauma systems.

### Rationale

Bleeding is the most common preventable cause of death following severe injury. Up to a quarter of severely injured patients develop a condition known as acute traumatic coagulopathy that is observed shortly after injury and is associated with excessive clot breakdown and increased mortality. Bleeding is exacerbated by early-onset clotting defects, which are associated with high mortality. Tranexamic Acid (TXA) has been shown to reduce mortality due to bleeding when given in hospital, but its usefulness as

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FROM THE JOURNALS

## Do not delay tranexamic acid for hemorrhage

**Publish date:** January 20, 2018

**Author(s):** [M. Alexander Otto](#)

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SPECTRUM OF APPLICATIONS BEING



# Effect of treatment delay on the effectiveness and safety of antifibrinolytics in acute severe haemorrhage: a meta-analysis of individual patient-level data from 40 138 bleeding patients



Angèle Gayet-Ageron, David Prieto-Merino, Katharine Ker, Haleema Shakur, François-Xavier Ageron, Ian Roberts, for the Antifibrinolytic Trials Collaboration\*



## Summary

**Background** Antifibrinolytics reduce death from bleeding in trauma and post-partum haemorrhage. We examined the effect of treatment delay on the effectiveness of antifibrinolytics.

*Lancet* 2018; 391: 125–32

Published Online  
November 7, 2017

**Findings** We obtained data for 40 138 patients from two randomised trials of tranexamic acid in acute severe bleeding (traumatic and post-partum haemorrhage). Overall, there were 3558 deaths, of which 1408 (40%) were from bleeding. Most (884 [63%] of 1408) bleeding deaths occurred within 12 h of onset. Deaths from post-partum haemorrhage peaked 2–3 h after childbirth. Tranexamic acid significantly increased overall survival from bleeding (odds ratio [OR] 1·20, 95% CI 1·08–1·33;  $p=0\cdot001$ ), with no heterogeneity by site of bleeding (interaction  $p=0\cdot7243$ ). Treatment delay reduced the treatment benefit ( $p<0\cdot0001$ ). Immediate treatment improved survival by more than 70% (OR 1·72, 95% CI 1·42–2·10;  $p<0\cdot0001$ ). Thereafter, the survival benefit decreased by 10% for every 15 min of treatment delay until 3 h, after which there was no benefit. There was no increase in vascular occlusive events with tranexamic acid, with no heterogeneity by site of bleeding ( $p=0\cdot5956$ ). Treatment delay did not modify the effect of tranexamic acid on vascular occlusive events.

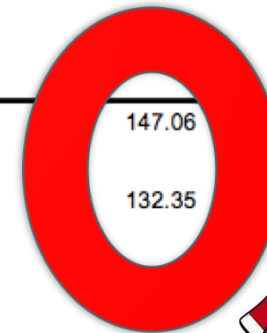
# Questions to consider...

1- Rural, Suburban, or Urban Use? – **YES!!**

2- Harm or Benefit?- **YES!!!...but**

3- And seriously...

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|---|---------|---|----|--------|--------|
| 1 | 1222841 | Tranexamic Acid Inj 100mg/mL 10/Bx          | BX | 147.06 | 147.06 |
|   |         | 42192060510 Acella Pharmaceuticals LLC      |    |        |        |
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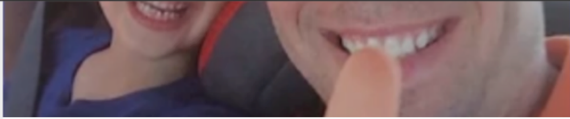
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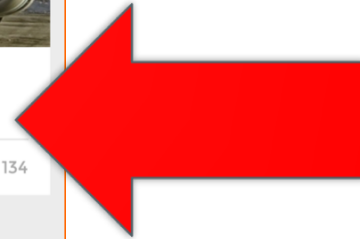
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# Getting There Faster with an EMS Bypasser:

## *Police and Civilian Transport of Blunt and Penetrating Trauma*



C. Crawford Mechem, MD  
Department of Emergency Medicine  
Perelman School of Medicine  
University of Pennsylvania

EMS Medical Director  
Philadelphia Fire Department



# Questions

- EMS transport of trauma pts is “the norm”
  1. Does the literature support it?
  2. If not, are there situations where EMS transport is beneficial?



*Ann Emerg Med* 2014; 63:608-614.  
Prehosp Emerg Care 2017; 21:715-721.

- **Philadelphia**

1. Compared penetrating trauma pts transported to trauma centers by EMS vs. police
2. Compared EMS vs. police transport of blunt trauma pts

- **No significant difference in mortality between groups**

- Certain penetrating trauma pts did better if transported by police



## So Now What?

- How quickly trauma pts get to trauma centers more important than how they get there
- EMS interventions rarely make a difference
- Both police and EMS can provide basic treatment
  - Tourniquets, pressure dressings
- So when *may* EMS add benefit to trauma care?

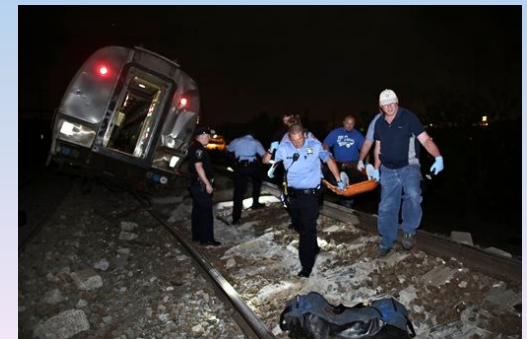
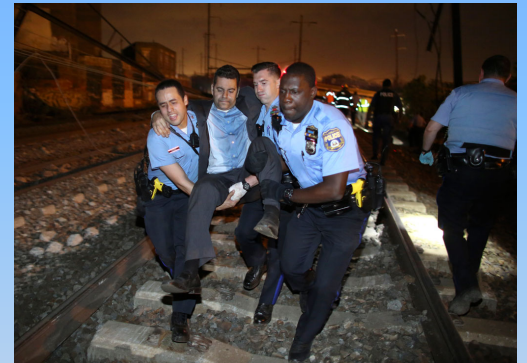


# AMTRAK Train 188: May 12, 2015



# AMTRAK Train 188

- Of 253 passengers, 8 fatalities
- 186 pts taken to hospitals
- 162 by police or SEPTA buses, only 24 by EMS
- EMS took only 3 of 43 seriously injured pts
- Pts taken by police began arriving at EDs just as PFD was setting up triage, transport groups at crash site



# AMTRAK Train 188

- **Pros of police transport**

- Patients got to hospitals faster
- Per NTSB no negative outcomes from police transport

- **Cons of police transport**

- No prehospital care
- No police pre-notification of EDs
- Minimal patient tracking – PFD unaware where pts went
- Some hospitals overwhelmed, others got few or no pts

*So...*

# What EMS Can Add

- Sometimes trauma patients need EMS care
- In MCIs, EMS can:
  - Impose structure to chaos through use of ICS
  - Assign personnel to scene safety role
  - Perform more controlled patient extrication
  - Get the right patients to the right hospitals
  - Systematically track patients
  - Draw on mutual aid, connections to medical community





# Conclusions

- Non-EMS transport of trauma pts is safe in most cases
- Incorporating police in EMS systems
  1. Gets trauma pts to care faster, *and*
  2. May free up ambulances for pts who most need them
- Inclusion of police should follow community discussion
- Inter-agency coordination needed to optimize pt care and tracking during routine and mass-casualty operations









# A COOLER WAY TO STOP HEMORRHAGE

Kevin McVaney, MD

Medical Director, Denver Paramedics





# COMBAT Study

## Early FFP for Critical Trauma Patients

Keep the hot side hot  
&  
The cold side cold





# Ballistic Box Cooler -18 C













# Results

- 144 Enrolled
  - No difference in mortality
  - No difference in multi organ failure
  - Decrease in hyperfibrinolysis





# Conclusions

- No benefit in a high functioning urban 911 system connected to a level 1 trauma center
  - 911 call to ED
    - 26 minutes (median)
- Perhaps rural flight system???

