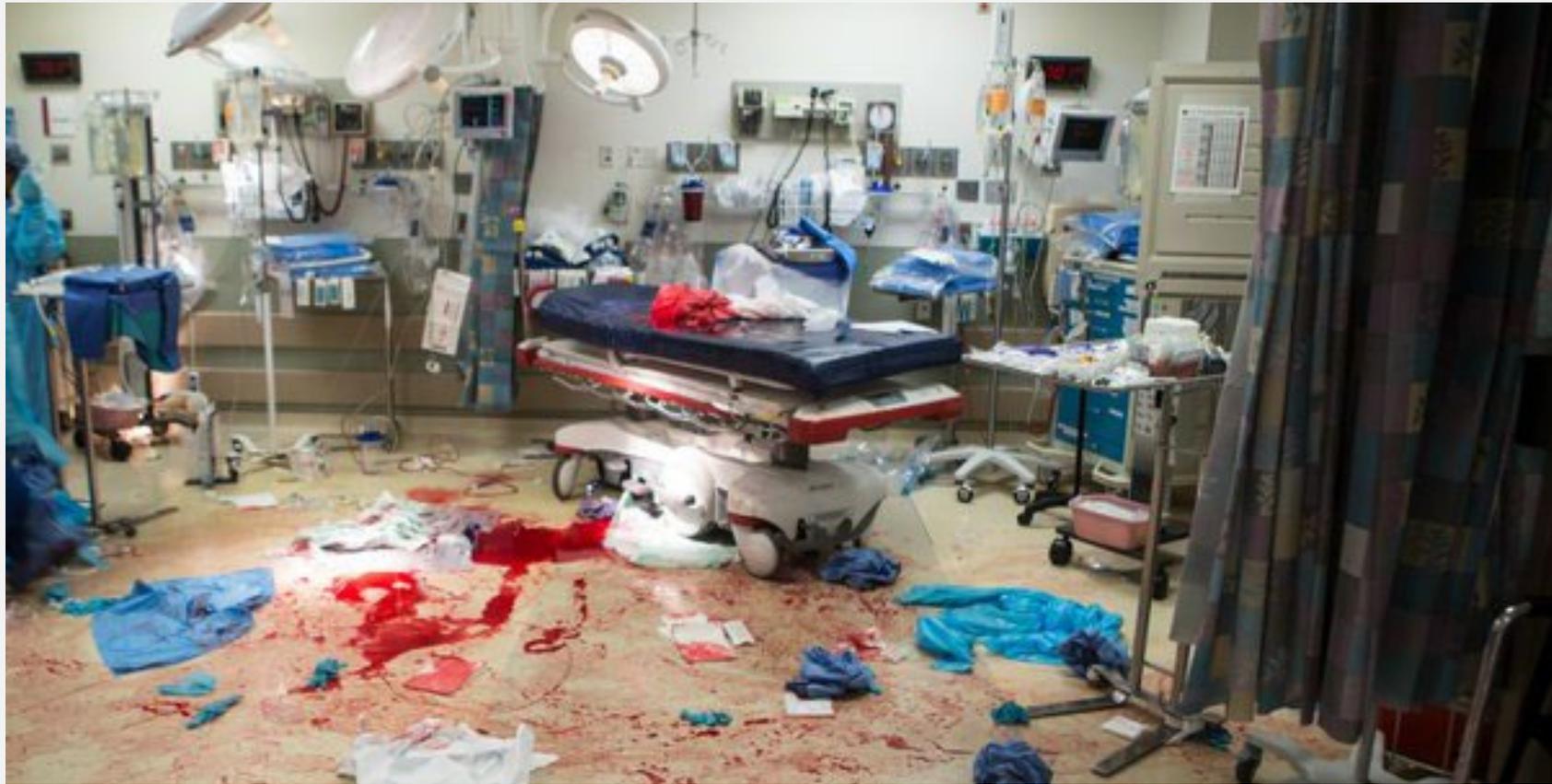


Recent Trauma Guidelines: What Should I Be Doing Differently?

Christopher B. Colwell, MD

San Francisco General Hospital and Trauma Center



Trauma Resuscitation



Crystalloids in Trauma Patients

- European Society of Intensive Care Medicine 2025 clinical practice guidelines on fluid therapy in adult critically ill patients
 - Mekontso Dessap et al
 - Intensive Care Med, 2025
 - Systematic review and meta-analysis guiding expert panel
 - Recommends restrictive fluid resuscitation (permissive hypotension approach) for both blunt and penetrating trauma patients



Whole Blood

- Recent clinical guidelines and consensus statements strongly endorse the use of low-titer group O whole blood (LTOWB) as the preferred resuscitation fluid for hemorrhagic shock
 - ACEP - 2024
 - ACS – 2023
 - NIH – 2022



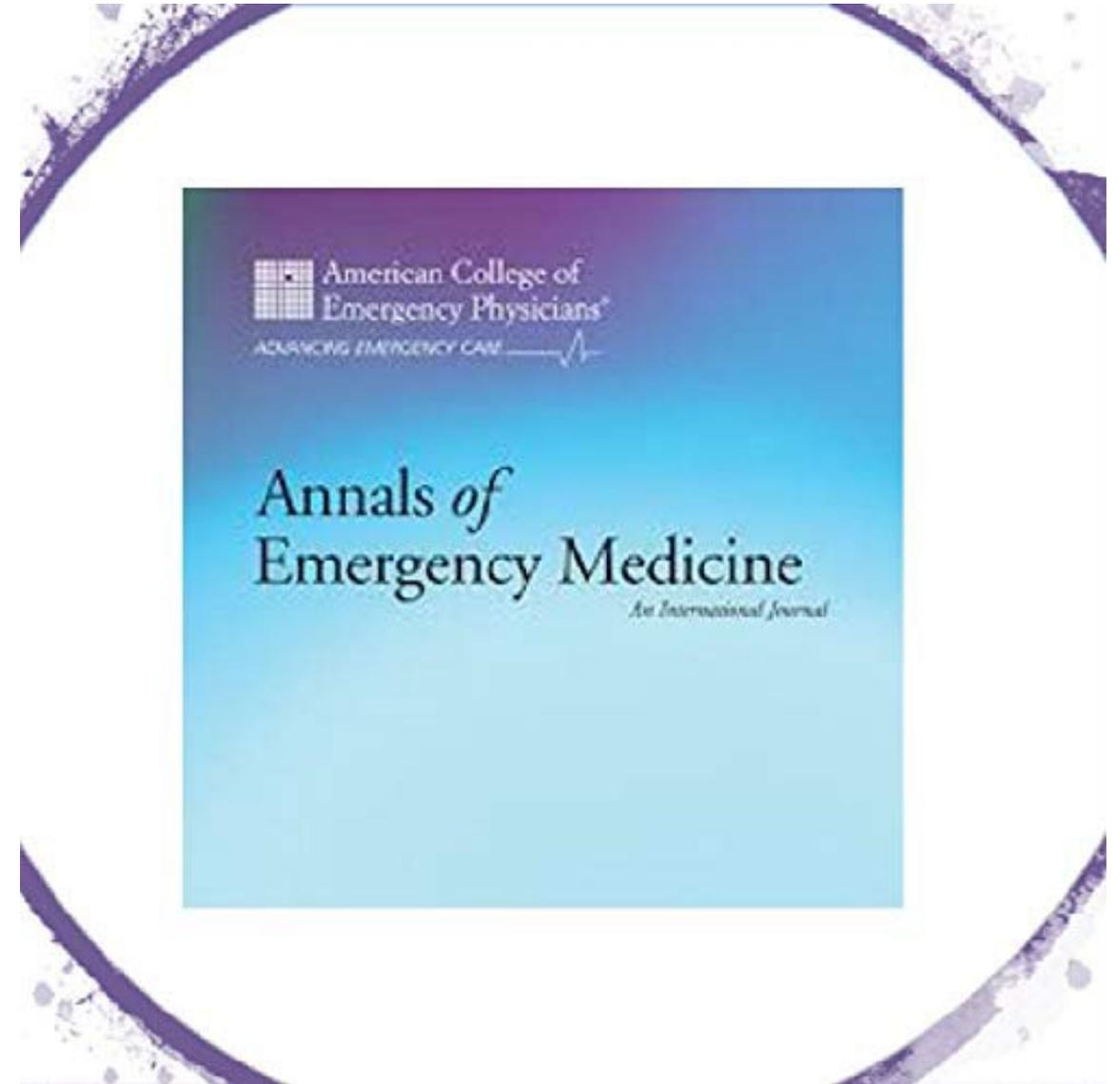
Balanced Resuscitation

- Balanced (damage control) resuscitation includes
 - 1:1:1 RBC:Plasma:Platelet ratios
 - Limit crystalloid resuscitation
 - Permissive hypotension
 - Early TXA
 - American Association for the Surgery of Trauma (AAST)
 - 2025



TXA in Trauma

- Tranexamic acid timing and mortality impact after trauma
 - Ali et al (PATCH-Trauma trial investigators)
 - Ann Emerg Med, 2026
 - Exploratory analysis of the Prehospital Tranexamic Acid for Severe Trauma (PATCH-Trauma) trial
 - Randomized to 1 gram + 1 gram versus control
 - Death within 28 days
 - Optimal therapeutic window may be within 90 minutes



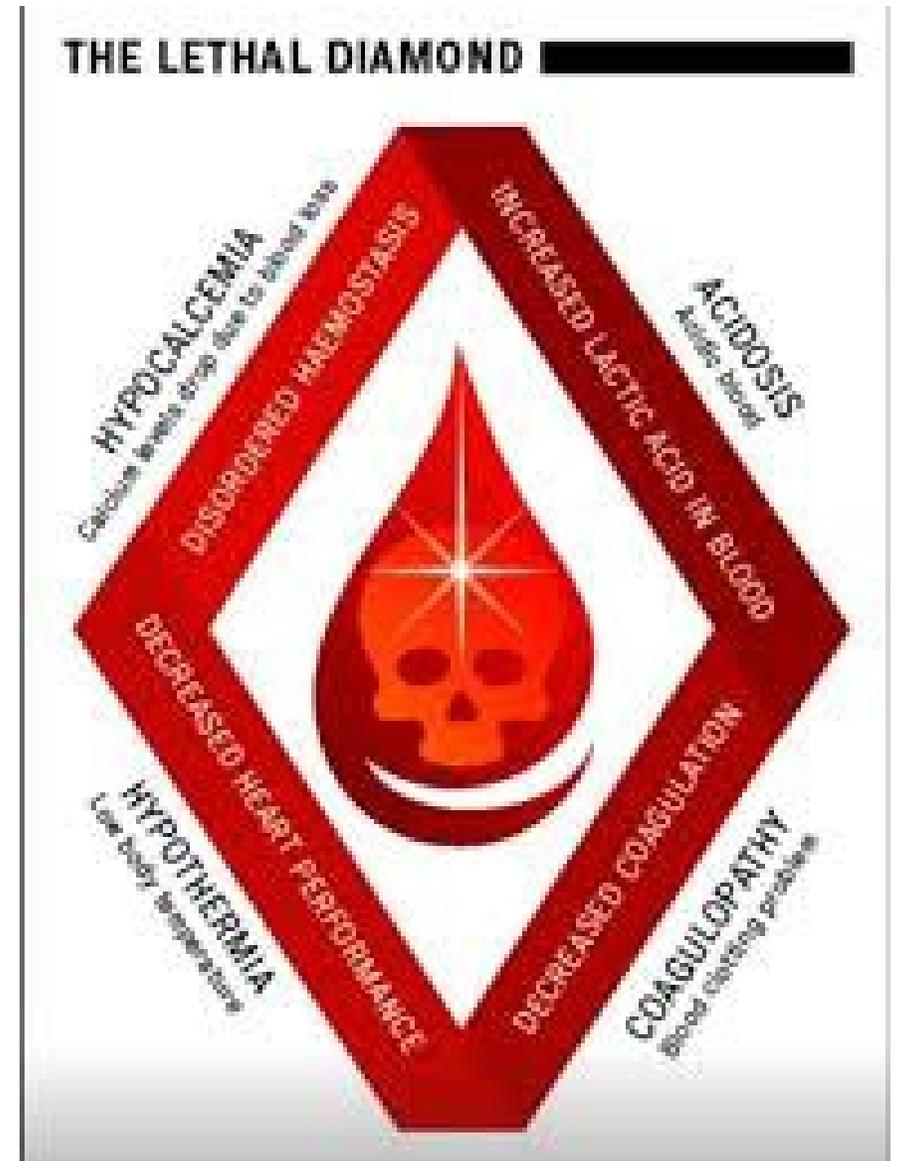
TXA in Trauma

- Tranexamic acid in trauma: a joint position statement and resource document with NAEMSP, ACEP, and ACS-COT
 - Barrett et al
 - Ann Emerg Med, 2025
 - May reduce mortality and improve outcomes in patients with hemorrhagic shock
 - Safe, with low risk for adverse events
 - Can be given as 1 gram and 1 gram, or a 2-gram slow push



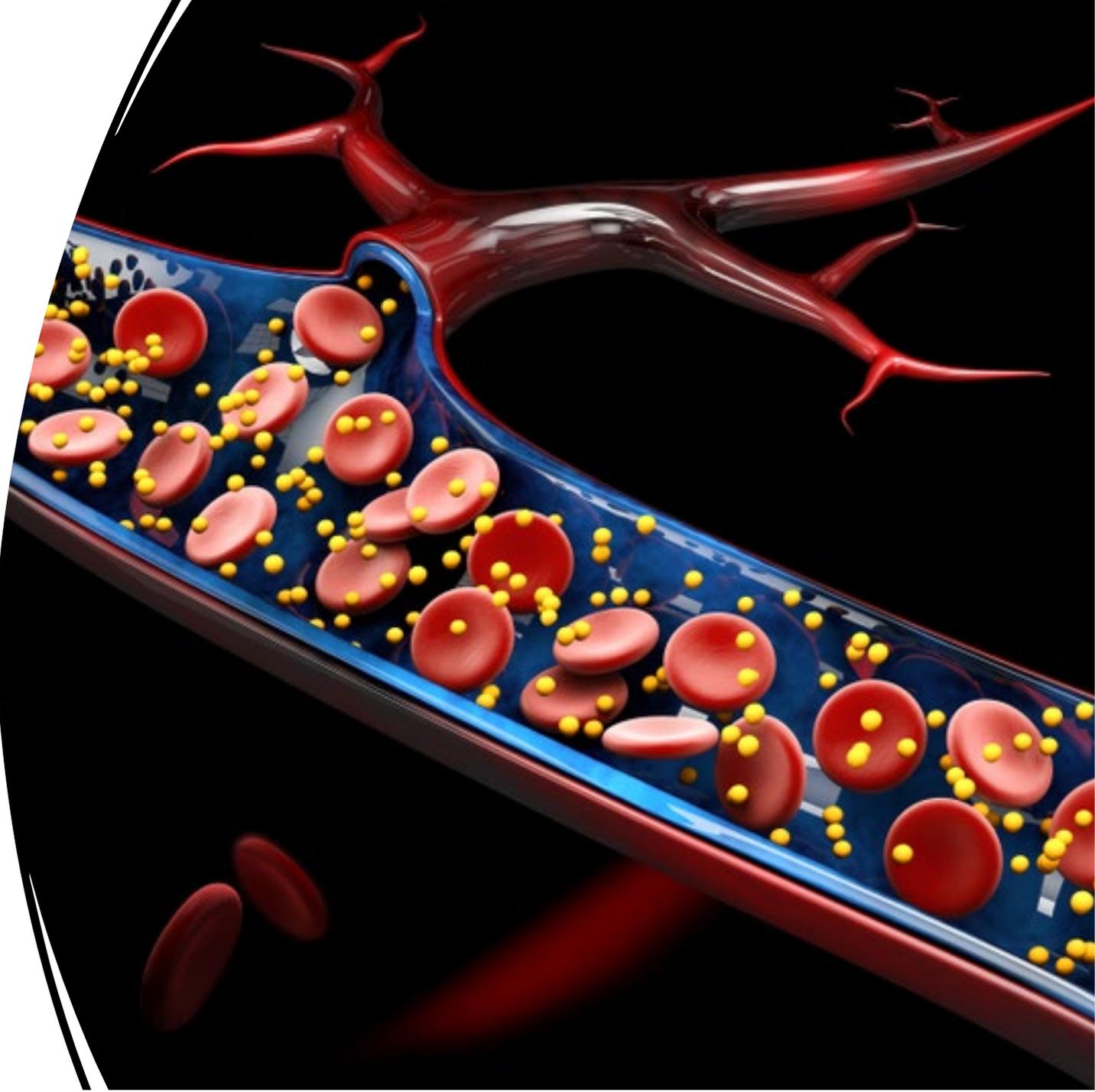
Calcium in Trauma Resuscitations

- Fluid resuscitation in trauma: What you need to know
 - Dhillon et al
 - J Trauma Acute Care Surg, 2025
 - Limit crystalloids to every extent possible
 - Significant physiologic implications of hypocalcemia
 - Citrate anticoagulant in stored blood



Calcium?

- European guideline on management of major bleeding and coagulopathy following trauma: sixth edition
 - Rossaint et al
 - Crit Care 2023
 - Recommendation 31:
 - Monitor ionized calcium and maintain within a normal range
 - Goal of 1.2 mmol/L
 - Not < 0.9
 - Recommend using calcium chloride
 - Higher concentration of elemental calcium
 - Preferable if abnormal liver function



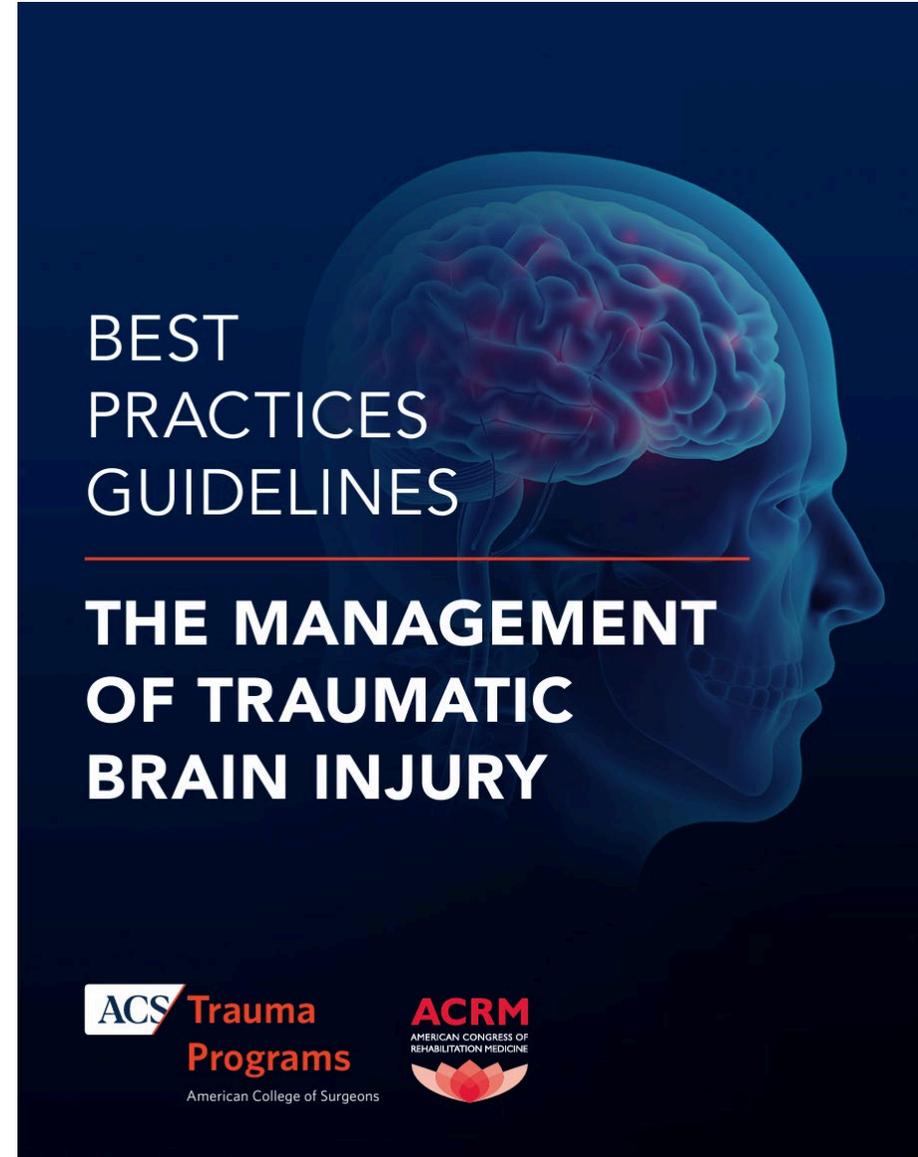
Traumatic Brain Injury

- Adverse prehospital events and outcomes after traumatic brain injury
 - Maiga et al
 - JAMA Open Network, 2025
 - Multicenter cohort study
 - 14,994 patients
- Prehospital hypoxia, hypotension, and hypocarbia were associated with poorer TBI outcomes



Traumatic Brain Injury

- Best practice guidelines
 - ACS, 2024
- PaO₂ > 94%
- PaCO₂ 35-45 mm Hg
- pH 7.35-7.45
- Avoid hyponatremia
 - Na 135-145 mEq/L



Traumatic Brain Injury

- Avoid hyper or hypoglycemia
 - 100-180 mg/dL
- ICP 20-25 mm Hg
 - CPP > 60 mm Hg
- SBP > 110 mm Hg
 - MAP > 80 mm Hg
 - SBP < 90 mm Hg = 2x mortality
- Hgb > 7 g/dL



Epinephrine in Trauma Patients?

- Joint position statement of NAEMSP, ACEP, and ACS COT
 - Breyre et al
 - Ann Emerg Med, 2025
 - Epinephrine should not be routinely used in traumatic circulatory arrest



Oxygen for Trauma Patients

- Early restrictive vs liberal oxygen for trauma patients: The TRAUMOX2 randomized clinical trial
 - Arleth et al
 - JAMA, 2025
 - 1979 patients
 - Restrictive
 - 94% saturation
 - Liberal
 - 12-15 L/min for 8 hours
 - No difference



Pediatric Trauma

- PECARN prediction rule for cervical imaging of children presenting to the emergency department with blunt trauma: a multicentre prospective observational study
 - Leonard et al
 - Lancet Child Adolesc Health, 2024



PECARN - Neck

- High risk
 - AMS
 - GCS 3-8 or unresponsive
 - Abnormal CBAs
 - Focal neurologic deficit
- Non-negligible risk
 - Neck pain
 - AMS
 - GCS 9-14 or Verbal/Pain
 - Substantial
 - Head injury
 - Torso injury



PECARN - Neck

- High risk and non-negligible risk factors combined had
 - 94.3% sensitivity
 - 60.4% specificity
 - 99.9% negative predictive value
- Would have decreased CT use from 17.2% to 6.9%
- Not a 2-way decision rule



PECARN Trauma – Head and Abdomen

- PECARN prediction rules for CT imaging of children presenting to the emergency department with blunt abdominal or minor head trauma: a multicentre prospective validation study
 - Holmes et al
 - Lancet Child Adolesc Health, 2024
 - Prospective validation study
 - 7542 kids with abdominal trauma
 - 19,999 with minor head trauma



PECARN - Abdomen

- Abdomen
 - Negative if none of the following:
 - Abdominal pain
 - Vomited since the injury
 - GCS < 14
 - Absent or decreased breath sounds
 - Evidence of thoracic wall trauma
 - Evidence of abdominal wall trauma
 - Abdominal tenderness



PECARN Head

- Younger than 2 years
 - Negative if none of the following:
 - GCS < 15 or AMS
 - Non-frontal scalp hematoma
 - Hx of LOC for > 5 seconds
 - Palpable or suspected skull fracture
 - Acting abnormally per parent
 - Severe mechanism
- 2 years and older
 - Negative if none of the following
 - GCS < 15 or AMS
 - History of LOC
 - Vomiting since the injury
 - Clinical signs of basilar skull fx
 - Severe headache
 - Severe mechanism

PECARN – Head and Abdomen

- Abdominal injury rule
 - Sensitivity - 100%
 - NPV – 100%
- Trauma brain injury rule
 - < 2
 - Sensitivity – 100%
 - NPV – 100%
 - 2 and older
 - Sensitivity – 98.8%
 - NPV – 100%
- One-way decision rules





Eastern Association for the Surgery of Trauma
Advancing Science, Fostering Relationships, and Building Careers

Spinal Motion Restriction

- EAST Guidelines for Spinal Motion Restriction
 - 2018
 - **Strongly** recommend against spinal immobilization in adults penetrating trauma

Spinal Motion Restriction

- NAEMSP Position Statement on Prehospital Management of Spinal Cord Injuries
 - 2025
 - There are no data in the published literature to support spinal immobilization or spinal motion restriction as standard of care in trauma patients



**National Association
of EMS Physicians**



Trauma Airways

- Airway management in patients with suspected or confirmed cervical spine injury: Guidelines from a multidisciplinary working group
 - Wiles et al
 - Anesthesia, 2024
 - Systematic review
 - 67 articles
 - 21 RCT

Trauma Airways



- 23 recommendations
 - Remove rigid collars before intubation
 - Video laryngoscopy
 - Did not recommend routine use of manual in-line stabilization

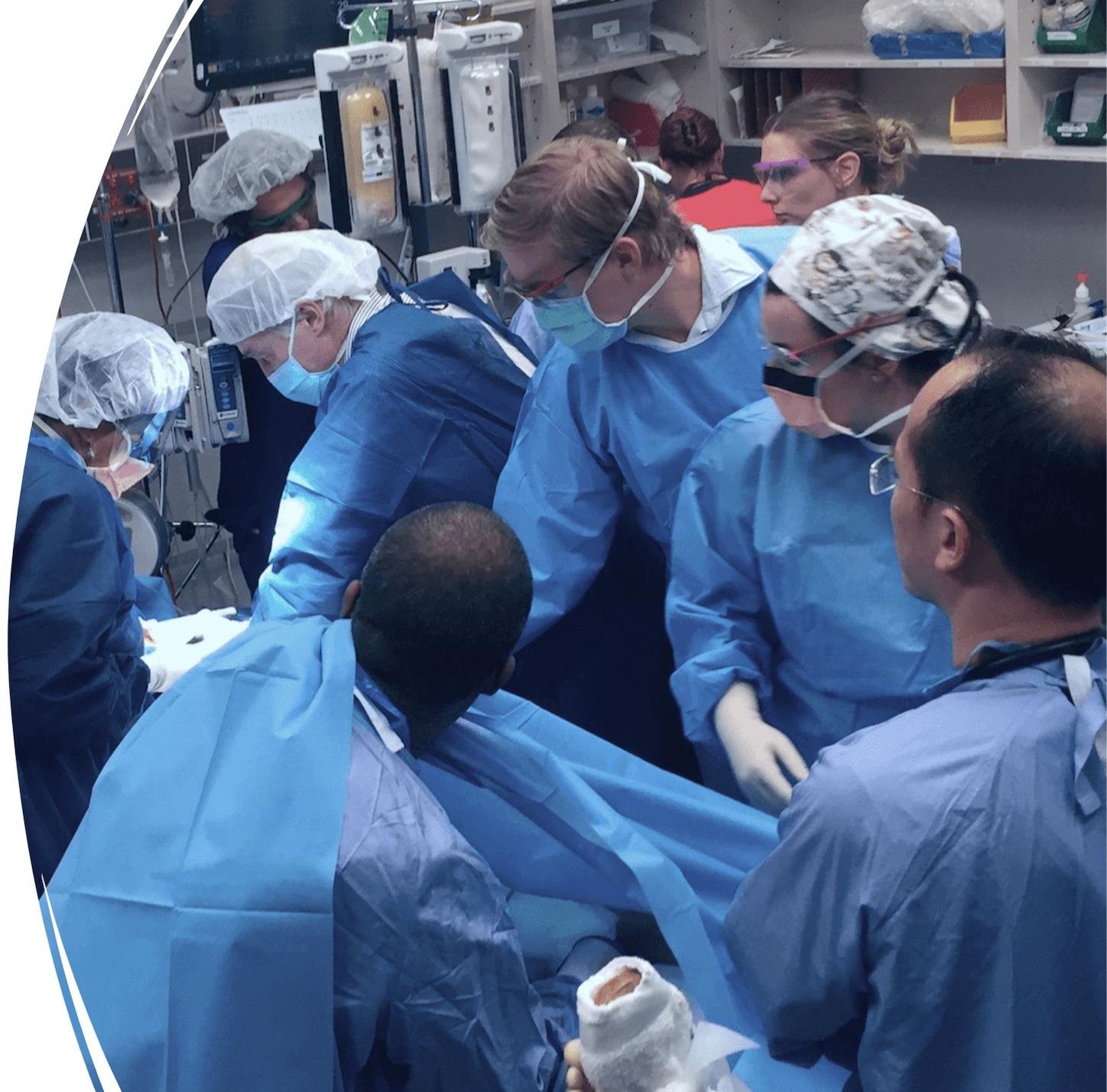
Whole Body CT Scans

- Clinical policy: Critical issues in the evaluation of adult patients presenting to the emergency department with acute blunt trauma
 - Gerardo, et al
 - Ann Emerg Med, 2024
 - Does WBCT improve clinically important outcomes?
 - Level C recommendation: Due to lack of quality evidence, use your judgement



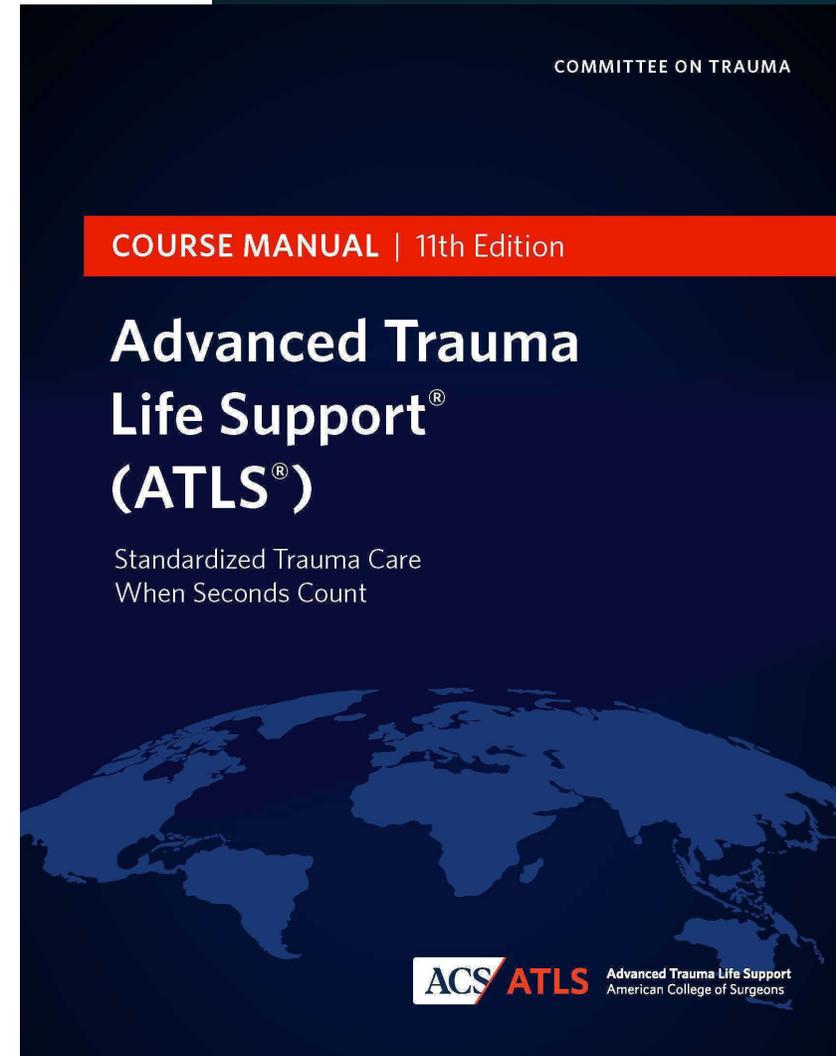
xABC Trauma Resuscitation

- Impact of prehospital exsanguinating airway-breathing-circulation resuscitation sequence on patients with severe hemorrhage
 - Ritondale et al
 - J Am Coll Surg, 2024
 - Single year prospective analysis
 - 93 patients
 - Overall mortality was lower in the xABC group (13% versus 47%)
 - Prehospital circulation-first prioritization decreased in-hospital mortality

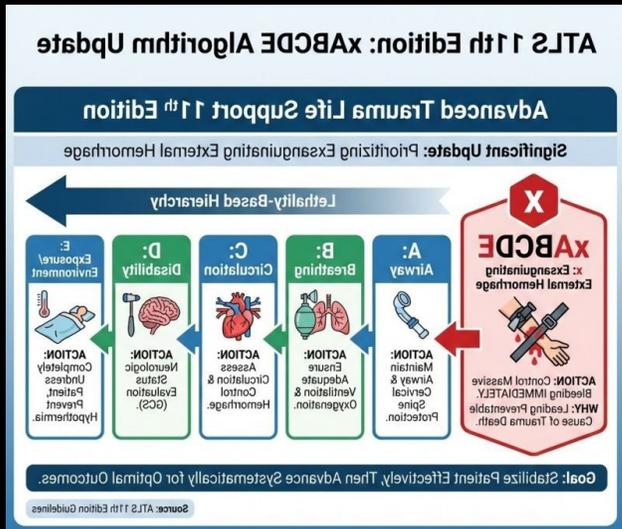


Advance Trauma Life Support

- 11th Edition coming this year
- 11 required videos
 - 91 minutes
- Skill stations
- Team dynamics are emphasized



ATLS



- xABCDE format
 - "x" is control of exsanguinating hemorrhage
 - Basic airway maneuvers while initiating volume resuscitation prior to RSI meds in hypotensive trauma patients
 - Treat the greatest threat to life first
- Blood products are preferred for resuscitation of shock
- Still allowed to give crystalloids
 - But only 1 liter
- Lactate levels can be used to monitor resuscitation progress

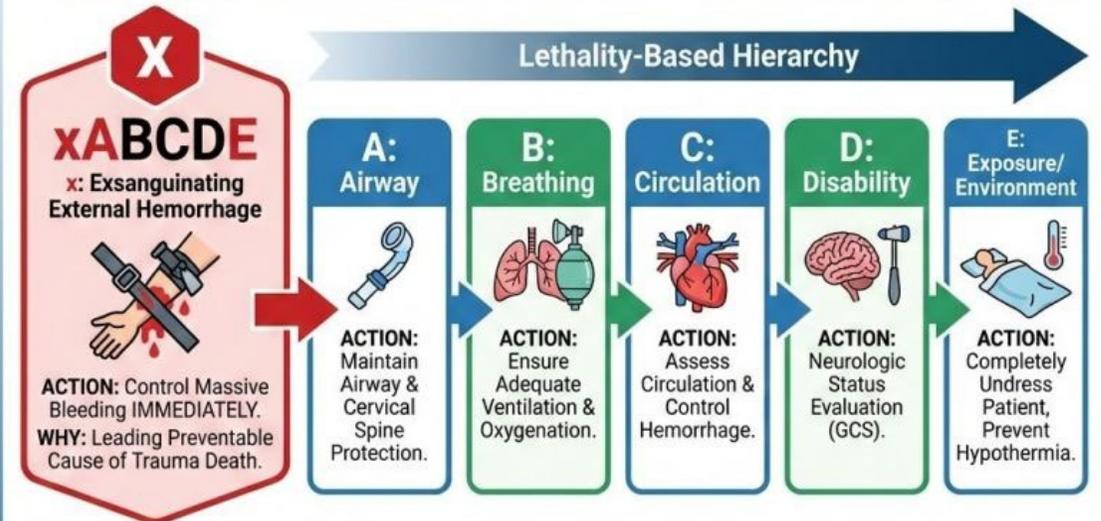
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ATLS 11th Edition: xABCDE Algorithm Update

Advanced Trauma Life Support 11th Edition

Significant Update: Prioritizing Exsanguinating External Hemorrhage



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

Source: ATLS 11th Edition Guidelines

ATLS

- Airway
 - Jaw thrust preferred
 - Chin lift removed
 - RSI
 - Rapid refers to medication effects rather than rapidity of the procedure
 - Video laryngoscopy preferred
 - Bolus dose vasopressors may be used to treat RSI-related hypotension
- “Geriatric trauma” is renamed “trauma in the older adult”
 - Frailty

COURSE MANUAL | 11th Edition

Advanced Trauma Life Support[®] (ATLS[®])

Standardized Trauma Care
When Seconds Count

New!

ATLS

- New chapter on communicating serious news in the acute care setting
- Importance of the prehospital handoff
- All trauma airways are to be considered “potentially difficult”
 - No more Mallampati, LEMON, MACOCHA, etc...



ATLS

- Apneic oxygenation should be used during laryngoscopy
- After 3 intubation attempts, change technique or user
- “Surgical” airway may also be known as “incisional” airway
- Needle cricothyrotomy is now recommended only for younger children/infants



EXCITING UPDATE: ATLS 11th EDITION

TRAUMA REDEFINED

xABCDE of TRAUMA



X - Exsanguination
A - Airway & C-spine
B - Breathing
C - Circulation
D - Disability
E - Exposure & environment

What's New in
ATLS 11

- xABCDE Algorithm
- Expert-Driven Updates
- Hands-On Learning Enhanced
- Revamped Manual
- Anytime, Anywhere Access
- Mobile-optimized digital modules

This isn't just an update – it's a transformation.

#TraumaCare #ATLS11 #EmergencyMedicine
#HemorrhageControl #xABCDE

ATLS

- Class I-IV hemorrhage has been replaced with mild to major
- Fluid calculations for burn injuries have changed
 - 2 mLs/hr/kg/%TBSA
 - 4 mLs/hr/kg/%TBSA for electrical burns
- Trauma is not an “accident”

Summary

- Limit crystalloids
- Whole blood if you have it
- Balanced ratios (1:1:1) if you don't
- TXA early
 - 2 grams
- Avoid hypotension, hypoxia, and hypocarbia in TBI
 - SBP > 110
 - PaO₂ > 94%
 - PaCO₂ 35-45



Summary

- Epinephrine is not effective in traumatic circulatory arrest
- Liberal oxygen is fine
- PECARN decisions rules can safely reduce imaging in kids
 - 1-way decision rules
- Spinal motion restriction/immobilization is unproven and may be harmful
- Not every trauma patient needs a CT
- ATLS is getting better





Thank You!

- Christopher.Colwell@ucsf.edu
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