

Persistent Injurious Concepts: Continuing Major Myths in Trauma Care

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Pot Madness



More Madness



Next Phase





Myths in Trauma Care

- Binding pelvic fractures
- Ketamine in trauma
- Cervical collars
- Pain management
- Trauma resuscitation



Myth # 1: X-Ray Before Binding the Pelvis

- Concern for potential harm
 - No data that it causes harm
- Should be done when possible in the pre-hospital arena
 - Schweigkofler et al
 - Eur J Trauma Emerg Surg, 2018
- Should be considered management for major hemorrhage
 - Scott et al
 - Emerg Med J, 2013



Binding Pelvic Fractures

- Close the book
 - Don't need a commercial device
 - Fu et al
 - Am J Emerg Med, 2013
- MAST trousers?
 - Loftus et al
 - J Spec Oper Med, 2017



Sheet Tie



After Sheet Tie



Myth # 2: Ketamine and Head Trauma

- Ketamine myths
 - Raises ICP
 - Needs a monitor every time



Increased ICP?

- Evaluated the available evidence on the effects of ketamine on intracranial and cerebral perfusion pressures
 - Cohen at al
 - Ann Emerg Med
 - July, 2014



Increased ICP?

- Conclusions
 - No adverse effect on
 - ICP
 - CPP
 - Neurologic outcome
 - ICU stay
 - Mortality



Myth # 3: Cervical Collars are the Bomb!

- They must be....we put them on everybody!!
- Origin has more historical than scientific precedents
 - Cacho-Garcia et al
 - Int J Crit Care Emerg Med, 2019



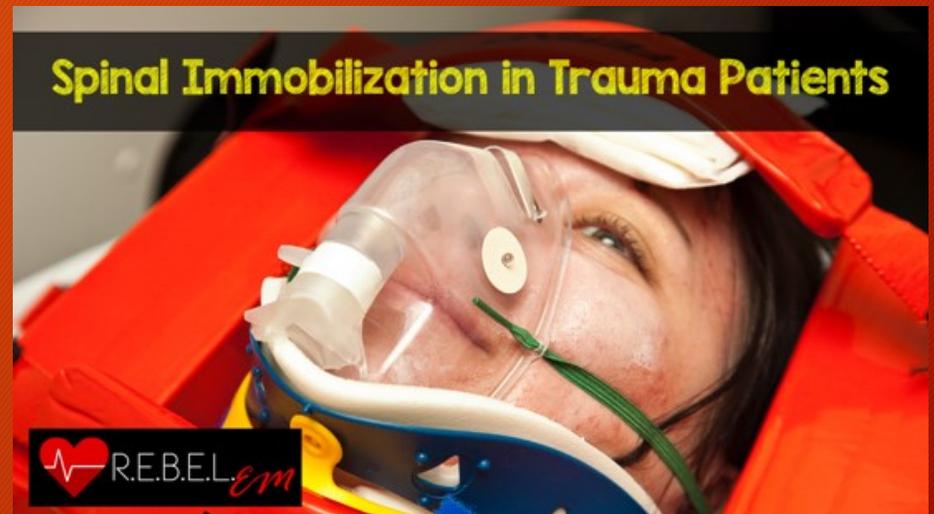
C-Collar

- Never based on data!
- May be harmful
 - Ben-Galim et al, J Trauma 2010
 - Engsberg et al, J Emerg Med 2013
- “Routine use” can be safely avoided
 - Sundstrom et al, J Neurotrauma 2014



C-Collars Harm

- Increase ICP
 - Mobbs et al, J Surg 2002
- Reduce venous return
 - Sundstrom et al, J Neurotrauma 2014
- Complicate airway management
 - Increased intubation attempts
 - Increased risk of failed airway attempts
 - Gaither et al
 - J Emerg Med, 2014
- No evidence that they limit the mobility of the spine



Joint Position Statement

- ACEP
- NAEMSP
- ACS - COT
 - Prehospital Emerg Care, 2018



Joint Position Statement

- Take homes
 - Current techniques do not provide spinal immobilization
 - Spinal Motion Restriction (SMR)
 - Spine board is an extraction device and can be safely removed early
 - No SMR in penetrating trauma



Myth # 4: Pain Management is Bad

- Hypotension
- Masking symptoms
- Opioid Abuse



Pain Management

- We still aren't doing a good job
 - Hewes et al
 - Prehosp Emerg Care, 2018
- Appropriate pain management is our job



Pain Management in Trauma

- Pain management is safe and effective in prehospital trauma patients
 - Porter et al
 - Eu J Emerg Med, 2019
- Many options
 - Fentanyl
 - Ketamine
 - 0.1-0.3 mg/kg IV
 - 10 mg in an adult
 - IV Tylenol



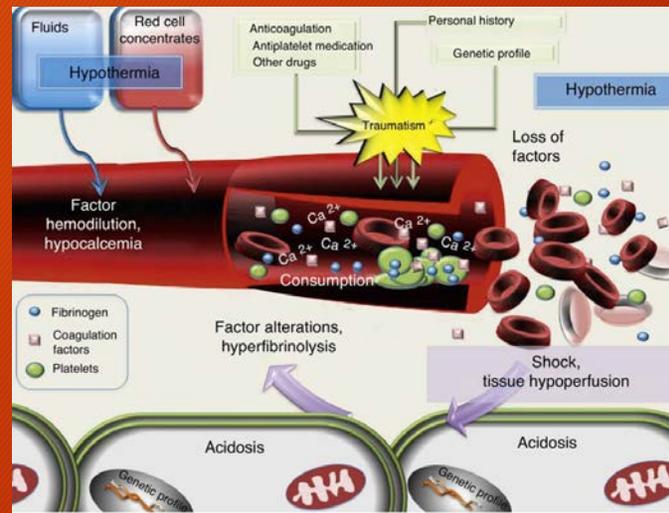
Myth # 5: Trauma Resuscitation Means Giving Fluids

- Normal saline
 - There is nothing normal about normal saline!
- Increased bleeding
- Coagulopathy



Trauma-Induced Coagulopathy

- Acute traumatic coagulopathy
- Coagulopathy associated with resuscitation
 - Dilution
 - Hypothermia



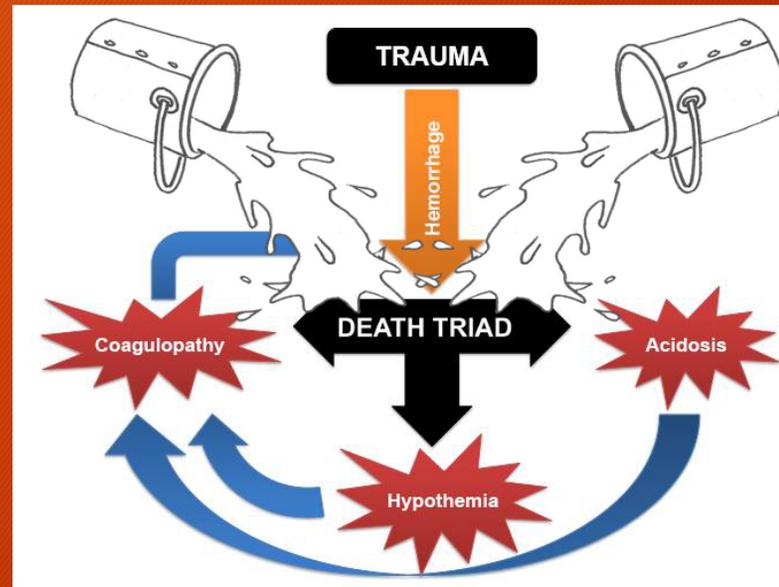
Trauma Resuscitation

- “Inaccessible or uncontrolled sources of blood loss should not be treated with intravenous fluids until the time of surgical control”
 - Walter Cannon



Any Role?

- Once you are sure you have stopped the bleeding
 - Maybe
- Head injury and hypotension
 - Possibly
- Goals?
 - > 70 mmHg for penetrating
 - >80 mmHg for blunt
 - > 100 mmHg for blunt with TBI
 - Schreiber et al, 2015
 - Cantle et al, 2017



Crystalloids vs Saline

- Slovis paper
- Balanced crystalloids were better
 - Lactated ringers or plasmalyte
 - Semlar at al
 - NEJM 2018
- Done in critically ill adults
 - Not just trauma patients



The NEW ENGLAND
JOURNAL of MEDICINE

Plasma in the Field

- Prehospital Plasma during Air Medical Transport in Trauma Patients at Risk for Hemorrhagic Shock
 - Sperry et al
 - N Engl J Med, 2018
- Pragmatic, multi-center, cluster randomized



Plasma in the Field

- Randomized to plasma or standard care
 - 2 units plasma
 - Crystalloid, red cells
- Conclusions
 - Prehospital administration of plasma and resulted in lower 30-day mortality



Plasma in the Field

- Plasma-first resuscitation to treat hemorrhagic shock during emergency ground transportation in an urban area: a randomized trial
 - Moore et al
 - Lancet, 2018
- Prospective, randomized trial
- Single center
- COMBAT



Prehospital Plasma

- Randomized to plasma or saline
- 125 patients
 - 65 plasma
 - 2 units
 - 60 control
 - Averaged 250 cc
- No survival benefit

THE LANCET

Volume 378 - Number 9234 - Page 948 - July 3-9, 2010 www.thelancet.com



TXA

- CRASH-2 was great!
 - But not perfect
- There is concern for thromboembolism
 - Johnston et al
 - JAMA Surg, 2018
- So far studies are positive
 - Nishijima et al
 - Ann Emerg Med, 2019



In Summary!

- Don't be afraid to bind the pelvis
- Cervical collars are not the bomb
- Ketamine is fine in head trauma
 - And good for pain!
- Treat pain
- Avoid saline
 - And all fluids if you can
- Blood products when appropriate
- Keep studying TXA



Thank You!

- Thoughts? Frustrations?
- Christopher.Colwell@UCSF.edu

UCSF

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ZUCKERBERG
SAN FRANCISCO GENERAL
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The Evolving Toll of e-Scooters

The impact(s) of Electric Scooters and Bikes

Clement Yeh MD, FAEMS
Medical Director, San Francisco Fire Department



Disclosures



- None

That electric scooter might be fun. It also might be deadly

The Washington Post
Democracy Dies in Darkness



WSJ



Electric scooters are now disrupting wrists, elbows and heads

Injured scooter riders are flooding US emergency rooms. Accident rates could be as high as 1,000 per month.

Adults Are Terrorizing San Francisco On Tiny Electric Scooters

Scooter injuries are a thing, and they're sending people to the ER

'The problem is only going to get bigger.'

Electric scooter injuries are on the rise, Consumer Reports says

Health Officials Prepare to Track Electric Scooter Injuries

Business

Scooter use is rising in major cities. So are trips to the emergency room.

Trendy electric scooters blamed for spike in accidents



Scooter Issues



- Availability in dense areas
- Lack of regulation/enforcement
- Traffic engineering
- Scooters behaving badly



afvofficial



jbreww



birdgraveyard



bird_fails

InShot

Injury patterns?

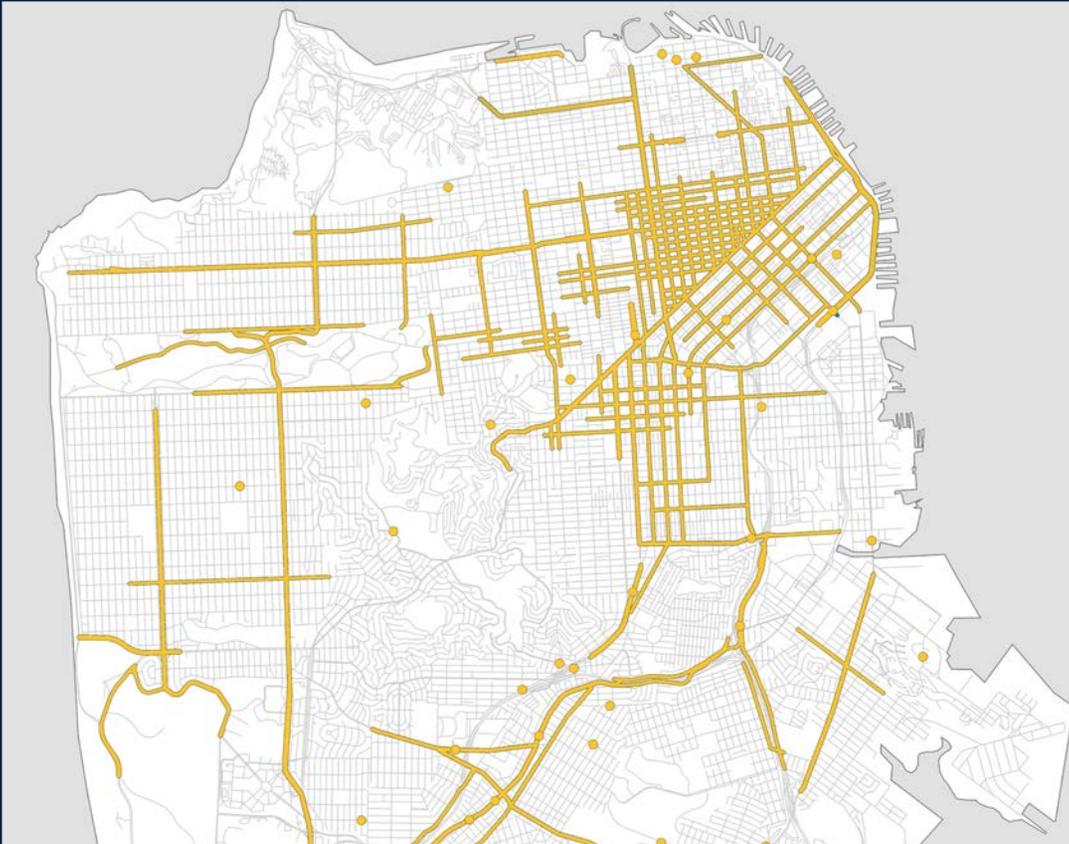
Trivedi, et al. JAMA 2019



- 249 patients, 12 months
 - Head injury = 40.4%
 - Fractures = 31.1%
 - Contusions = 27.5%
- Helmet use = 5.3%
- Sidewalk = 26.4%
- Intoxication = 5.2%

Vision Zero SF

www.visionzerosf.org



- SFMTA + SFDPH + 40 partners
- Since 2014
- International safety initiative
- Goal to eliminate traffic deaths in San Francisco
- Transportation policy advisory
- Traffic engineering & law enforcement resource

SF Powered Scooter Pilot



- 1 year, 2 permittees
- 2500 devices max
 - 625 devices each with option to double after 6 month evaluation
 - Focus on Safety and Equity
 - Requirement to share usage data including collision data

Vision Zero Injury Prevention (VZIPR) Research Collaborative

0	None (N/A)	
1	Unknown	
2	Electric bicycle	
3	Powered scooter (standup)	
4	Moped or motor-driven cycle	
5	Electric skateboard	
6	Hoverboard, electric unicycle, other electrically motorized board	
7	Segway-type vehicle	
8	Ride-hail vehicle, Transportation Network Company car (TNCs; e.g. Uber, Lyft)	
9	Other	

- Data linkage
 - Trauma registry
 - EMS
 - California Highway Patrol
 - SWITRS
- What are injury risks of e-Scooters or other mobility technology?
- What are policy and design implications?

Next steps...



- Injury risk is not well defined
- Improve EMS data quality for new transportation technologies
- “e-scooter” or powered stand-up scooter
- Collaborate with local stakeholders
 - Ongoing studies including CDC in Austin
- Scoot Safely!

ACEP Scooter Safety Campaign



 American College of
Emergency Physicians®
ADVANCING EMERGENCY CARE 

emergencycareforyou.org

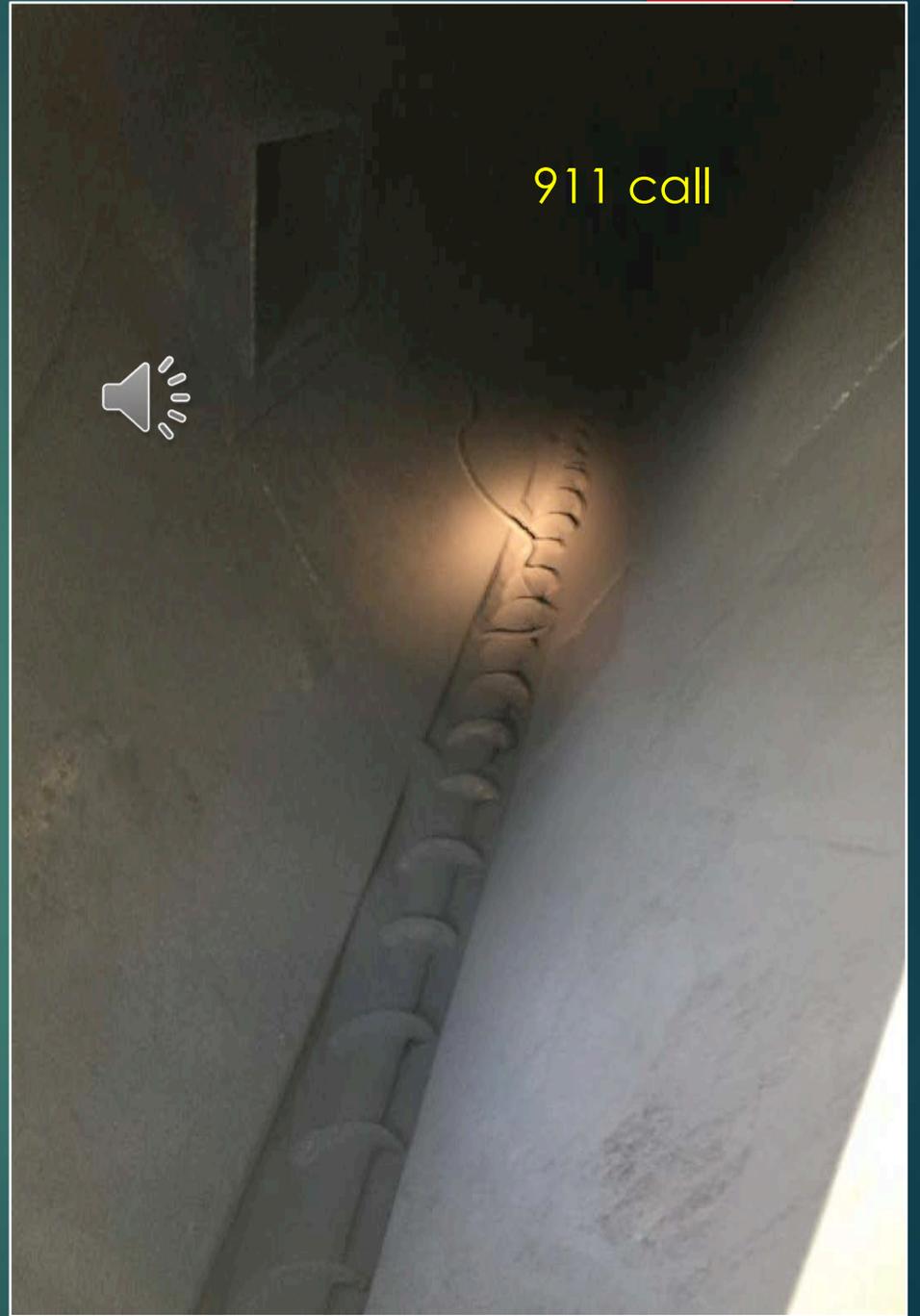
Clusterphobia: *The Challenges of Confined Space Amputation*



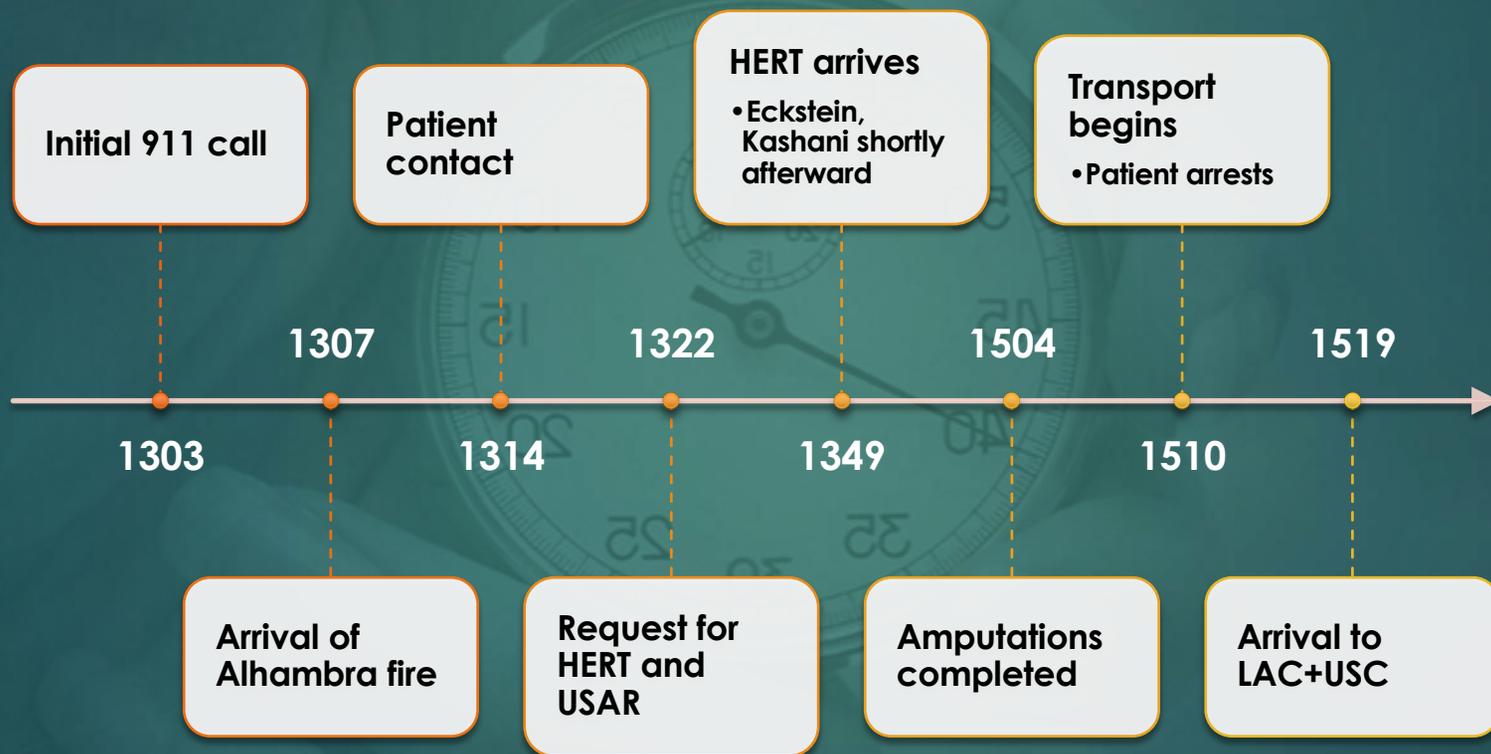
MARC ECKSTEIN, MD, MPH, FACEP, FAEMS

MEDICAL DIRECTOR/EMS BUREAU COMMANDER

LOS ANGELES FIRE DEPARTMENT

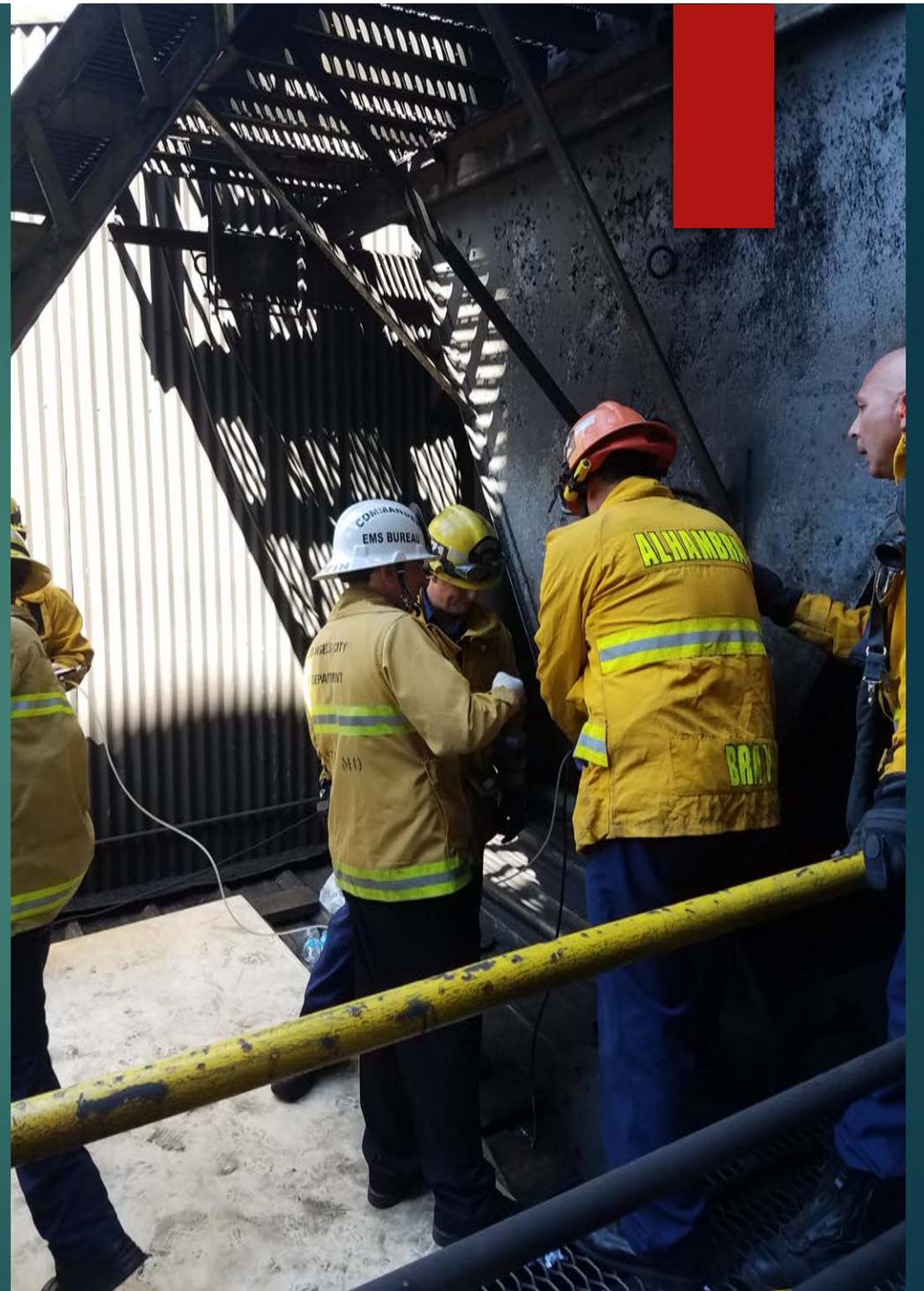


Timeline



Initial challenges

- ▶ Access to the site
- ▶ Access to patient
- ▶ Confined space
- ▶ HEAT
- ▶ Coal dust

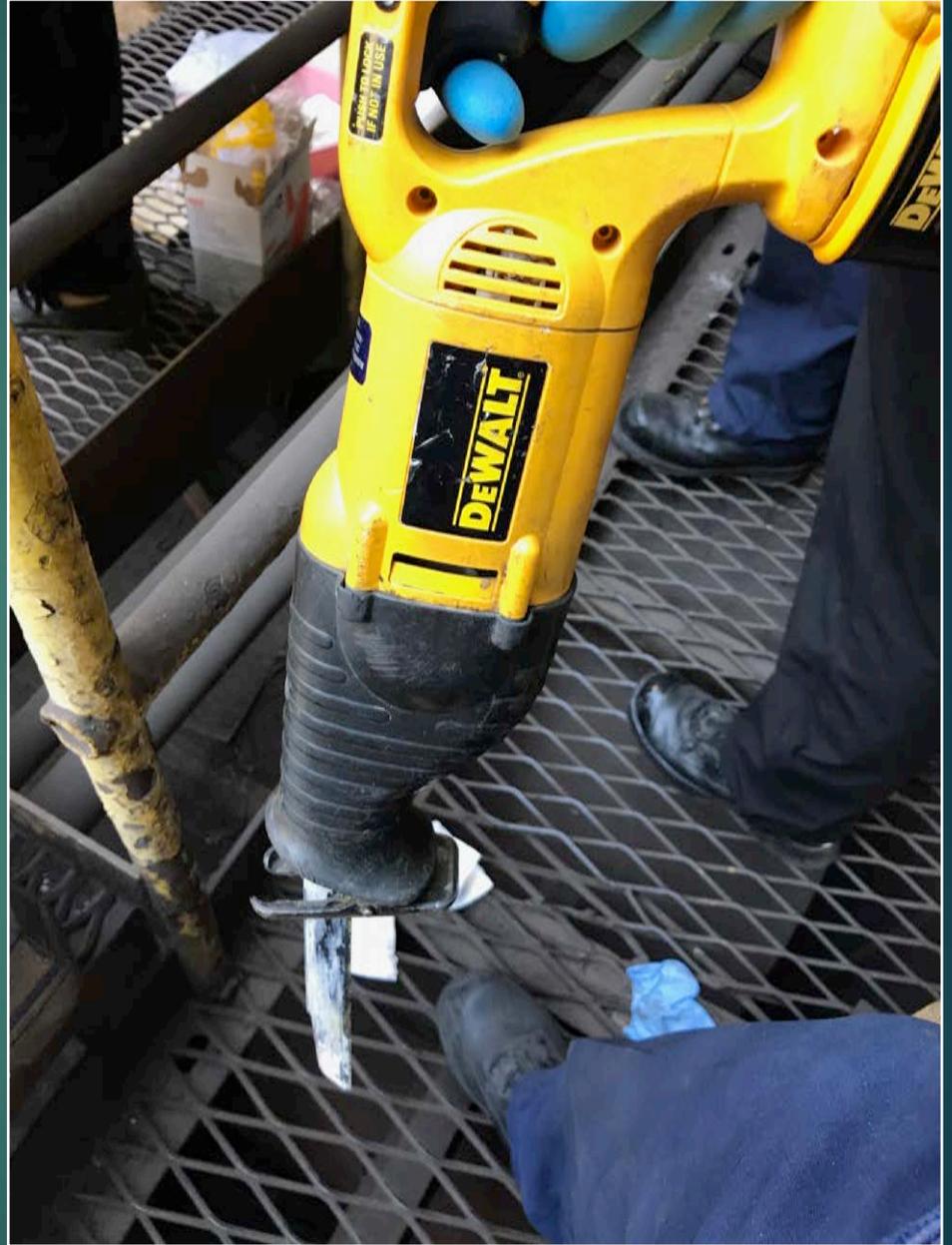
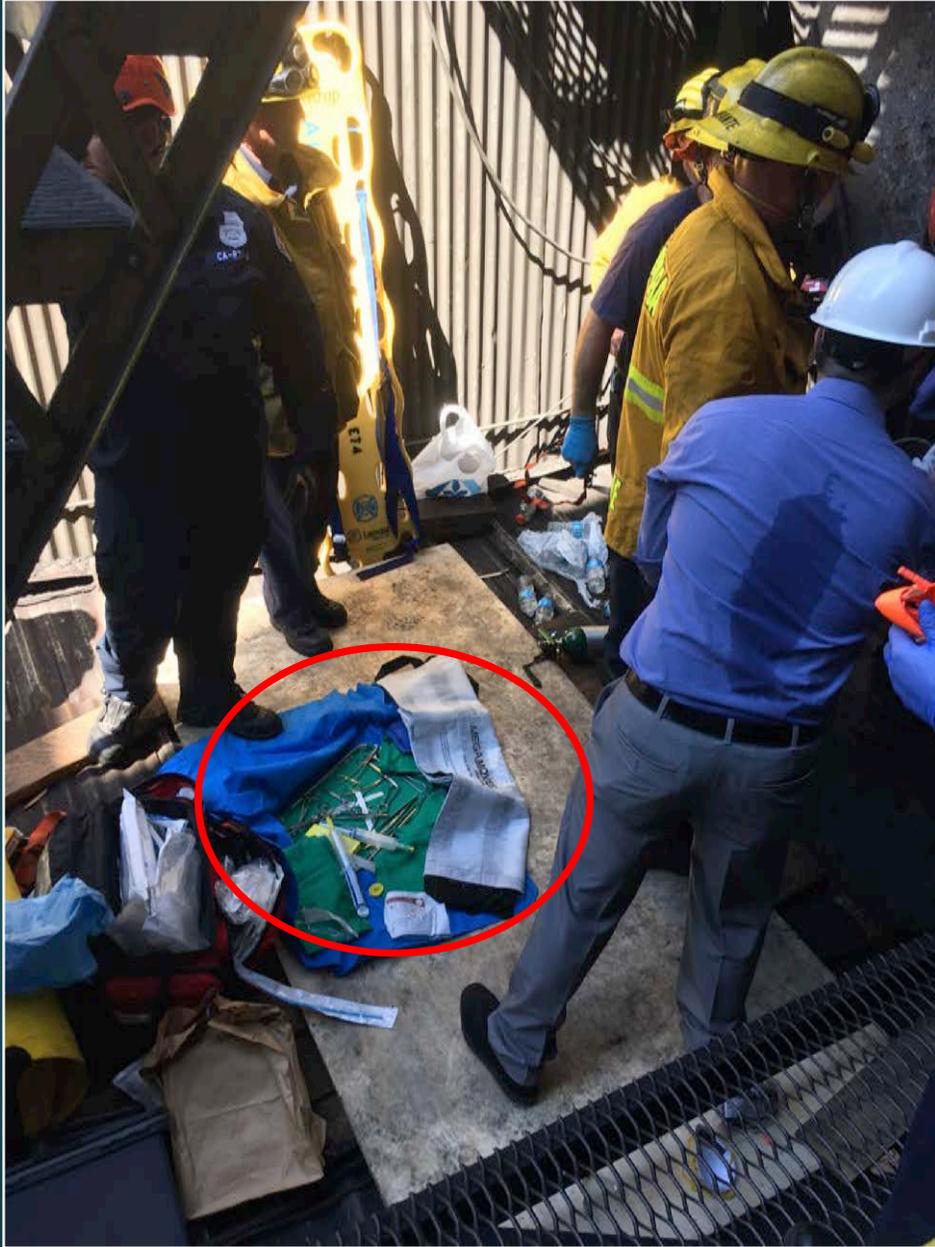


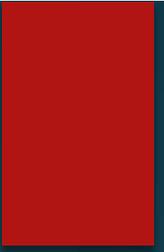


Initial actions

- ▶ Power turned off
- ▶ Monterey Park, San Marino, Alhambra Fire established ICS.
- ▶ Safety preparations made for entry
 - ▶ Air sampling / monitoring within hopper
- ▶ Reversal of auger mechanism
- ▶ Rotary saw and cutting torch operations





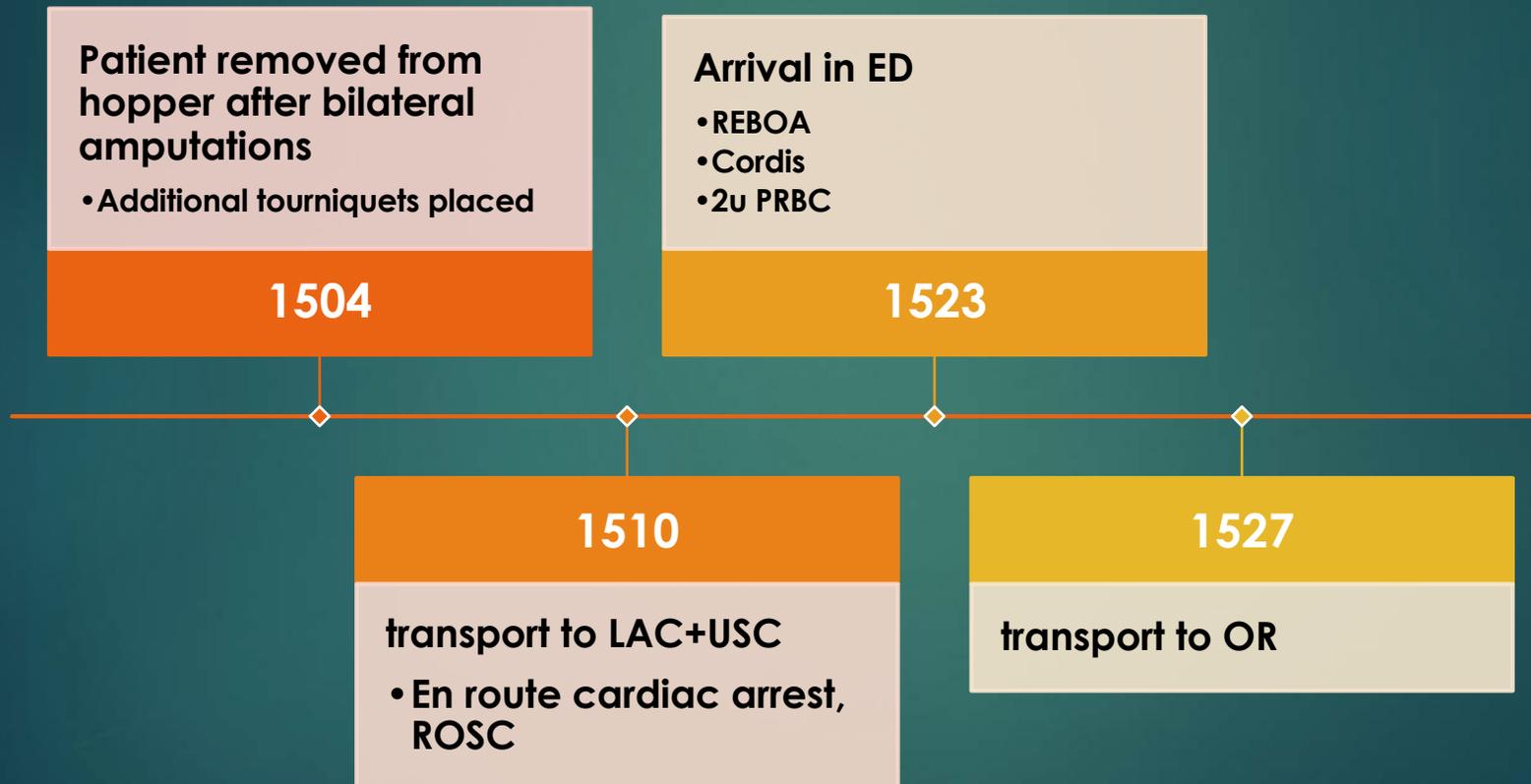


On Scene

- ▶ HERT team entered hopper
- ▶ Bilateral tourniquets placed
- ▶ Humeral IO access
- ▶ Ketamine administration
- ▶ Attempts at reversing blades failed, caught in lower extremity soft tissue
- ▶ Decision for amputation made
- ▶ Bilateral amputations performed
- ▶ Additional tourniquets applied after extrication

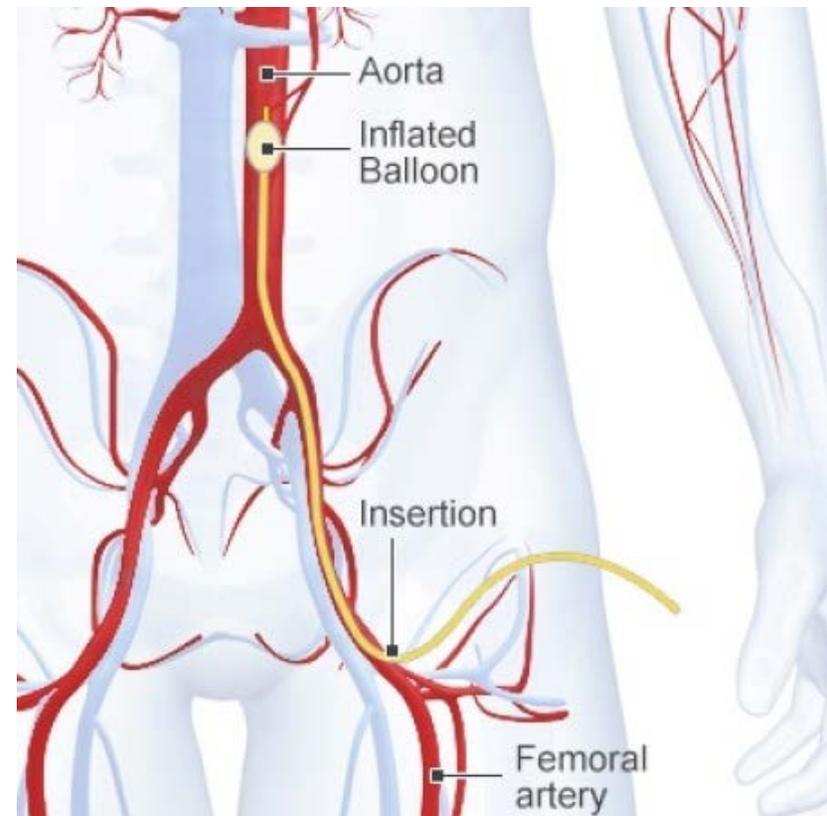


Post Amputation Course



ED course

- ▶ Arrived to the ED with pulses
- ▶ Airway confirmed
- ▶ 2U O neg given
- ▶ Central line placed
- ▶ REBOA placed
- ▶ Left ED in 6min to OR



Operative Course

- ▶ OR contacted from field
- ▶ Trays/Staff waiting
- ▶ 1530: In OR
- ▶ 2 surgical teams
 - ▶ Revision guillotine amputations
 - ▶ 4uPRBC, 3uFFP, 1plt
 - ▶ Procedure 56min
- ▶ ICU for recovery



Post-operative Course



- ▶ ICU
 - ▶ Continued resuscitation, Bronchoscopy
- ▶ POD 2: Return OR
 - ▶ Amputations formalized
 - ▶ Incomplete closure due to areas of devitalized tissue and need for skin stretching maneuvers
- ▶ POD 3: Extubated
- ▶ Total: OR x5 to close bilateral AKA wounds
- ▶ Physical Therapy/Social Work

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Legs cut off to save worker stuck in machinery in Alhambra

POSTED BY TONI MCALLISTER ON AUGUST 28, 2017 IN CRIME | 1,236 VIEWS | [LEAVE A RESPONSE](#)

LOCAL NEWS

Man's legs amputated after Alhambra machinery accident



By **CHRISTOPHER YEE** | cye@scng.com | San Gabriel Valley Tribune
August 28, 2017 at 11:22 pm



Double-Amputation Performed To Free Worker From Foundry Machine



Kurt Niland
September 4, 2017



News

Doctors amputate man's legs after Alhambra foundry accident

By **City News Service** - August 29, 2017

Lessons learned / Future considerations

- ▶ **Established Hospital Emergency Response Teams (HERT)**
- ▶ **Smooth interface with FD resources on scene**
- ▶ **Scene safety**
- ▶ **Single mission**
- ▶ ***No room for egos!***

