Saving Lives with Data

Right Patient ~ Right Place ~ Right Time ~ Right Care

Case Records of the JOINT TRAUMA SYSTEM

Military Health Science Research Symposium

4 August 2026

COL Julie Rizzo, MAJ Michael Broussard,

Col Valerie Sams, LTC Andrew Beckett,

CAPT Matt Bradley, CAPT (Ret) Travis Polk,

COL(Ret) Brian Eastridge

Moderator: COL Jennifer Gurney

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Disclaimers

The opinions or discussions are not to be construed as official or as reflecting the views of the Departments of the Army, Navy, Airforce, the Defense Health Agency or the Department of Defense.

These are actual case records from the DoDTR; most of the photos are of the case being presented, some of the photo representations of the injuries because actual photos were not able to be obtained.

Savi

Right Patien

Case Records of the JTS 10-year Anniversary at MHSRS!!

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NEWS | Oct. 19, 2016

U.S. Army Institute of Surgical Research launches 'Case Records of the

"The lessons learned are incredible," Gurney said. "I think that going forward as the operational tempo decreases that there's a lot of benefit to looking at the management of these challenging cases from the point of injury all the way back to the care in the states."

Gurney's intent is to have this program held at other military and civilian meetings and conferences because she believes that this initiative is beneficial to trauma surgeons in the military and civilian sector.

"I hope that this is something that sustains into the future so that we can continue to learn and support the warfighter," Gurney said.

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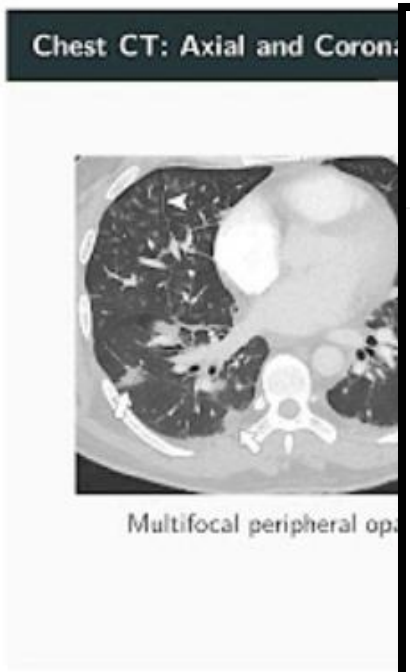
Learning from patient care….learning about the system…learning on how to *keep getting better*

CASE RECORDS OF THE
MASSACHUSETTS GENERAL HOSPITAL

A 36-Year-Old Man with Abdominal Pain, Fever, and Hypoxemia



Multifocal peripheral op

14, 2011 NEJM.ORG

IMAGES IN CLINICAL MEDICINE

1449 Calcification of the Aorta and Common Iliac Arteries
K. Sudo and H. Harada

e29 Amalgam Tattoo
P. Dubach and M. Caversaccio

INTERACTIVE MEDICAL CASE

e30 A Sweet Source of Abdominal Pain
J.J. Ross, S.S. Rogal, and C. Ukomadu

CASE RECORDS OF THE MASSACHUSETTS GENERAL HOSPITAL

The NEW ENGLAND JOURNAL of MEDICINE

CURRENT ISSUE SPECIALTIES TOPICS

CASE RECORDS OF THE MASSACHUSETTS GENERAL HOSPITAL

Case 22-2026: A 37-Year-Old Woman with Persistent Nasal Ulceration

Authors: Stacey T. Gray, M.D., Carolina D. Geadas, M.D., and Peter M. Sadow, M.D., Ph.D. Author Info & Affiliations

Published July 29, 2026 | N Engl J Med 2026;395:493-501 | DOI: 10.1056/NEJMcpc2603178 | VOL. 395 NO. 5

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Agenda

Panel Members:

Please introduce yourself:

1) **Name and Current Job**
2) **Connection to Combat Casualty Care**
3) **Tell the audience 1 thing that you think can be improved in battlefield trauma management when thinking about challenges faced in combat casualty care.**

Rules of Engagement

- ❑ Be mindful of OPSEC issues, especially when discussing the current case
- ❑ Audience participation encouraged…caveat emptor
- ❑ Complex cases
  - Should generate enthusiastic discussion…..

...so that lessons learned are not forgotten

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Case #1 – March 2026

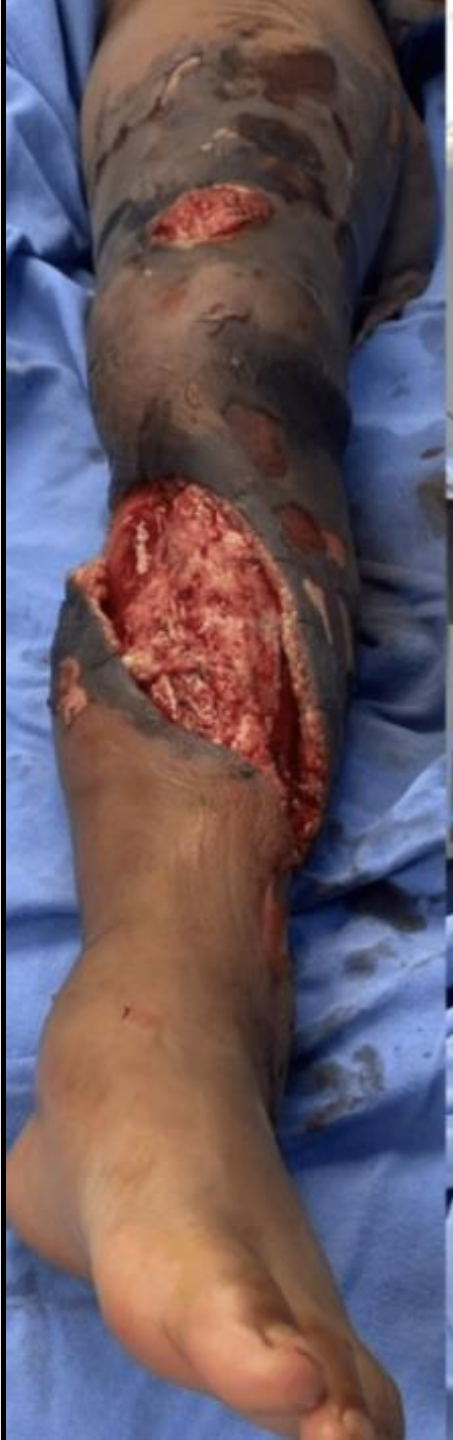
Home | JAMA Surgery | Vol. 153, No. 9

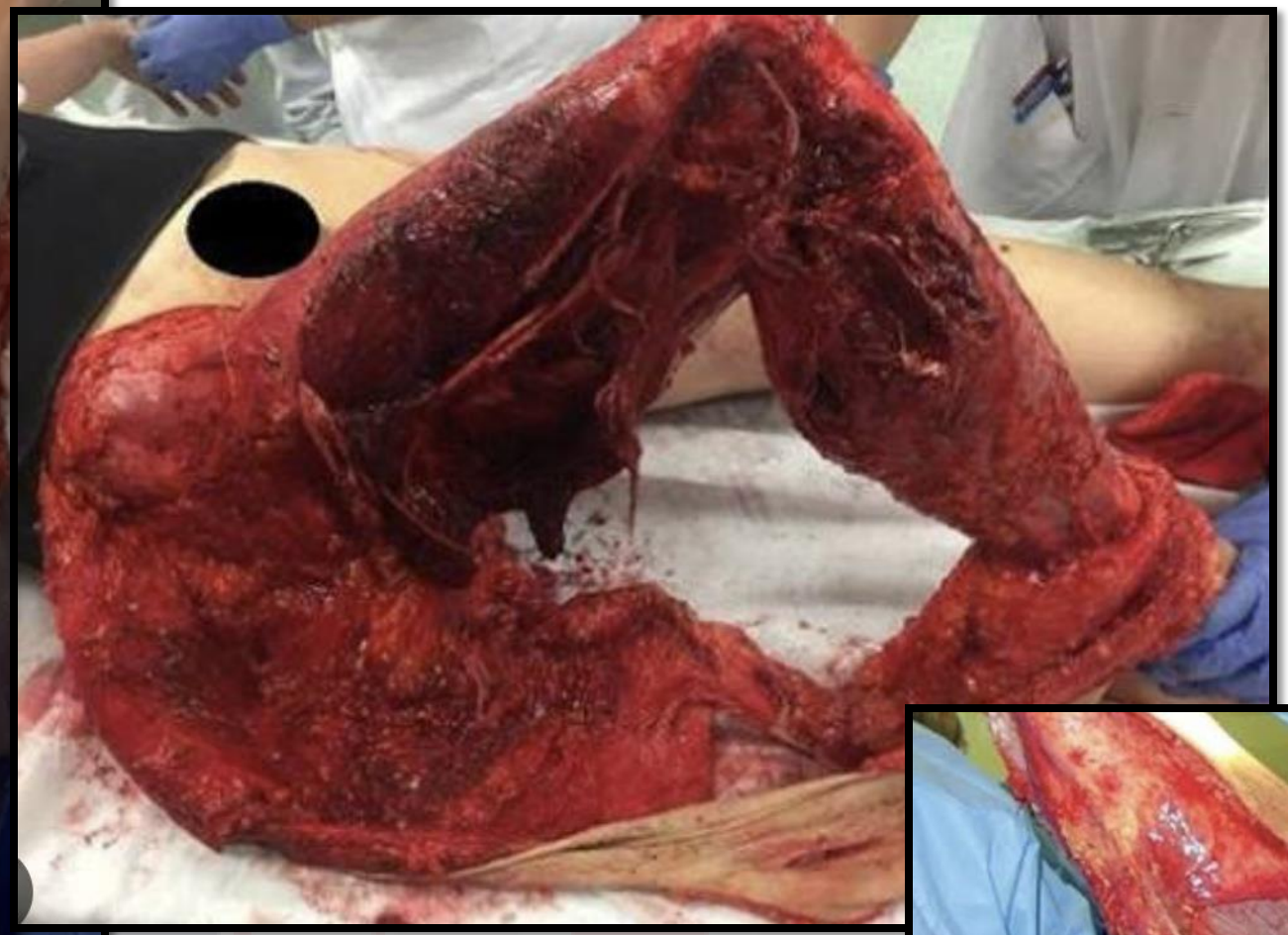
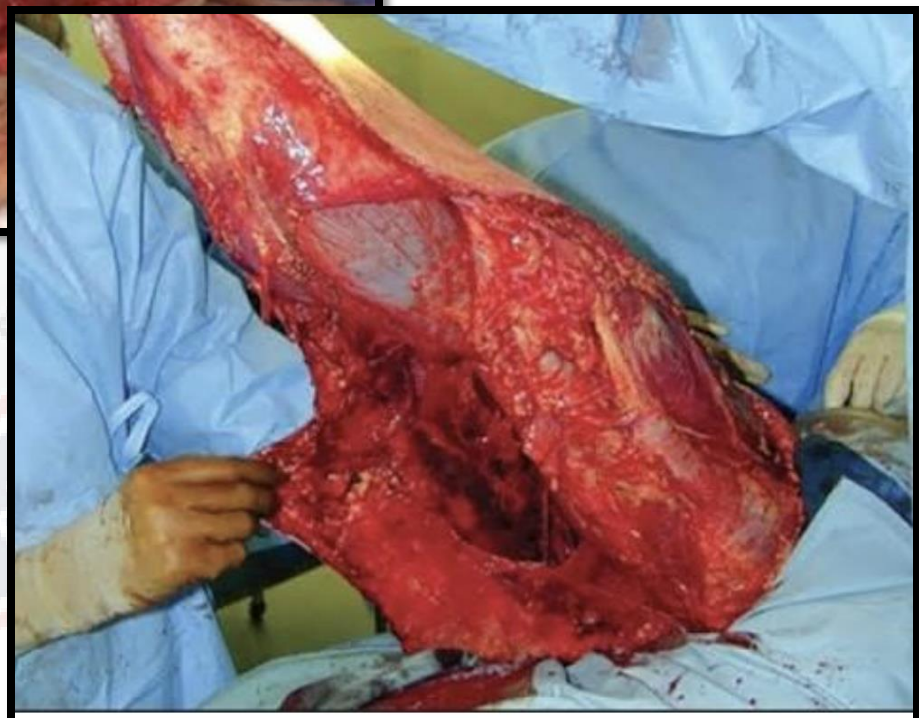
Original Investigation

A 12-Year Analysis of Nonbattle Injury Among US Service Members Deployed to Iraq and Afghanistan

Tuan D. Le, MD, DrPH[1]; Jennifer M. Gurney, MD[1,2,3]; Nina S. Nnamani, MS[1]; et al

» Author Affiliations | Article Information



Case #1 – March 2026

❑Situation

- 22yo M slipped and fell on flight deck
- Run over by F/A-18G that was in tow
- Severe LLE degloving injury resulting in completely exposed muscle, tendon and bone from left thigh to left foot
- **Flight deck corpsmen stabilized patient for transfer down to Main Medical BDS.**

Case #1 – March 2026

- **Main Medical BDS**
  - Secondary assessment was normal except for complete degloving of L leg
  - Some tissue attached by connective tissue with all underlying bone, muscle, tendons and ligaments exposed, great toe missing
  - Musculature at bottom of foot dusky, no pulsatile/arterial bleeding but innumerable small venous bleeds noted.

Vitals:

BP 141/98, P 108, RR 16, T 98.4F, Pain 10/10

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WOUND MANAGEMENT

What if no possibility to transfer?

What if you had to hold the patient for 3 days?

Telemedicine consultation is available

Case #1 – March 2026

❑Role 1 Care

- IV access: 18g to bilat AC's
- Pain controlled w/ Ketamine and Fentanyl
- Ceftriaxone administered
- Placed on 2L NC
- MARCH Algorithm completed, additional R foot injury identified
- Lab panel drawn / FAST Neg
- X-rays of chest, pelvis, L leg & R foot obtained

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Case #1 – March 2026

- ❑ Transfer to Role 2 for Surgeon Management

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Why is there no Role 3 in current MCO?

What are MCO?

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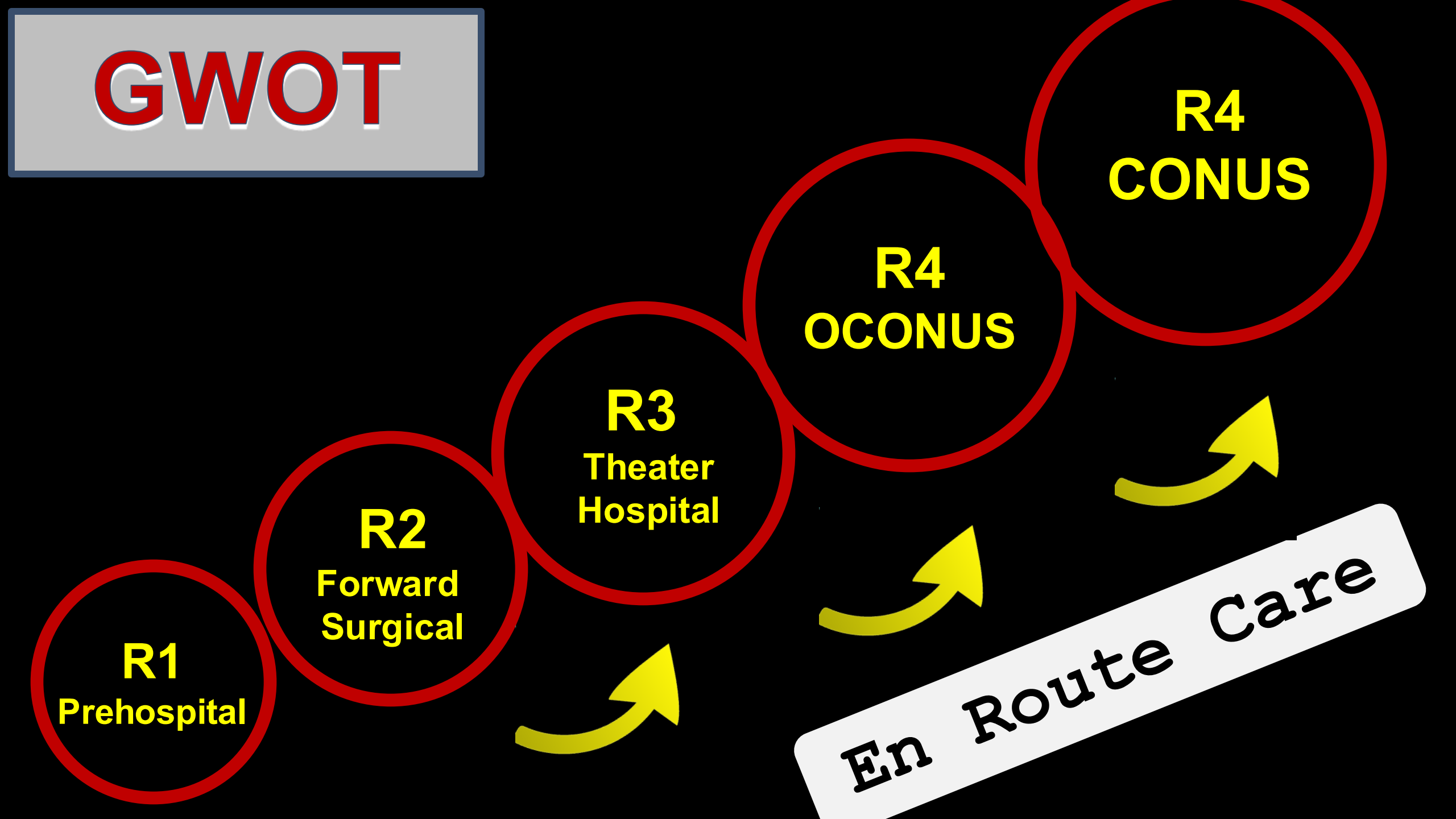
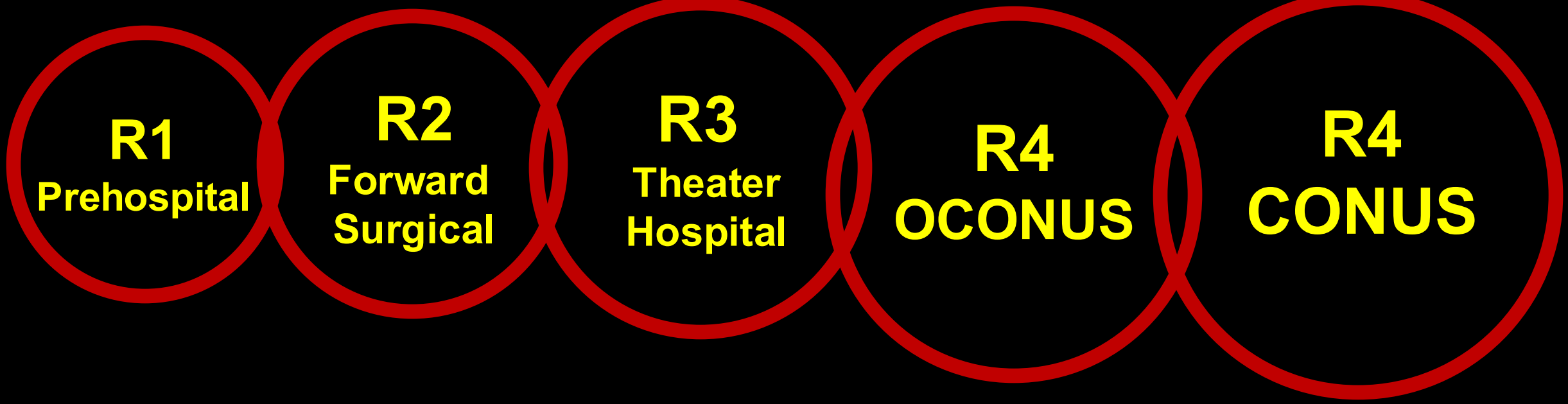
Why is there no Role 3 in current MCO?

What are MCO?


GWOT
R1
Prehospital
R2
Forward
Surgical
R3
Theater
Hospital
R4
OCONUS
R4
CONUS
En Route Care



The last war shaped our assumptions:

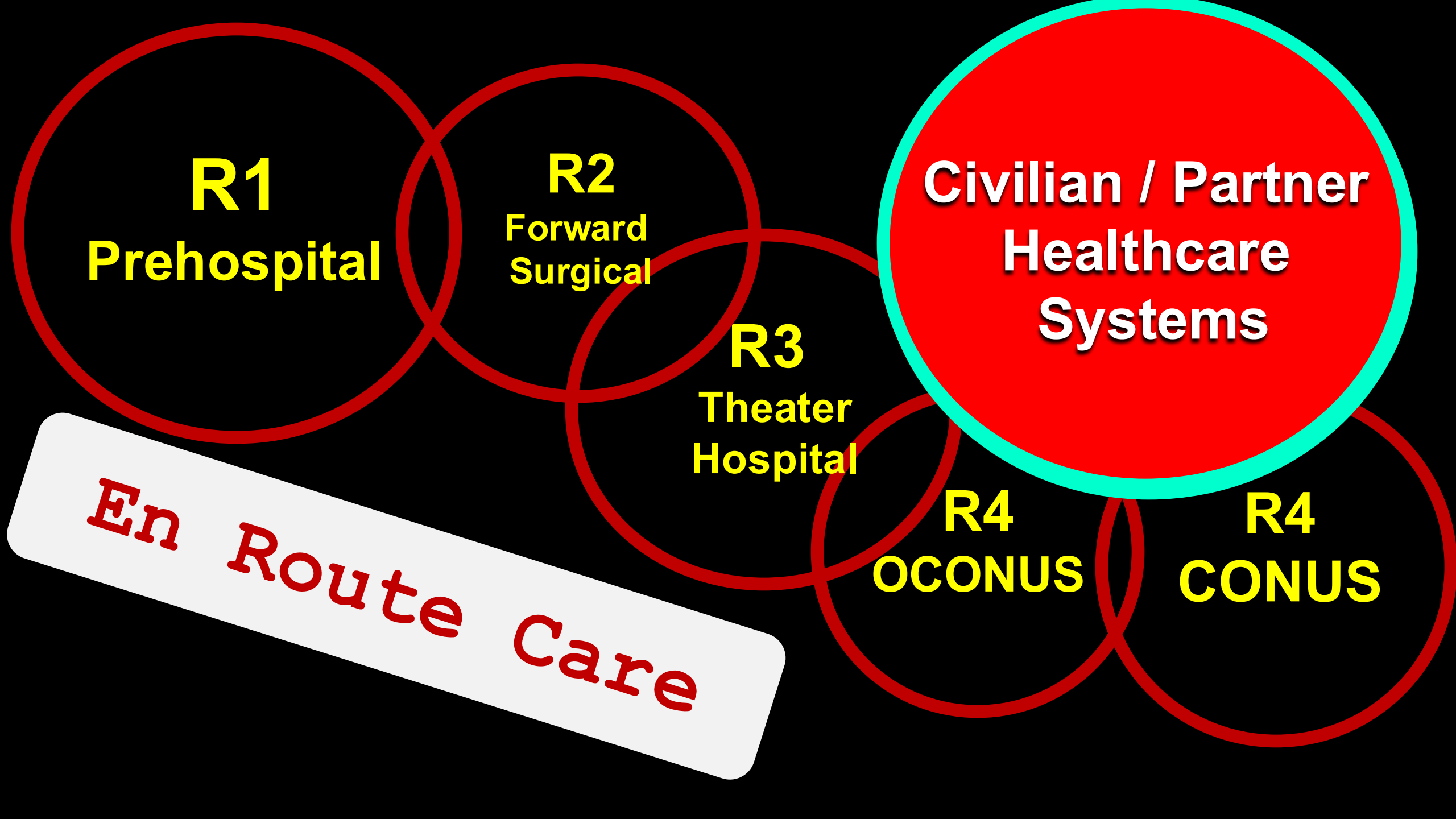
- Little reliance on civilian health care system
- Bombs from below → IED blasts
- Trauma system adapted: TQ/Transport/DCR/DCS
- Optimized trauma system for specific threats

ion Capability Degraded

Biggest responsibilities are on those with the least training/experience

Needs of the future battlefield are NOT the needs from the GWOT

En Route Care


R1
Prehospital
R2
Forward
Surgical
R3
Theater
Hospital
Civilian / Partner
Healthcare
Systems
R4
OCONUS
R4
CONUS
En Route Care

Civilian / Partner Healthcare Systems

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Case #1 – March 2026

Admitted to ship ICU and prepared for transport to Host Nation Hospital

CAPT Bradley / CAPT (Ret) Polk

1) Can we transfer patients from ship to LRMC?
2) How long could a casualty like this be managed on a ship?
3) Pearls?

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Case #1 – March 2026

- ❑ Arrived to HN Hospital PID#2
  - Labs and Bilateral LE XR performed
  - Ortho Consult – further debridement and application of external fixator was performed
  - Undecided if amputation is warranted
  - Per LRMC H&P → no PNF Documentation found
  - 5-day LOS at HN hospital

Thoughts on amputation of partner force limb? Our experience? Stigma?

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Case #1 – March 2026

- MEDEVAC to LRMC PID 7
  - Documentation Received
  - Stable to fly per ISOS Surgeon
  - No complications en route

Col Sams

1) What are the 'fit to fly' criteria
2) You ran CCAT training – how much do you work with iSOS….*they are flying our patients…*

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Case #1 – March 2026

- Arrived at LRMC PID 7
  - ExFix Spanning Knee and ankle
  - Stable / normal vital signs

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DP & PT pulses present

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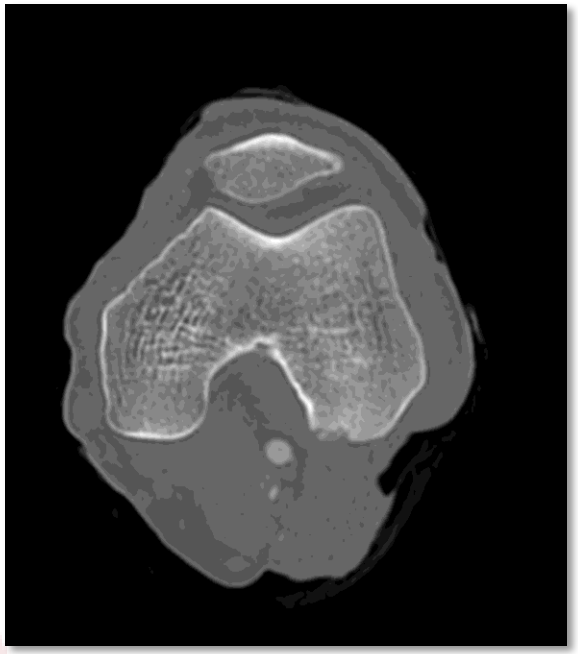

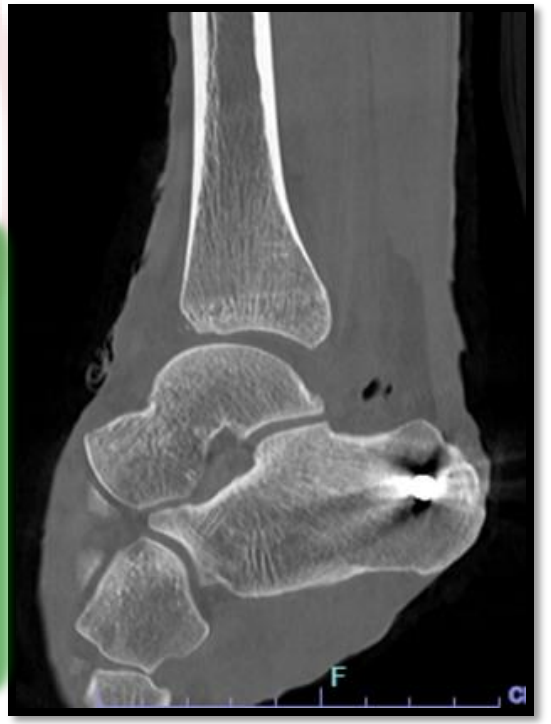

Case #1 – March 2026

- LRMC PID#7
  - Bilateral screening venous duplex negative
  - Given Ceftriaxone, Flagyl, Tdap for Gustilo

Col Rizzo

1) Why did we send histopathology?
2) Let's talk about IFI….what's the risk?

- Application of NPWT; IFI Histopathology sent

Case #1 – March 2026

- LRMC PID#7
  - Post-operative course uncomplicated
  - Pain control with PCA, Sciatic/Femoral nerve catheters
  - Transferred to Walter Reed

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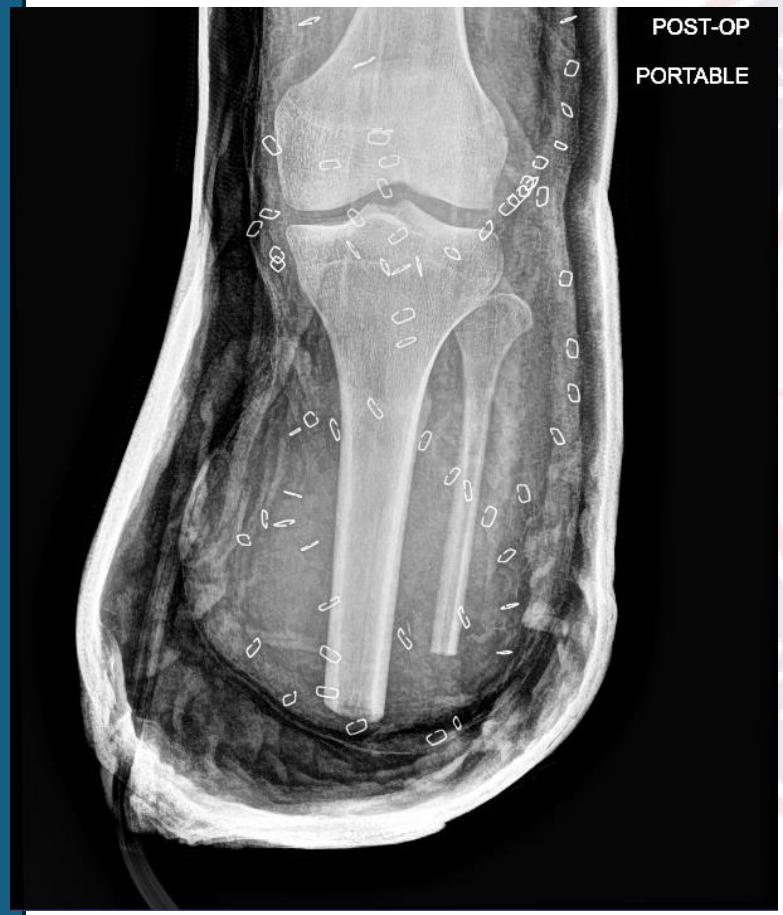
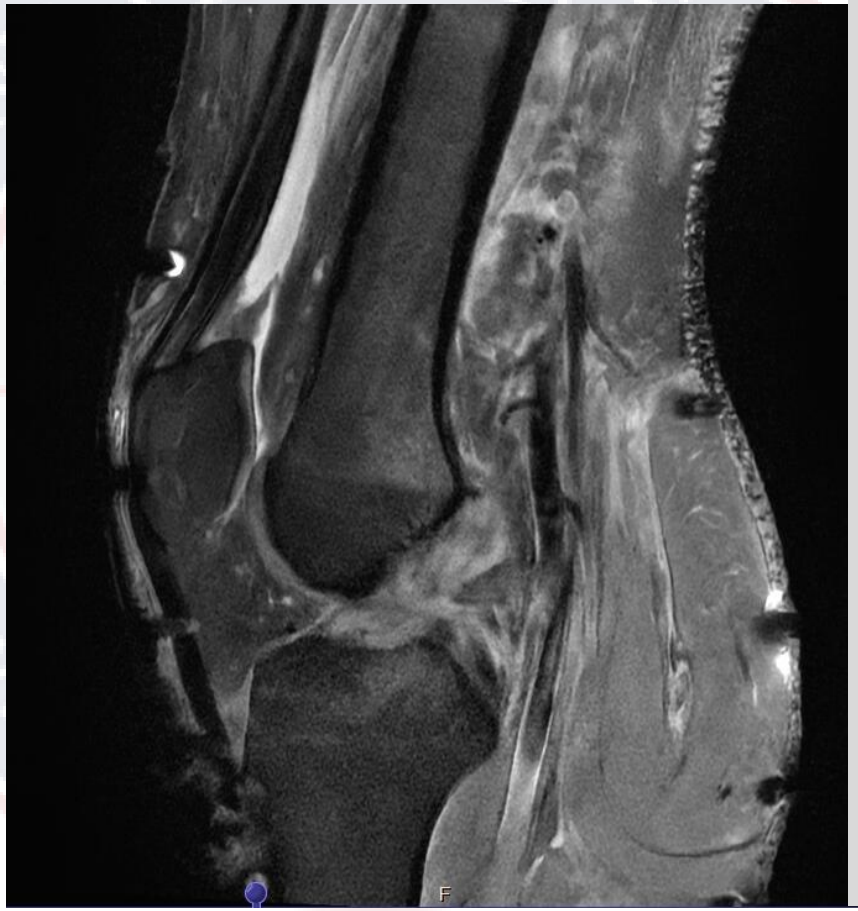
Case #1 – March 2026

- **Transferred to Walter Reed**





Complete tear of the ACL Posterolateral injury of the knee with tear of the LCL, biceps femoris tendon, & anterior horn of the lateral meniscus. Postop changes

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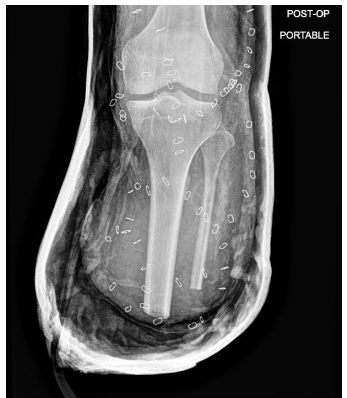
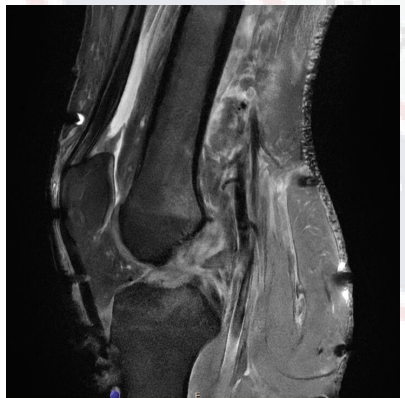
Case #1 – Discussion

Opportunities to improve trauma system?





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Rapid-Fire Round

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Drs. Bradley, & Beckett…COME TO THE OR STAT!

Now What?

White Phosphorus

- ❑Most important first step?
- ❑What about water?
- ❑Medical vs Surgical Therapy?

Be prepared!

- →Chemical
- →Biological

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Scenario: Some place.. / Africa / Ukraine

- ❑ Humanitarian mission
- ❑ 5-person team
- ❑ 1 surgeon, 1 CRNA
- ❑ Basic OR supplies
- ❑ Walking Blood Bank

  …if you set it up
- ❑ Rudimentary Xray
- ❑ 4-10 hour transport to next level of care

What do you Pack?
- your 'must haves' for an austere mission

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Case #1

AUDIENCE QUESTIONS / DISCUSSION

Case #2 – Afghanistan

- September 2018
  - Explosion followed by small arms fire

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Explosion followed by small arms fire

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Right Patient ~ Right Place ~ Right Time ~ Right Care

Explosion followed by small arms fire

- Afghanistan, September 2018
- Troops inspecting area for school construction
  - Coordinated attack with VBIED
  - Followed by small arms fire
  - Multiple casualties most with extremity injuries
- Combat Support Hospital (Role 3) is 70 minutes away
- FRSD (Role 2) is 20 minutes away

How much at POI?

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In general: How much care should be done at POI?

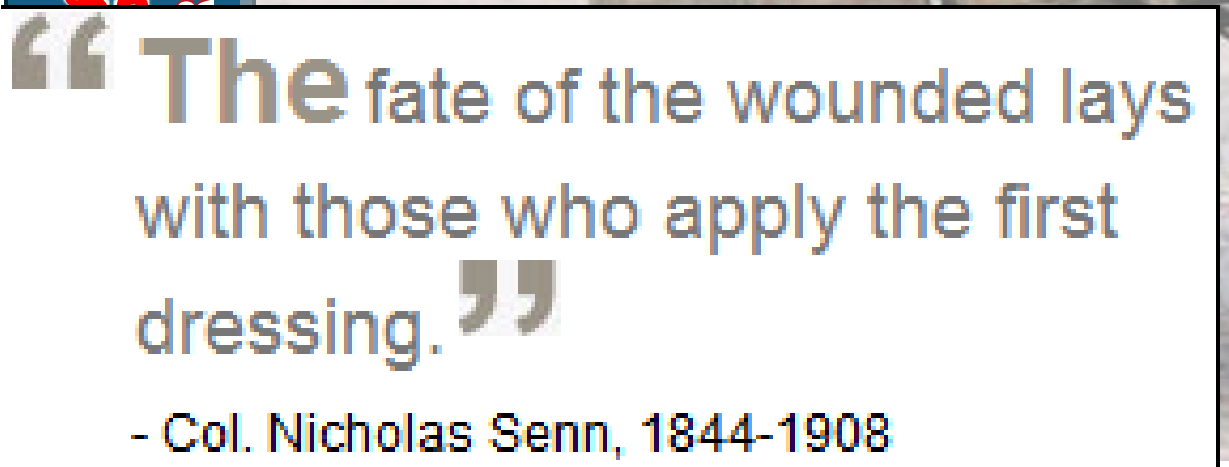
Scoop and Run?

Stay and Play?

Junctional Tourniquets?

CUF principals

Airway mgmt.?



MEDEVAC Called to go to Role 2

POI:

- **4 casualties get at total of 6 TQ placed by non-medics**
  - **2 casualties have b/l LE TQ; 1 has UE TQ; 1 with LE TQ**
  - **Extremity bleeding controlled when medic arrived**
  - **All casualties have normal mentation, HR 100-120; strong radial pulses**
- **1 casualty has GSW to chest (25 y/o male US SM)**
  - **POI: Unresponsive, continued enemy fire**
  - **Pulsatile bleeding from wound**
  - **HR 120, palpable carotid, GCS 8, RR 25**

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MEDEVAC Called to go to Role 2

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  - POI: Unresponsive, continued enemy fire
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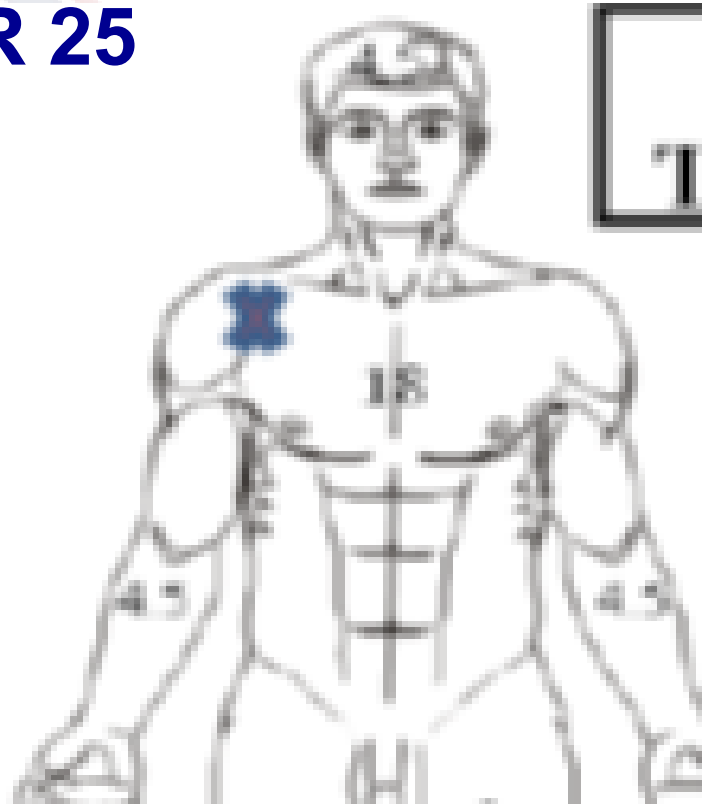

> "The fate of the wounded lays with those who apply the first dressing."
>
> - Col. Nicholas Senn, 1844-1908

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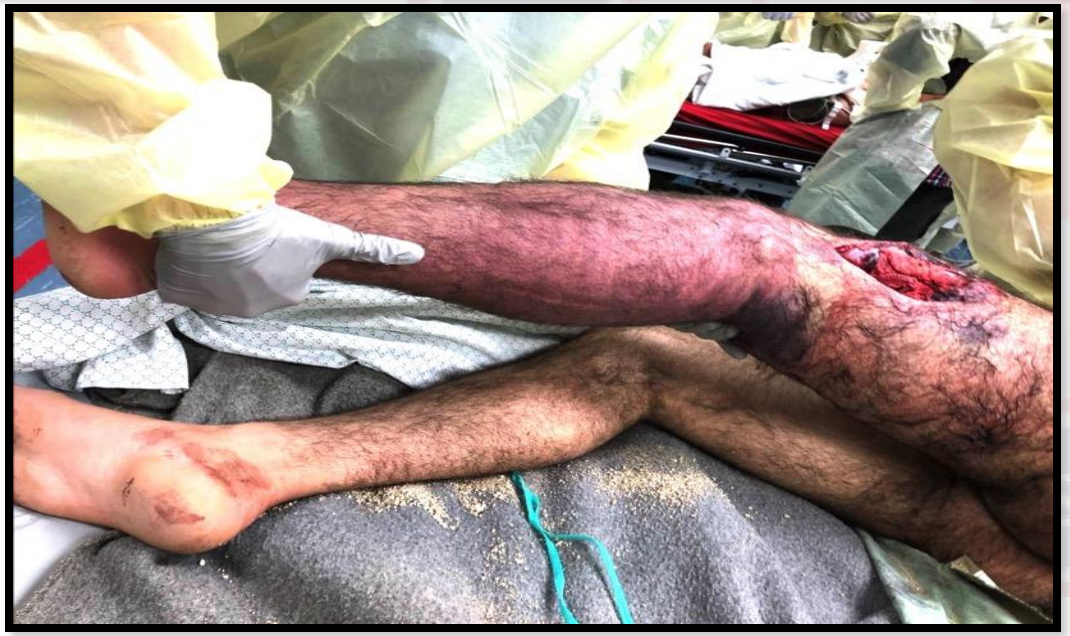
Should every extremity injury get a TQ during CUF?

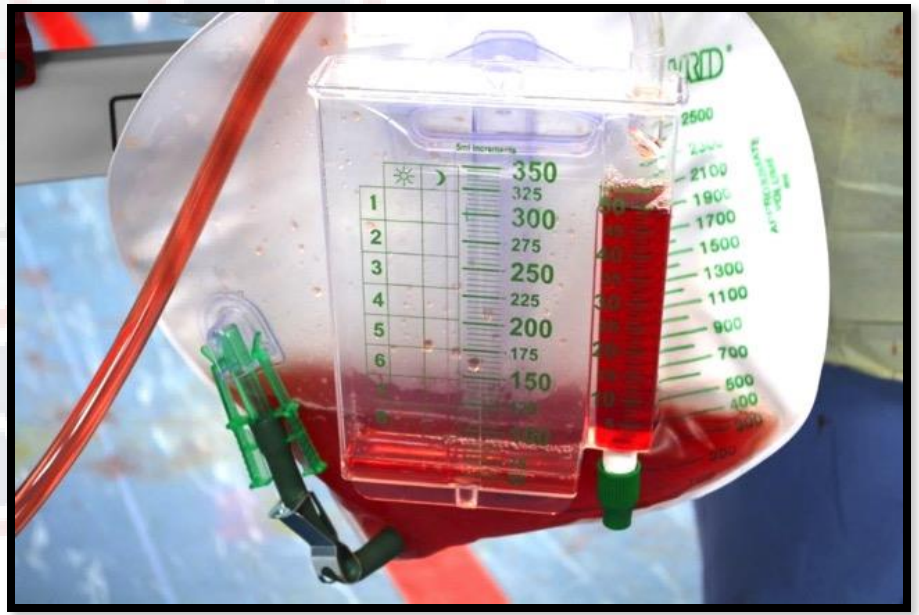
There is active combat engagement

Four 'stable' DELAYED casualties with TQ and 1 unstable IMMEDIATE casualty with active junctional hemorrhage and GSW to chest

Let's talk tourniquet use

High & tight always?





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Right Patient ~ Right Pl

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OPEN

Rethinking limb tourniquet conversion in the prehospital environment

John B. Holcomb, MD, FACS, Warren C. Dorlac, MD, Brendon G. Drew, DO, Frank K. Butler, MD, Jennifer M. Gurney, MD, Harold R. Montgomery, BA, ATP, Stacy A. Shackelford, MD, Eric A. Bank, AS, Jeff D. Kerby, MD, PhD, John F. Kragh, MD, Michael A. Person, MD, MPH, Jessica L. Patterson, MD, Olha Levchuk, MD, Mykola Andriievskyi, Glib Bitiukov, Oleksandr Danyljuk, MD, *and* Oleksandr Linchevskyy, MD, PhD, *Birmingham, Alabama*

OPEN

Who needs a tourniquet? And who does not? Lessons learned from a review of tourniquet use in the Russo-Ukrainian war

Frank Butler, MD, FAAO, FUHM, John B. Holcomb, MD, FACS, Warren Dorlac, MD, FACS, Jennifer Gurney, MD, FACS, Kenji Inaba, MD, FACS, Lenworth Jacobs, MD, MPH, FACS, Bob Mabry, MD, FACEP, Mike Meoli, AS, Harold Montgomery, BBA, Mel Otten, MD, FACEP, Stacy Shackelford, MD, FACS, Matthew D. Tadlock, MD, FACS, Justin Wilson, EMTP, Kostiantyn Humeniuk, MD, Oleksandr Linchevskyy, MD, PhD, *and* Oleksandr Danyliuk, MD, *Pensacola, Florida*

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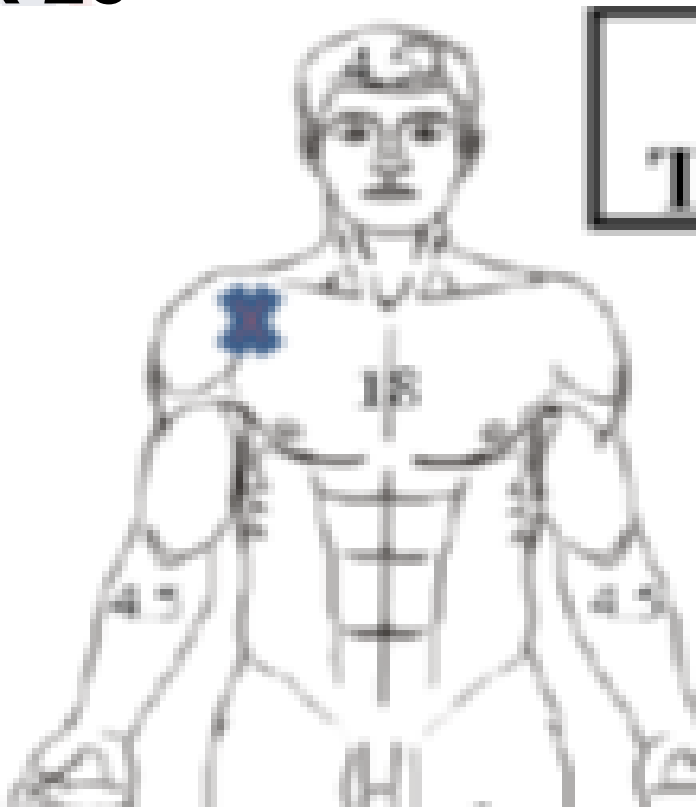
POI Pearls?

- Hemostatic agent thoughts?
- Manual compression?
- IO vs IV → location?

- Pulsatile bleeding from wound
- HR 120, palpable carotid, GCS 8, RR 25

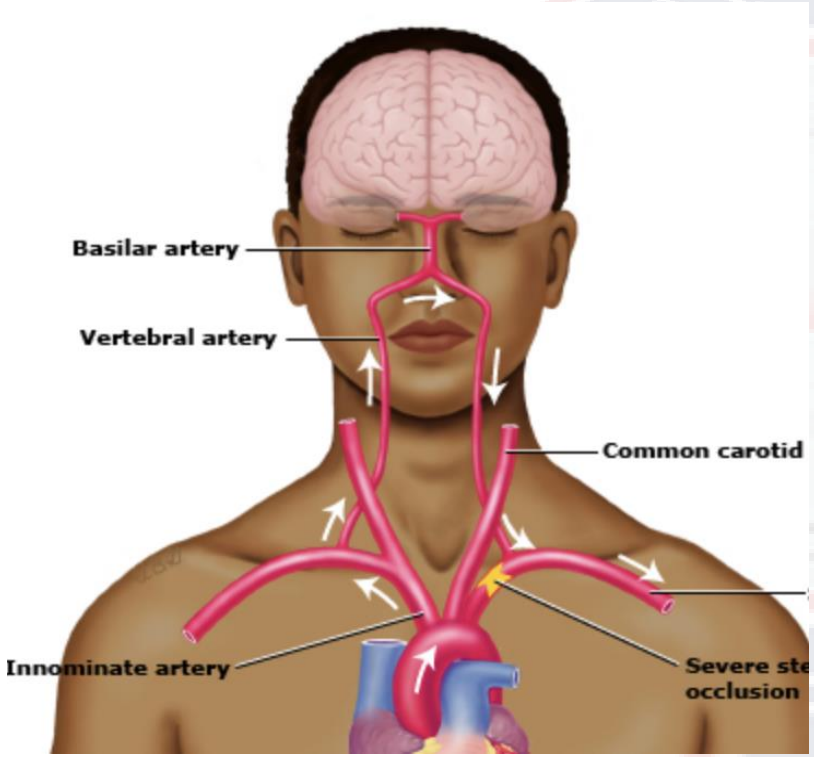
POI Care:

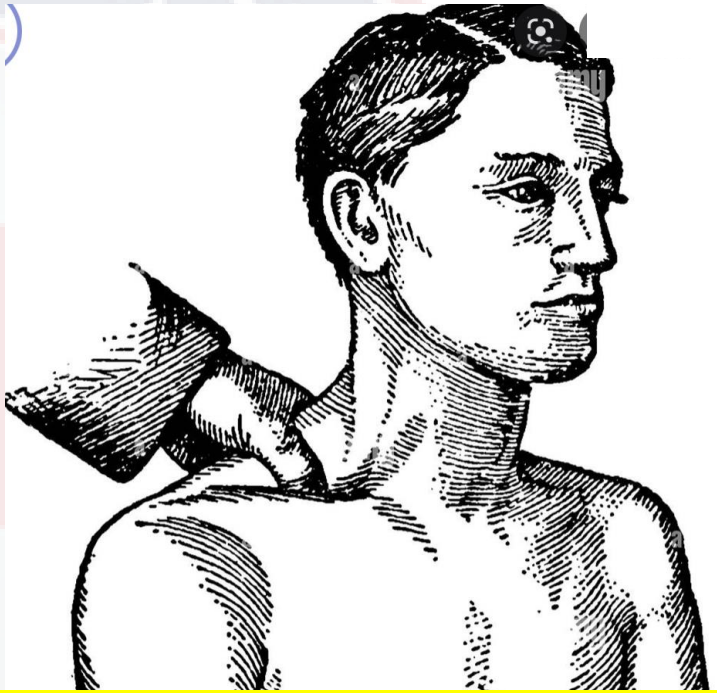
- Chito Gauze to wound
- Sternal and left humeral IO placed
- 1 unit Cold Stored LTOWB transfused
- 1 gram of TXA, Ketamine 50mg
- NDC of right chest
- Blizzard Blanket and Ready heat placed



Option for junctional hemorrhage:

→ Does manual compression of subclavian (or femoral) work?





Should this be taught?

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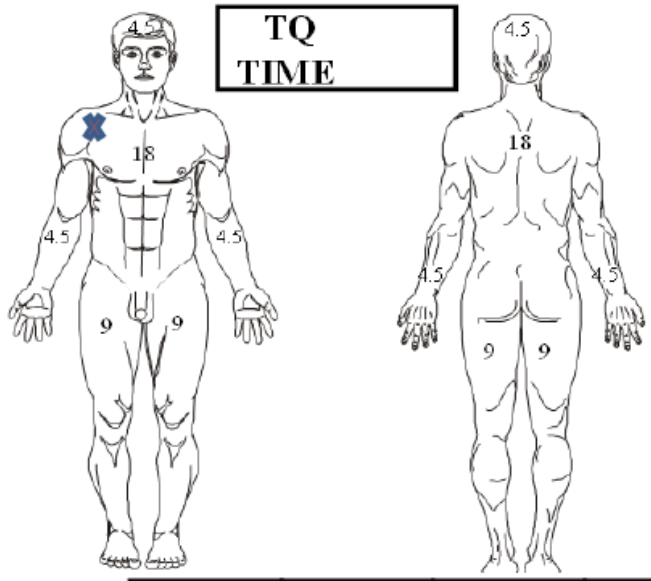
TCCC AAR

UNCLASSIFIED/FOU

Name/ID: DAH5000, Jack (Maqsod)

DTG: 0230 12 SEP 18 ALLERGIES: NKA



TIME	0220	0225	0235	0245
AVPU	U	P	V	V
PULSE	100	120	120	120
RESP	25	30	30	30
BP	CAROTID	CAROTID	CAROTID	CAROTID

Immediate Delayed Expectant Minimal

Critical(Urgent) Priority Routine

A: NPA Cric KingLT ETube

B: Chest Seal NeedleD 0240 ChestTube

C: TQ Hemostatic 0225 Packed PressureDx

SalLock IV EJugular IO 0225

FLUIDS: NS / LR 500 1000 1500

Hextend 500 1000

Other: 1 unit CWB 0225

DRUGS (Type / Dose / Route):

PAIN KETAMINE / 50mg / IO 0230 / 0235

ABX

CWPP OTHER: 1g TXA 0225

Mech. of Injury- Treatments

GSW BLAST MVA Other_____

Medic's Name SGT MCDONALD

TCCC AAR

0240

B: Chest Seal NeedleD ChestTube

0225

TCCC AAR

Are we doing too many?

Is the lateral site a risk with the longer needle?

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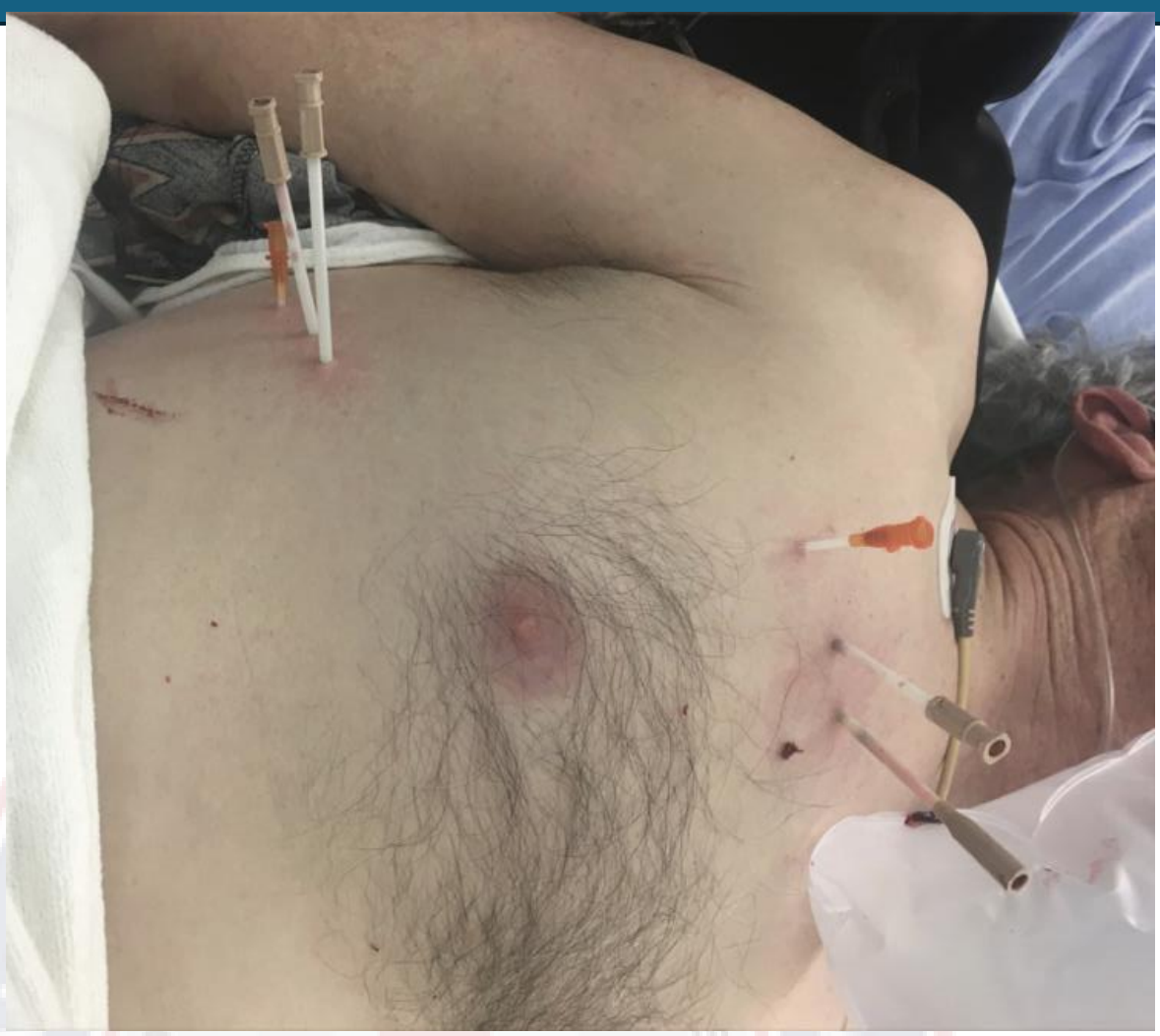
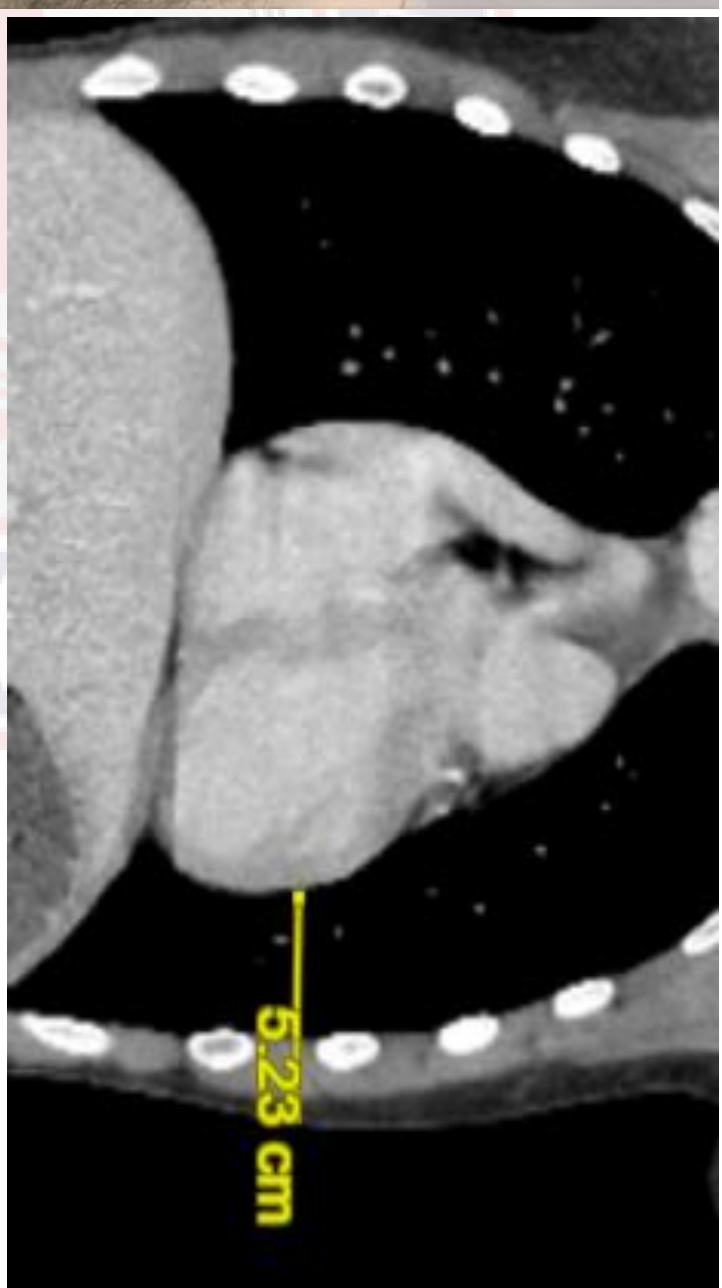
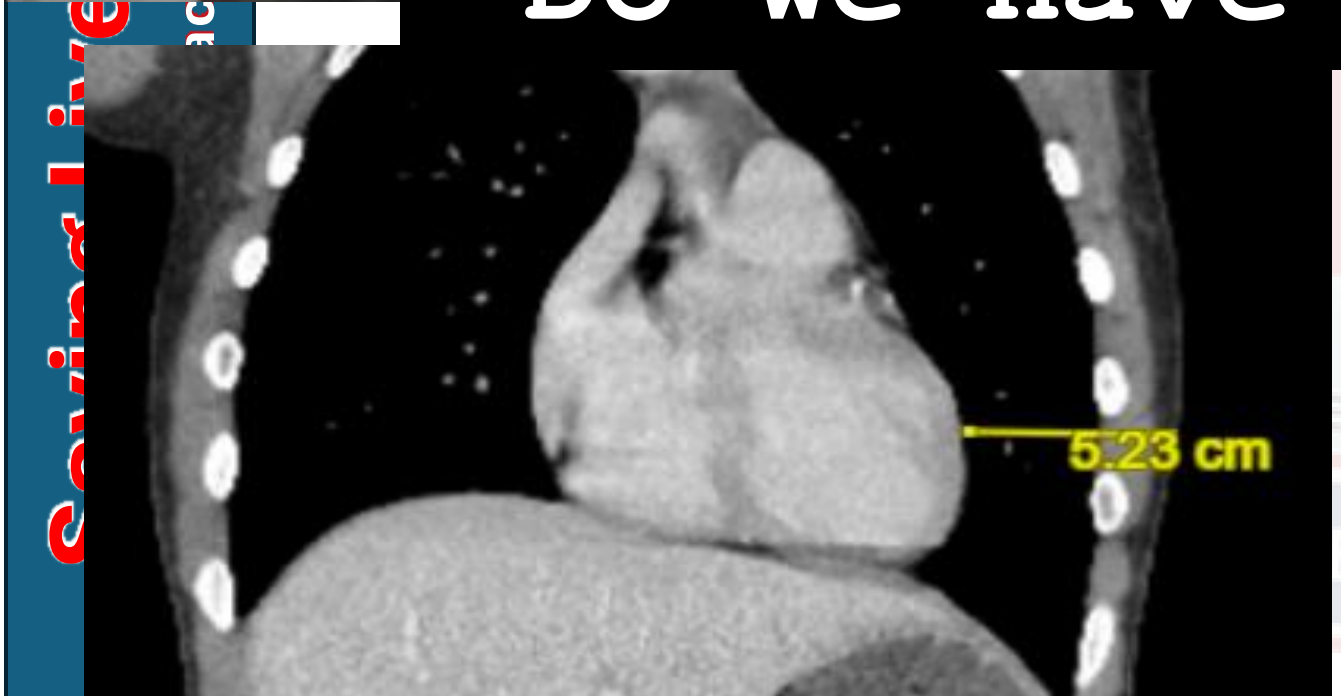




Do we have a problem?



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TCCC AAR

UNCLASSIFIED/FOU

Injury Specifics & Treatment

Mechanism of Injury
- [x] GSW
- [ ] Fragmentation
- [ ] Blast – IED
- [ ] Blast – Other
- [ ] A/C Crash
- [ ] Airborne Op
- [ ] Collapse
- [ ] Crush
- [ ] Drowning
- [ ] Fall
- [ ] FRIES
- [ ] MVA
- [ ] Other:_____

Injury Type (1 or more)
- [ ] Amputation Comp
- [ ] Amputation Partial
- [x] Soft Tissue-Deep
- [ ] Soft Tissue-Superfic
- [ ] Burn
- [ ] Fracture
- [ ] Other_____

Bleeding Management:
Tourniquet Type_____ PressDx Splint
Hemostatic (Type CHITO GAUZE)
Tourniquet Application Time:_____
Tourniquet Location: _____
Tourniquet Release Time:_____ Not Rel

Circulation Management:
Saline Lock EJ IO (Type STERNAL HUMERAL)
IV Fluids Type CWB Dose_____
IV Fluids Type_____ Dose_____

Drug Therapy:
Pain KETAMINE Dose 50mg Route IO
Pain _____ Dose_____ Route_____
ABX_____ Dose_____ Route_____
- [ ] Combat Wound Pill Pack

Other TXA Dose 1g Route IO

Disability Management:
C-Collar Backboard Splint Pelvic Splint

Exposure Management: BLIZZARD BLANKET +
Hypothermia Kit Type READY HEAT
IV Fluid Warmer Type_____

Head Injury: YES / (NO)
GCS Score:__Time____
MACE Score_____
MTBI

Vision Injury: YES / (NO)
Visual Acuity_____
Notes:

Hearing Injury: YES / (NO)
Hearing Acuity_____
Notes:

Blast Injury: YES / (NO)
Notes/Assessment:

Other:

UNCLASSIFIED/FOU

Saving Lives with Data

Right Patient ~ Right Place ~ Right Time ~ Right Care

TCCC AAR

Drug Therapy:

Pain KETAMINE Dose 50mg Route IO

Pain _____ Dose _____ Route _____

ABX _____ Dose _____ Route _____

❑Combat Wound Pill Pack

Not FDA Approved for this use…..*does it matter?*

→ It matters for Combat Capability Developers….

→ It matters for funding / research for things like autoinjectors

How do can clinicians better inform <u>what is needed on the battlefield?</u>

Saving Lives with Data

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But wait….we are high tech

Saving Lives with Data

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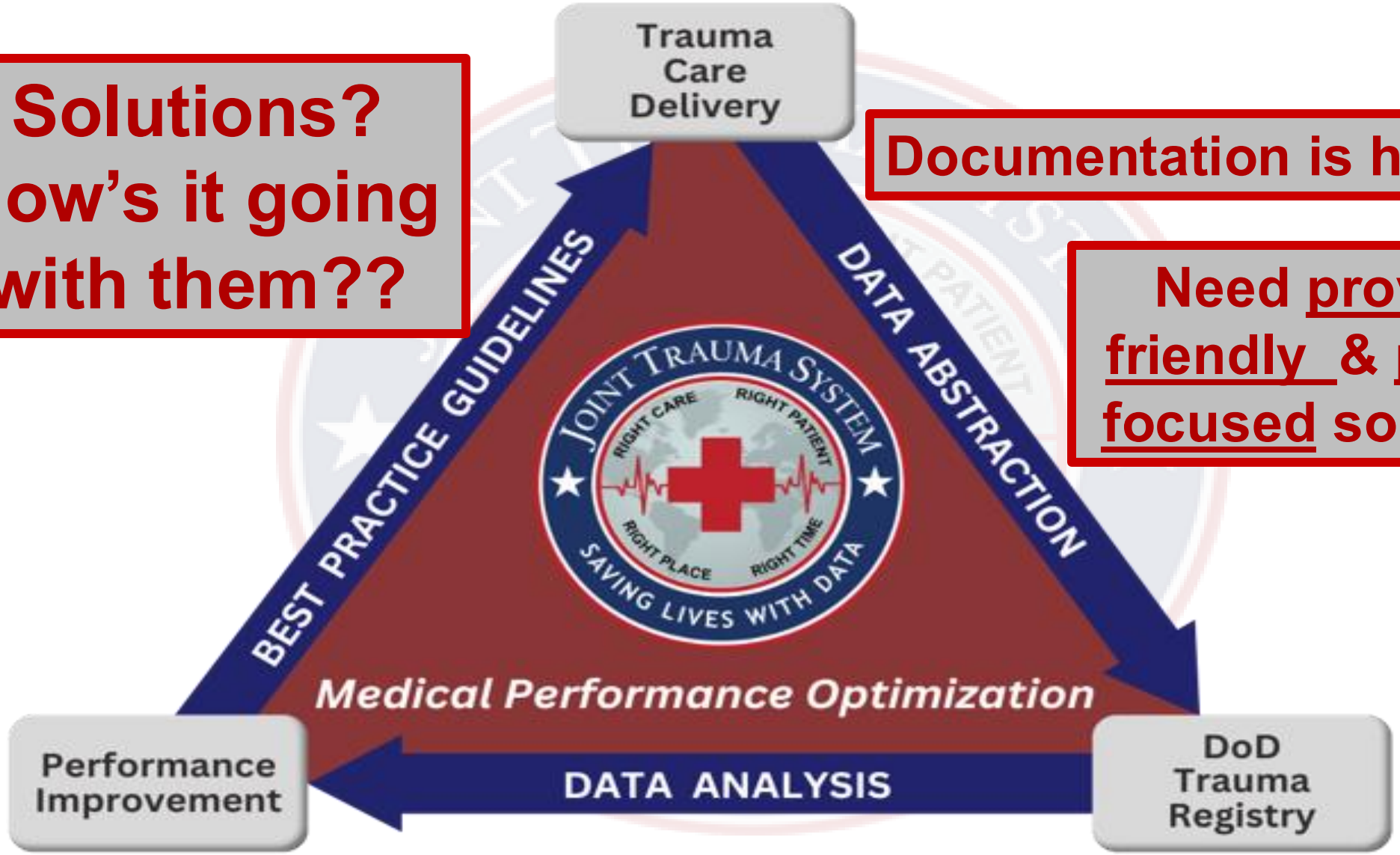
You don't know what you don't measure

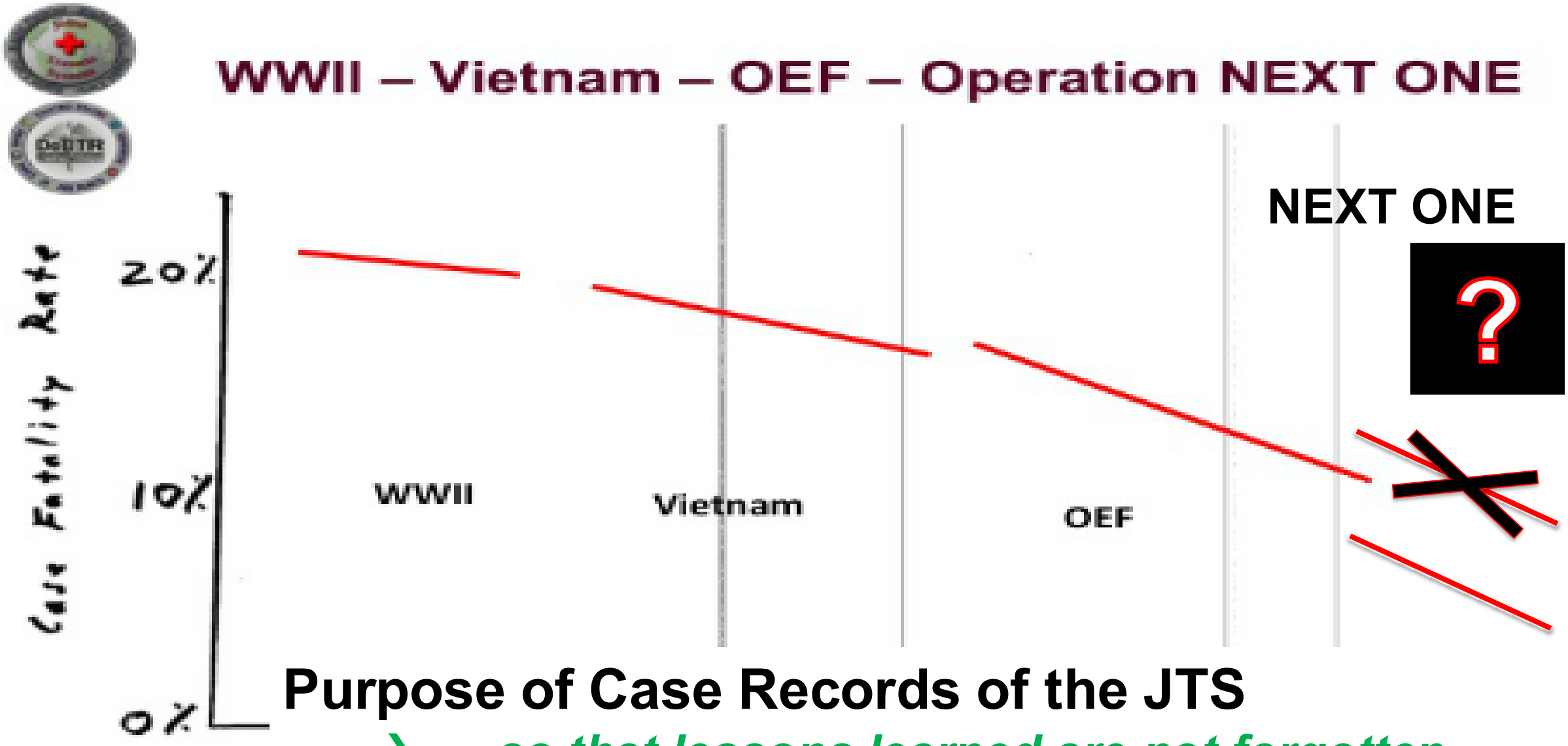
Solutions? How's it going with them??

Documentation is hard….

Need <u>provider friendly</u> & <u>patient focused</u> solutions



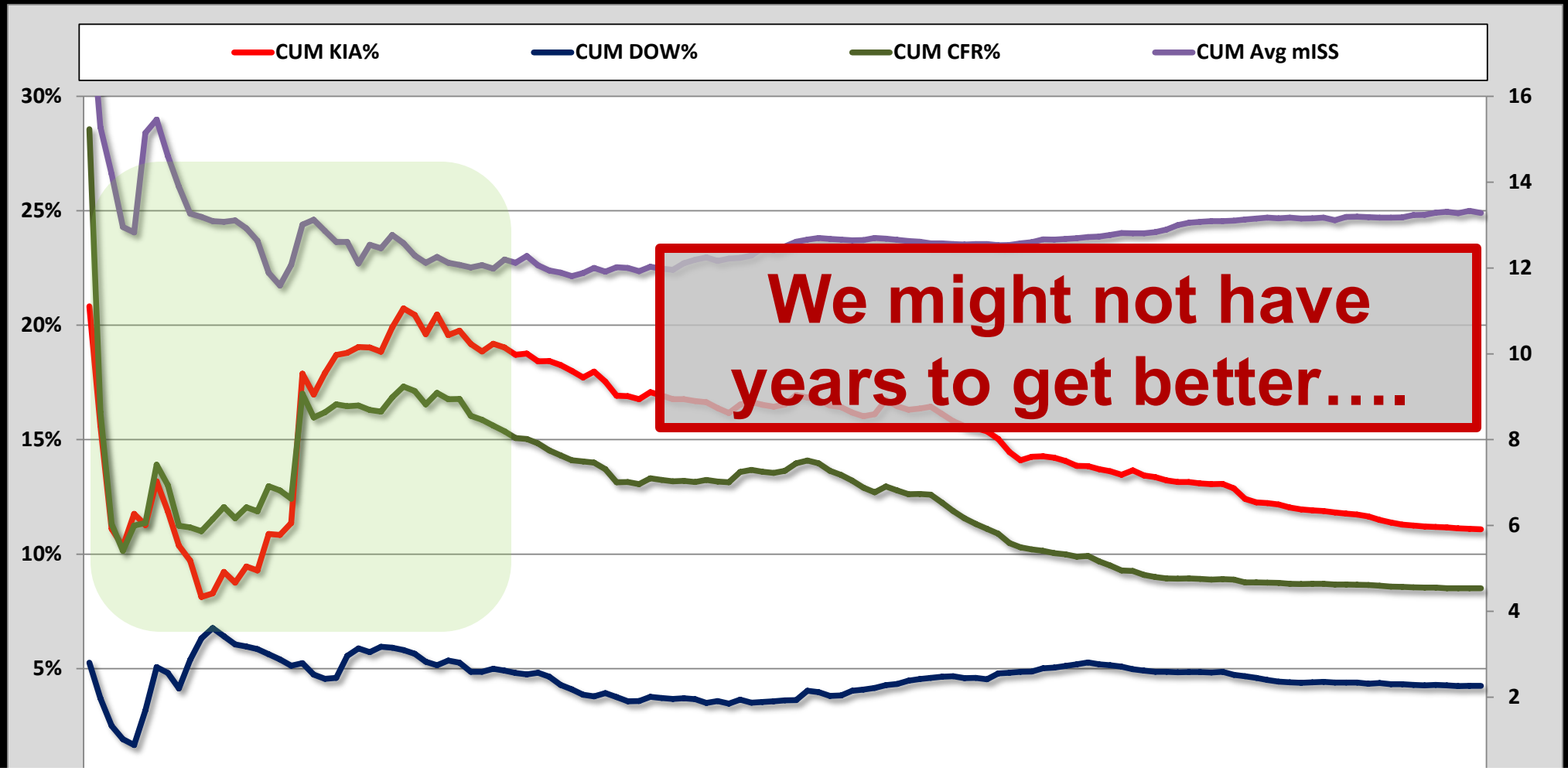
The Future of Combat Casualty Survival



Purpose of Case Records of the JTS

→ *.....so that lessons learned are not forgotten*

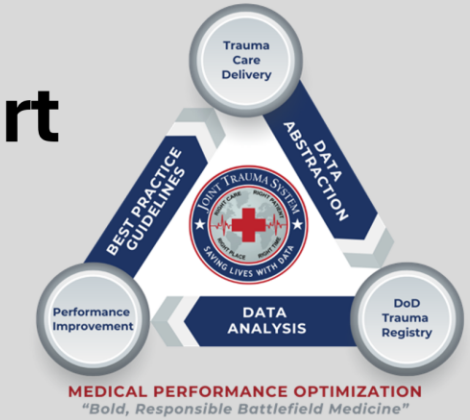
The Future of Combat Casualty Survival



Purpose of Case Records of the JTS

→ *…..so that lessons learned are not forgotten*

JTS Data Enterprise: DODTR Modernization Effort



Lessons Learned

Casualty Care Data & AARs

Research & Development

Acquisitions

Military Departments

Training Requirements

JOINT TRAUMA SYSTEM

- Reference Body for Trauma Care Data Management
- Ensure Comprehensive Data Collection Across Continuum of Care
- Support Evidence-Driven Medical Performance Optimization
- Facilitate Trauma System Planning and Improvement
- Preserve Knowledge and Lessons Learned

JTS DATA ENTERPRISE

- Conduct Current Registry Operations
- Develop Future Registry Requirements
- Conduct Research & Analysis

U.S. ARMY · NAVY · MARINE CORPS

NEW SIMON

System for Injury Monitoring and Outcomes Nexus

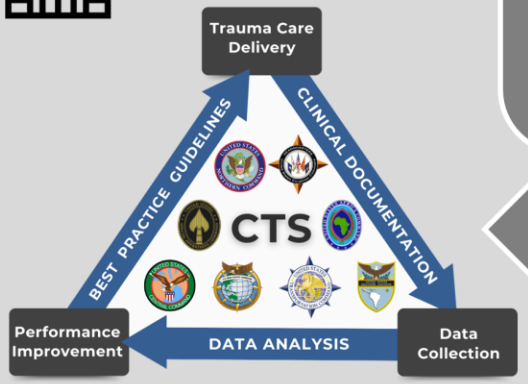
- Efficiency: Data Ingestion Automated, AWS Lambda, AWS Dynamo DB
- AI/ML Tools: AWS Tesseract (OCR), AWS Comprehend (NLP)
- Common Data Model: Observational Medical Outcomes Partnership (OMOP)
- Innovation: Unified, Data Agnostic Approach to Registry Operations

Conduct Research & Analysis

- Data Quality: Standardization, High-quality data, Trustworthy data, Reduced errors
- Scalable/Interoperable: Seamless integration, Large-scale studies, Future-proof solutions
- Near Real-Time Analytics: Analyze current trends, Dynamic Visualization, AI/ML Models

DOD CCC Stakeholders

- New Source Data Integrated with Trauma Data
- Enhanced Data-Driven Decision Making
- Accelerated Research and Guideline Development



CCC Trauma System Improvement

- Seamless Data Integration Across Echelon
- Health System and Outcomes Benchmarking
- Improved Operational Readiness and Support

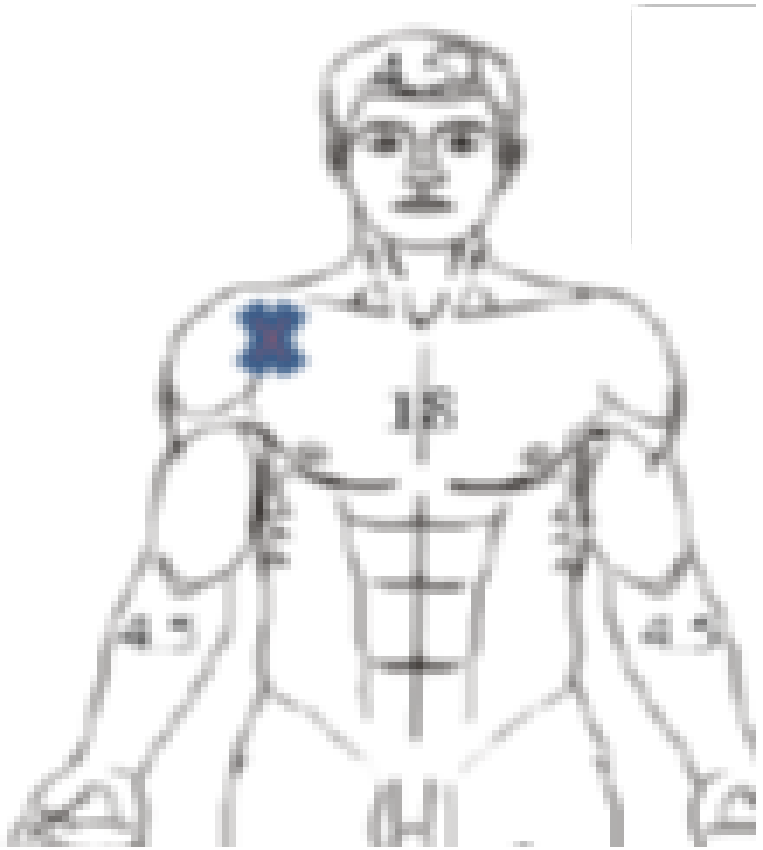
Data Enterprise, Joint Trauma System (April 2025)

Let's Get Back to the Case…

25 yo male GSW to right upper chest, POI:

- HR 130, palpable carotid, GCS 8, RR 25
- Has 2 IOs: Sternal & L humerus
- 1 unit of CS-LTOWB
- Had 1gm TXA, 50mg Ketamine
- Needle Decompression
- Manual pressure & Chito Gauze
- Pulsatile bleeding from wound

MEDEVAC to Role 2 FRST



Saving Lives with Data

Right Patient ~ Right Place ~ Right Time ~ Right Care

Forward Operating Base

Your Location

Saving Lives with Data

Right Patient ~ Right Place ~ Right Time ~ Right Care

Forward Operating Base

Your Capabilities

Forward Surgical Team (split)

- One general surgeon
- One orthopedic surgeon
- One CRNA
- Capabilities: Sonosite, iSTAT, portable X-Ray
- 40 units of PRBCs / 40 FFP / 40 units of Cryo
- 10 units of LTOWB
- Capability for walking blood bank

Saving Lives with Data

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Forward Operating Base

Saving Lives with Data

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Forward Operating Base

Saving Lives with Data

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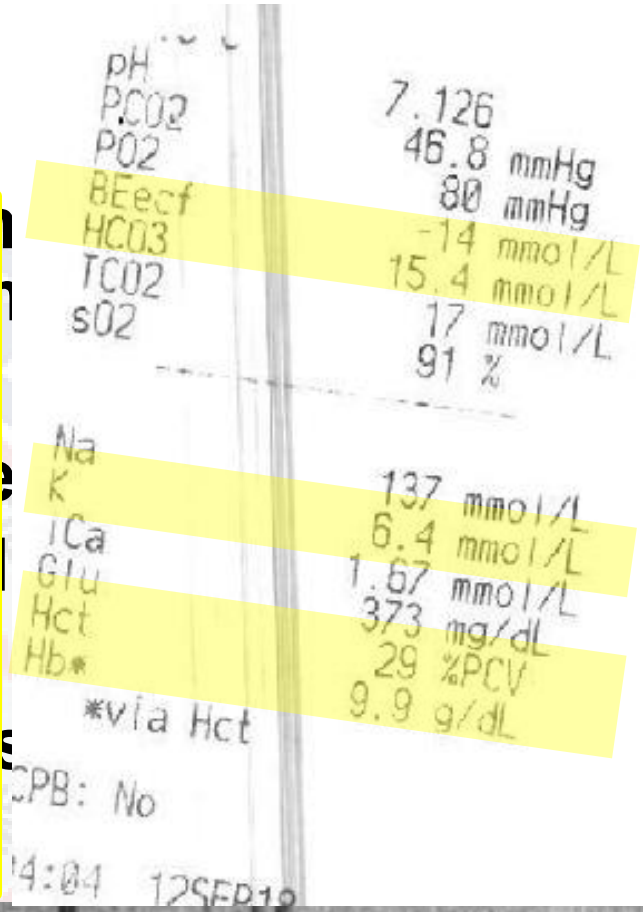
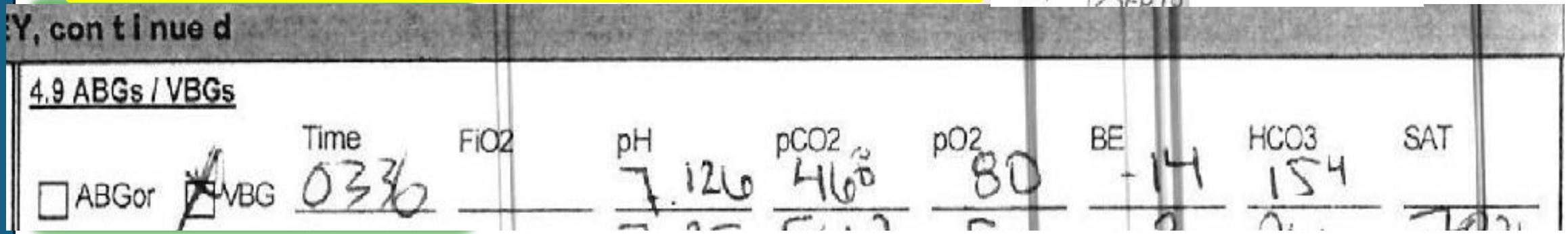
Forward Surgical Team

Arrives at 0256

Thoughts on Resuscitation?

- Bicarb appropriate
- Calcium administration
  - → how much?
- Potassium concerns
  - → transfusion thoughts





Forward Surgical Team

ATLS Tre

- Rapid S
- Right cl
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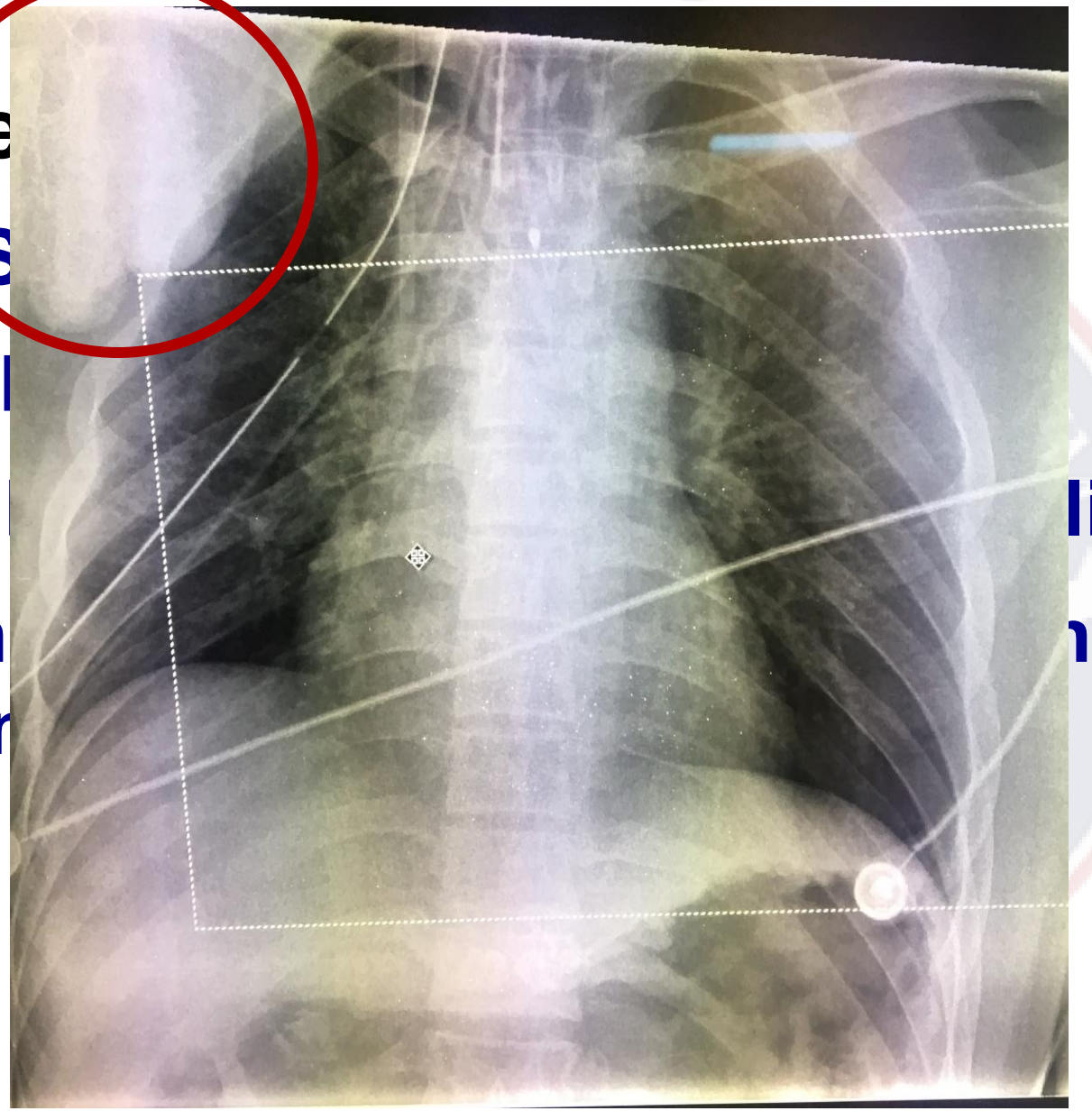
- Ongoin n secondary to large ar



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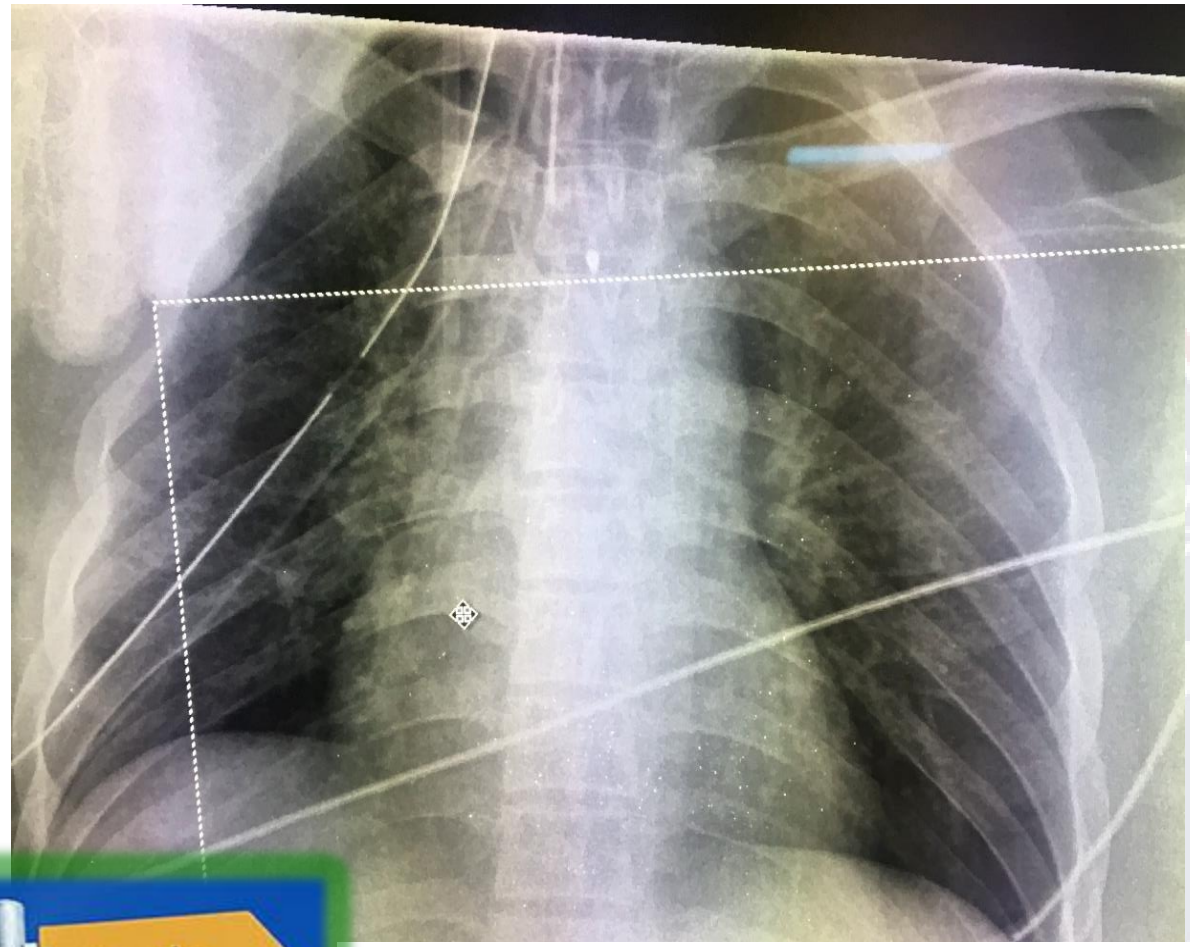
Forward Surgical Team



- OR?
- Transfer to Role 3 (45 min)?

Proceeded to Operating Room

Activate walking blood bank or call for blood resupply?

What are the incision options?

What are the tricks?

What are the bail outs?

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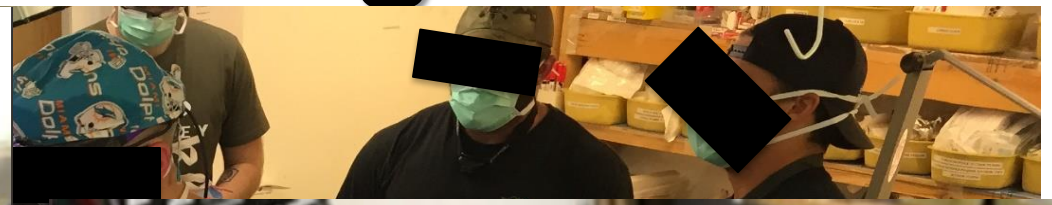
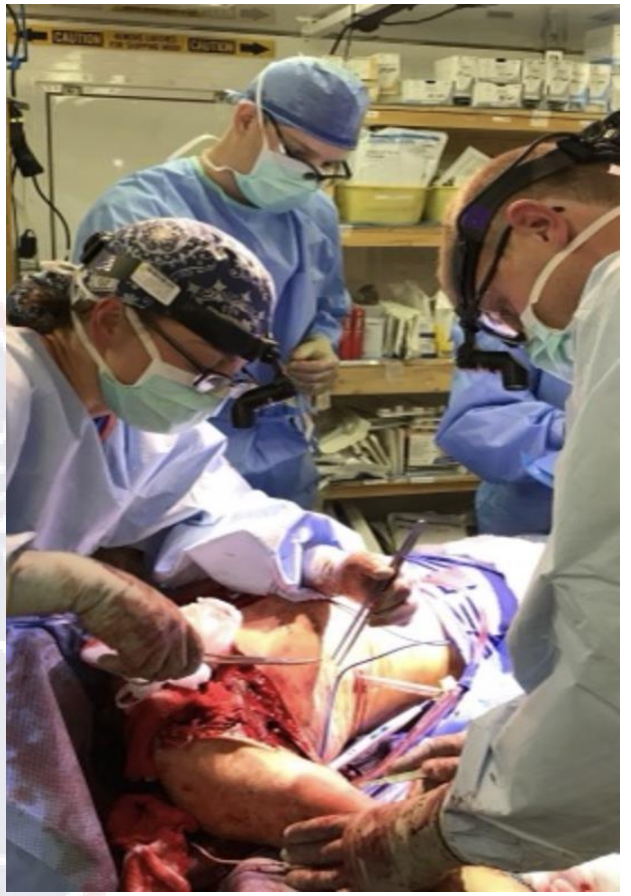
Role 2 Operating Room



Role 2 Operating Room

Operating Room

- Right subclavian control unable to be obtained through wound → median sternotomy
- No vein injury
- Shunt placed from subclavian to axillary artery
- Right forearm fasciot
- OR Time: 2.5 hours



Criteria for UE fasciotomy?

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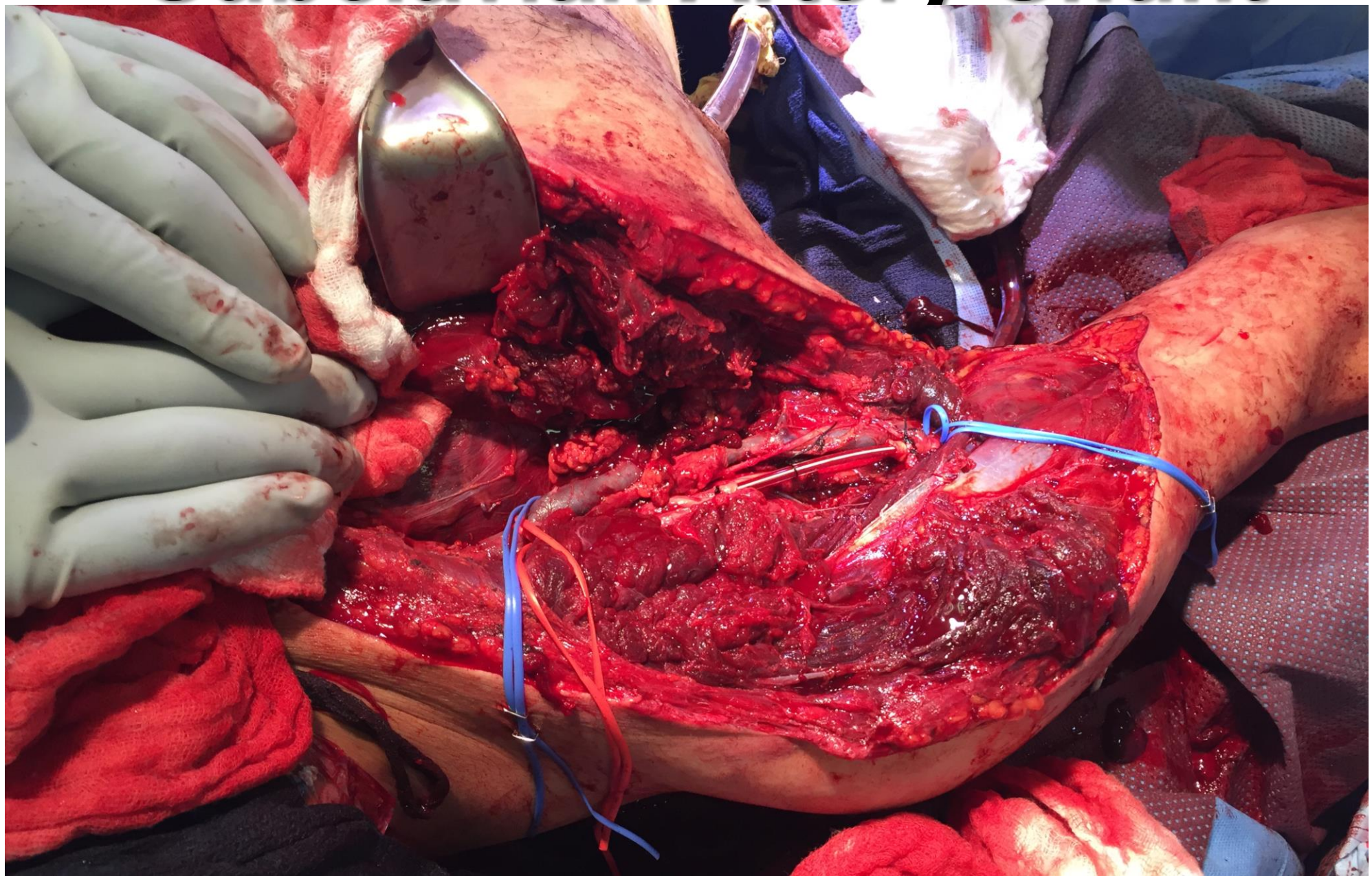
Subclavian Artery Shunt



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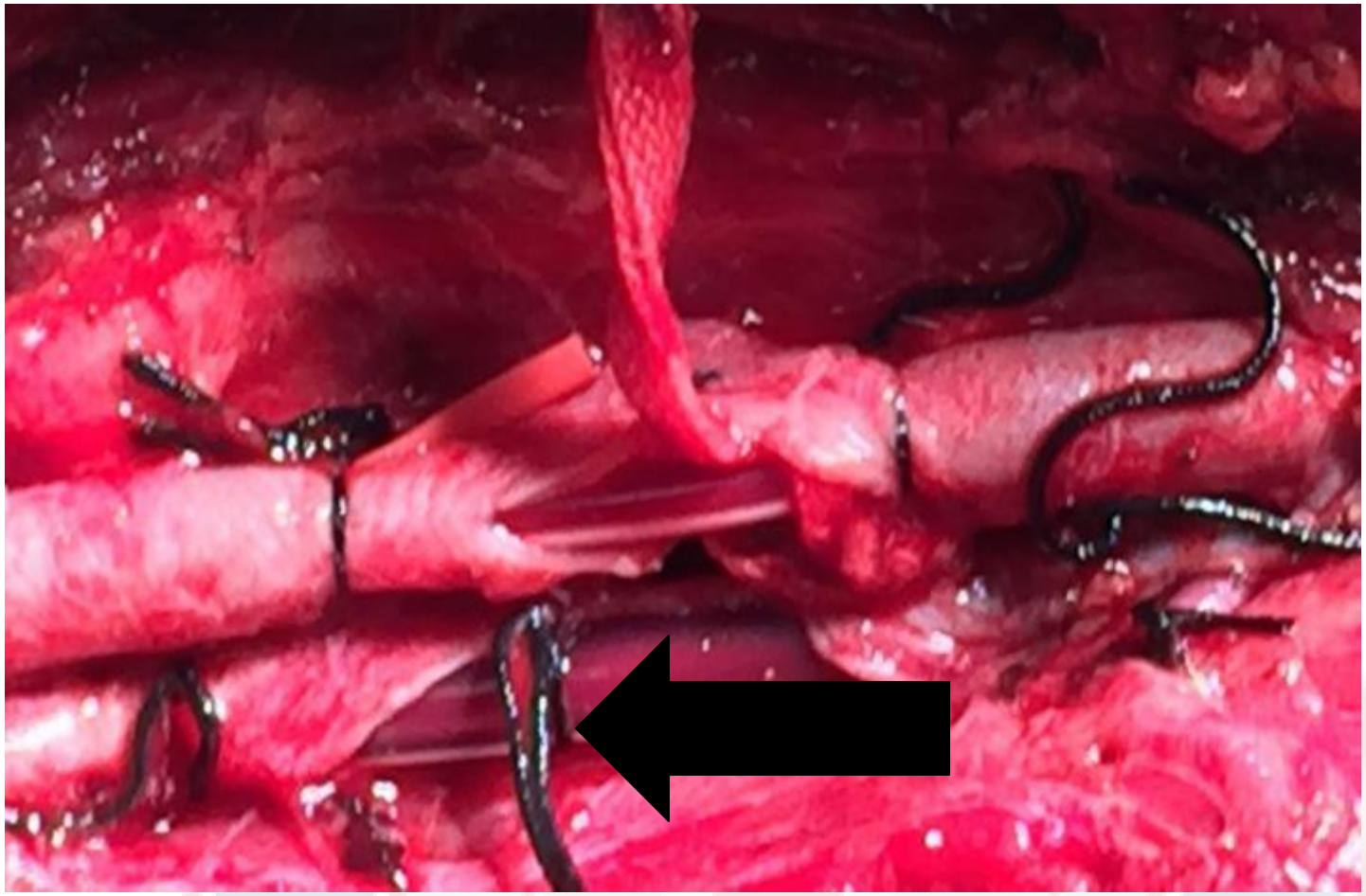

Shunt tricks / traps / lessons learned

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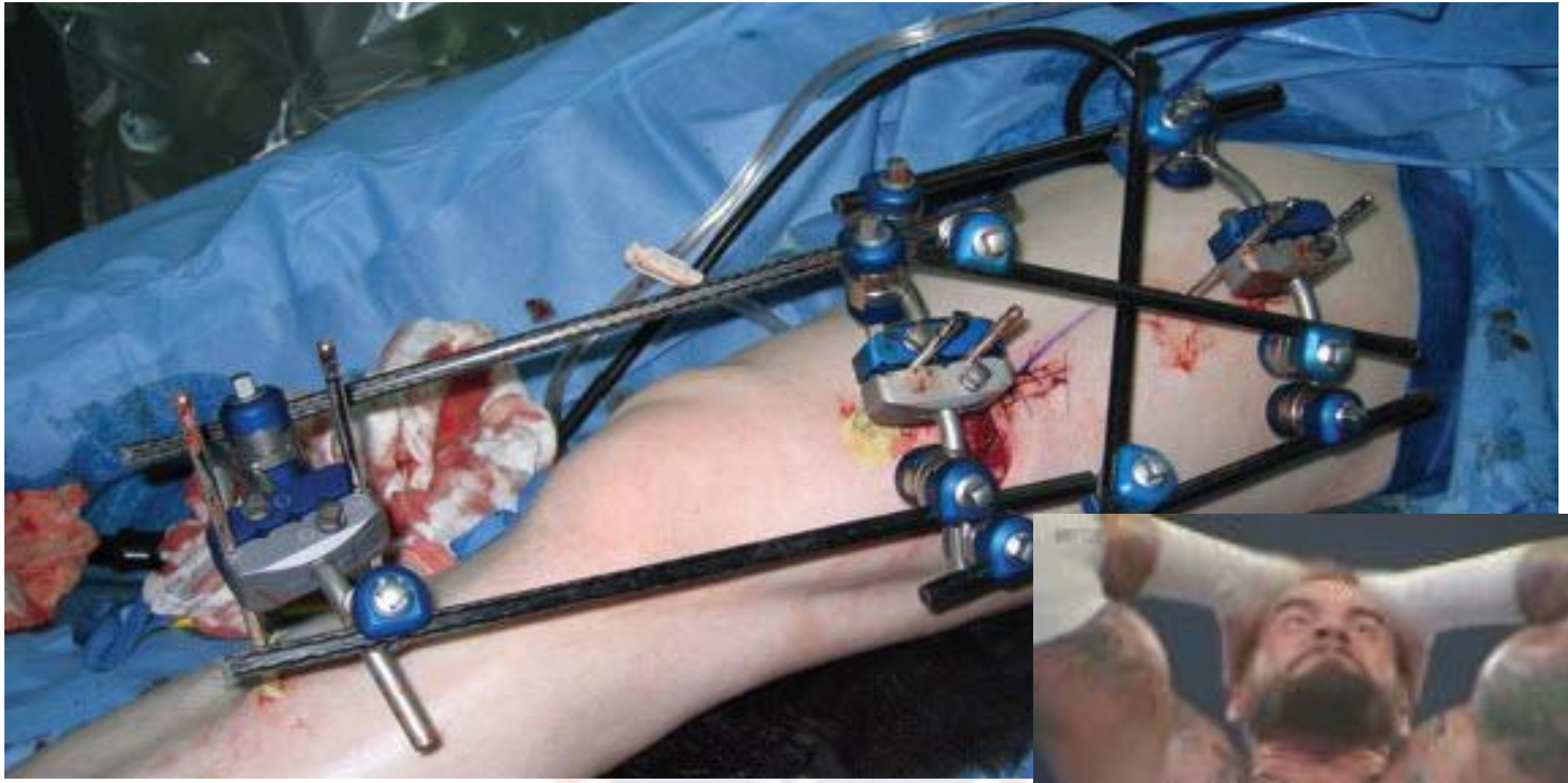
Shunts with Ortho Injury – which 1st ?



Saving Lives with Data

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Role 2 Operating Room

Total Products/Hemostatic meds

- WB 5u
- pRBC 21u
- FFP 24u
- Cryo 14u
- Plt 2u
- TXA + CaCl x6

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When to Transfer to Role 3?

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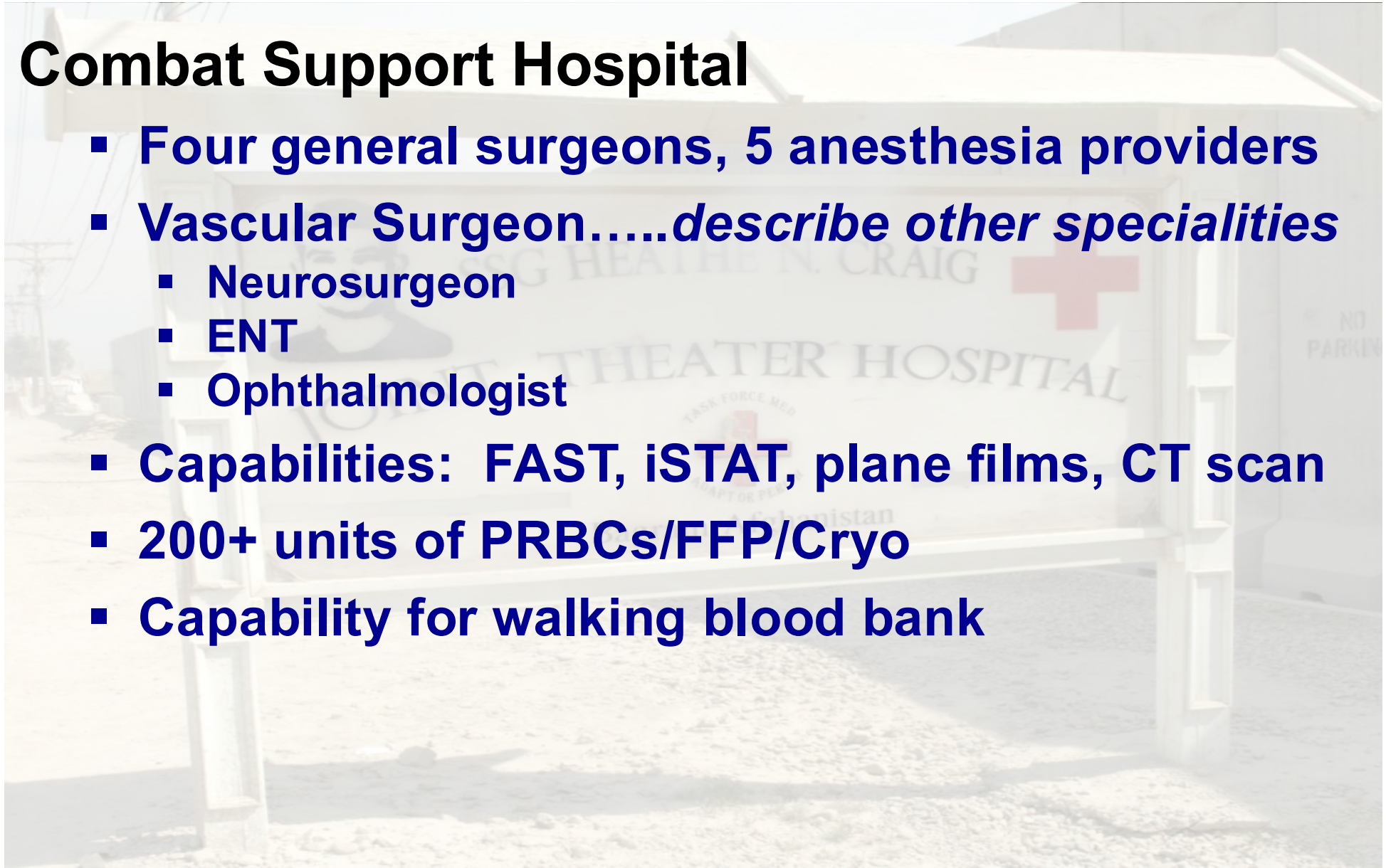
Role 3 Combat Support Hospital

Role 3 Combat Support Hospital



Combat Support Hospital

- Four general surgeons, 5 anesthesia providers
- Vascular Surgeon…..*describe other specialities*
  - Neurosurgeon
  - ENT
  - Ophthalmologist
- Capabilities: FAST, iSTAT, plane films, CT scan
- 200+ units of PRBCs/FFP/Cryo
- Capability for walking blood bank

Saving Lives with Data

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Role 3 Combat Support Hospital

- Arrives at 0750, 5.25 hours post injury
  - Hypotensive
    - Levophed immediately started

- 33 / 50 / 90 / HCO_3^- 26.5
- BP 83/60
- T → 11/34 PLT 50 INR 1.8 PTT 123
- Lactate 6.3

Thoughts on vasopressors

Next Step?

CT scan / OR / ICU

Saving Lives with Data

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Role 3 Combat Support Hospital

Is vascular surgery a 'trauma surgery' skill?

Is it a 'general surgery' skill?

Should military general surgeons have different requirements to meet the needs of an expeditionary scope of practice?

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Role 3 Combat Support Hospital

Recovery:

- Recovered at Role 3 for weeks
- Nerve ends tagged for future repair
- Aspirin for vascular graft
- STSG to forearm
- PT / Rehab of right upper extremity
- Discharged to HN care

Lessons Learned?

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Rapid-Fire Round

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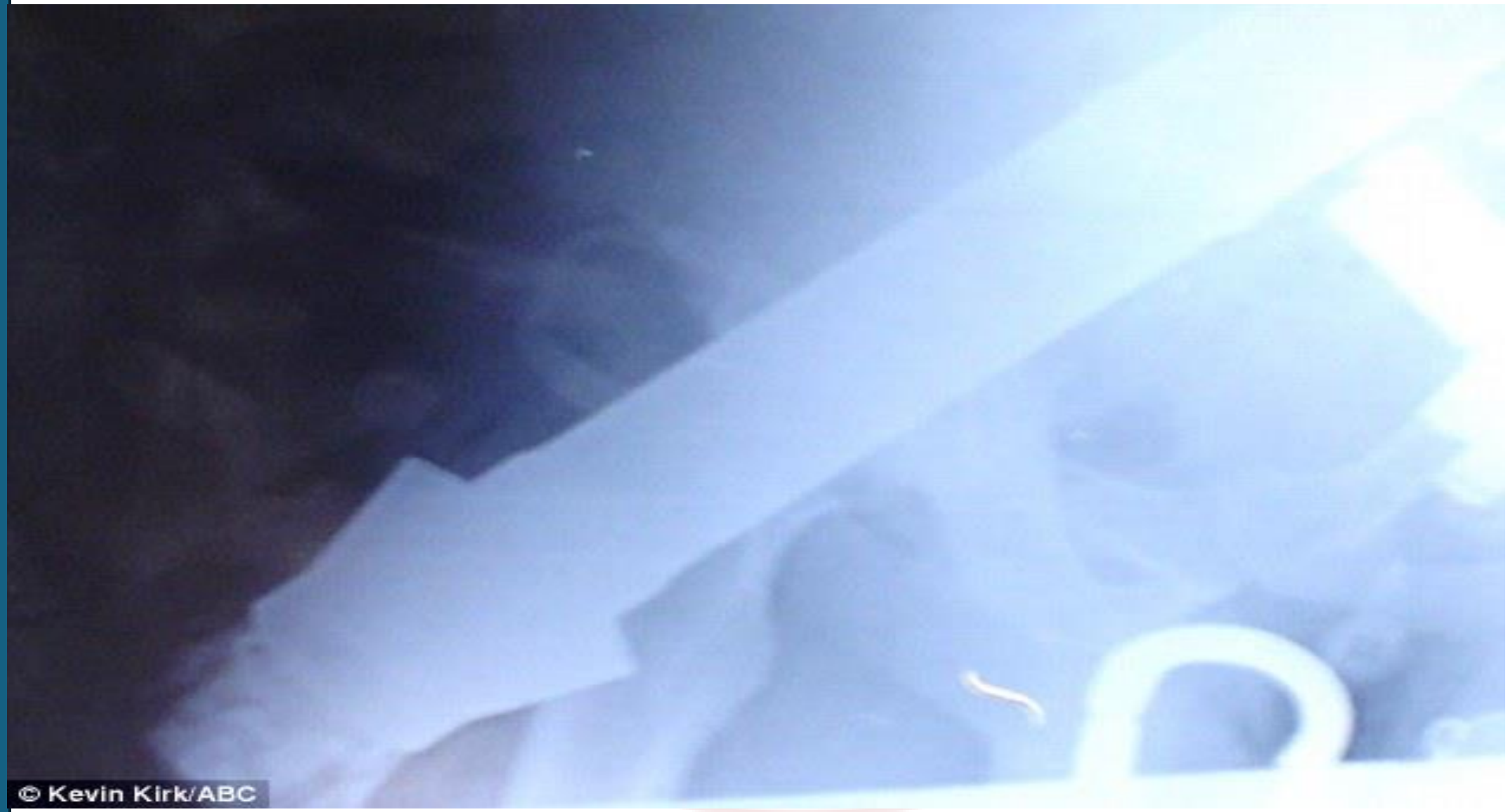
Houston, we have a problem



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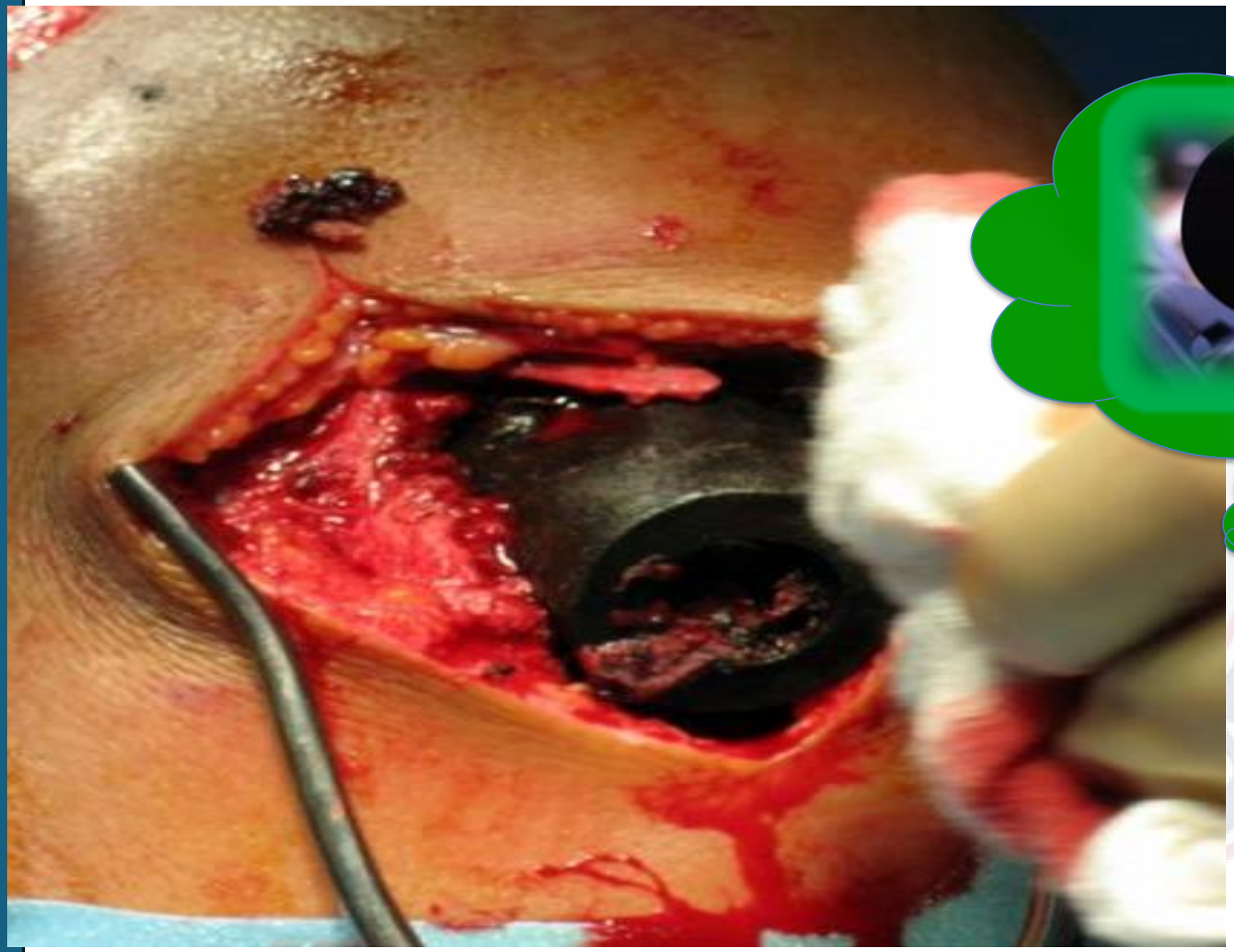
Unexpected Finding…..



Now What?


Personal Protective Equipment??

Saving Lives with Data

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Host National Patient

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Right Patient ~ Right Place ~ Right Time ~ Right Care

AUDIENCE QUESTIONS / DISCUSSION

Saving Lives with Data

Right Patient ~ Right Place ~ Right Time ~ Right Care

THANK YOU PANEL MEMBERS!

Purpose

…so that lessons learned are not forgotten

Saving Lives with Data

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Lest we forget