COMMITTEE ON SURGICAL COMBAT CASUALTY CARE

WORKING IN THE DARK SPACE – DEVELOPING CAPABILITIES FOR THE UNKNOWN

MARCH 27TH -28TH 2024

Marriott San Antonio Airport

San Antonio, TX

Meeting Minutes Prepared by: Mr. Dominick Sestito

Day #1 CoSCCC March 27th

Day #1		
Time	**Presentation**	**Speakers**
0800	**Welcome, Introductions, WHAT DO WE DO AND WHY WE DO IT – Intro of New Members / CoSCCC Mission and Expectations**	Tadlock/Sestito/Gurney – 30 min
0830	Current IDF Experience Discussion & Questions	BG Glassberg (Virtual) - 30min Gurney– 10min
0910	Ideal Utilization of ARSC Teams for Surgical Care …COIN vs. LSCO	Tadlock – 5 min
0915	Navy ERSS/Army FRSD/AF GST/ USMC FRSS -STP/Army ARST/France -10 Min Presentations/Status	Navy-Brandau; USAF - Mahoney; Army ARST - Clemens; USMC - Edson; Army FRSD - Rowland ; France - Monchal
1015	Utilization of ARSC Teams For LSCO – Discussion	Tadlock Moderator – 15min
1030	**BREAK**	
1045	The Future Is Not Bright -MTF GME: Excellent Training with a Crisis of Confidence -Military General Surgery GME Survey Preliminary Results -Leveraging Talent For solutions	 Choi-15min Baird – 15 min Discussion – 10 min
1125	Where I See Risk as Director, Defense Health Network Pacific Rim	RDML Valdes – 30 min Discussion/Question – 15 min
1230	**LUNCH**	
1330	Advocating for the KIA & DOW	Beckett – 20 min
1350	Futility in Severely Injured Patients	Cotton – 20 min
1410	Panel Discussion: Futility in Deployed Military Operations	- 15 min Hardin moderator
1425	Expectant Casualty Care Guidance Development: Review of End of Life Conditions	Tadlock – 15 min
1440	The Deployed Surgeon – The Continuum of Care from the Patient's Perspective	Sirkin & Wallentine 45 min

1525	Discussion – our ethos, our obligation, our future – what can we do better	15 min
1540	**BREAK**	
1555	Breaking Clinical Research – What You Need to Know Moderated Discussion	Schreiber – 20 min Martin (Virtual) – 10 min
1630	**LET'S GET SOME WORK DONE!**	
Group 1	Position Statements -Role 2 Ortho Capabilities Statement (Marsh) -Role 1 Procedures Survey Results & Statement (Hout)	
Group 2	-Role 2 Critical Care at 24 Hours – What We Need to Know – Capability Gaps for the Future Fight (Powel & Biberston) -Bling My CPG: AKA DOTMLPF my CPG (Gurney)	
1730	**ADJOURN**	

0800 CAPT Tadlock welcomed attendees to the meeting and began with a brief overview of what the Committee has been focused on since inception in 2016 and where priorities should be and need to be realigned moving forward.

First meeting in Fall 2016

Goals-

1. Develop and maintain CPGs for forward surgical care to include resuscitation and critical care.
2. Focus on sustainment, training, systems doctrine and research for forward surgical care.
3. Make recommendations to the DHA, ASD-HA, Service SGs to influence policies and doctrine related to surgical readiness.

Recent improvements to the CPG Process:

Updated Roughly Every 5 years

- Streamlined Process for New/Updated CPGs
    - Kathy Robbel - JTS
    - Remealle How – JTS Fellow and CoSCCC Member
    - Mike Van Gent – DCoT Chair
    - Matthew Tadlock – CoSCCC Chair
    - Jennifer Gurney – JTS Chief
- JTS CPG Website Re-organized → Easier to Find CPGs
- JTS CPG narrated PowerPoint slides are back!
- **Key CPGs will be Published in Military Medicine**

Lines of Effort/Deliverables and areas of focus for the future:

- Appropriate use of ARSC Teams In LSCO→ Position Statement?
- Saving the Future Military Surgeon
- Futile Care
- Role 1 Expectant Casualty Care→ "End of Life Conditions"
- Surgery in the Air?
- GHE: Globally Integrated Trauma System & Integrated Deterrence
- What Does CoSCCC Membership Mean? Clarifying Expectations
- INFORM: Research Updates, JTS Data Process, JMPT overview
- Austere Role 2 Critical Care Gaps
- Role 1 Procedures Statement→ Licensed Independent Providers
- Role 2 Ortho Capabilities Statement
- Bling My CPG!

COL Gurney provided guidance on the JTS position during this inter-war period. Promoting Combat Casualty care and ensuring it is still a focus by the MHS to prevent to Walker Dip.

Top Goals for JTS 2024:

-Trauma System Leadership and Verification

-CoSCCC Members to accompany and assist to ensure crosswalk and familiarization with the JTS process.

COL Gurney introduced BG Glassberg, Surgeon General for the Israeli Defense Force.

1) **BG Glassberg Virtual Presentation:** BG Glass berg gave an overview of the current IDF experience.

> *"It is our goal to provide Lessons Learned to our JTS friends and partners. I feel like a club member and I have learned so much from you all, I feel it is my duty to give back."*

We operate in a National Health System which of course is a little different form the United States, we do not have Military Hospitals. It helps us remain focused on Pre-hospital care and trauma casualty care. We only provide care for AD personnel, not families, not children.

BG Glassberg showed a video of the attack and devastation that took place on October 7th at 6:32am.

"I ill be very honest, the IDF failed that day and did not protect our citizens to the best of our ability. We are here for the defense of our citizens and nation, and we failed. Despite that burden of failure, we recovered and made the hard realization that we had to go to war."

Lessons Learned:

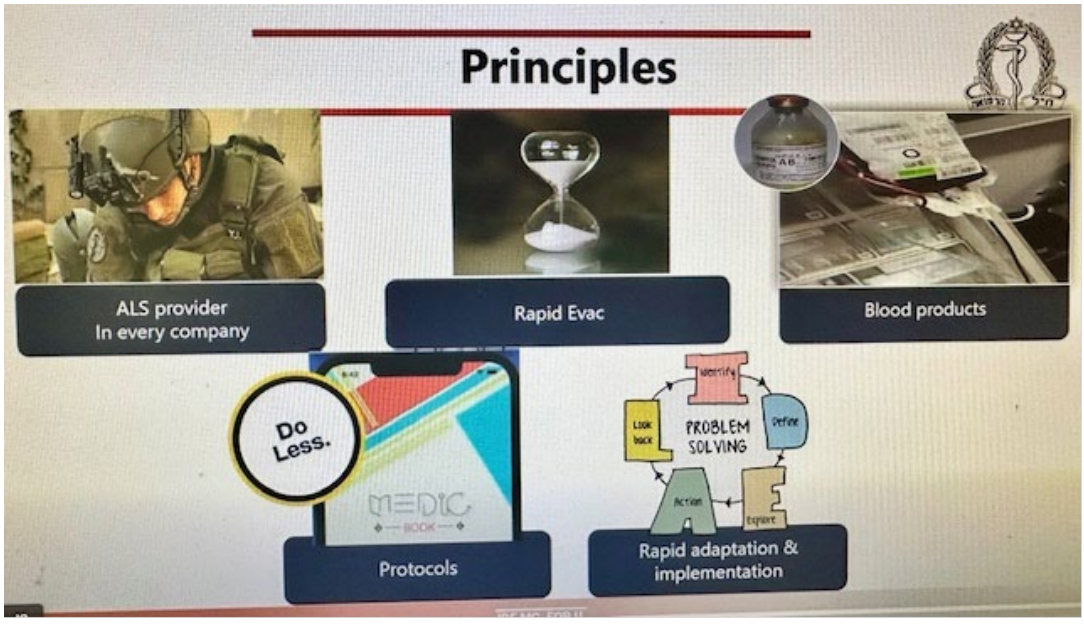
-We took out all crystalloids

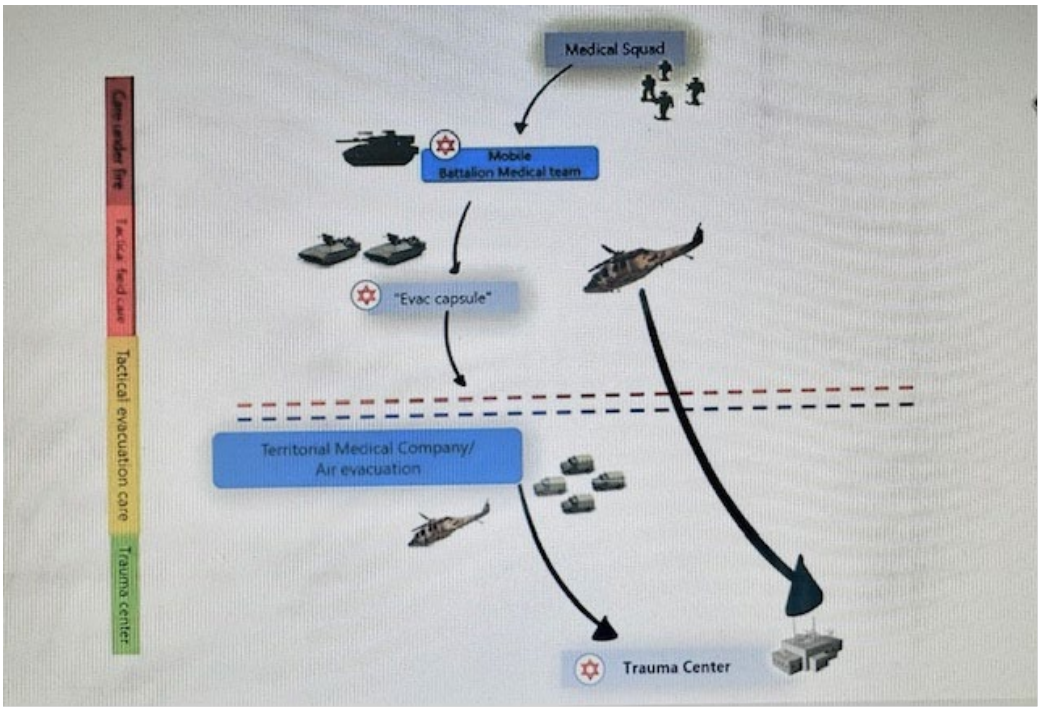
-Constantly meeting with Division Surgeons from last 24 hrs

-Medical Book Ap

Do LESS

"Most people survive despite our treatment and intervention not because of them"





Basic medics (Physician or Paramedic) are 1:20 in Battalion. We want them to stop bleeding, do as little as possible and get the patient out of there.

We do not follow TCCC. We have different scenario, different providers, different health system. Also, we do not have to follow FDA.

Our Providers:

-Physicians
-EMT-P
-Medics
-ALS Providers -676 ALS Providers (80 female)

63% of injuries are shrapnel/ 10% gunshot wounds – high percentage of limb injuries – over 50%

"We are currently at 6.5% case fatality rate, down from 14.6% in 2006, even though ISS scores have increased. We do not publish these numbers for two reasons. 1. The war is not over, and I do not want to create a benchmark that is unsustainable when we cannot predict the future of this conflict."

Some numbers to support our successes (saves):

-424 Direct Pressure to stop bleeding
-79 cases of packing/ 74 hemostatic dressings, 5 foley catheters
-484 tourniquet applications to 300 patients
-19 manual pressure point

Less than 2% of casualties get airway interventions

"We are very aggressive with NOT providing airway interventions. We DO NOT believe in Needle Decompression. Needle D do not work, our goal is to reduce or even eliminate this from practice. Change and protocols take 8-10 years to be adopted by everyone."

We will need to look at our protocols and make changes to switch from ABC's to something else in the future.

CAPT Bitterman – How do you get after rapid mobilization and respond so quickly…as we get more resource constrained and enter possible LSCO?

BG Glassberg – We coordinate with the Ministry of Health to prepare for MASCAL, available beds etc. We also have regulatory authority. I can call Level 1 and tell them they need to clear 16 beds by a proposed time, and they will comply. There must be oversight and authority to direct patient movement.

COL Gurney – Is everyone transfusing whole blood or just physicians?

BG Glassberg – We do not do walking blood banks. We only use cold stored whole blood. We have a small country with short evac times, so not an issue. We set the regulation, so Paramedics take a test to be credentialed. But yes physicians can.

Col Shackelford – How are you so effective with treatment and evacuation?

BG Glassberg - The system is the same regardless of the casualty. Yes we simplify everything. We have one medical system and only one way to provide medical care and it works.

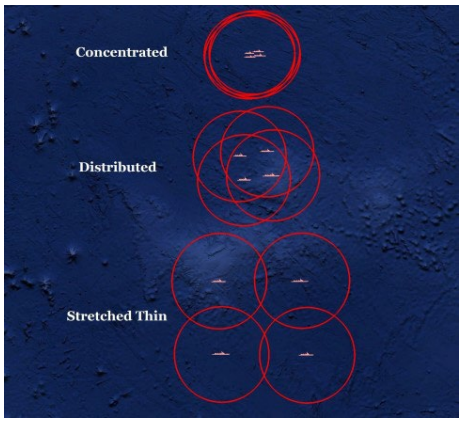
COL Gurney thanked BG Glassberg for presenting.

2) **Future employment of ERSS (CDR Brandau) –** CDR Brandau presented on the Expeditionary Resuscitative Surgical System regarding expansion during LSCO.
Current Setup:

- General/Trauma Surgeon
- Certified Registered Nurse Anesthetist
- Emergency Medicine Physician
- ER or ICU trained Registered Nurse
- Physician's Assistant
- Respiratory Therapist
- Surgical Technician

Navy plans to fight future operations in Distributed Maritime Operations; Spread out but not stretched too thin. Mutual support in the operational realm, however, does not translate to mutual support from a medical asset standpoint and capability.

Distributed Maritime Operations and Expeditionary Advanced Base Operations



This scenario does not represent scale. Taking the fight to the enemy would be fighter jets and submarines followed by Cruisers, Destoryer etc…the overall goal is to protect the Carrier.

Goal: Distributed Medical Support to correlate to Operational Distribution.

Initial Concept:

- Put ERSS teams on ships, like DDGs, that will be operating outside conventional casualty evacuation times.
- Distribution of surgical assets to match distribution of operational forces.

Issues with that concept:

- DDGs are not physically designed for surgical care.
- No evacuation or prolonged holding capability.
- Surgical resources are a critical limitation to planning. Can't be everywhere that the line wants.
- Risk to team and degree of mitigation the surgical team offers the ship must be considered.

Augmentation Recommendation for future ERSS:

- Augmentation
    - Amphibious Ready Groups (LPDs and LHA/LHDs)
    - Carrier strike groups
    - USMC Role 2s
    - Casualty receiving treatment ships
- Partner nation hospitals
- Transport (Maritime version of CCAT within WEZ)

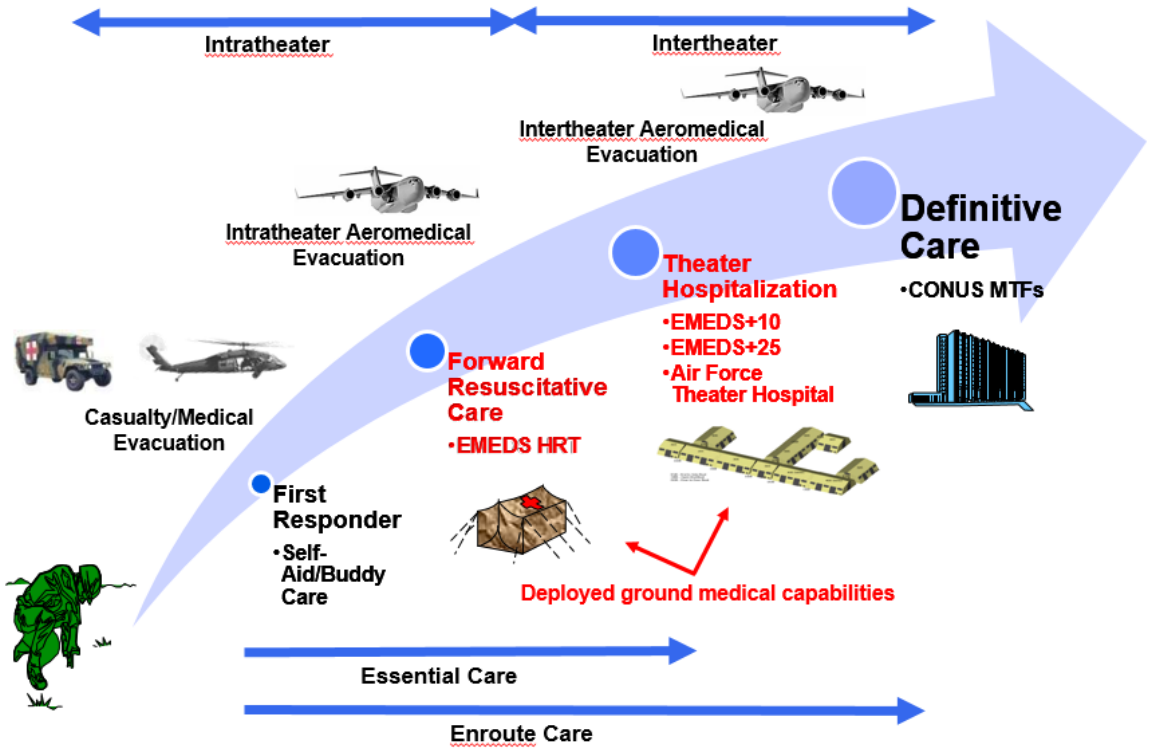
3) Ground Surgical Teams and Large-Scale Combat Operations (Lt Col Mahoney)

Breakdown of Air Force GST:

- 6 Person, Conventional Air Force Team, managed by ACC
    - General Surgeon (Subs: Trauma, Surg Onc, Colorectal, Peds Surg)
    - Anesthesia Provider (MD/DO, or sub CRNA)
    - Emergency Medicine Physician
    - OR Technician
    - Critical Care Nurse (ICU primary, ER sub)
    - Medical Administrator/Planner
- 75 teams in ADAF/ANG/AFR
- Deployments (CENTCOM, AFRICOM, IRF, DCRF)

Two missions:

- Surgical component of an EMEDS (Expeditionary Medical Support)
    - 1 GST for EMEDS HRT/EMEDS+10
    - 2 GSTs for EMEDS+25
- Standalone Role 2 surgical capability
    - Fully independent of EMEDS
    - Forward-deploy from EMEDS



Capabilities:

- Damage Control Resuscitation & Damage Control Surgery (Life/Limb/Eyesight)
- Modular Equipment Set
    - 3 DCS or 6 non-operative resuscitations (bags 1-6)
    - 10 DCS or 20 non-operative resuscitations (14 bags)
- 12-hour holding capability

Limitations:

- Single-surgeon team (one at a time, please)
- Limited holding capacity
    - Dependent upon functional patient movement pipeline
    - Prolonged patient holding requires shift work within team
    - Potential to rapidly exhaust supplies and personnel
- Blood
    - Typically operate with 20 units of whole blood or equivalent components
    - Limited Walking Blood Bank capability

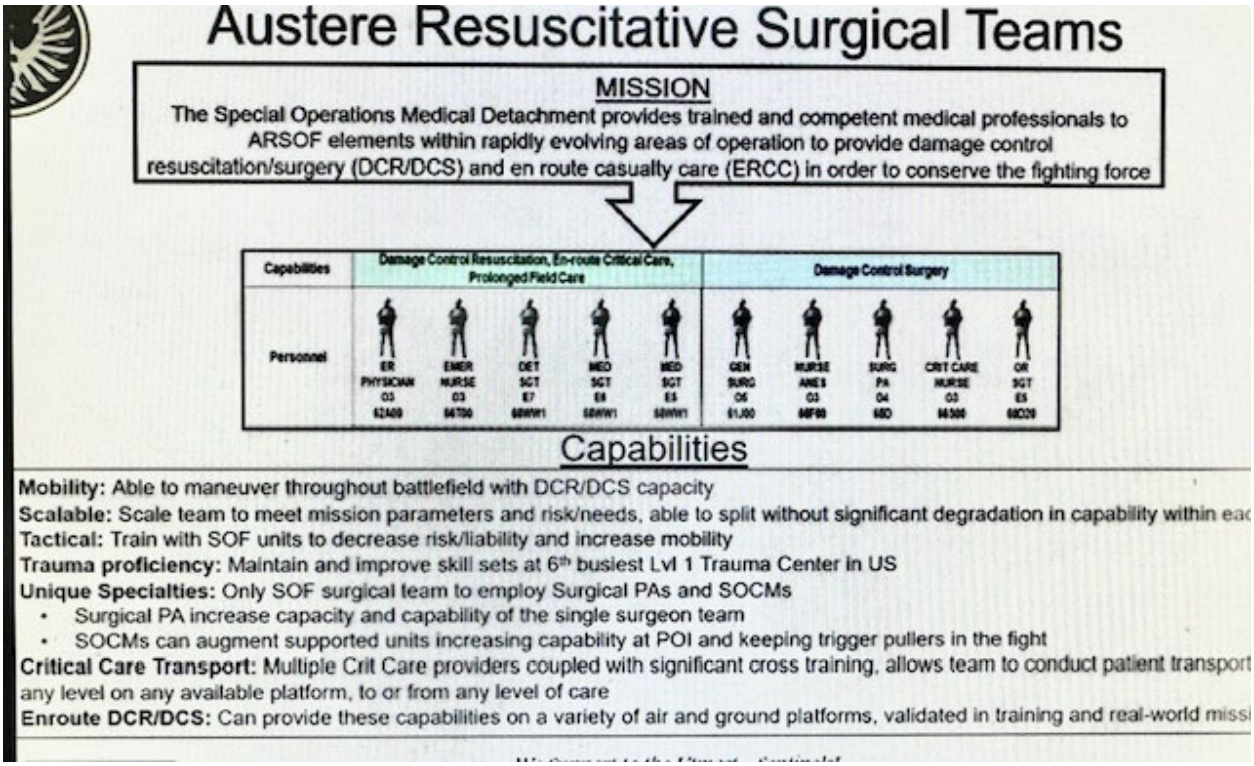
Assumptions in LSCO:

- Potential for large volume, complex casualty events
- Incomplete air superiority
- Prolonged patient holding times
- Prolonged patient transport times, with potential to require multiple avenues of movement
- 24-hour operations will be required
- Success of teams up to now in COIN operations has been due to low volume of casualties and/or readily available pt evacuation/resupply capability

Summary:

- GST is a flexible 6-member team, currently effective in low volume, mature transport system COIN operations
- Limitations in personnel, resources, and holding capability
- LSCO threatens greater volumes of casualties in theaters without guaranteed air superiority to allow resupply and pt movement
- However, teams are employed, must be tied to a patient movement and resupply capability

4) **Austere Resuscitative Surgical Teams (MAJ Clemens) –** MAJ Clemens presented on Special Operations Medical Detachment



Variety or packages from Light to Heavy – The more Class 8, the less patient capacity and the less mobility.

Goals:

-Support Irregular Warfare
-Support Direct Action
-Unconventional Warfare

MAJ Clemens outlined some recent SOMEDD Missions around the world partnering with SOCEUR.

5) **Forward Role 2 Support for USMC (Ted Edson) –** Health Services Support Manual dictates functions and management of casualties to include mobility, conformity, proximity etc. Forward Resuscitative and EnRoute care fall under HSS.

Typical Surgery Company

Basics:
Provides the highest level of medical care organic to the Marine Corps
One SC can support a regimental size force
Structure and organization enable it to divide into independent elements for deployment.
Capabilities:

- Provides direct or general HSS including:

- Surgical care,
- Forward Resuscitative Capability
- Stabilization,
- Collecting/evacuating care
- En route care
- Radiology& laboratory
- Holding care capability, and dental. As a planning factor

Table 2. Major USMC Forward Damage Control Care.

	FRSS	STP	ERCS	ACW
Personnel	8	25	2	10-11
Surgical Procedures	18	0	0	0
Non-surgical Procedures	0	50	0	0
Simultaneous Holding Capacity	5 (2 Pre-Op; 1 OR; 2 Post-Op)	10	2	10
Simultaneous Holding Operating Time	4 (for Post-Op)	48 Hours		10
Operation Without Resupply	2 Days (48 Hours)	30 Days	2 Hours	50 Bed Days
Patient Movement Ability	No	Yes	Yes	No

Expeditionary Health Service Support Initial Capabilities Document (EHSS ICD) **01 June 2011**

"Marine forces require capabilities that allow rapid global deployment to a wide range of environments and a high degree of self-sufficiency for operations in ungoverned spaces."

Force Design 2030

1. The Marine Corps will be the Nation's Naval Expeditionary Force-in-readiness.
2. "A return to our historic role in the maritime littoral will also demand greater integration with the Navy and a reaffirmation of that Strategic partnership."
3. Development of smaller, lower signature and more affordable amphibious ships
4. Marine Corps must be able to fight at sea, from the sea, and from the land to sea.
5. "Forward bases and station and fixed infrastructure are easily targeted, and extremely vulnerable to disruption." MOBILITY

CMC guidance - “The force will be uniquely capable of performing EABO and Distributed Operations (DO).”

Threats and Challenges:

- Return to Maritime/Littoral Roots
- “Blueside” vs. “Greenside” Casualties
- Flexibility Without Sacrifice of Capability
- Loss of Air Superiority
- Contested Sea Lanes
- Peer and Near Peer with Increased Lethality
- Long Logistic Chains
- Theater Essential Logistic Requirements
- Peace Dividend/Walker Dip

Proposed N State for Marine Corps HSS by 2027

Marine Corps Future HSS Environment

End State for the HSS Future System:

- By FY 27, a modernized medical force to support Marine Corps Commanders with a distributed network of care that is purposed built , positioned, and sustained forward to enable Expeditionary Advanced Based Operations (EABO) and Advanced Naval Bases (ANB) while capable of support to other missions.
- To support Marine Corps Commanders' conducting EABO and ANB operations HSS capabilities that can accept augments from the Naval and Joint force through interoperable equipment and UTCs.

Key Issues/Gaps:

- Evacuation of casualties in a contested environment by surface, air, and ground
- Sustainment of Class VIII pre-positioned far forward to include APODs/SPODS. Resupply and re-equipping of Class VIII in contested logistics environments. Integration of Marine Corps CLASS VIII with the GPN and JLENT.
- Available R2E for DMO/EABO/ANB necessary prior to patient movement to CONUS
- Need to modernize BAS with prolonged holding and DCR/DCS while still capable of treating DNBI

Support EABO/ANB, HSS has identified Required Capabilities of:

- DCR/DCS Teams "bolted on" modernized BASs
- UTC Structures capable of receiving augments from the Naval and Joint Force
- Modernized BAS that can conduct PCC
- ERC from MLRs to ANBs via surface ships
- R2E for ANB at APODs and SPODs
- Patient Staging APODs and SPODs
- Class VIII Integration w/ GPN
- Push and Intelligent Resupply
- Prepositioning CLASS VIII at APODs and SPODs
- Role 1 Enhanced to support Tier 4 TCCC providers and CASEVAC

COL Gurney Presented CAPT (Ret) Ted Edson with a Letter of Appreciation for serving on the CoSCCC.

6) Army Forward Resuscitative and Surgical Detachment (LTC Rowland) –

What is the Army FRSD

-20 Soldier Detachment

-Provide *far forward* Resuscitative & Surgical Intervention to render non-transportable patients sufficiently stable to allow for MEDECAV to a Role 3 hospital.

Clinical Difference Between FST vs FRSD

FRSD –

- 1.5 hr set up to become fully functional
- 2 OR tables per team
- Max of 10 cases/24-hrs (average 135 min per patient)
- MES will only support 30 cases without reconstitution
- No organic holding capability
- Postop care up to 6 hrs with max of 8 simultaneous patients
- Relief, reconstitution, or augmentation required after 72-hrs
- 2 Resuscitative & Surgical teams (10 personnel)
- administration, surgical, and resuscitative sections
- 12 patients over a 72-hr period
- Postop care for 4 patients over 6-hrs post-surgery

- Barriers faced
  - No organic **x-ray** capability
  - No organic lab capability
  - Not equipped for management of tropical disease

  - Class VIII
  - Blood
  - MEDECAV
  - Patient hold limits
  - Electronic footprint
  - Staff exhaustion
  - Increasing injury severity. As we get better at protecting ourselves from injury the enemy gets better at creating devastating was to create injury.

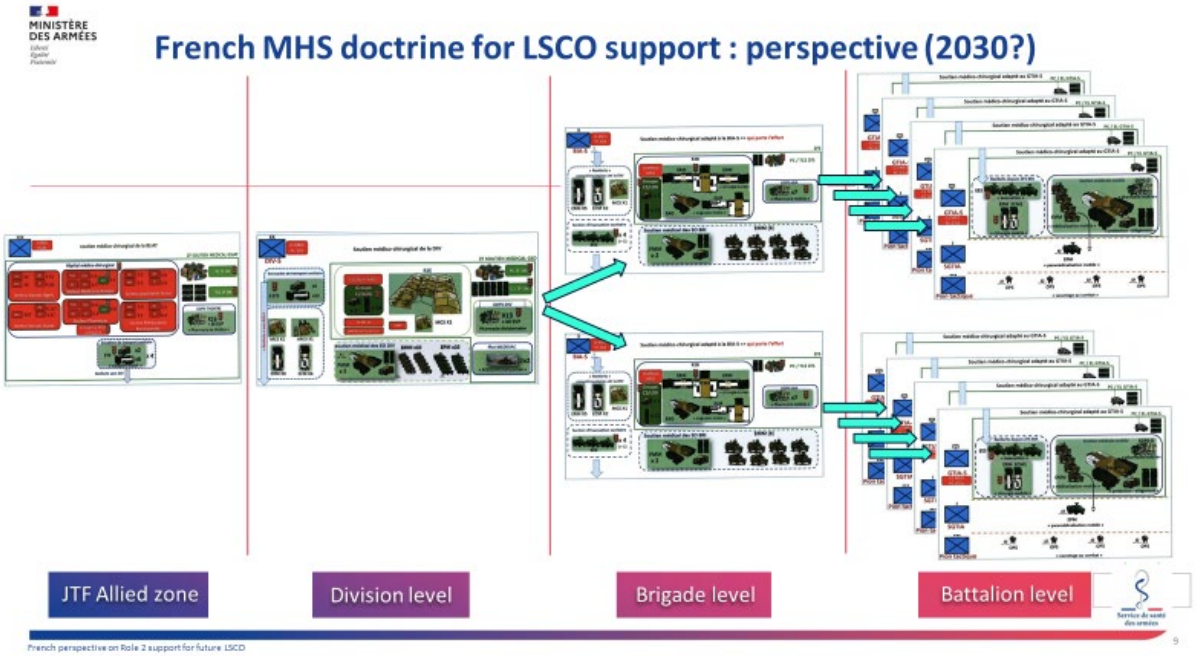
FST

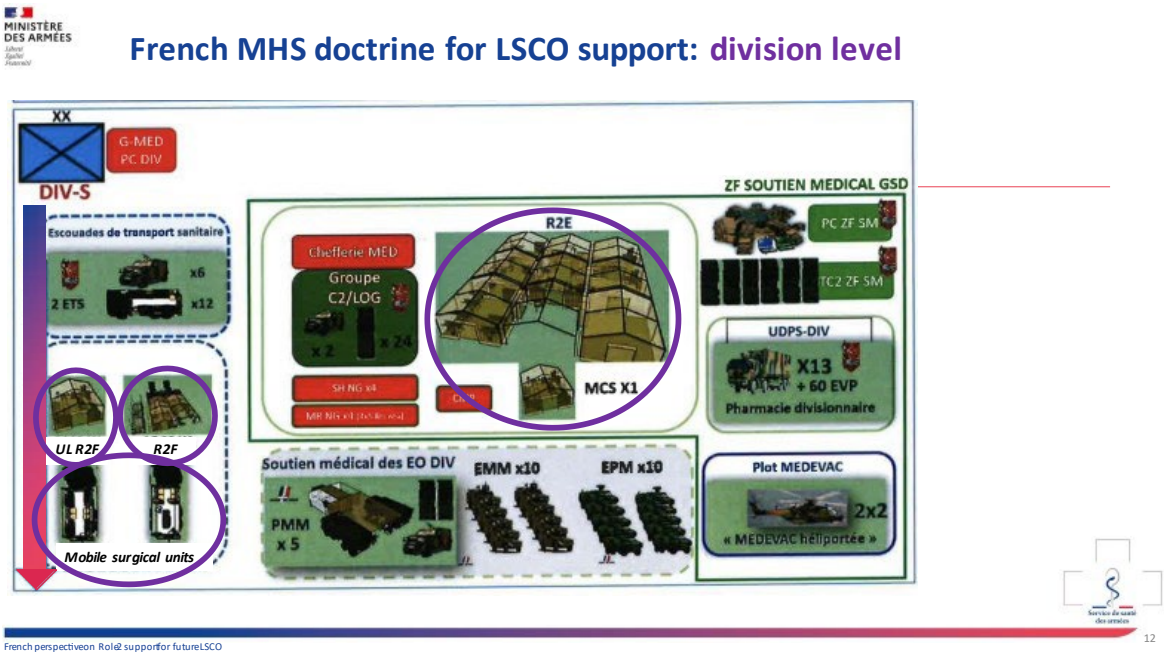
- 4 Surgeons
  - 3 General Surgeon
  - 1 Orthopedic Surgeon
- 2 CRNAs
- 3 RNs
  - ER, OR, ICU
- 2 LPNs
- 3 Surgical Techs
- 3 Medics

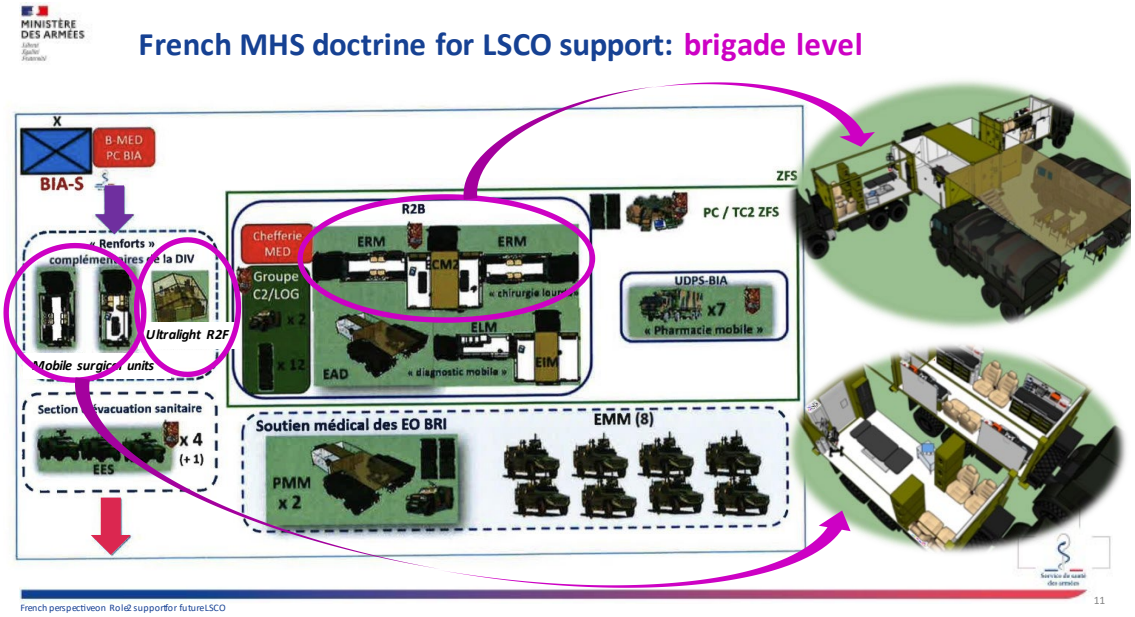
FRSD

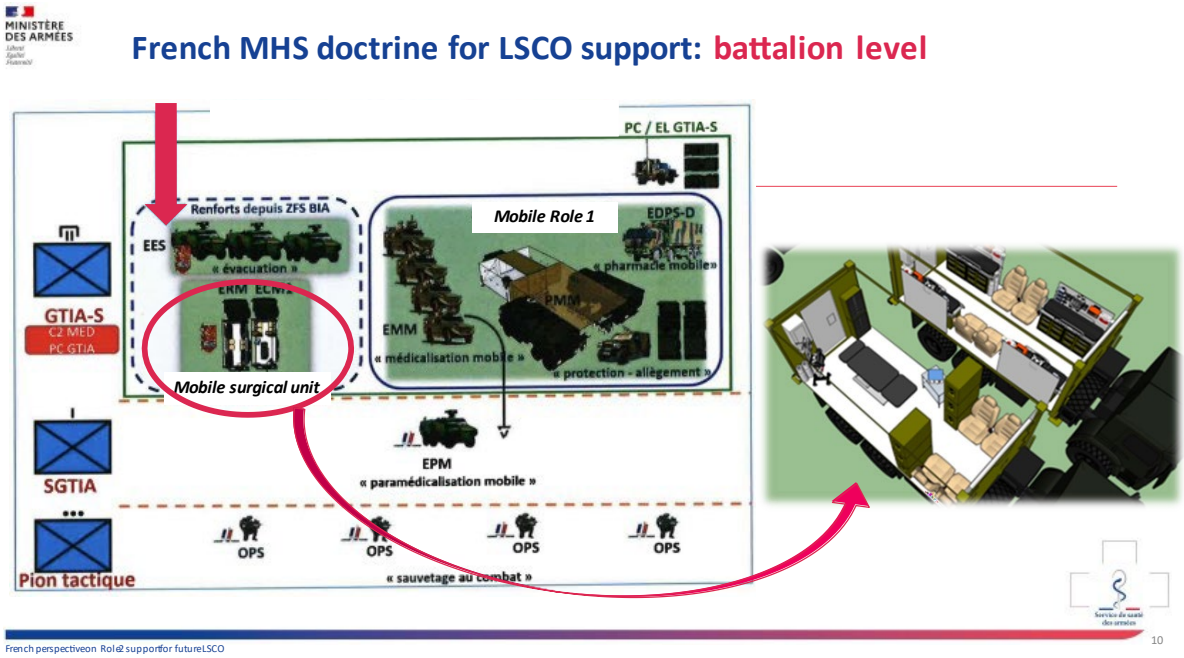
- 4 Surgeons
  - 2 General Surgeons
  - 2 Orthopedic Surgeons
- 2 CRNAs
- 4 RNs
  - 2 ER, 2 ICU
- 2 LPNs
- 2 Surgical Techs
- 2 Medics
- *2 ER Physician*

7) **ARSC Teams in French MHS medical support (COL Monchal) -** French MHS Role 2 support. COL Monchal discussed the arrangement of proposed LSCO from the perspective of the French Military.









French MHS doctrine for LSCO support: perspectives

- Agility to bring surgical care along the chain
- MTF as targets = mobile and/or protected: shelter, bunker?

- On-theatre prolonged field care VS early stratevac
- Providers and resources consuming: ambitious (achievable ?)
- Multinational coalition

MAJ Merkle – Medical does not do a good job formalizing and structuring what it takes to have an augmented medical capability with them entails ie bio-med, Class 1, Class 8, Blood.

COL Czarnik – There is no such thing a "medical operations"…it's just operations. There is no such thing as "medical logistics" there is just logistics. Medical community is never trained to meet or express our needs and requirements. Take ownership and communicate to the line…that is your job as a medical leader.

CAPT Bitterman – Lighter, agile, capable…all great terms. But can we stop saying "near-peer" they are our peer and very capable and formidable adversaries. Our triage paradigm is going to dictate where we put these modular surgical capabilities. We need to put them where we have operating capabilities, and prolonged holding and movement capacity. In the next fight, casualties will exceed our capabilities.

COL L. Benavides – Small surgical teams are great but if we are focused on Return to duty is going to be ortho-centric, you are not thinking about returning the RTD if you have a PA or Gen Surg, and our focus may need to be on RTD in LSCO. Ortho will be a key factor in success of LSCO.

CAPT Tadlock – What I am hearing is a distinction in services, that the focus may need to be on returning people to the fight and not returning them home like we did in the previous conflict.

COL Baker – You are not going to be in the belly if we are talking RTD. Those washouts can be done by combat medics and PA in service support areas. The surgeons in this room need to be in the Brigade support area/FRSD Role 3 saving lives and let the RTD be done by someone less skilled.

Ted Edson – There is still a huge push for these smaller teams. CoSCCC needs to give them more flexibility while still maintain capability.

CAPT Tadlock – So do we need a position statement to outline phase zero and how to augment other Role 2 adaptability in Role 2 scenarios…I feel we do, but can we take a vote?

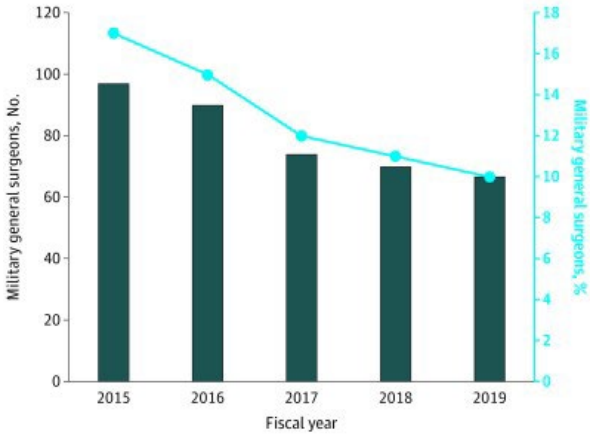
Majority of room agreed.

COL Gurney – There is risk with these small teams, and the endeavor needs to focus on informing the Services how to best utilize them and what is needed to sustain them to optimize survival.

8) **Perceptions of General Surgery Residents at Military Treatment Facilities (CDR Choi) –** Survey results were discussed and presented showing KSA decline in surgical volume and an increase in referrals to the network. Decline in number of cases as well as complexity of cases at Naval Medical Center San Diego.

Background

- Clinical volume at Military Treatment Facilities has declined



Analysis of Surgical Volume in Military Medical Treatment Facilities and Clinical Combat Readiness of US Milit
Dalton MK, Remick KN, Mathias M, Trinh QD, Cooper Z, Elster EA, Weissman JS. JAMA Surg. 2022 Jan 1;157(1):43

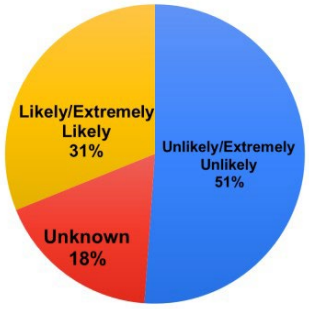
7 years ago, 45% of residents were at the main institution, whereas in this survey representative of today, only 22% of residents are at the main institution.

Problem statement: While training is successful, this shift away from MTF's is going to pose unintended negative consequences.

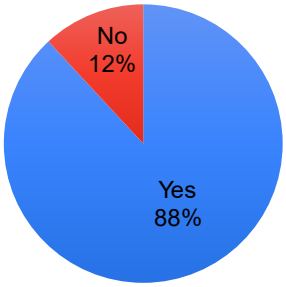
Survey results:

	Strongly Agree/Agree
My general surgery program provides the training needed for me to be a competent Military Surgeon.	95.2%
My general surgery program provides the knowledge and mentorship I need to be a good Army/Navy/Air Force Officer.	69.1%
The civilian surgery rotation sites are as invested in my training to become a military surgeon as Military Treatment Facility (MTF) rotations.	66.7%

How likely are you to stay in the military as an Active - Duty surgeon beyond your initial service obligation?



Does the decreasing surgical volume at MTFs impact your decision to stay in the military?



	Strongly Agree/Agree
I am confident that after residency, the military will provide the opportunity for skill sustainment as a staff surgeon.	9.5%
I am confident that military medicine will continue to thrive and successfully train future military surgeons.	19.1%

Survey limitations:

- Survey does not capture all the complexities of the ongoing issues in Military Medicine/GME
- Selection Bias
- Small Sample Size

Although military surgical residents have an overall positive perception of their surgical training, the results reflect a lack of confidence in their future military surgical careers. In addition, the declining surgical volume at MTFs will negatively impact long-term retention of military surgeons.

COL Gurney – This is a huge deal threatening Military medicine. Everyone is saying this, and now we have baseline data to support it. DHA is doing the best they can, but what can this group do from your perspective?

COL Schreiber – 2 Choices…either fund it and do it properly. Identify MTF's that mirror the civilian centers of excellence with heavy military contingencies with AD already embedded and fund it, or shut it down.

Col Nott – We lose 85% of people and that goes beyond GME. IF you go to a MTF that has zero capabilities because the throughput from ER and Primary care is down, it's a tough climb. This is also an enlisted, nurse corps problem etc. You put on 0-4 you're not a RN anymore, you turn into an admin Dept head for promotion.

CAPT Tadlock – Admitting there is a problem is imperative. We did a commentary and used words like "crisis" and "existential threat", and the PAO response was to "tone it down or it wouldn't be published."

9) Military GME Survey: Preliminary Results (CPT Baird) -

- Trainees are generally satisfied with training in adult trauma and acute care surgery
- 2/3 feel confident they will be ready to deploy at residency graduation
- Few are confident with management of more complex injuries and procedures
- Trainees ranked faculty with combat experience and annual surgical skills courses as most helpful during training

Our objective was to assess trainees for satisfaction in their program, readiness to deploy, and confidence in managing/treating combat injuries.

Response Rates:

- Army - 61/147 (41%)
- Navy - 44/79 (56%)
- Air Force - 27/79 (34%)
- 132 total responses (43%)

Results: Confidence in Managing Combat Conditions

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	PGY2-PGY3 n (%)	PGY4-PGY5 n (%)	Fellow n (%)	p-value
Blunt Abdominal Trauma	38 (56)	39 (95)	21 (91)	<0.01
Hemorrhagic Shock	46 (68)	39 (95)	21 (91)	0.01
Penetrating Abdominal Trauma	32 (47)	38 (93)	21 (91)	<0.01
Extremity Compartment Syndrome	28 (41)	32 (78)	20 (87)	<0.01
Non-hemorrhagic Shock	31 (46)	29 (71)	19 (83)	<0.01
Extremity Vascular Injury	15 (22)	25 (61)	13 (57)	<0.01
Burn TBSA > 20%	27 (40)	24 (59)	16 (70)	0.01
Penetrating Thoracic Trauma	13 (19)	21 (51)	15 (65)	<0.01
Pelvic Fracture	12 (18)	19 (46)	17 (74)	<0.01
Duodenal Injury	5 (7)	13 (32)	12 (52)	<0.01
Penetrating Neck Wounds	8 (12)	14 (34)	14 (61)	<0.01
Complex Liver Injury	4 (6)	7 (17)	13 (57)	<0.01
Pancreatic Injury	5 (7)	7 (17)	11 (48)	<0.01

Results: Confidence in Combat Surgery Skills/Procedures

20

	PGY2-PGY3 N (%)	PGY4-PGY5 n (%)	Fellow n (%)	p-value
Fracture Washout	26 (38)	27 (67)	19 (83)	<0.01
Wound Debridement	61 (88)	40 (98)	23 (100)	0.10
Fasciotomy	32 (47)	36 (88)	23 (100)	<0.01
Exploratory Laparotomy	35 (51)	39 (95)	22 (96)	<0.01
Bowel Repair	25 (37)	38 (93)	21 (91)	<0.01
Gastric Repair	16 (23)	38 (93)	22 (96)	<0.01
Liver/Portal Vein Repair	3 (4)	6 (15)	10 (43)	<0.01
Vena Cava Repair	1 (1)	8 (19)	12 (52)	<0.01
Carotid Artery Repair	3 (4)	14 (34)	12 (52)	<0.01
Extremity Amputation	26 (38)	31 (76)	20 (87)	<0.01
Thoracotomy	17 (25)	31 (76)	20 (87)	<0.01
Neck Exploration	4 (6)	15 (37)	16 (70)	<0.01
Temporary Vascular Shunt	6 (9)	20 (49)	18 (78)	<0.01
Definitive Vascular Repair	3 (4)	16 (39)	9 (39)	<0.01
Ventilator Management	38 (56)	27 (66)	18 (78)	0.09
Burn Management > 24 hours	31 (46)	24 (58)	16 (70)	0.11

Limitations of Survey:

- Trainee response rate (consultation fatigue)
- Survey presentation and questions
- Survey population (accurate emails, reaching residents)
- Trainee Bias (Dunning Kruger Effect)

Conclusions:

- 1/3 of trainees do not feel confident they will be able to treat future combat casualties
- Most trainees satisfied with training in adult trauma and acute care surgery
- Few trainees confident in managing complex injuries
- Trainees ranked surgical faculty with combat experience and having additional skills courses as most valuable

Solution:

- Delphi Study with attending surgeons to inform potential MUC
- AAST DRAFT Taskforce (Deployment Readiness Assessment of Fellowship Training)
- Additional surveys of non-military surgical residents, non-military trauma fellows, trauma attendings
- Development of formal GME MUC

COL Gurney – Competence gives you more awareness of your incompetence. People who have never deployed before, have "more confidence" in performing war surgery…but then after deployment, they go way down because eyes are wide open.

Col Shackelford – Confidence is a poor training outcome, but sometimes is all we have. Quantifying competence was the point of the Emergence War Surgery. It looks like a small percentage took this course. For a Military Gen Surg resident not to take the Emergency War Surgery course is a travesty. Why is that?

CAPT Tadlock – There is often no funding mechanism to get them there. There is no routine travel funding for EWS or ASSET+. It needs to happen before they check into their operational billet, because after that it is unlikely to happen.

LTC Sirkin – Why do we not try and deploy or integrate Residents into deployed or operational environment.

Col Nott – It's not prioritized. I have had many discussions about why presentation conferences are being prioritized for funding and attendance over this type of training.

COL Schreiber – We need to establish the criteria of what needs to be completed as far as training to be considered deployable.

CDR Choi – I think one of the biggest factors of attrition is that the Military is just going to deploy people regardless of their operational experience or competency.

LTC Earnest – The metrics at MTF's are wrong especially regarding GENESIS. In principle it happens, but we must fix the data to figure out what we are doing. We can't evaluate wrong data. BAMC is supposed to have 30 OR's but we can't even fund 17.

10) **RDML Valdes VIP Guest Speaker Commander Naval Medical Forces Pacific Rim –** Admiral Valdes gave an overview of his capacity and responsibilities in his current position. He spoke about surge capacity and the expectations of LSCO. Lessons learned from COVID is that there is no bed capacity spread across the country from Navy perspective.

Our line Commanders have not been privy to the notional casualty flow that we will need at the MTF's, and we are working to improve those communications.

"Our biggest risk is the decline of the Military Healthcare System. We are not revitalizing the MTF's and it needs to be prioritized, to include recapture of care, training of HM/RN, GME etc. What I am doing about that is building support structure in the MTF to support bringing care back to the MTF by hiring support staff to increase bed capacity, working OR's etc. My immediate goal in the Pacific region is to get our Contract and Employees to the maximum capacity to build the MTF's and recapture care through things like rapid onboarding, location salary rate that are competitive."

We are losing Physicians at a 10% attrition. We are targeting and revitalize recruiting with a deliberate and concerted approach to include special pay, signing bonus etc.

CAPT Tadlock – How can we help you and the Navy and other services with the goal and messaging of your current efforts?

RDML Valdes – Deck plate leadership. At the MTF work with your CO/Directors and find creative ways to bring back patients into the MTF. Each location is different and poses a different set of challenges.

Col Beckett – In Canada there is no Military bed left open. This may be a NATO issue, but the easy button is to call the Americans and send casualties to LRMC…but that isn't going to be a solution in the future conflict. Bed capacity is an issue for multiple nations.

Lt Col Hall – How are we going to improve the MHS "brand." No one wants to be treated by the MTF's based on reputation and proximity?

RDML Valdes – This is no secret over the last 2 decades. We have pockets/silo's of excellence, but we need to expand those successful locations to the entire MHS. Bringing back older patients is a good start. Those patients want to come back to the MTF. Social media is a black hole of criticism, and we have pockets where we suck at customer service. This is a society and culture issue that need addressing. We need to chip away at the barriers and processes we have implemented.

Col Wood – There is messaging from the strategic level we could be at war by 2027. Is there any work being done to Federalize the US Healthcare System to potentially absorb 50K casualties in a matter of days?

RDML Valdes – I will be honest; the plan is to absorb the first punch and readjust. We feel we have identified and planned for what we can in theory, but the actual solution will not be visible until we know the actual problem set. I am confident that the Mil/Civ partners we have will not be hard to unite as a Nation to respond to the best of our ability.

COL L. Benavides – Should combat casualty care be separated out from MTF dependent care and fall under Joint Staff Surgeon instead of DHA?

RDML Valdes – I can't really answer that, but it is an interesting point as far as programmatic funding, people, money and places.

RDML Valdes thanked the committee and CAPT Tadlock for the invitation to speak. We are listening to your requests and are working towards the solutions you ask for while breaking through the barriers and bureaucracy of the process.

11) KIA and DOW Don't Complete Patient Satisfaction Forms (LCol Beckett) – LCol Beckett is a trauma surgeon with the Canadian Forces Health Services. Patient satisfaction surveys attempt to translate subjective results into meaningful, quantifiable, and actionable data.

"Canada currently has ZERO inpatient Military beds in the whole country."

Surgeons in a current war never begin where the surgeons in the previous war left off; they always go through another long learning period.

LCol Beckett spoke on the similarities between an Artillery war of 1917 and the current conflict in Ukraine ie Case Fatality Rate, DOW, KIA etc.

The US estimates that at least 17,000 Ukrainian soldiers have been killed in action. Another official told the New York Times the number could be as high as 70,000.

- Prolonged field care is the norm
- CCPs are a 50-500m drag generally with a threat of IDF or direct fire. From there they have adapted to
- Carrying the casualties 5-10km through bush to try and avoid drones and get to the pick up point
- Non-standard cas-evac vehicles (generally cars or quads with improvised trailers

Threats: The next war will not be like GWOT

- Tactical and strategic environment will very different
- Injury patterns and number of wounded will be more like WWI
- Human tissue and physiology and response to injury will remain same
- Human suffering and death will be present on a large scale
- We will not be ready
- The clock is running down quickly

Top 10 Reasons why most NATO Nations Envy the JTS: *"We do not even have a Trauma System in Canada."*

1. Systematic approach to injury care across spectrum
2. Guidelines – that are updated
3. Being the Clinical Governance Leader
4. The DoDTR-data and stats teams
5. The Research Teams and their Publications
6. The Thurs am JTS call-Transparency on Clinical Issues
7. The reach of the JTS into civilian organizations
8. The passion to ensure every wounded service member has the optimal chance for survival and maximal potential for functional recovery.
9. The influence it has on Commanders

****10. The ability to call out B.S. and stop decisions being made that will be detrimental to high quality combat casualty care (and mostly get away with it)**

12) **Facing Futility: When to say when in trauma (Dr Cotton) –** We are really good at "exhausting resources to save a life, but we are really bad at deciding when to say when…especially when it comes to blood products."

- The Covid-19 pandemic disrupted many vital supply chains, including the supply of blood products required for essential medical care.
- Blood products joined other critical medical necessities in shortage.

In addition to dealing with COVID directly, hospital disaster preparedness teams have also needed to urgently address these unforeseen critical shortages and vulnerabilities in the delivery of care

"While many shortages have alternatives, blood is one for which there is often no adequate substitute."

"We did remove one metric from predicting futility…Age alone should not be considered a contraindication to high-volume transfusion."

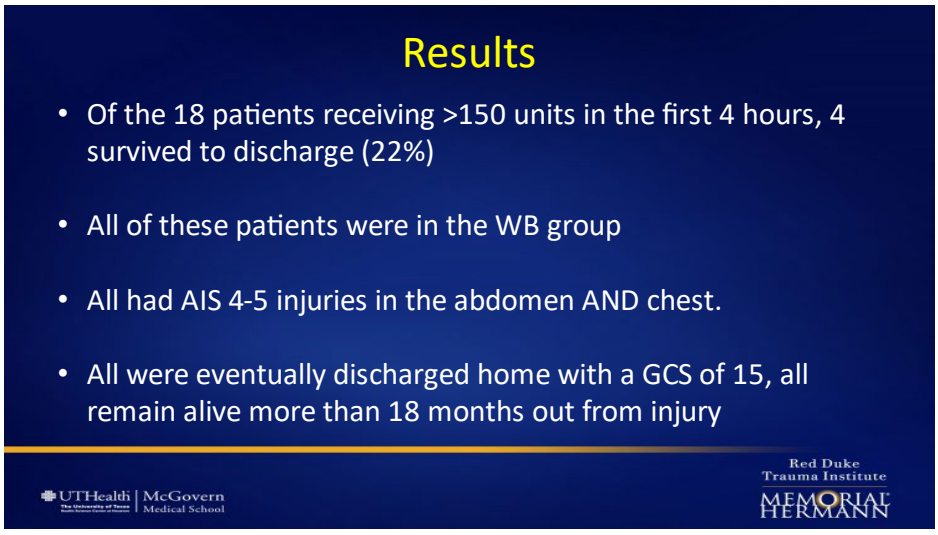
Is Ultra Massive Transfusion (UMT) a futile and wasteful practice?

- Whole Blood (WB) has been associated with improved survival, decreased need for transfusion, improved hemodynamics and less coagulopathy
- WB has never been studied in the setting of UMT
- Avoidance of physiologic exhaustion may lead to improved outcomes

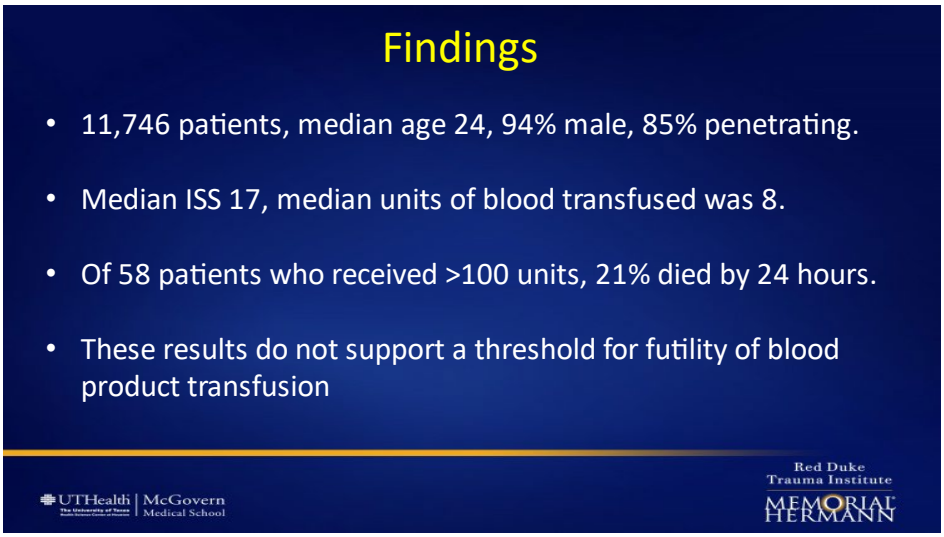
Can blood transfusion volume be used to predict futility?

Method:

- Patients were excluded if:
  - Dead on Arrival or within 30 minutes of arrival
  - Burn patients with >20% TBSA burn
- Subgroups of ≤ 50 Units of blood product and >50 units in the first 4 hours
- Also separated into WB vs Component (comp) groups



- In this study, no threshold for futility based on transfusion volume alone was identified
- Unsurprisingly, mortality increases as total transfusion rate increases
- Meaningful survival was achieved in 22% of patients receiving >150 units in the first 4 hours
- Survival rates as high as 60% were seen with 50 units in the first 4 hours, with 15-25% survival after 100 U
- Survival rates in trauma patients receiving >50 units of blood products in the first four hours of care are as high as 50-60%, with survival still at 15-25% after 100 units.
- While responsible blood stewardship is critical, futility should not be declared based on high transfusion volumes alone.
- Early WB transfusion was associated with improved survival
- Early, aggressive transfusion practices including WB may improve outcomes through avoidance of physiologic extremis



Wrap up / Conclusions:

- Survival rates in trauma patients receiving >50 units of blood products in the first four hours of care are as high as 50-60%, with survival still at 15-25% after 100 units.

- While responsible blood stewardship is critical, futility should not be declared based on high transfusion volumes alone.
- STOP criteria provide futility cut points to help guide early decisions for discontinuing aggressive treatment of patients in extremis

- Extreme admission lab values are capable of predicting 100% mortality and futility of additional care in severely injured children with a high level of accuracy.

- If supported, should initiate discussions about application and cessation of resuscitation efforts to optimize resource use.

PANEL DISCUSSION: COL DAVE HARDIN MODERATING

COL L. Benavides – Most of us only have iSTAT with a CG8 Plus, it doesn't have TEG values etc….do you have anything that looks at just pH and base deficit?

Dr. Cotton - Yes but they are not hitting 100% and in this paper that is what we were going after was 100%. That information is published in the larger tables of this paper, I just didn't display that here today.

COL Hardin – I think we have to look at the parity of this great utilization of blood in future fights, how do we manage pre-hospital blood given at POI that don't even meet Return Of Spontaneous Circulation (ROSC)…medics just need the permission to not do that. If we maintain current practices in LSCO, without rapid triage as an ongoing intervention, blood availability will be an issue quicker than we anticipate.

Lt Col Hall – I think a valuable effort would be to give an ethical point paper where providers can "give up" and identify supply vs utilization and triage. I think there is an effort circling this, but maybe more prescriptive.

COL Gurney – Some of this problem is going to solve itself in LSCO. There will be too many dead to expire resources on the wrong type of patients because they are going to expire during triage or before interventions can even be rendered.

If the JTS did one thing, what would it be? I know COL Becker would say get the JET Course mandated, but if there was one consensus thing we are not doing, what would it be?

LCol Beckett – We have failed to identify a domestic supplier in 7 years of freeze-dried plasma. That should be an "easy fix". Second, I would say a realization of mobilization of ALL assets and resources for National Response to LSCO and huge number of casualties in a short period of time or we will be burying a lot of bodies. This will lead to very tough decisions like does Grand ma get her Chemotherapy or doe we ship blood to the Battlezone, and those are very tough ethical decision making for both Bureaucrats and Providers.

What is the JTS doing to codify the Lessons Learned and what the Grade is for a Role 1? Take actual data and saying this Battalion is ranked 110th out of 200 Role 1's, now we can say we have an issue here or there with medical interventions, training etc.

COL Gurney – We are currently standing up a team to do that and a Survey by COL Baker is being devised, but we are working on that very idea.

CDR Choi – Looking at guidelines from developed states with these identifying markers such a s decapitation for *"these people are dead, don't give blood and this is a complete waste of resources and actually against good medical practices."*

LCDR Rausa – I disagree, I think it's the guy that's still talking to you, that's in distress and severe injury, but is looking in your eyes…those are the patient and resource guidance needs to be since that is a much harder situation that the "decapitation."

COL Hardin – I would like to ask one of my mentor's COL(Ret) Kirby Gross, what he thinks should be the number 1 JTS priority circling this topic?

Dr. Gross – Triage is critical! Not a CPG, but considerations that would be in various categories. IT would help manage large numbers of patients and take the burden off the Medic. Not suggesting we stop doing everything in our power to save a life, but appropriate management of supplies, resupply, potential for additional casualties…etc.

Col Shackelford – The Golden Hour will always exist. It drives me crazy when people say that. It's time to intervention, not disappearance of the Golden Hour in LSCO. The key is to train so the people on scene wherever LSCO happens, have the knowledge and ability to provide life saving interventions on a timeline, so I agree with Kirby about a consideration guideline.

COL Hardin – Early surgical intervention needs to be sectioned by time, DCR/DCS and transition triage away from Hemorrhagic Shock portion you need to start to focus on things like wound contamination, and we don't talk about Crystalloids, Pressors and Antibiotics because patients that survived and got to a surgeon doesn't need blood, they have a fever and need definitive surgical interventions.

COL Schreiber – The investment should be in people. We need a cadre of well-trained leaders that could be placed in any setting around the world at moment's notice and can inform immediately the 5 W's of what is needed to provide successful combat medicine.

COL Chovanes – I agree, a matrix to help balance a few key points with a basic framework to help the medic…but people are smarter than we give them credit for, and they will adapt and quickly respond appropriately to the situation at hand.

****BREAK****

CAPT Tadlock initiated Introductions by the attendees…Name, Location, Sub-specialty

13) LTC Sirkin and SGT Wallentine gave a brief on their helicopter crash MASCAL scenario as patient and first responder.

SGT Wallentine is a Ranger Medic on his first mission on his first deployment. LTC Sirkin gave a detailed account of the crash and his experience as an injured CH-47 crash on the LZ during night operations. LTC Sirkin was tied into the helicopter by his "Monkey Tail." He recalls the tail shaking and then a large explosion. He did not lose consciousness but clearly demonstrated S/S of a concussion at minimum but provided surreal details of the injuries sustained by himself and his team. LTC Sirkin suffered liver laceration, hemothorax, 10 broken ribs, concussion with TM damage, and torn hamstring.

LTC Sirkin Opinion:

1. If Surgical Team assets are going to be placed far forward, you must train and be familiar with what to do in that environment. It saved my life and possibly others.
2. You must stay in shape and truly be able to function in an operation environment.

SGT Wallentine gave an account of his response to the MASCAL on the LZ, and the care he provided to multiple patients at the Role 2 (approx. 100yards). There were 22 casualties overall.

SGT Wallentine, and ER physician and 3 additional Medics were identified to fly with 6 of the most urgent on a 2hr flight.

All 6 patients had multiple injuries ranging from intubation and ventilated, broken extremities with tourniquet placement, orbital fractures pelvic instability and desaturating vitals.

SGT Wallentine stated it was TCCC and the basics of MARCH algorithm that saved the lives of all 22 casualties. Also, his cross-trained Advanced Ranger First Responders were integral to the survival of these casualties. Their training and knowledge freed up SGT Wallentine to provide advance interventions to Urgent patients instead of exhausting his efforts on every patient.

Col Shackelford – What did you guys do to document all these casualties? Would an Electronic Health Record (EHR) been possible in this scenario?

SGT Wallentine – Initially we were using TCCC cards, but they filled up with dosage quickly and in my opinion it was insufficient and became completely illegible. I was very unsatisfied, and I therefore carry 2 PFC cards with me now, that I wish I had at that time. I had an ATAC, but no AP on my phone, but yes, I think BATDOK could have worked…I have not used it outside of familiarization training so I can't speak to that.

MAJ Clemens – My takeaway was train and be prepared, great presentation.

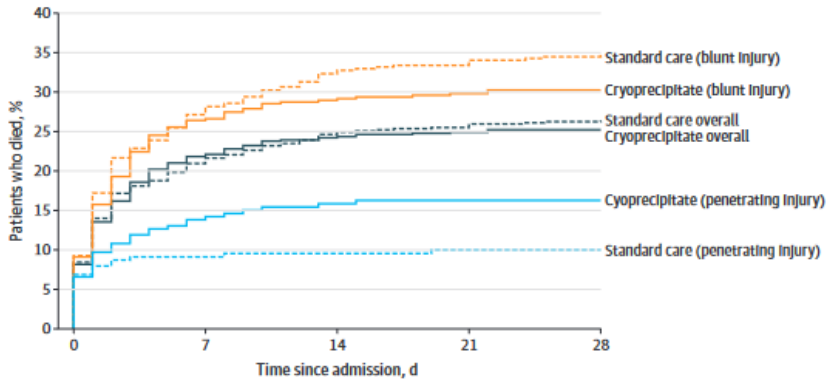
COL Czarnik – Everything in DoD comes down to 3 things…Policy, Authority and Resources. Ranger Battalions are never tasked with anything other than training for and executing their mission. Conventional forces are not thought of as Medics, but Soldiers and Battalion Commander personality drives a lot of the prioritization.

14) **Breaking Clinical Research (COL Schreiber) –** COL Schreiber gave an overview of 5 important Research topics currently relevant to the Trauma world.

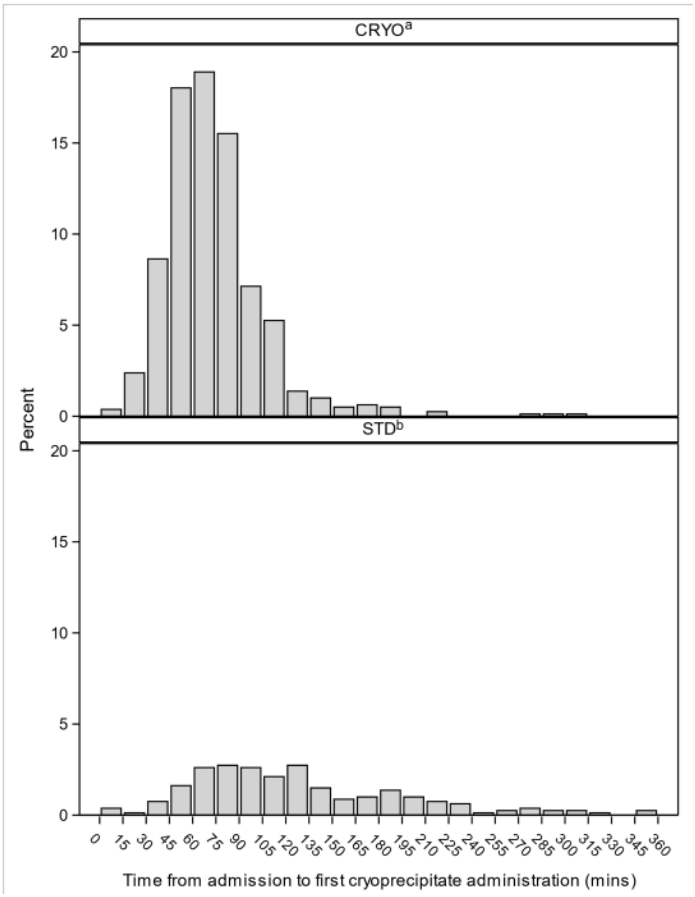
   A. **Cryo-precipitate –** people believe that to make a clot you need fibrinogen, which is true, but some believe you need to give it early in Trauma patients to help stop bleeding.
      -Inclusion criteria -Hypotension, 1 unit of blood, activation MTP, standard care and 3 pools/6 G of Fibrinogen given. (age/sex, MOI all similar)

      -average transport time was 75 min and TXA was given during POI treatment with ISS 29 or worse

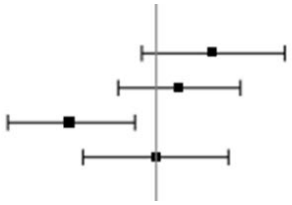
Figure 2. Mortality Overall and by Injury Type



Blunt and penetrating was an important significant factor**



Cryoprecipitate timing		201/771 (26.1%)		
CRYO <= 45m from adm	33/96	(34.4%)	1.45 (0.91, 2.31)	0.12[b]
CRYO 46-60m from adm	42/144	(29.2%)	1.16 (0.78, 1.73)	0.46[b]
CRYO 61-90m from adm	44/267	(16.5%)	0.57 (0.38, 0.87)	0.01[b]
CRYO > 90m from adm	31/123	(25.2%)	1.00 (0.62, 1.60)	0.99[b]



****Takeaway – Too early/Too late unfavorable outcome. 75-90 Optimal time for Cryoprecipitate****

B. Bleeding Edge Study: Is there a time where blood becomes futile:

Criteria: Treated at MTF, in DoDTR, 1 unit of blood

Most Transfused Patients

TABLE 3. Mortality at 24 Hours and Units of Blood Products Among 10 Patients Who Received the Most Units of Blood Products

Patient	Units of Total Blood Product	Units of Whole Blood	Mortality Status	ISS	Injured Body Regions
1	164	0	Deceased	41	Thorax, abdomen, upper extremity
2	165	0	Alive	21	Abdomen, lower extremity
3	168	27	Alive (deceased after 9 d)	33	Face, abdomen, upper extremity, lower extremity, thermal
4	181	7	Alive (deceased after 6 d)	30	Head, thorax, abdomen, upper extremity, lower extremity
5	189	0	Deceased	38	Thorax, abdomen, upper extremity
6	191	40	Alive (deceased after 1 d)	45	Abdomen, upper extremity, lower extremity
7	227	7	Alive	50	Face, thorax, abdomen, upper extremity, lower extremity
8	229	6	Alive	50	Head, thorax, abdomen, upper extremity, lower extremity
9	276	3	Alive	22	Thorax, abdomen, lower extremity
10	290	29	Deceased	36	Abdomen, upper extremity, lower extremity

d, days; ISS, Injury Severity Scores.

Gurney et al. *JTACS* 2023;95:635 – 641.

***Patients are surviving after getting over 200 units of blood**

C. LITES SWAT Study

Criteria: Prospective, multicenter, observational, 7 Level 1's, over 3.5 years, Leukoreduction titer levels and indications determined by center, WB group received at least 1 unit

Outcomes

Table 2. Primary and Secondary Outcomes by Resuscitation Type

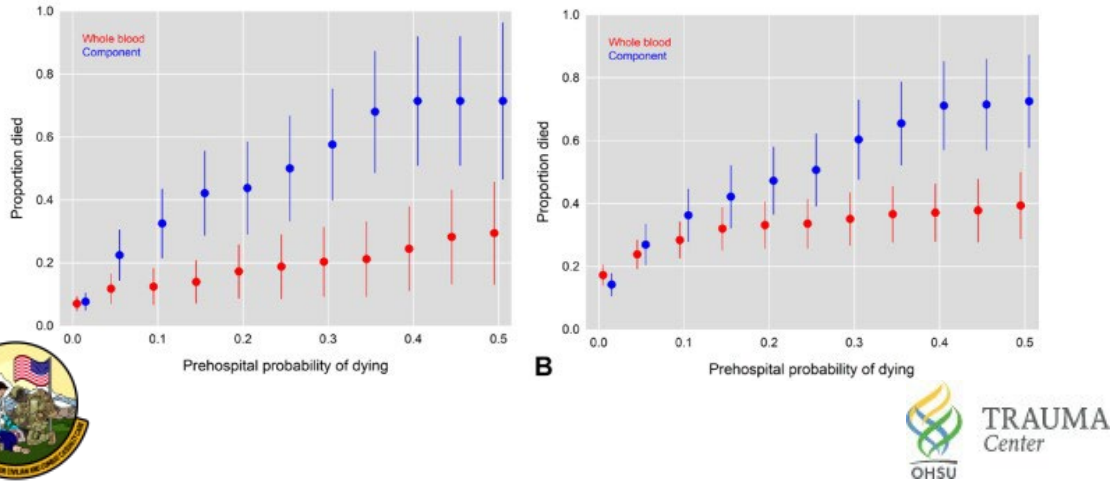
Outcomes	LTOWB (n = 624)	COMPONENT (n = 427)	Unadjusted RR	Unadjusted 95% CI	Unadjusted p Value	Adjusted* RR	Adjusted* 95% CI	Adjusted* p Value
Primary								
4-h mortality†	50 (8.2)	32 (7.5)	1.09	(0.71–1.66)	0.70	0.90	(0.59–1.39)	0.64
TBI subgroup	6 (6.4)	2 (4.5)	1.40	(0.29–6.68)	0.67	0.61	(0.14–2.70)	0.51
Secondary								
24-h mortality	82 (13.4)	49 (11.5)	1.16	(0.83–1.62)	0.37	1.08	(0.77–1.52)	0.67
TBI subgroup	19 (20.2)	6 (13.6)	1.48	(0.64–3.45)	0.36	0.89	(0.41–1.96)	0.78
28-d mortality	110 (17.9)	66 (15.5)	1.16	(0.88–1.53)	0.30	1.10	(0.83–1.47)	0.51
TBI subgroup	25 (26.6)	11 (25.0)	1.06	(0.58–1.96)	0.84	0.84	(0.45–1.56)	0.57

Sperry et al. *JACS* 2023;237:206 – 219.

TRAUMA Center OHSU

***Resulted in a negative study so need to do a deeper dive into the data. Resulting in a survival benefit to the sicker patient.**

Outcomes Adjusted for Prehospital Likelihood of Dying



D. PATCH Pre-hospital Tranexamic Acid for Sever Trauma:

Criteria: 1310 patients, 15 EMS services in Australia, NZ, Germany; 1g prehospital, 1g infusion vs placebo; COAST score > 3 = high risk for TIC; Primary outcome – survival with favorable GOSE

Patient Characteristics

Table 1. Characteristics of the Patients at Baseline.*

Characteristic	Tranexamic Acid (N=657)	Placebo (N=643)
Age — yr	44.1±19.7	44.2±18.9
Male sex — no. (%)	459 (69.9)	459 (71.4)
Mechanism of injury — no. (%)		
Blunt	610 (92.8)	588 (91.4)
Penetrating	44 (6.7)	55 (8.6)
Burn	3 (0.5)	0
Median initial heart rate (IQR) — beats/min†	110.0 (88.0–130.0)	109.0 (88.0–128.0)
Initial systolic blood pressure — no./total no. (%)		
≤75 mm Hg	246/639 (38.5)	248/626 (39.6)
76–89 mm Hg	218/639 (34.1)	197/626 (31.5)
≥90 mm Hg	175/639 (27.4)	181/626 (28.9)
Initial body temperature — °C‡	35.5±1.2	35.5±1.3
Initial Glasgow Coma Scale score — no./total no. (%)§		
<9	229/655 (35.0)	211/642 (32.9)
9 to 12	51/655 (7.8)	73/642 (11.4)
13 to 15	375/655 (57.3)	358/642 (55.8)

PATCH Trauma Investigators *NEJM* 2023:389;127 – 136.

Secondary Outcomes

Table 2. Primary and Secondary Outcomes.*

Outcome	Tranexamic Acid (N = 657)	Placebo (N = 643)	Risk Ratio or Hazard Ratio (95% CI)†
Primary outcome			
Survival with a favorable functional outcome at 6 months — no./total no. (%)‡	307/572 (53.7)	299/559 (53.5)	1.00 (0.90–1.12)
Secondary outcomes			
Death — no./total no. (%)			
24 hr after injury	64/657 (9.7)	90/640 (14.1)	0.69 (0.51–0.94)
28 days after injury	113/653 (17.3)	139/637 (21.8)	0.79 (0.63–0.99)
6 mo after injury	123/648 (19.0)	144/629 (22.9)	0.83 (0.67–1.03)

PATCH Trauma Investigators *NEJM* 2023:389;127 – 136.

***Takeaway- many never receive the second dose of TXA -recommend giving 2G TXA upfront to eliminate patient never receiving second 1G dose**

E . Aspirin or Low Molecular Weight Heparin for Thromboprophylaxis after fracture – DVT Prophylaxis:

Criteria: 12,211 pts at 21 N. American TCs; > 18, extremity fx treated operatively or pelvic/acetabulum op or non-op; Lovenox 30 BID vs ASA 81 BID at least until D/C; Primary outcome – Death

Pulmonary Embolus

Table 2. Primary and Secondary Outcomes.*

Outcome	Intention-to-Treat Population			Per-Protocol Population		
	Aspirin (N=6101)	Low-Molecular-Weight Heparin (N=6110)	Difference (CI)†	Aspirin (N=5505)	Low-Molecular-Weight Heparin (N=5170)	Difference (CI)†
	no. (% 90-day probability)		*percentage points*	*no. (% 90-day probability)*		*percentage points*
PE type						
Any	90 (1.49)	90 (1.49)	0 (–0.43 to 0.43)	50 (0.92)	43 (0.84)	0.08 (–0.17 to 0.54)
Massive	1 (0.02)	3 (0.05)	–0.03 (–0.10 to 0.03)	0 (0.00)	2 (0.04)	–0.04 (–0.09 to 0.02)
Submassive	22 (0.36)	15 (0.25)	0.12 (–0.08 to 0.31)	11 (0.20)	10 (0.20)	0.01 (–0.16 to 0.18)
Clinically significant	61 (1.01)	64 (1.06)	–0.05 (–0.41 to 0.31)	34 (0.62)	26 (0.51)	0.11 (–0.17 to 0.40)
Asymptomatic	3 (0.05)	5 (0.08)	–0.03 (–0.12 to 0.06)	2 (0.04)	2 (0.04)	0 (–0.08 to 0.07)
Segmental	61 (1.01)	59 (0.98)	0.03 (–0.32 to 0.39)	36 (0.66)	26 (0.51)	0.15 (–0.14 to 0.44)
Subsegmental	38 (0.63)	40 (0.66)	–0.03 (–0.32 to 0.25)	23 (0.42)	22 (0.43)	–0.01 (–0.26 to 0.24)

METRC *NEJM* 2023;388:203 – 213.

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***There was no difference in death or Pulmonary Embolism.**

Secondary Outcomes

Table 2. Primary and Secondary Outcomes.*

Outcome	Intention-to-Treat Population			Per-Protocol Population		
	Aspirin (N=6101)	Low-Molecular-Weight Heparin (N=6110)	Difference (CI)†	Aspirin (N=5505)	Low-Molecular-Weight Heparin (N=5170)	Difference (CI)†
	no. (% 90-day probability)		*percentage points*	*no. (% 90-day probability)*		*percentage points*
DVT type						
Any	151 (2.51)	103 (1.71)	0.80 (0.28 to 1.31)	109 (2.01)	73 (1.44)	0.57 (0.08 to 1.07)
Proximal	74 (1.23)	59 (0.98)	0.25 (–0.12 to 0.62)	46 (0.85)	41 (0.81)	0.04 (–0.30 to 0.39)
Distal	87 (1.45)	52 (0.86)	0.58 (0.20 to 0.96)	65 (1.20)	36 (0.71)	0.49 (0.12 to 0.86)
Secondary safety outcome						
Bleeding complication	834 (13.72)	869 (14.27)	–0.54 (–1.78 to 0.69)	730 (13.30)	693 (13.44)	–0.14 (–1.43 to 1.16)
Wound complication	8 (0.13)	14 (0.23)	–0.10 (–0.25 to 0.05)	7 (0.13)	10 (0.20)	–0.07 (–0.22 to 0.09)
Infection	103 (1.73)	93 (1.55)	0.18 (–0.28 to 0.64)	100 (1.86)	69 (1.36)	0.50 (0.02 to 0.98)

METRC *NEJM* 2023;388:203 – 213.

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***There was a small distal DVT deviation in patients that got Lovenox**

Meeting Adjourned 1700

Day #2 CoSCCC March 28th, 2024

Day #2		
Time	**Presentation**	**Speaker**
0700	Thursday JTS CCC Conference Call	
0830	Surgery On a Plane!?! – Science Fiction or Needed Future Capability? -Brief History of Rotary & Fixed Wing Surgery -CCATT Surgical Capability – Feasibility & Limitations -Discussion: Do We Need This Capability for the Future Fight? (panelist's will be ARSC team speakers from the AM session)	Jack Mather – 15 min Ryan Earnest – 15 min Leslie Wood – 15 min
0915	Deployed Surgeon: Global Heath Engagement in Syria Supporting Rukban Refugees	Juan Grado-40min
0955	Global Health Engagement & Trauma Systems Improving Outcomes Through Trauma Systems – Trauma Systems Plan -UAE Trauma System Development as an ideal model -UAE Burn Program Discussion -EUCOM -ARICOM through a GHE lens	Derek Licina -10min Lt Col DeSoucy -10min Lt Col Ellie Curtis -10min Col Chambers – 15 min (Virtual, Pending Confirmation) Jim Czarnik -20 min
1100	GHE & Trauma Systems Discussion -What is Integrated Deterrence? -Does it Help Trauma Systems? -Does the JTS have a Role?	Discussion – 15 min
1115	Cracking The Code on the JTS Data Process (DSAs and IRBs oh my!)	Stallings – 15 min overview and questions
1130	The Joint Medical Planning Tool – What Clinicians Need to Know	LT Marler -15 min overview and questions (Virtual)
1145	Building The JTS Bench – JTET & The Trauma System Support & Consultation Branch	Gurney – 15min
1200	**BREAK**	
1215	**LET'S GET SOME MORE WORK DONE!**	
Group 1	-Role 2 Critical Care at 24 Hours – What We Need to Know – Capability Gaps for the Future Fight (Powel & Biberston) -Bling My CPG: AKA DOTMLPF my CPG (Gurney)	
Group 2	Position Statements -Role 2 Ortho Capabilities Statement (Marsh) -Role 1 Procedures Survey Results & Statement (Hout)	

1315	**Report Outs/Updates** Role 1 Procedures Statement (5 min) Role 2 Ortho Capabilities Statement (5 min) Role 2 Critical Care Capability Gaps (5 min) DOTMLPF Lessons Learned (5 min)	
1335	**Discussion: Putting it All Together: Priorities, LOE, Vote Results (Role 1 Procedures & Expectant Casualty Care) August Meeting Planning**	Gurney/Tadlock
1430	**ADJOURN**	

1) Day 2 began with the JTS weekly Combat Casualty Care Conference 0700CST. Presentation on Exoskeleton advances by Dr Steven Scott, Tampa VA.

2) Three AF perspectives on the potential for Surgery in the Air – Capabilities and Concepts

In-Flight Surgery: A Brief History (Maj Mather) – Dr Mather gave a brief historical perspective on battlefield evacuation prior to 1800 and the progression of Casualty Evacuation through modern day.

These changes brought about significant reductions in case fatality rates

- Goal is not "some" preventable deaths
- Goal is NO preventable deaths
- How do we achieve this end?

Tactical and strategic success based on greater mobility and adaptability of military medical units

- Agile Combat Employment (ACE) Environment
- Golden Hour
- Platinum 10 minutes
- TCCC

The CCATT concept is instructive in the broad sense

- Developed in early 1990s and a fairly bold idea
- Have the technology and sophistication to take highly complex medical therapy for extremely sick patients, make it compact and move it to the sky
- Not just transport
- Evacuation of unstable patients in forward deployed locations

Maj Mather gave 3 brief patient vignettes' exemplifying the concept for inflight surgery/ flying Role 2's, but proposed this concept is just a "solution looking for a problem" that doesn't exist.

- No data from the conventional side of the Iraq or Afghanistan wars that suggest need for an airborne surgical team
- No recorded CCATT transports (that I can confirm) that went sideways because of the inability to operate mid-flight
- In none of my 30 missions did I unsheathe my scalpel in preparation for a rogue splenic hilar clamping

The AF is pushing forward with the TCCET-E concept.

- Tactical Critical Care Evacuation Team (TCCET)
    - ER/Critical Care Physician
    - CRNA
    - ER/Critical Care Nurse
- TCCET-E
    - Adds an OR tech and a Surgeon
    - Air Force initial proof of concept for in-flight surgery
    - Fixed wing and based out of Germany
    - Surgical team able to provide DCR/DCS on the ground or during patient movement
    - Concept generated out of tactical and strategic concerns regarding moving patients out of Africa. Exemplified in part by the difficulty in quick response to the attack on the U.S. Consulate in Libya

Summary:

- Achieving timing targets ("golden hour" "platinum 10 min") reduces mortality dramatically
- Tyranny of distance and agility of combat environments requires unconventional approaches to meet these time targets
- History, though brief, of the in-flight surgery concept has demonstrated that lives can be saved. Guideposts are already in place and it is clear that other forces in the world are already preparing for the inevitability
- The Goal: Zero Preventable Deaths

LTC Earnest presented on CCATT SURGICAL CARE – Red Team Surgical Care Working Group "Is the En-Route care platform optimally designed for the future fight?"

Characteristics of most recent conflicts:

- Unrestrained Environment
- Air Movement
- Resources
- CCATT
- Single Surgeon

What is CCATT?

- Fixed wing medical evacuation
    - Role 2 and higher
    - C130 and C17
    - Up to 3 Vented & 3 ambulatory patients
    - Critical care management
    - Perform critical procedures
        - chest tube, intubation, cric, central line
- "Critical Care" Physician
    - Surgeon/Pulm/ER/Anesthesia
- Critical Care Nurse
- Respiratory Therapist
- 4 Week training pipeline
    - CCATT Basic – WPAFB, OH
    - CCATT Advanced – CSTARS Cincinnati, OH

Lessons Learned from Ukraine Conflict:

- Prolonged evacuation from the trenches
- No freedom of movement
- Drone warfare
- Limited to no air evacuation
    - Vehicle of opportunity
    - Delayed care common
    - Prolonged tourniquet application
    - Dirty wounds/infection
    - Large volume blood loss from smaller injuries

Air Evacuation in Large Scale Combat Operations

- Lack of air superiority – no freedom of movement
- Long distances
- Pulsed operations
- Electronically complex
- Drone saturation

Resource Availability in Large Scale Combat Operations

- Patient volume exceeds available airframe capacity
- Ground surgical capabilities overwhelmed
  - In theatre ground ICU bed requires 3x resources than Air Evac

Future concept of Surgical Care in the Air

- Not a traditional Role 2: DCR/DCS
- Deliberate choice not to use the term “Role 2”
- Conceptually tied to CCATT and used to augment capability
- Designed to function when plane capacity is maximized
- Designed to salvage the ill effects of prolonged field care
- Resourced to manage delayed patient population
  - Able to manage patients before or after Role 2 care
  - Focus on soft tissue injury and sepsis management on both critical and non-critical patients
- Trained to function in the resource constrained environment

"Greatest Good for the Greatest Number"

AFRL

CCAT-SAT (Critical Care Air Transport– Surgical Augmentation Team)

- Team Composition
  - General or Trauma surgeon
  - Anesthesia provider
  - OB vs Urology vs Ortho vs APP vs Surg Tech
- CCATT Scope of Procedures
  - Chest tube
  - Cricothyroidotomy
  - Intubation
  - Central Line placement
- CCAT-SAT Scope of Surgeries
  - Fasciotomy
  - Escharotomy
  - Decompressive laparotomy
  - Amputation
  - Wound debridement
  - Burn debridement
  - Ex-fix placement
- Allowance standard
  - Surgical bag
  - Anesthesia bag
    - Local blocks
    - TIVA
- Training Pipeline
  - CCATT Basic Course (2 weeks
    - Surgeon and Anesthesia
  - CCATT Advanced Course (2 weeks)
    - Surgeon and Anesthesia
  - CCAT-SAT Course (1 week)
    - Surgeon + Anesthesia + Other

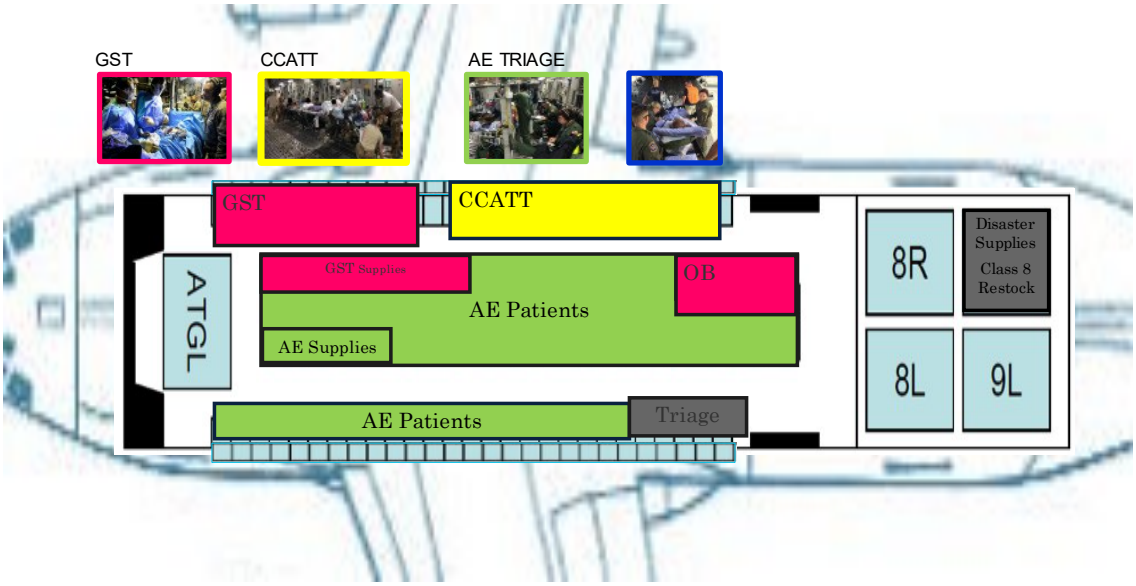
Air Surgical Capability: A Concept for the Future Fight? – LtCol Wood

AFRL

Flying Role 2 Concept SWOT 2019

Strengths	Weaknesses
• Already have highly effective ERCC and ground surgical capabilities • Agile employment of workforce/Doesn't require new manpower authorizations • Multi-domain C2 concept already exists • Clinical pre-work done with previous AST initiative and SOF air surgical teams • Current GST policy/doctrine already supports in air utilization of GSTs	• Inadequate grasp of impact of A2AD, attrition of medical capability, delay in care and resource constraint on casualty survival • Clinical currency opportunity lacking in direct care system for readiness of critical AFSCs • Critical AFSCs fenced off within MAJCOMs • Current patient validation process cumbersome/ electronic health record inadequate • High readiness training requirements negatively impacts clinical currency opportunity
Opportunities	**Threats**
• Multi-domain C2 concept already exists • Parallel line efforts with ACC Mobile Extender Team CONOPS for ACE already being worked • AE/CCATT/GST training already colocated at USAFSAM • GST equipment already inStF program, e.g. DOAKS table • SOF pursuing interoperability between SF air surgical capability and AE/CCATT • Opportunity to drive greater interoperability and agility	• Operating in an Anti-Access/ Area Denial (A2/ AD) environment with potential adversary anti -air, cyber, space and CBRN capabilities may require prolonged provision of medical care prior to the availability of PM capabilities • MODE/Large AORs…Near -Peer Adversaries… Rapid access to OR will be challenged • Divergent theater requirements • DoD fiscal constraint will drive service alignment with doctrinally assigned tasks • DHA "build it and they will come" pivot to direct care system will leave a clinical currency gap for years

Holistic Flying Role 2 Concept on C-17



Red Team Concept:

- Concept understood by line as a mechanism to inform commanders operational risk assessment and likely to improve effective strategic communication with line leadership
- First time in recent memory to stand up an AF medical red teaming effort consisting of an independent Multi-D stood up to prevent strategic surprise

Red Team Analysis C-17 Load Plan

- Plan for slick aircraft
  - *Likely cargo on outbound leg*
  - *No LSAS or Comfort Pallet*
- Floor loading of majority of litter patients
  - *Allows 2 columns 3 litters wide*
  - *Max 48 litters with no stanchions*
- Minimum equipment/supplies secured to cargo deck
  - *Wall mount of roll packs, bags*
  - *Seat mount remainder AE equipment/supplies*
  - *Minimum crew baggage*
  - *Crew Flight armor/survival vest worn onto aircraft*
  - *ACBRNe equipment loaded as per Intel/ROE*
- One seat per crew member
- Decedents on ramp

- Max load
  - Litter = 48 - anything strapped to floor or stanchion
  - Ambulatory seats – crew/equipment
  - Cargo straps across patients on floor?
- ↑crew + gear ➡patients↓

Red Team assessment – Unless you can reduce weight/cube and scope to casualty population (after PFC), surgical capability on the plane may or may not result in greatest good for greatest number of casualties depending on context

Recommendations

- Fight tonight
  - Need to strategically communicate true readiness state and risk to force and fight
  - Decouple AF readiness mission from delivery of the healthcare benefit mission
  - Develop TAES/RCO doctrine
  - Preposition PMI/Class 8 outside of known high priority target zones
- 2027
  - Develop and validate extender team COAs
  - Optimize force for AF specific mission
  - Expand of clinical capabilities of FN, AETs
  - Develop novel delivery or prepositioning mechanisms for PMI/Class 8 resupply

2040

- AI/machine learning integration
- Leverage Manned Mars mission prep research to assess for convergent equities
- MEDCOP+ and divest from DHA if not aligning with line

LTC Sirkin – If we prove we can do surgery on a plane we can do surgery anywhere. When we talk about LSCO, these small teams are in support of "special things" and I see them doing Surgery anywhere and getting in and out fast and be +'d up…a fast, flexible surgical team.
CAPT Bitterman – We have identified the problem is how can we touch patients and intervene in their survivability during travel time in resource constrained environments…filling that time known as "transport."

CAPT Tadlock – The reality is that the system is not doing what it needs to do on the conventional side to get teams ready to do this, training, logistics, manpower etc.

Col Wood – Surgical teams need to be treated like Legos and I can put pieces wherever I need them, service agnostic, to meet the mission. Healthcare resources need to be looked at as to how we can continue and sustain and maintain an assemblance of care in LSCO with 1k patients. Putting 1-3 patients on a plane and evacuating them is an unrealistic useless concept in LSCO.

LTC Sirkin – You ask how do we do that; I counter by saying how do we not plan to do this? We must prove to the Line that we need to be able to flex regardless of mode of transport or time. We need to build this capability on the Conventional side, a small…mobile…and very streamlined but able to be +'d up a CCAT or a Navy ESB etc.

Col Shackelford – I think there are some technology developments that can help solve some of these problems. Pressure models to avoid prophylactic fasciotomy's we have been doing, and also the REBOA Pro that is partially occluding…it can stay up quite a bit longer – 12+ hours.

Dr. Czarnik – I think we are looking at the problem too much from the last war. We are going to be triaging Units, not people…battalions, not driver and passenger of a HUMVEE. We can never plan for all the change that is going to happen…the element of surprise is part of the art of war. Adaptation needs to be equal to or close to the rate of change…..that means the 85% solution, and adjust on the fly to improve the situation as it unfolds. We all know people are going to die in war. Train your non-providers…buddy and first responders can be trained to do major life saving interventions.

3) Deployed perspective The Rukban: Refugees of the Syrian Civil War (MAJ Grado) -
MAJ Grado is a PA that deployed to provide medical care and "alleviate the suffering" to the refugees (approx. 8000 people). MAJ Grado stated he was not properly informed of the situation he was entering into, regardless of his 27-year career as a Green Beret.

The Rukban camp for internally displaced persons (IDPs) sits within a 55 km deconfliction zone surrounding the U.S. al-Tanf garrison at the intersection of the Jordanian and Iraqi borders with southeastern Syria.

1. Cannot cross the Jordanian or Iraqi Border under any circumstances
2. Cannot seek care within the regime at Damascus as they will be captured, tortured, ransomed, or killed.
3. No Resources north for them.
4. The US nor any World organization provides no materials support of any kind to them.
5. There are no trained providers. Only midwives and medics who have been OJT by peers who used to go to school but never completed training

Currently, the only way goods are brought into the camp is through smuggling routes coming from Damascus to Rukban. They supply a small black market that sells goods at exuberant prices far too steep for most camp residents, the vast majority of whom are unemployed.
For food and other necessities, Rukban relies on rare UN aid convoys, which require approval from the Assad regime and Russia to access the camp.

Treated over 800 patients through 35 medical civic action programs (MEDCAPS) to enhance Syrian refugee health, stability, and influence to the region.

Delivered care to over 280 disease non-battle injuries (sick call), assisted in 45 dental cases,7 orthopedic surgical cases, 22 Cesarean section surgeries, 3 Hernia Repairs and oversaw aeromedical casualty evacuation of 6 patients. and responding to various medical emergencies to include gunshot wounds (GSW), overpressure injuries, blast injuries, sepsis, and complicated pregnancies.

Medical Rules of Engagement I was given:

- Could not directly treat any Rukban patient, provide only recommendations and supervised direction.
- Could not conduct Medical Civil Action Program events (MEDCAPS).
- Could not evacuate or assist any SFA or Rukban member by flight or ground to any location.
- Approved to intervene during immediate loss of Life, Limb or Eyesight situations.
- Approved to conduct high risk c-sections

Cultural Hurdles:
- Husbands never present
- C-sections preferred over delivery
- Boys preferred over girls
- No birth control
- No planned pregnancy
- No desire or ability to breast feed

Our Facility

- Manning
  - 7 US Army medics (6 of which on their first deployment)
  - 1 Physician Assistant
  - 3 Medical Doctors on rotation every 3 months (FM, EM, Ortho Surg)
  - 1 MEDO
- Treatment Areas
  - Triage Area (12-15 Liter capacity)
  - Critical Care and Post-Op area (3-4 Liter Capacity)
  - Two Trauma Resuscitation Beds
  - One Surgical Bed
- Equipment and Resources
  - 3 Ventilators / Suction
  - 1 Bedside US
  - Bumblebee mobile X-ray
  - 1 Defibrillator
  - 3 VS Monitors
  - ISTAT
  - Blood Warmer (Quantum)
  - Blood Cooler

Blood and Medications
- 7-12 WB at any given time (Air Drop)
- 11 soldiers tittered and compatible for WBB
- Adequate pain control

Landing Zone
- 2 pads supportive of UH-60 to cv-22
- 1 Dirt airfield C -130 compatible

Surgical Capability
- Ground Surgical Team < 30 min by flight (Jordan)
- 1 General Surgeon
- 1 CRNA
- 1 CC Nurse
- 1 Surg Tech

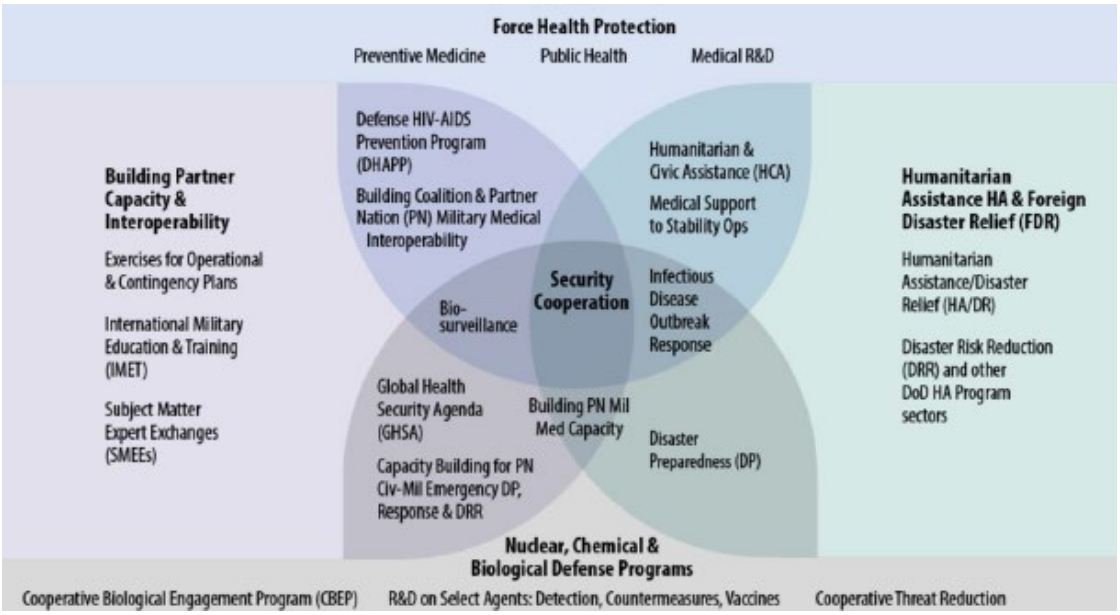
Diseases of Non-Battle in Nature

- Systemic Infection (Bacterial, Fungal)
- Immune Diseases (Psoriasis)
- COPD
- HTN, HF, DM
- Substance abuse (Captagon)
- Psychiatric Disorders
- Cancer (Liver, Lung, Breast)
- Accidental Overdose
- Palliative or Comfort Care

Lesson's Learned:

- Difficulty in leadership to comprehend the IDP medical situation.
- Difficulty in new providers to understand the always possible unannounced withdraw of forces.
- Create shared decision making and shared responsibility among your providers.
- Always seek specialty provider recommendations (Take the time to call or ask)
- Full dress rehearsals on every aspect of your mission, and do not be derailed by prideful conflict.

3) Codifying a Role for the Defense Health Agency (DHA) in Global Health Engagement (GHE) (Derek Licina) – Mr. Licina spoke on what DHA is doing in the GHE space, and how the JTS can affect GHE.



Some people do not think DHA should be involved in Global Health, but by policy and doctrine, DHA has affected Combat Support role in support of component and combatant commands.

GHE is needed to enable the DoD, allies, and partners to address emerging threats.

RECENT DHA GHE SUCCESSES

Integration with the Geographic Combatant Commands (GCCs) to **align capabilities in support of operational requirements and strategic priorities**

- Supported a Secretary of Defense initiative with the United Arab Emirates to enhance **trauma, burn, and rehab medicine** capabilities (JTS)
- Developed and shared surveillance information with partner nations to inform globally integrated **Force Health Protection** measures (AFHSD)
- Collaborated with interagency partners enhancing bio **surveillance information** collection, analysis, and distribution (AFHSD)
- Assisted foreign military partners with **HIV/AIDS prevention, care, and treatment** programs (DHAPP)
- Assisted Georgia in developing a **rehabilitative medicine** capability for acute and long-term care which serves as a regional resource (EACE)
- Delivered partner nation and interagency **education and training** such as Combat Casualty Care Course and Joint Med Ops Course (DMRTI)

The JTS can help guide integrate centers of excellence to guide what is done and how it is done.

Potential Benefits and Future State

These are a few of the opportunities across DHA and the broader DoD

Codifying GHE

- Creates a Combat Support Agency mission-driven GHE organization
- Increases operational efficiencies across the agency
- Increases access to valuable DHA capabilities
- Reduces costs (time and money) while improving services provided to Combatant Commands
- Establishes a clear strategy to support efficient and effective integration of capabilities
- Aligns resources and implementation to strategy and greatest areas for success

JTS can look to build and integrate capabilities through allies and partners, leverage facilities and assets and how to attract new partners and enhance relationships.

• More effectively enables partner countries to **strengthen and sustain their military health system** which contributes to a globally integrated and interoperable military health system
• **Mitigates JME shortfall risks,** supports national defense objectives, improves the health and safety of our warfighters, and provides enhanced readiness of the medical force

Dr. Czarnik – People have friends, Nations have interests. Everything we/they do is to support those interests…allied partners is never about friendship.

We imposed our will in Iraq and Afghanistan…but that is not going to work in a Sovereign Nation. The Us Government and DoD comes down to three things…Policies, Authorities and Resources. The strategy or Command plan is imperative…don't act like a Doctor or Nurse, act like an Officer.
Dr. Czarnik spoke in depth about strategic communications with Geographical Combatant Commanders. We are trained to do "GAP Analysis"…that is primarily the US Military that utilizes this concept for logistics, planning resources etc. DON'T DO A GAP ANALYSIS, do an "Asset Analysis" …help the process so you can expand the effect of what they are doing to eventually fill the gap, but with sustainability.

The US Military has the "State Partnership Program" Educate yourself on this program and how the State and Guard interact and how you can use them to your advantage.

Mr. Licina – Dr. Czarnik is talking about where your GCC and Service Components and figure out how they are going to do integrated deterrence. Your job is to figure our how to integrate your mission into the "Country Plan." How does your military health capability plug into this strategy plan.

Lt Col DeSoucy and Lt Col Curtis spoke on the UAE/US partnership and how it came to be. The U.S. helped rescue U.A.E. soldiers after a 2017 helicopter crash.

- The TBRM initiative was a result of:
    - Secretary of Defense directive in 2017 to deepen bilateral ties with the Emirates
    - The rescue of Emirate injured soldiers who subsequently received US Combat Casualty Care
- TBRM Case formed around:
    - Identified Emirati national healthcare sector shortfalls in treatment of casualties from conflict in Yemen
- The "Heart" of the case
    - Establishing a regional Trauma system in Abu Dhabi anchored by a Level I Trauma Center at Sheik Shakhbout Medical City (SSMC)
- The Case was established and directed in 2019 to the Army for fulfilment
    - 11 military member team arrived at SSMC August 2019

End State:

A comprehensive, integrated, and enduring trauma, burn, and rehabilitative medicine capability and an in-theater military readiness platform that supports the provision of civilian trauma care, combat casualty care, and subsequent recovery and rehabilitation of civilians and service members

LtCol Curtis briefed on the capabilities of the Burn Center in Abu Dhabi; Staffing issues and standard of care practices.

GHE Opportunities

- Engagement/alignment across multiple agencies (DoD, DoS, MoD, DOH, Civil Defense, SSMC, Presidential Guard)
- Advance diplomatic and military objectives while competing outside usual FMS case parameters
- Incorporate operations and contingency planning into ground level GHE efforts/proposals
- Capitalize on skills currency for deployed surgical teams through Title 10 MOU and an embedded administration/coordination team
- Codify GHE administration and develop TBRM as a clinical, leadership, professional currency platform for deployment to additional geographic commands

- Develop an objective means to assess efficacy and return on investment of GHE efforts

Takeaway – Less is more and align your efforts and capabilities to their needs and people in power will get things done for you.

COL Gurney – UAE cannot be replicated everywhere; it was a unique situation. We don't have enough teammate to deploy in proposed LSCO. We need to grow the capabilities, but where do we put them, to train, to stay proficient, MTF's are struggling, and UAE is thriving, and you are taking care of legit patients. Do you guys think this model could exist anywhere else right now? Integrated deterrence is a great term, and it is a big deal to the decision makers…this is a huge opportunity to find and build the next UAE.

Dr Czarnik – Take Command billets and become an Officer who understands medicine for a while and you can have an impact. It's hard from a career standpoint when you love doing medicine, but do you give a **** enough about the mission to sacrifice 2-3 years of practicing medicine to impact change, then stop whining, you're just part of the problem.

CDR Thota – How is the data gathered and where is it being stored in the UAE?

LtCol Curtis- short answer, It's not.

4) **The Joint Medical Planning Tool – What Clinicians Need to Know (LT Marler)** – LT Marler presented on the JMP Tool to understand the operation and how it is going to impact risk and casualty management, Casualty Estimation & Medical Network Sufficiency.

Medical Operations are a risk mitigation measure the commander can apply to conserve combat power and reduce morbidity and mortality.

Casualty Estimate:

Wounded in Action (WIA) / Disease & Non-Battle Injury (DNBI)
- Return to Duty (Local Hospitalization)
- Requires Evacuation

Killed in Action (KIA)
- Those that are killed prior to seeing a medical doctor

Died of Wounds (DOW)
- Patient that dies after receiving medical care (primary care doctor)
- Term for evaluating network sufficiency

JMPTK and JMPE Network Modeling

<u>Medical Planners' Toolkit (MPTk)</u>

- Purpose: Casualty Estimation
- Capability: Operations, & Intelligence informed Casualty Estimation Tool
- Results:
    - Casualty Estimate Over Time (Set of Values)
    - Patient Stream for Medical Network Analysis
    - High Level Theater Medical Requirements

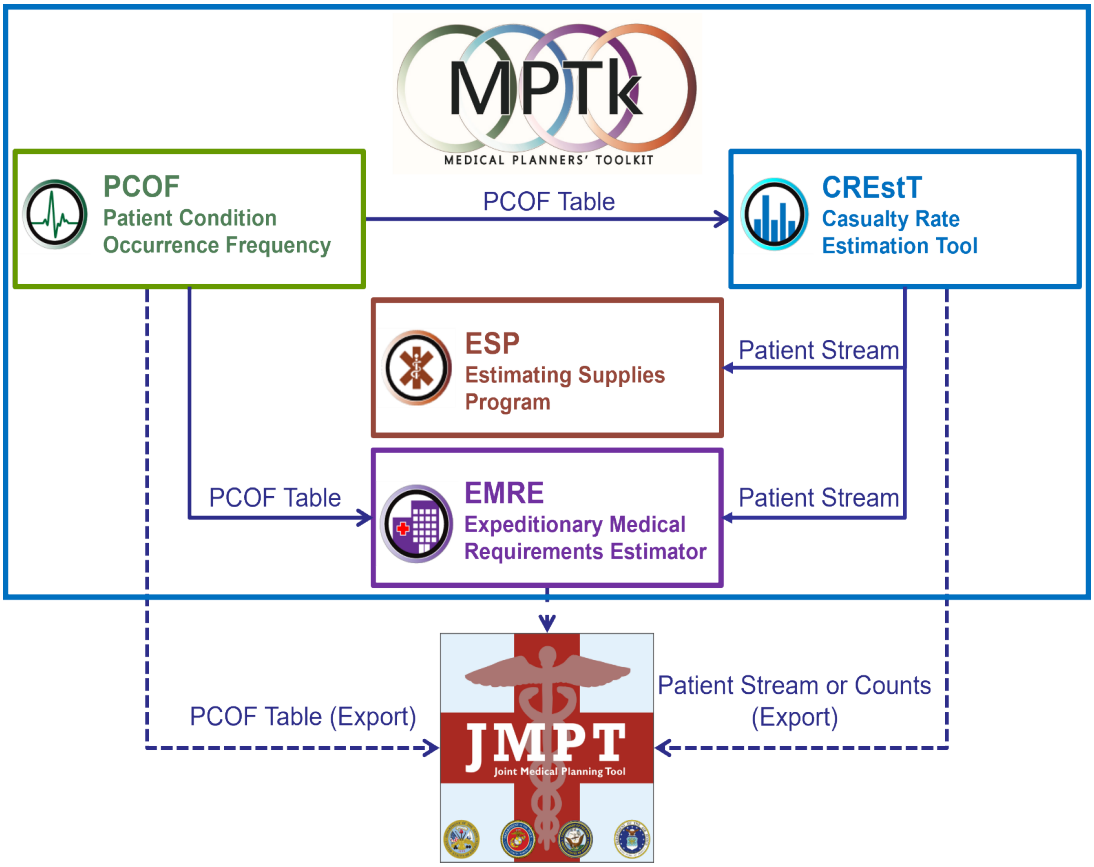
- Replacements by Military Specialty/Paygrade

Joint Medical Planning Tool (JMPT)

- Purpose: *Medical Network Analysis*

- Capability: Medical Capability, Time/Task/Treatment, Distance, & Transportation-based Medical Network Analysis Tool

- Results:
  - Sufficiency of the Medical Network (capacity analysis)
  - Transportation Analysis (transport use during scenario)
  - Patient Dispositions (Return to Duty, Died of Wounds, or Final Evac)



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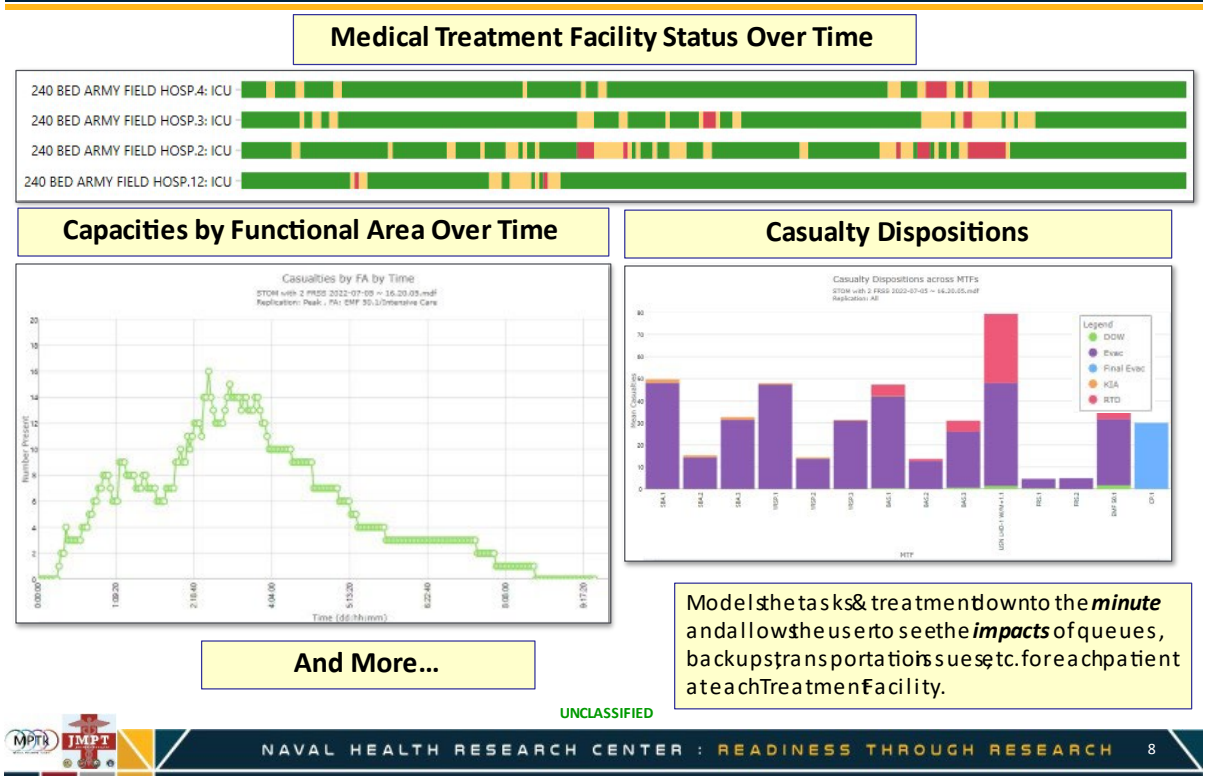
Key Outputs: Joint Medical Planning Tool



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Why are the MPTs important?

- ***Operational Data driven* casualty estimates provide the Commander with Course of Action *comparison criteria* and an *estimate* of combat force availability over time**

CDR Thota – Are you adding Logistics back into the model…Monte Carlo modeling?

LT Marler – Yes we are, and we are also adding tables and making updates currently to iterative logistics. You can also change the modeling to see if for example a Role 2 is appropriate or if the facility was modified or elevated to a Role 3 how it would impact the AOR and/or the mission.

LCDR Rausa – Is there a way to reach out and get advice or guidance on proper training because if you do not use or stay proficient with this tool, it is impossible to remember all the capabilities and uses it possesses.

5) **Cracking The Code on the JTS Data Process (Dr. Stallings) –** Gave a brief synopsis on his career path and how his career path enhanced his current role and passion for data and registry management.

Reliable data is needed to facilitate medical performance optimization at all levels of the enterprise.

Current Challenges and Hurdles:

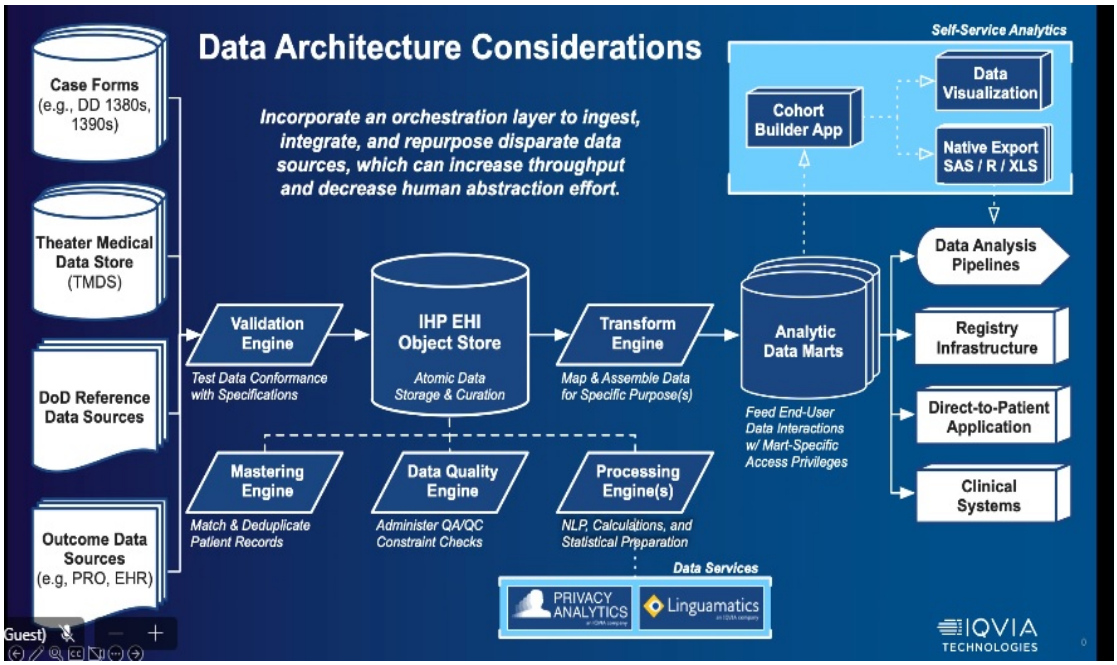
- 100% manual records abstraction
  - Abstractors read medical records and manually abstract into registry

    - Rate limiting step 0.25 to 3 cases per day per FTE
    - Represents a risk to JTS mission during LSCO
- Future technology will provide discrete elements
    - JTS lacks data governance & oversight to incorporate
    - Requires a back-end solution compared to 100% front-end entry
- Data out is too complex, too slow, and not integrated
    - Delays access and dissemination to DOD Trauma Enterprise (DTE)

DATA GOVERNANCE: Key Leaders in Data Enterprise with matrixed partners in PI, C3QIP and Other Key Stakeholders will form the JTS Data Governance Function.

Efforts Underway at JTS

- JTS working on Business Case Analysis (LOE2.1) for new registry paradigm
- Data Architecture working group (LOE2.2) developing concepts and COAs
- Provide agile back-end solution that leverages AI/ML prior to Registry-related abstraction of records in the object store
- Provides a solution for emerging registries via analytic specific data marts
- Enables governance and oversight thru a unified platform to support quality and self-documentation



Marissa Rodriguez – briefed on the Research Regulatory and IRB protocol framework and how JTS is moving forward with Data Sharing and Non-DoD / External JTS people wanting to do research.

MAJ Merkle – This is a phenomenal product, but the POI data has an incredibly low quality…from the garbage in/garbage out perspective, how do you fix the sequence?

Dr. Stallings – Produce better products for end users to document easier, train and inform leadership and try and simplify the complicated issues as best we can…one word answer – BATDOK.

6) **Orthopedic Role 2 Position Paper update (COL Marsh) –** COL Marsh gave an update and overview of the draft position statement. There was an argument posted that Role 2 didn't "require Ortho Surgeon." So we devised this position statement saying Role 2 DOES need Orthopedic Surgeon as a recommended requirement from the JTS/CoSCCC.

General Surgeons are no required to have Orth trained surgical practice…so do, but not all.

FACTS AND PRINCIPLES

1. An overwhelming majority of combat wounded personnel have an orthopaedic injury (75% in GWOT) (12% of FST patients in Afghanistan were polytraumas of which 60% also had orthopaedic injury) 58% of combat casualties in World War II had an extremity injury.

2. Disease Non-Battle Injury further increases volume of musculoskeletal injury being three times as common as battle injury.

3. Combat orthopaedic injuries are a significant source of disability and inability to return to duty. (64% of soldiers with a primary diagnosis of extremity wound were ultimately found unfit for service.)

4. Providing orthopaedic surgical procedures remains a doctrinal requirement for Role 2 surgical units.

5. Deployable orthopaedic surgeons must be capable of optimizing limb salvage through temporary fracture stabilization with external fixation, extremity wound debridement and infection management, amputation, fasciotomy, and temporary vascular shunting. (Appendix A)

6. Most general surgeons are not credentialed to perform orthopaedic surgery, nor do they have significant experience in it. The Accreditation Council for Graduate Medical Education does not require education in orthopaedic surgery as part of a General Surgery residency.

RECOMMENDATIONS:
The Committee on Surgical Combat Casualty Care, Defense Committee on Trauma, Joint Trauma System, and tri-service senior orthopaedic leadership recommend the following to mitigate risk to the Joint Force from musculoskeletal injuries sustained in large scale combat operations:

1. Combat extremity injuries requiring surgical management will occur in very high volume in LSCO. Current medical doctrine relies on surgical combat casualty care beginning at the Role 2 level. Optimal surgical care requires the presence of orthopaedic surgeons within these Role 2 teams.

2. Regular management of high energy orthopaedic trauma is critical to sustaining a deployable pool of military orthopaedic surgeons, and pre-deployment combat orthopaedic trauma training, like the COTS+ course, should be maintained.

3. Area of Responsibility medical planning in LSCO must provision orthopaedic surgeons to provide musculoskeletal surgical interventions in a timely and safe fashion.

LCOL Beckett- Xray capability is not in the Canadian FRSD concept. We have so few of them and the argument is if there is no Xray there is no point in having the limited resource of Orthopedics far forward.

COL Marsh – Xray is something we love to have and use, but it is not make or break, no pun intended. You can determine ex-fix placement and other inter-operative techniques and even portable Xray capabilities that are available. The benefit is we can handle many orthopedic injuries as well as be an extra set of hands in Trauma situations.

COL Gurney – We have seen the importance of the Orthopedic surgeon on the Weekly JTS call recently. They are an underutilized resource and will be needed in LSCO. Does tri-service community have consensus on this statement and those that oppose it, what is their reluctance and justification?

COL Marsh – Younger surgeons are reacting to deployments where they had little to do and didn't see the need for Ortho, but I think it's Dunning-Kreuger Effect…you don't know what you don't know.

COL Benavides- Also, having ortho at the Role 2 prevents those without Orth expertise from evacuating injuries that could potentially be retained and sent back to the fight in a matter of time and not make the decision to remove them from the AOR because you don't have the expertise to diagnose and properly treat the injury. In Iraq and Afghanistan, we evacuated everything and in LSCO, that will not be feasible.

COL Gurney – Way forward is to Socialize to DCOT, primarily CoSCCC, and if consensus amongst SME's then I say we push forward to publish in several Military Journals.

7) **Role 2 Critical Care at 24 Hours – What We Need to Know – Capability Gaps for the Future Fight (LCDR Biberston/Maj Powell) –** In future conflicts, even if we decide to do surgery in LSCO, there may be long hold times and prolonged care (platform agnostic care). If we are going to provide surgical interventions, we need to be prepared for competent peri-operative and critical care.

Gaps -

- **Personnel**
    - Physicians
    - RNs
    - RTs
    - Medics
    - Tele-medicine
    -

- **Capabilities**
    - Respiratory support
    - Renal failure/electrolyte disturbance
    - Resuscitation
    - Hemodynamic management

    - Complication prevention
    - Nutrition
    - Neurologic injury
    - CBRN care
    - Environmental extremes

- **Diagnostics and technology**
    - Laboratory
    - Imaging
    - Advanced monitoring
    - Automaticity

- **Logistics and resupply**
    - Theater-specific resupply planning

LCDR Biberston – Implementing CPG's and adhered to is an understated expectation.

Maj Powell – My intent with the Capabilities list is to also imply that if we are going to train and supply Critical Care personnel we are also going to advocate for research and development and not make patients fit technology being developed but take Technology and make it fit the environment we will be operating in…good, better, best.

COL Gurney – If you feel that is the way forward, that intent needs to be discussed with CAPT Polk at CCCRP to ensure synergy to meet intent from the field.

LTC Sirkin – As someone that developed an "item" for the Army, without a "Needs Statement" there will be no funding and no path forward for implementation.

LCOL Beckett – Also as a side bar, appropriate vehicles will be a necessity for this type of care. Moving patients from Role 2 to further back definitive care are going to be essential without air superiority.

Col Sams – I agree with the prioritization, we must be able to identify accurately and realistically what it is we can do, and then we must find a way to get the development and acquisition process expedited, because right now it takes 5-7 years to implement a new product and often times it is either obsolete or outdated for the need 7 years ago.

Closing Comments – COL Gurney/CAPT Tadlock

COL Gurney stated the importance of doing work between meetings, and not just showing up to the meeting twice a year. She highlighted the importance of the JTS CPG's and data analysis and the presentations on JTS way forward with passive data. CPG's drive requirements and training and logistics.

Documentation tools – we all need to get in line to use these tools as they are fielded. They are not perfect, but they are what we are receiving and need to embrace the ability to document accurately and get data in the DoDTR. There is no excuse for a trauma to have no documentation in 2024 and it's happening.

Trauma Systems consultation and support Branch standing up- Steve Flaherty will lead this branch and conduct assessments of MTF's and Trauma Systems throughout the DoD.

Research – If you are interested in doing research project, please get with the JTS. There are a lot of shortcomings with the DoDTR, but we can't make it better until we identify those gaps and create bridges to close gaps and make the DoDTR the best repository.

JTS has more influences than authorities, but we want to gain more authorities from our influences. Also, we need to build future leaders. It is everyone in this rooms responsibility to grow the Trauma System and mold future leaders to keep the JTs moving in the right direction.

LCDR Hout – LCDR Hout provided an update on the Role 1 Surgical Procedures by non-surgeons survey. Survey is to be socialized further to ensure proper cohort diversity.

Current DCoT LOE and Priorities.

- ✓ Role 1 Whole Blood Capability & Availability
- ✓ JTS Triage Guidance
  - TCCC
  - Role 2
- ✓ Prolonged __X__
  - PCC
  - Role 2 Prolonged Holding
- ✓ DCoT Top 10 Priorities
  - CoSCCC Top 10 Research Priorities
- ✓ Complete ARSC Lessons Learned Handbook

Due Outs for November Meeting:

- Finalize Role 2 Orthopedic Capabilities Statement
- Role 1 Procedures Survey
- Critical Care Capabilities Gap

CAPT Tadlock concluded by emphasizing the importance of discussing Military Health System (MHS) challenges to improve the care of our beneficiaries at home and deployed. But we also need to help our MHS leaders like RDML Valdes, represent the MHS brand. Therefore, we need to pro-actively to provide actionable solutions to MHS challenges – current and for the future fight – while simultaneously representing the MHS brand. Wearing the uniform, representing the MHS surgical community and supporting the warfighter and operational units is an honor and privilege – IT IS OUR PURPOSE.

Meeting Adjourned at 12:42

Matthew Tadlock, MD, FACS
CAPT, MC, USN
Chair, Committee on Surgical Combat Casualty Care

Michael Van Gent, MD, FACS
LCDR, MC, USN
Chair, Defense Committees on Trauma

Enclosure (1) – Meeting Attendance

JTS Staff:
COL Jennifer Gurney (DCoT Chief)
Mr. Dallas Burelison (JTS Chief Administrator)
COL Brian Sonka (PI Chief)
Cord Cunningham (ERCCC Chair)
CAPT Travis Deaton (CoTCCC Chair)
CAPT Matt Tadlock (CoSCCC Chair)
Lt Col Lindsay July (PI)
CDR Brenda Williams (Senior Nurse)
HMCM Justin Wilson (Senior Enlisted Advisor)
Harold Montgomery (TCCC PM)
Dominick Sestito (SCCC PM)
Danielle Davis (CoTCCC Admin)
Dr. Russ Kotwal (Spec Projects)
Dr. Sean Keenan (JTET Spec Proj)
Trevor Gipper (A/V Spec)
Teresa (Teri) Duquette-Frame (Ops)
CDR Darshan Thota (Data)
Dr. Jonathan Stallings (Data)
Dr. Dan "Tre" Mosely (JTET)
Dr. Jeff Bailey
Mr. Rich Jarrett (JTET)
Dr. Steve Flaherty (Trauma Verification)
Mr. Derek Licina (GHE)

VIP Guest Speakers
RDML Valdes (INDOPACOM)
BG Glassberg (IDF)
COL Tristan Monchal (French MHS)

CoSCCC Attendance
Paul Allen
COL Jay Baker
Ms. Emily Baird
COL Tyson Becker
COL Linda Benavides
COL Jerome Benavides
LCDR Jeffrey Biberston
CAPT Jeffrey Bitterman
CDR Jack Brandau
COL John Chovanes
MAJ Michael Clemens
COL Lance Cordoni
LtCol Ellie Curtis
Col Erik DeSoucy
Mr. Luis Diolazo
LtCol Ryan Earnest
LtCol Andrew Hall
CDR David Hampton
COL Dave Hardin
LTC Emily Hathaway
LCDR Brittany Hout
LtCol Remealle How
COL Eric Jacobson
SFC Jonathan Johnson
MAJ Brandon Koser
Col Chris Mahoney
Dr. Don Marion
COL Nathan Marsh
MAJ Jack Mather
MAJ Jason McCartt
MAJ Alex Merkle
COL Kane Morgan
Col Erik Nott
CAPT Travis Polk
Maj Liz Powell
SFC Andrew Proctor
MAJ Joshua Randles
LCDR Rebecca Rausa
LtCol Anne Rizzo
LTC Michael Rowland
Col Jay Sampson
Col Val Sams
HMCS Tyler Scarborough
COL Marty Schreiber
Col Stacy Shackelford
MAJ Max Sirkin
Maj Nathan Smith
Mr. Jon Paul Trossi
CAPT James Wallace
SGT Ian Wallentine
COL Sandra Wanek
LTC Wendy Warren
LtCol Alicia Williams
Col Leslie Wood
LTC Kevin Worth
COL Curtis Wozniak

CoSCCC Virtual Attendance

COL Daniel Bridon
COL Scott Armen
CDR Jason Brill
LTC Alissa Byrne
COL Jonathan Catalano
LCDR Sarah Chilson
COL Jason Corely
LTC Brad Dengler
Mr. John Dominguez
Dr. Ted Edson
Mr. Max Ferguson
LTC Allison Ferro
Maj Jared Folwell
CPT Matthew Gaines
MAJ Brian Gomez
CDR Shawna Grover
COL Bonnie Hartstein
MAJ James Huang
MAJ Ian Jones
Ms. Melinda Lyon
Dr. Matt Martin
LtCol Dana Mayer
MSG Leanne Miller
MAJ Tererayi Muronda
Dr. Nick Namias
Mr. Timothy Nunez
Mr. Will Parker
COL Kelly Peterson
CDR Paul Porensky
Mr. Raymond Price
LtCol Summer Rose
LtCol Mary Steuver
MAJ Tselane Ware
LtCol Shi Xiaoming
CDR Jay Yelon
COL Young Yauger
Dr. Ken Leffler (JTS)