Joint Theater Trauma System (JTTS)
Joint Theater Trauma Registry (JTTR)

Information Brief to DHB

14 July 2010

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Ft Sam Houston, TX 78234

Objectives

- Describe the Joint Theater Trauma System (JTTS)
- Describe the Joint Theater Trauma Registry (JTTR)
- Present recommendations to the DHB establishing the Joint Theater Trauma System as a Program of Record with POM funding

What is a Trauma System?

- Organized effort in a geographic region to deliver full range of trauma care
- Improves patient transition between phases of care
- System coordination improves patient outcomes
  - –Reduces mortality by 15 - 20%

Why is JTTS Important to the Service Member?

- Trauma volume / rate
  - US Level I trauma center
    - 5,000 evaluations ~ 2,000,000 population
- Historically:
  - CENTCOM JTTS Centers
    - 8,000 evaluations ~ 200,000 population

History of the JTTS

- OTSG-directed theater evaluation visits (May 03)
- 2nd MED BDE directed to develop JTTS in Iraq (Mar 04)
- Service SGs coordinated with Health Affairs on (JTTR) and JTTS (Nov 04)
- OSD/HA directed services to implement JTTR (Dec 04)
- 44th MEDCOM CG to implement JTTS in Iraq (Dec 04)
- CENTCOM established JTTS for entire AOR (Mar 05)

JTTS Vision

- That every soldier, marine, sailor, or airman injured on the battlefield or in the theater of operations has the optimal chance for survival and maximal potential for functional recovery.

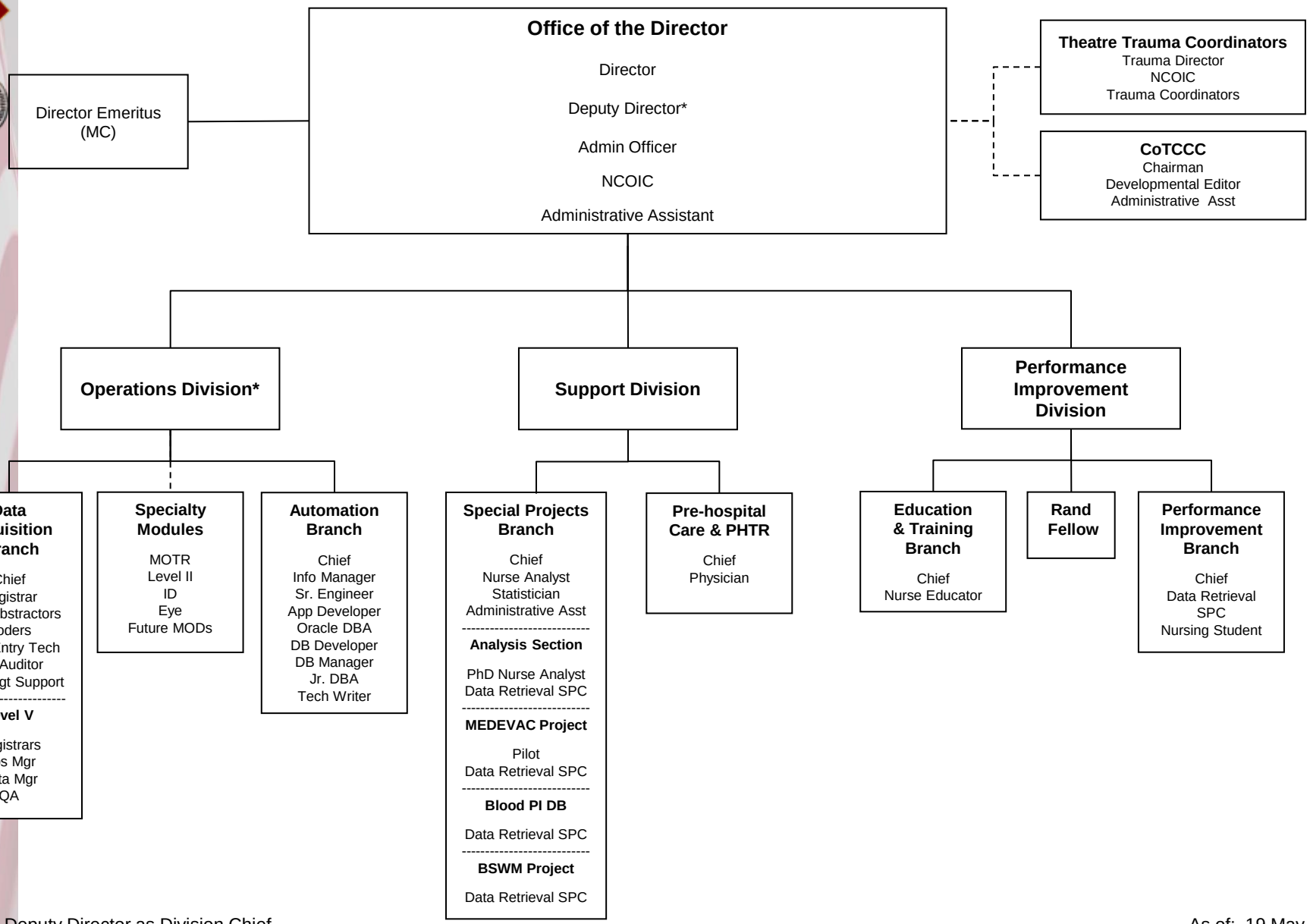
JTTS Mission

- Improve organization and delivery of trauma care
- Facilitate Morbidity and Mortality conferences to promote real-time, data-driven **clinical process improvements** and improved outcomes
- Develop and implement **clinical practice guidelines**; monitor compliance with them

JTTS Mission

- Improve **communication** among clinicians in the evacuation chain to ensure continuity of care and access to data
- Evaluate and **recommend new equipment** or medical supplies for use in theater to improve efficiency, reduce cost, improve outcomes
- **Populate the JTTR** to evaluate care provided, document outcomes, and facilitate conduct of formal research

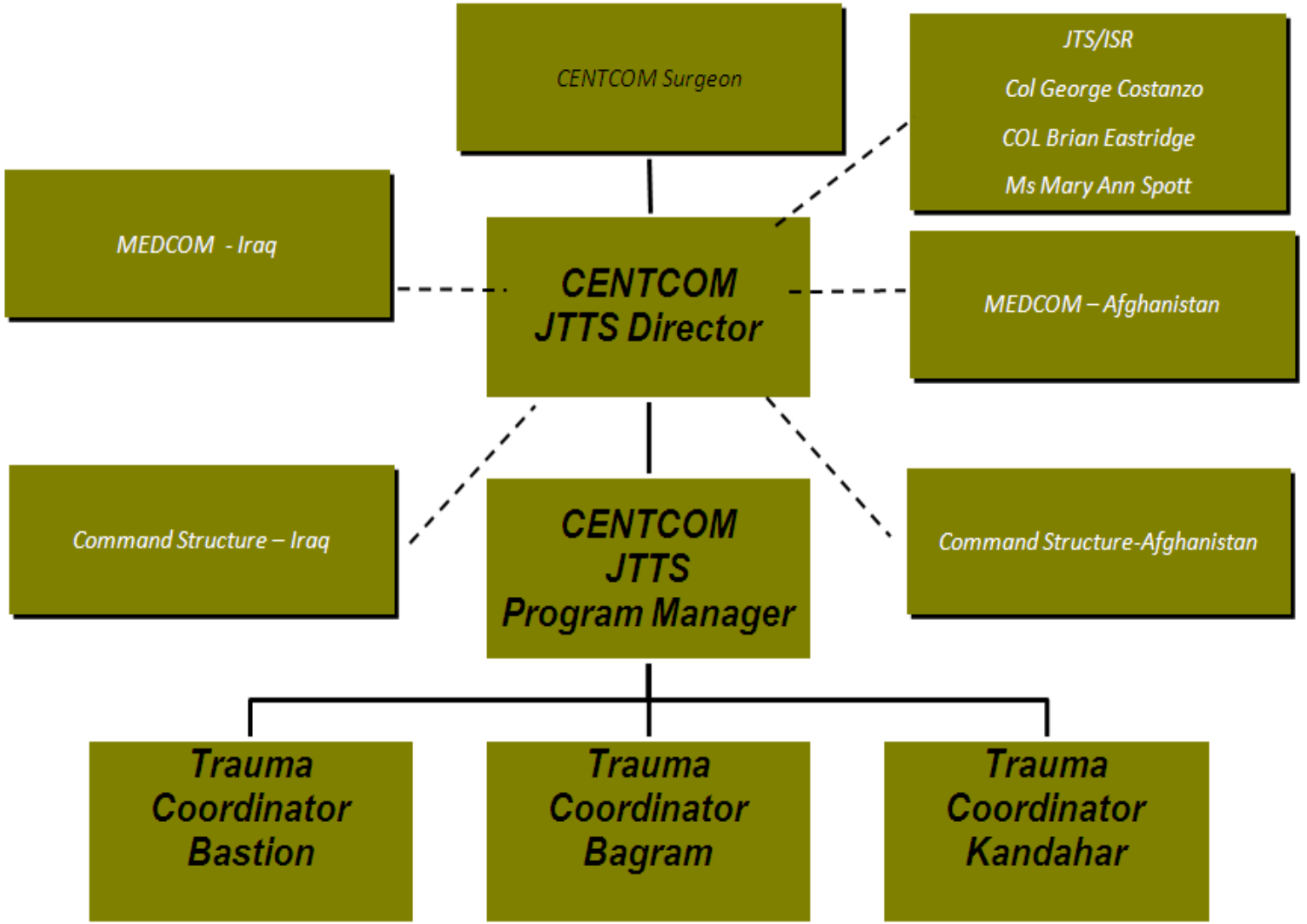
Joint Theater Trauma System Directorate



* Indicates Deputy Director as Division Chief

As of: 19 May 2010

CENTCOM JTTS Organizational Diagram



JTTS Theater Manning

- In Theater JTTS is supported by <u>all Services</u>:
  - 1 Theater Trauma Medical Director
  - 1 Theater Trauma Nurse Manager
  - 5 Theater Trauma Nurse Coordinator/Registrars (TNC)
  - 1 NCOIC
  - ***New CENTCOM JMD: 9 US TNCs & 5 NCOs***

One/Two NATO trauma nurse coordinators are trained for JTTS/JTTR support: current representative is from Canada. Data are not entered by physicians; there is no duplicate data entry into the medical record

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Volgograd
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KAZAKHSTAN
Lake Balkhash
Aral Sea
MONGOLIA
Ulaanbaatar
Almaty
Ürümqi
Caspian Sea
UZBEKISTAN
Bishkek
KYRGYZSTAN
Tbilisi
ARMENIA
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Line of Actual Control
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Rangoon
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YEMEN
Sanaa
Asmara
Bay of Bengal
Arabian Sea
Aden
Gulf of Aden
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Bangalore
Chennai (Madras)
ANDAMAN ISLANDS (INDIA)
Bangkok
DJIBOUTI
Djibouti
Berbera
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Laccadive Sea
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Province Boundary
Road
River
National Capital
Province Capital
City or Town
0 50 100 150 200 250 KM
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Termez
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Jorm
Pamir
Eshkashem
Mashhad
Dowlatabad
Kholm
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Gushgy
Qal'eh-ye Now
Morghab
Bamian
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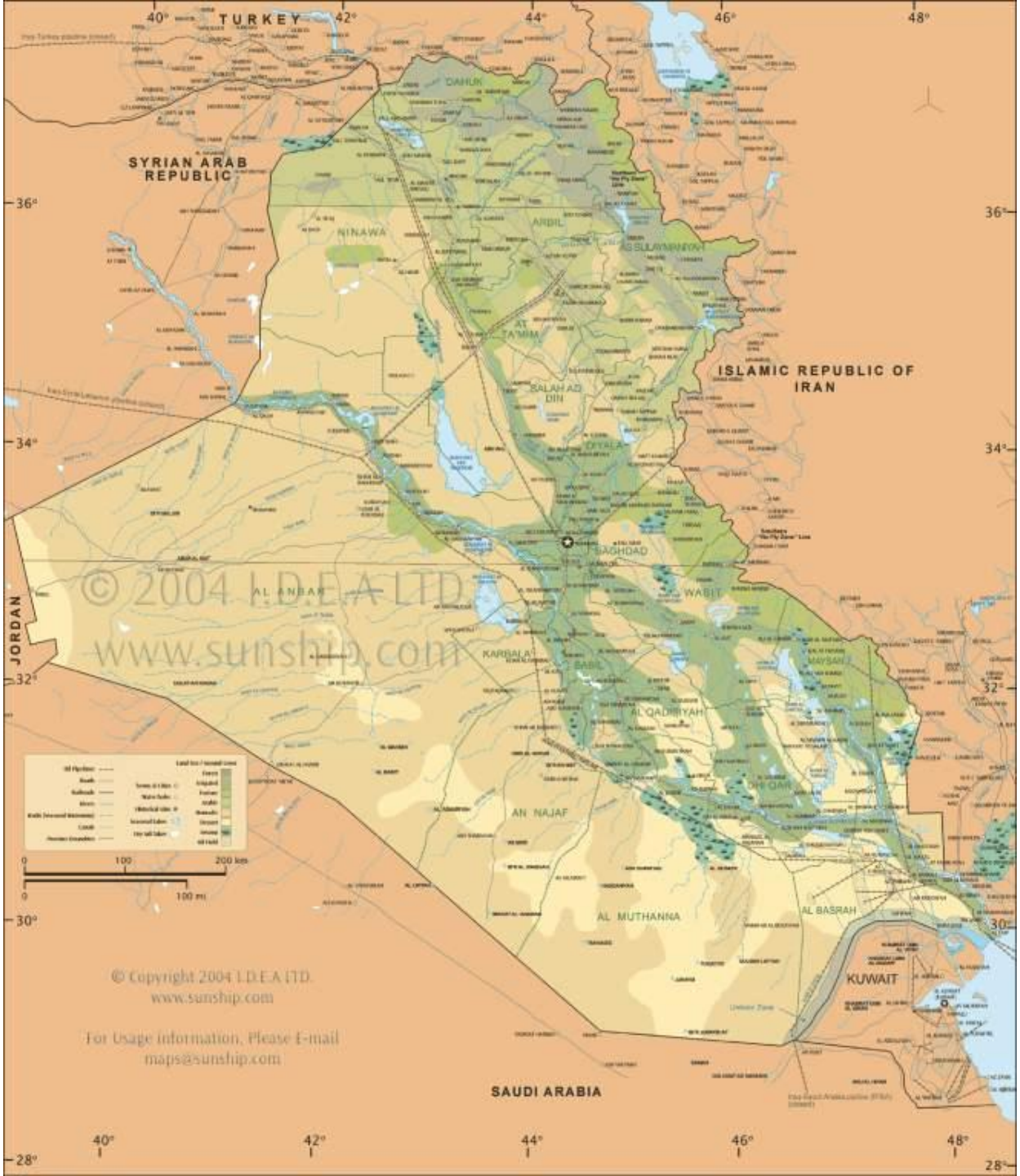
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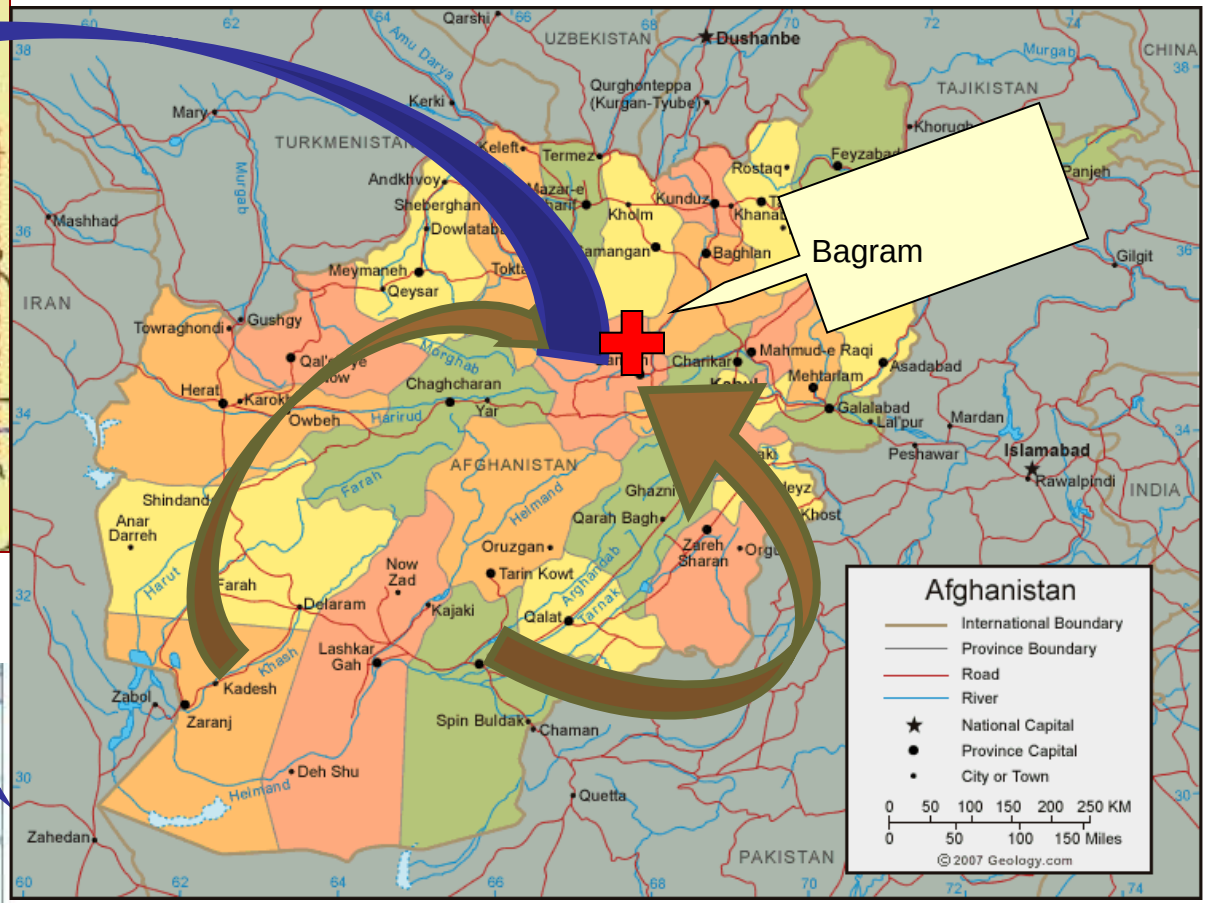
Enroute Patient Movement



Enroute Patient Movement

Current Route from Injury to Definitive Care

BAS
Level 1

CASEVAC
1 Hour

Forward Surgical Teams
Level 2

INTRA-THEATER AE
1-24 Hours

CSH, AFTH, EMF
Level 3

INTER-THEATER AE
24-72 Hours

Definitive Care
Level 4

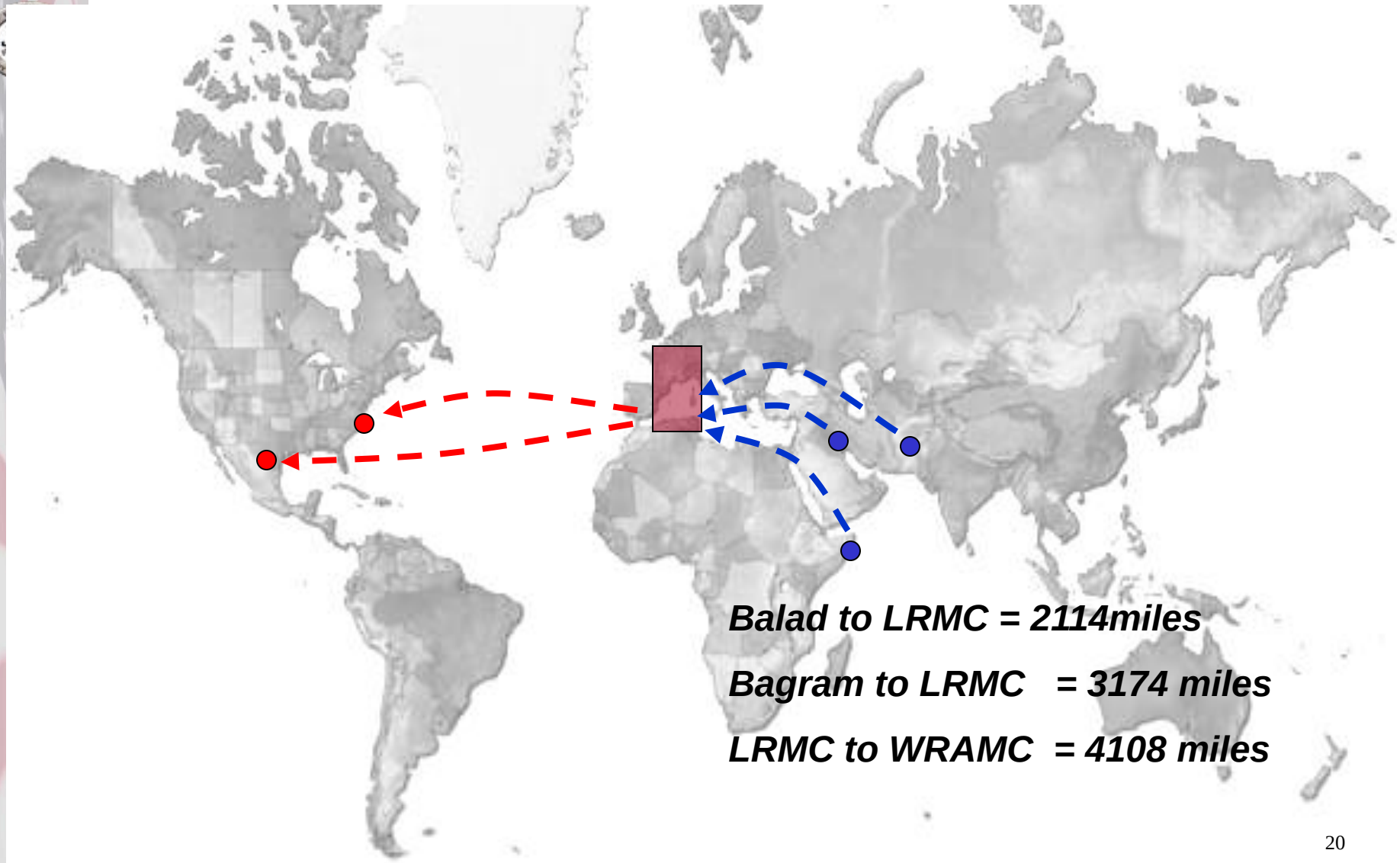
72 Hours Plus

CONUS
Level 5

Post Acute Care

VA

International Model



JTTS/JTTR Relationship

- The **JTTS** is an organized approach to providing improved trauma care across all Levels of Care to trauma patients
  - Battle Injuries and Non Battle Injuries

- **JTTR** is the backbone of the system
  - Data repository collecting and hosting DoD trauma related data
    - Admissions and deaths
    - Is an integral and integrated part of the System

JTTS Components

R4 -"Right Patient, Right Place, Right Time, Right Care"

Components Across the Continuum of Care

Performance Improvement
- ❖Patient Safety
- ❖Feedback Mechanism for Providers Throughout Continuum of Care
- ❖Loop Closure

Leadership & Communication
- ❖Trauma Director / Coordinators / Registrars
- ❖Intra-Theater
- ❖Inter-Theater
- ❖Recognized Lead Agent and Consulting Assets

Integrated Pre-Hospital, Levels 3-5
- ❖Integrated approach for MTFs and Divisional Medical Units
- ❖Coordinated Divisional Evacuation Standard Operating Procedures
- ❖Adopt Clinical Practice Guidelines
- ❖Communicate
- ❖Train

Education & Advocacy
- ❖ Linkage with Service Medical Education and Training Centers
- ❖Joint Combat Trauma Management Course (JCTMC)
- ❖Trauma Outcomes and Performance Improvement Course - Military (TOPIC-M)

Prevention
- ❖Linkage with Materiel Developers
- ❖Service Centers for Health Promotion and Preventive Medicine

Information Systems
- ❖Joint Theater Trauma Registry (JTTR)
  - ❖Data for PI and Analysis
  - ❖Data from Theater Medical Data Store (TMDS)
  - ❖Modules to Support Related Functional Disciplines
  - ❖DoD Trauma Registry - Longitudinal Trauma Registry
- ❖Provide Data and Information Needs for MTFs / Services / DoD

Supports Research
- ❖Provide Raw Data IAW Established MOAs and Protocols
- ❖Provided statistical information through approved protocols

Performance Improvement

Performance Improvement

- Data driven process
- Involved multidisciplinary staff
- Inclusive of entire continuum of care
- Evaluate system response
- Improve patient outcomes
- Ensure standardization of provider practices

Performance Improvement

- Trauma System Process Improvement
  - Pre-hospital Care and Triage
  - Timeliness of Care and Procedures
  - Review of Care
  - Appropriateness and Legibility of Documentation
  - Compliance / Development of Guidelines, Protocols and Pathways
  - Prevention

DATA COLLECTION!!!

JTTS Performance Improvement

- Each Level III (and Role 3)
  - Morbidity & Mortality conferences
  - Reviews done by Theater Trauma Coordinators
- Reviews at each facility (LRMC, WRAMC, BAMC, Bethesda)
- Weekly Patient Management Conferences
  - 0800 Eastern Time
- Monthly System-Wide Trauma conferences

Theater Performance Improvement Sample Indicators

- Last recorded temp pre-hospital
- First recorded temp at Level III
- Nurses TTR
- MD TTR
- Occult injury not found on initial history and physical
- Penetration of PPE
- DVT prevention
- Laparotomy for abdominal trauma >4hrs
- Craniotomy for head trauma >4hrs
- Initial treatment for open fracture or joint laceration >8hrs
- Unplanned return to OR within 24 hours of initial surgery
- Re-intubated within 24 hours of extubation

CPGs

POST-SPLENECTOMY VACCINATION

Original Release/Approval		30 Mar 2008	Note: This CPG requires an annual review.
Reviewed:	Dec 2008	Approved:	5 Jan 08
Supersedes:	Post Splenectomy Vaccination, 5 Nov 08		
☒ Minor Changes *(or)*	☐ ***Changes are substantial and require a thorough reading of this CPG*** *(or)*		
☐ Significant Changes	Added Appendix A: Includes 6-month review of use of the CPG in theater; includes additional clinical references.		

1. Goal. All post-splenectomy and functionally asplencic trauma patients in the CENTCOM AOR will receive appropriate and timely vaccination. All vaccinations will be documented in the longitudinal medical record and include date/time of physician order and date/time of administration by nursing personnel.

2. Background. Overwhelming, post-splenectomy sepsis (OPSS) is a rare but devastating complication with a case mortality rate in most studies approaching 50%.[1] OPSS represents a life-long risk, with the incidence in trauma patients estimated to be < 0.5%.[2] It is estimated that splenectomized individuals are up to 540 times more susceptible to lethal sepsis than the general population.[3] The majority of trauma surgeons provide some sort of post-splenectomy vaccination to their patients, although to date, there is no consensus on timing of initial vaccination, vaccination regimen, or future re-vaccination. In 2002, Shatz conducted a survey of trauma surgeons regarding their vaccination practices in post-splenectomy patients. Of 261 active surgeons, 99.2% immunized their splenectomized patients: 1) All but two provided the pneumococcal vaccine, 2) 62.8% advocated the meningococcal vaccination, 3) 72.4% added the Haemophilas influenzae vaccine, and 4) 56.7% gave all three vaccines. The timing of vaccination ranged from the immediate post-operative period to six weeks following surgery.[4]

Within the CENTCOM AOR, > 99% of splenic injuries are managed by total splenectomy. Since these patients are at risk for OPSS, there must be a standardized process to provide post-splenectomy vaccination, accurate documentation, and life-long tracking to identify outcomes (See Appendix A for additional clinical background).

3. Indications. All splenectomized patients and those deemed to be functionally asplenic (i.e., < 51% normal architecture and/or vascularization in the remaining splenic segment).

4. Dosing.

a. Streptococcus pneumoniae (23-valent polysaccharide): Single dose.

b. Haemophilus influenzae B. (Polysaccharide-protein conjugate) By patient age:

1) 2 - 6 months: Three doses + booster

2) 7 - 11 months: Two doses + booster

3) 12 - 14 months: One dose + booster

4) > 15 months: Single dose

c. Neisseria meningitidis (Quadrivalent): Single dose

Access Trauma CPGs

- http://www.usaisr.amedd.army.mil/cpgs.html

JTTS Home Page
(Google: USAISR)

Home | General Information | Joint Theater Trauma System | Tactical Combat Casualty Care | Burn Center | Combat Casualty Care Research | BRAC | Web Information

U.S. Army Institute of Surgical Research
Joint Theater Trauma System
Clinical Practice Guidelines

The Joint Theater Trauma System (JTTS) provides the following listed clinical practice guidelines for:
(Updated 25 November 2009)
Opposing viewpoints are encouraged in the interest of advancing medical treatment.
To submit an opposing viewpoint please e-mail: webmaster.usaisr@amedd.army.mil

1. CENTCOM JTTS CPG Development Approval Implementation and Monitoring Process
2. Acoustic Trauma and Hearing Loss
3. Trauma Airway Management
4. Blunt Abdominal Trauma
5. Burn Care
6. Compartment Syndrome and Fasciotomy
7. Damage Control Resuscitation at Level IIb/III Treatment Facilities
8. Prevention of Deep Venous Thrombosis
9. Emergency Resuscitative Thoracotomy
10. Use of Electronic Clinical Documentation in the CENTCOM AOR
11. Extremity Soft Tissue Wound/Amputation Management
12. Frozen and Deglycerolized Red Blood Cells
13. Fresh Whole Blood (FWB) Transfusion
14. Hypothermia Prevention, Monitoring and Management
15. Inhalation Injury and Toxic Industrial Chemical Exposure
16. Irrigation of War Wounds: Wound Debridement, Washout and Irrigation
17. Management of Mild Traumatic Brain Injury (mTBI)/Concussion in the Deployed Setting

Current CENTCOM JTTS CPGs

- CPG Index
- CENTCOM JTTS CPG Process – 30 April 10
- Acoustic Trauma and Hearing Loss - 16 Feb 10
- Amputation - 16 Feb 10
- Blunt Abdominal Trauma - 07 Nov 09
- Burn Care - 21 Nov 09
- Catastrophic Care - 16 Feb 10
- Cervical Spine Evaluation - 16 Feb 10
- Compartment Syndrome (CS) and the Role of Fasciotomy in Extremity War Wounds – 30 Apr 10

Current CENTCOM JTTS CPGs

- CPG nutrition - 16 Feb 10
- Damage Control Resuscitation at Level IIb/III Treatment Facilities – 13 Feb 10
- Emergent Resuscitative Thoracotomy – 06 May 10
- Fresh Whole Blood (FWB) Transfusion - 12 Jan 10
- Frozen and Deglycerolized Red Blood Cells (RBCs) - 12 Nov 09
- Hypothermia Prevention, Monitoring, and Management 12 Nov 09
- Infection Control - 16 Feb 10

Current CENTCOM JTTS CPGs

- Inhalation Injury and Toxic Industrial Chemical Exposure – 07 Nov 09
- Initial Care of Ocular and Adnexal Injuries - 16 Feb 10
- Intratheater Transfer and Transport of Level II and III Critical Care Trauma Patients – 19 Nov 09
- Management of Mild TBI (mTBI)/Concussion in the Deployed Setting – 21 Nov 09
- Management of Patients with Severe Head Trauma 13 Feb 10
- Management of War Wounds - 16 Feb 10

Current CENTCOM JTTS CPGs

- Pelvic Fracture Care 12 Nov 09
- Post-Splenectomy Vaccination – 05 Jan 10
- Prevention of Deep Venous Thrombosis (DVT) – 21 Nov 09
- Trauma Airway Management – 26 Nov 09
- Urologic Trauma Management – 07 Nov 09
- Use of Electronic Clinical Documentation in the CENTCOM AOR – 07 Nov 09
- Use of Trauma Flow Sheets - 01 Dec 09
- VAP - 16 Feb 10
- Vascular Injury – 07 Nov 09

CPG “Authority”

- Approved by CENTCOM JTTS Director, JTS Director and Deputy Director and CENTCOM SG

What is the JTTR?

- It is **NOT** the medical record
- It is **NOT** a research database, although it supports it
- It is **NOT** a patient tracking tool
- A trauma registry is a compilation of *identified* information taken from the medical record, expert clinical inference, scoring and coding schematics, probability determination and ***performance improvement data*** requiring human intervention

JTTR

- Largest combat Injury database in existence
- All services injury data derived from level IIb, III, IV and V medical charts
  - Scoring of Injuries (AIS, ISS, MISS)
  - Diagnosis and Procedures
  - Outcomes
- Currently represents >24,000 US trauma patients, >53,000 total patients, >90,000 total patient-records

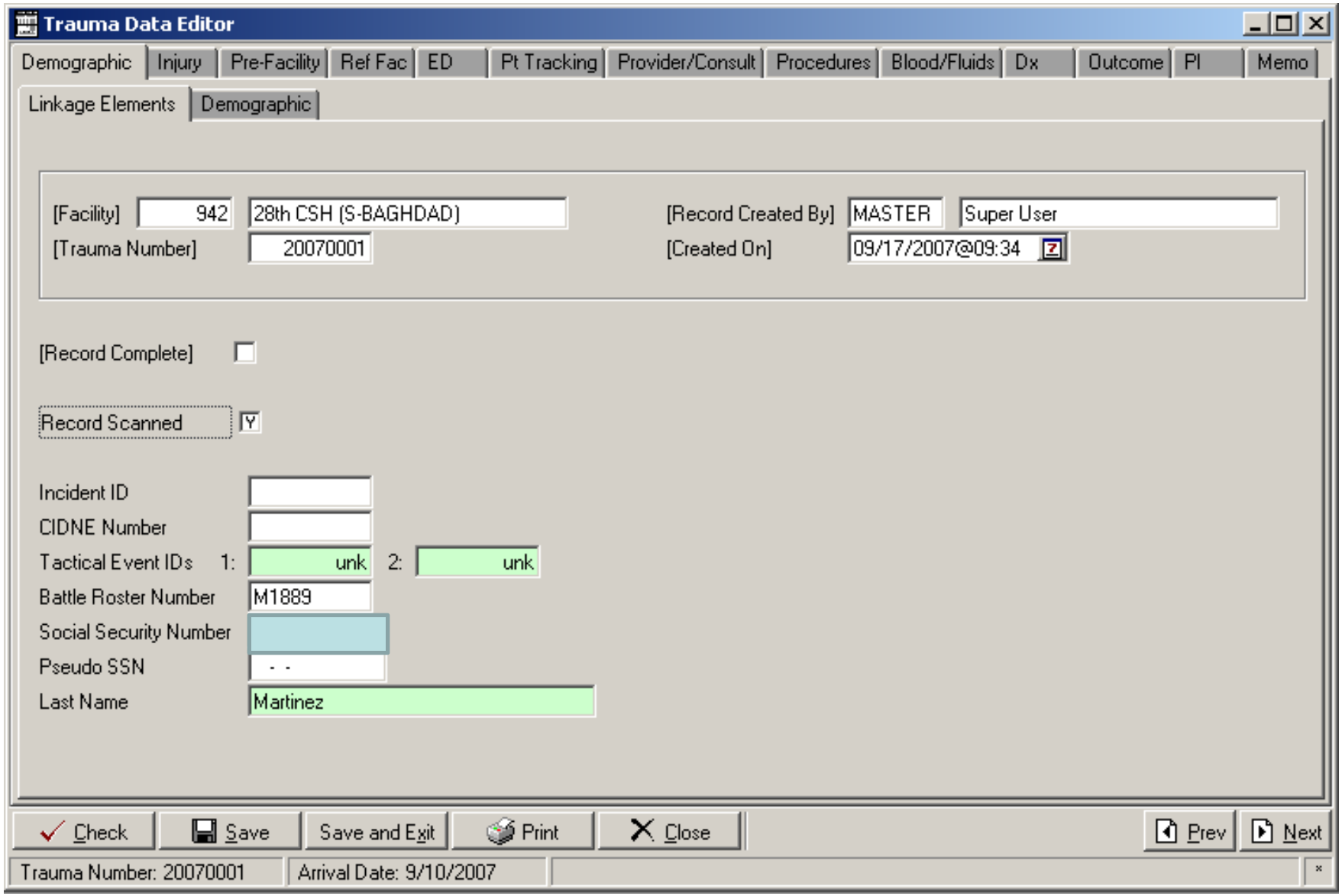
JTTR

- Comprehensive initial database
  - Demographic
  - Mechanism
  - Anatomic
  - Physiologic
  - Acute outcomes
- Increased commitment tracked II/III through level V
  - Documentation / capture prior Level II needs improvement

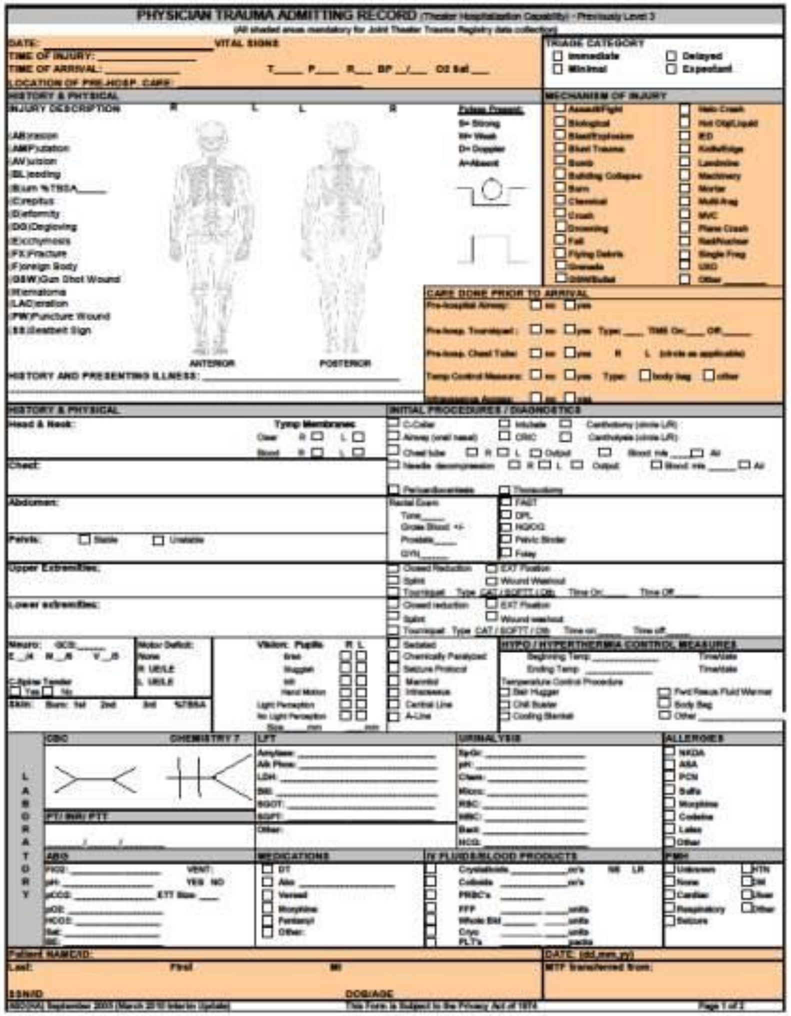
Why are Data Important?

- Data improve practice
- Data drive doctrine and policy

Key Data Elements

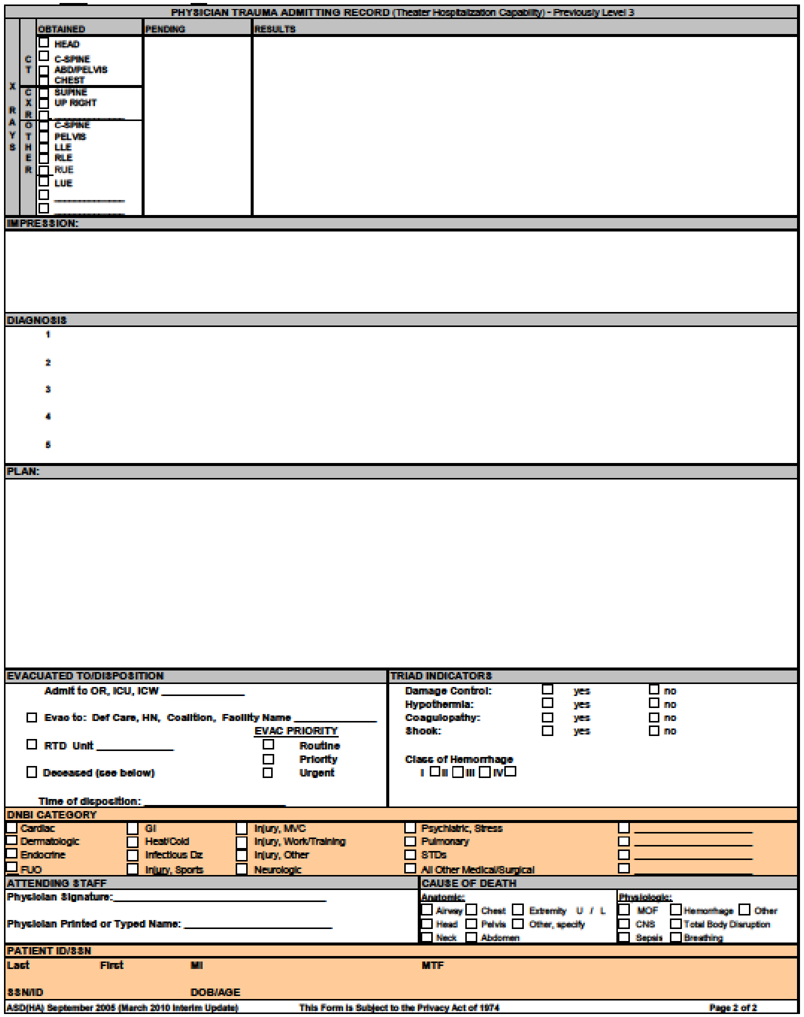


Where Does JTTR Data Come From?



PHYSICIAN TRAUMA ADMITTING RECORD (Theater Hospitalization Capability) - Previously Level 3

DATE: VITAL SIGNS
TIME OF INJURY:
TIME OF ARRIVAL: T___ P___ R___ BP __/__ O2 Sat __
LOCATION OF PRE-HOSP. CARE:
TRIAGE CATEGORY
HISTORY & PHYSICAL
INJURY DESCRIPTION
MECHANISM OF INJURY
CARE DONE PRIOR TO ARRIVAL
HISTORY AND PRESENTING ILLNESS:
INITIAL PROCEDURES / DIAGNOSTICS
Head & Neck:
Chest:
Abdomen:
Pelvis:
Upper Extremities:
Lower extremities:
HYPO / HYPERTHERMIA CONTROL MEASURES
CBC CHEMISTRY 7 LFT URINALYSIS ALLERGIES
ABG MEDICATIONS IV FLUIDS/BLOOD PRODUCTS PMH
Patient NAME/ID:
Last: First MI
SSN/ID DOB/AGE
This Form is Subject to the Privacy Act of 1974 Page 1 of 2



PHYSICIAN TRAUMA ADMITTING RECORD (Theater Hospitalization Capability) - Previously Level 3

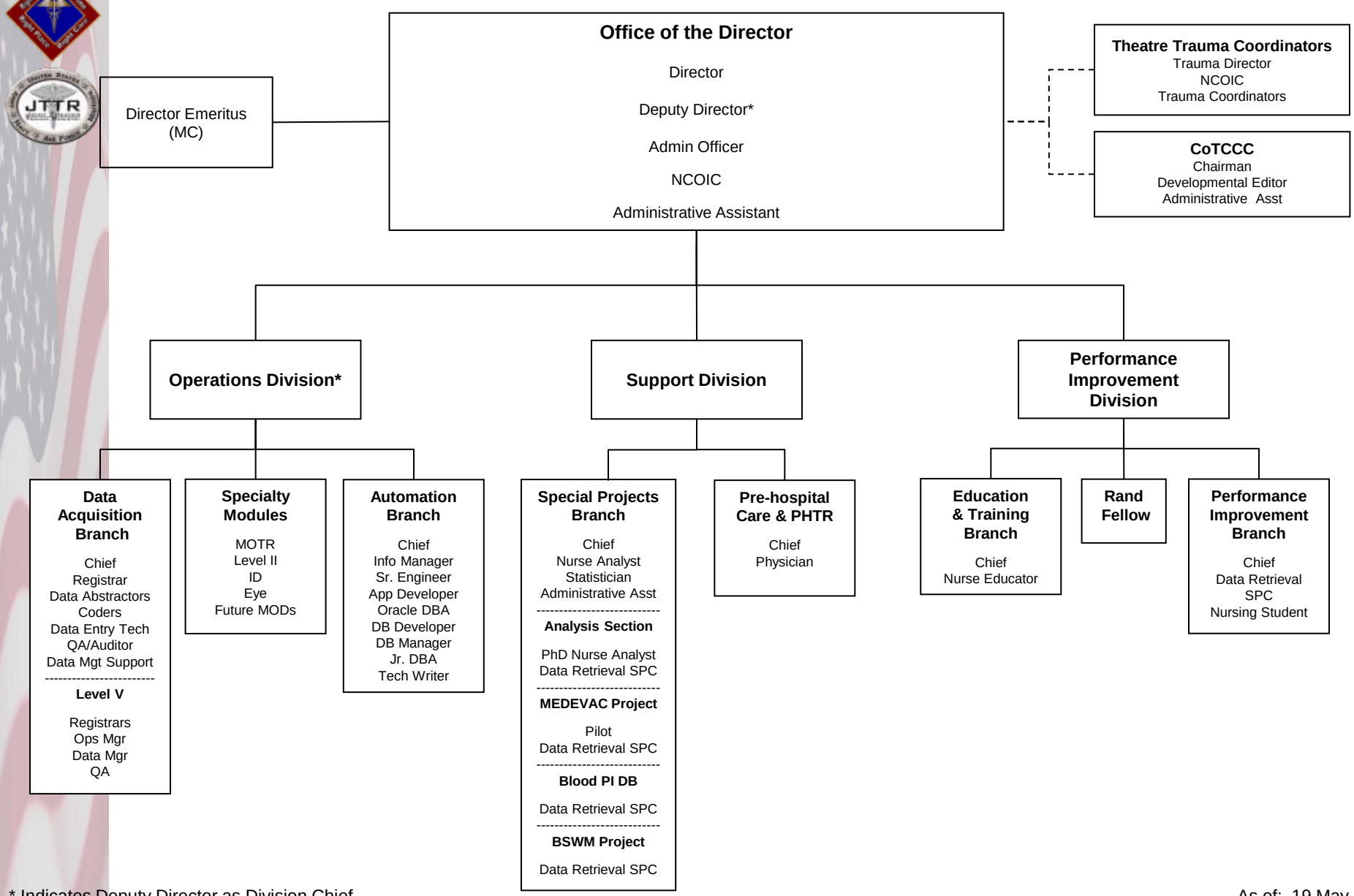
OBTAINED PENDING RESULTS
X-RAYS: CT: HEAD, C-SPINE, ABD/PELVIS, CHEST; CXR: SUPINE, UP RIGHT; OTHER: C-SPINE, PELVIS, LLE, RLE, RUE, LUE
IMPRESSION:
DIAGNOSIS
1
2
3
4
5
PLAN:
EVACUATED TO/DISPOSITION
Admit to OR, ICU, ICW __________
Evac to: Def Care, HN, Coalition, Facility Name __________
EVAC PRIORITY
RTD Unit __________ Routine
Priority
Deceased (see below) Urgent
Time of disposition: __________
TRIAD INDICATORS
Damage Control: yes no
Hypothermia: yes no
Coagulopathy: yes no
Shock: yes no
Class of Hemorrhage I II III IV
DNBI CATEGORY
Cardiac, Dermatologic, Endocrine, FUO, GI, Heat/Cold, Infectious Dz, Injury, Sports, Injury, MVC, Injury, Work/Training, Injury, Other, Neurologic, Psychiatric, Stress, Pulmonary, STDs, All Other Medical/Surgical
ATTENDING STAFF
Physician Signature: __________
Physician Printed or Typed Name: __________
CAUSE OF DEATH
Anatomic: Airway, Chest, Extremity U / L, Head, Pelvis, Other, specify, Neck, Abdomen
Physiologic: MOF, Hemorrhage, Other, CNS, Total Body Disruption, Sepsis, Breathing
PATIENT ID/SSN
Last First MI MTF
SSN/ID DOB/AGE
ASD(HA) September 2005 (March 2010 Interim Update) This Form is Subject to the Privacy Act of 1974 Page 2 of 2

From Where Do JTTR Data Come?

TC2 Progress Note
Author: XXXXX, XXXXX
BAGRAM/CAMP LACY(7459)
OP NOTE
pre/post op dx: penetrating trans-abdominal/trans-spinal injury
procedure: re-laparotomy, splenectomy, re-resection of distal transverse colon, temporary abdominal closure
surgeon: xxxxxx/zzzz
GETA
findings: moderate peri-splenic hematoma tracking along the gastro-splenic ligament and up around the GE junction with some active extravasation. Splenectomy performed. Pancreatic tail in close proximity to the splenic hilum so blake closed suction drain placed in the LUQ.
Distal aspect of the previously resected transverse colon appeared dusky so an additional 2-3 cm were resected. The previous suture repair of the sigmoid colon appeared healthy. The L renal fossa and injured psoas muscles were oozing minimally--thrombin soaked gelfoam placed in the wound bed after irrigating with warm saline. R inferior renal pole floating but no expanding R perinephric hematoma seen so Gerota's fascia left intact. Due to previously identified collecting system disruption, closed suction drain placed in the vicinity of the R kidney. No additional injuries were identified the abdomen was irrigated with 6L warm saline and then a temporary abdominal closure was fashioned. He was transported back to the ICU intubated on the same drips as pre-op (neo, low dose propofol, fentanyl).
Plan: monitor labs and hemodynamics--if stable, plan for evacuation via next CCATT mission

The Future

Joint Theater Trauma System Directorate



* Indicates Deputy Director as Division Chief

As of: 19 May 2010

The Future

- Military “White Book”
- COCOM site visits
- Medical Director Fellowship
- Program Manager Fellowship
- TNC Fellowship
- Tri-Service Military manning: Need Navy

Recommendations

- **Establish the JTTS as a program of record with the Army as Executive Agent and provide long-term funding and spaces to the Army that are sufficient to sustain JTTS operations both during and between periods of conflict. The ongoing presence of the JTTS and JTTR will ensure that the Department does not experience a recurrence of the deficiencies in theater trauma care identified in Operations Desert Shield and Desert Storm.**

Recommendations

- **Establish the permanent location of the JTTS and JTTR as a part of the US Army Institute of Surgical Research at the Battlefield Health and Trauma Research Institute at Fort Sam Houston, Texas**
- **The Board further recommends that this issue be reviewed after 18 months to evaluate the action taken on the above recommendations.**

Questions????