



# Joint Theater Trauma System: Strategic Overview

MHS Conference  
January 2011  
Brian Eastridge, COL, MC, USA



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# JTTS Vision

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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

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- Improve organization and delivery of trauma care
- Improve communication among clinicians in the evacuation chain to ensure continuity of care and access to data
- Populate the JTTR to evaluate care provided, document outcomes, and facilitate conduct of formal research

# JTTS Mission

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- Evaluate and recommend new equipment or medical supplies for use in theater to improve efficiency, reduce cost, improve outcomes
- 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

# Data

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- Data drives doctrine and policy
- Data improves clinical patient care
- Data creates new knowledge

# Joint Theater Trauma Registry (JTTR)

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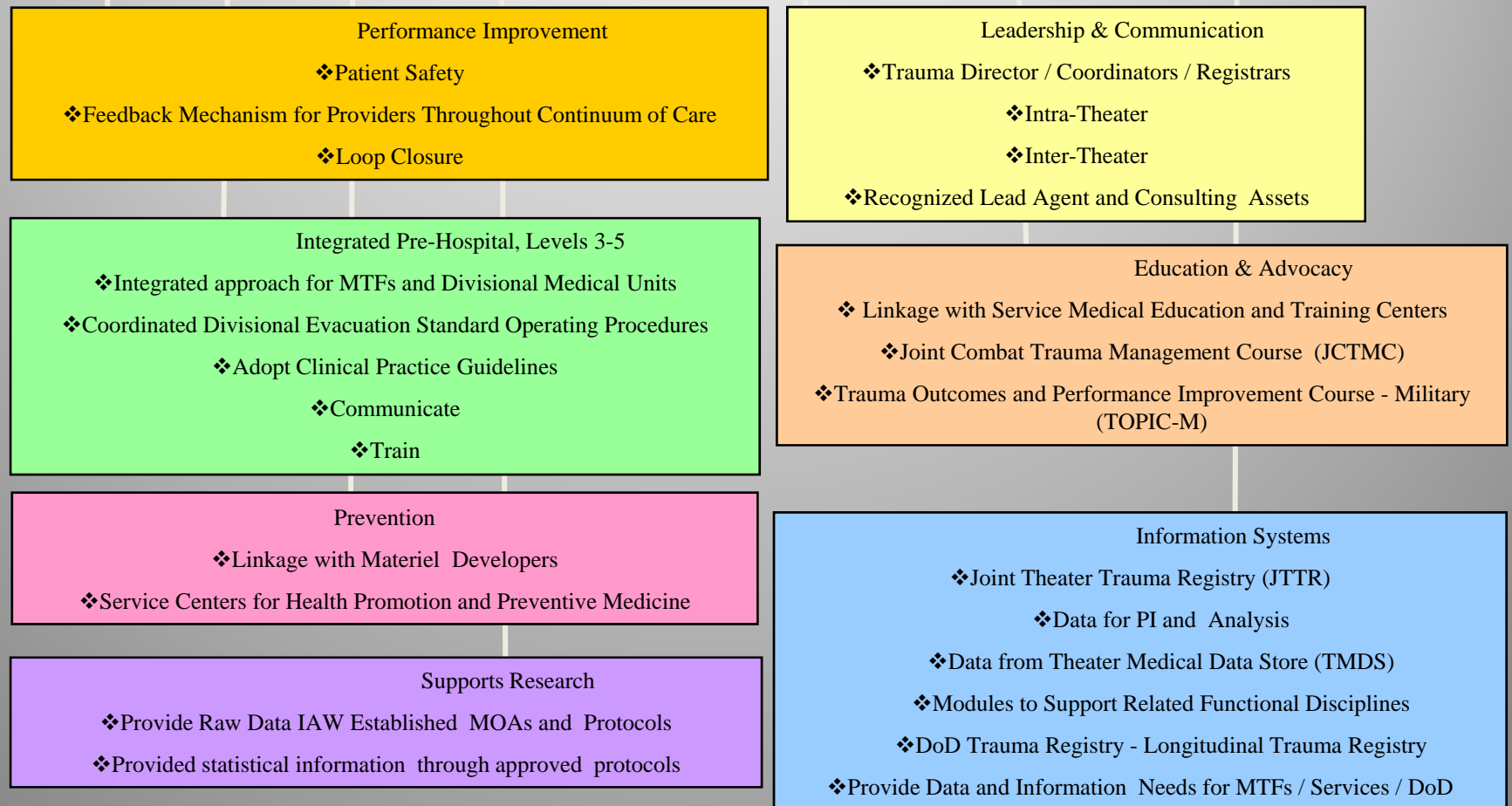
- Largest combat Injury database in existence
- All services injury data derived from level IIb, III, IV and V medical charts
  - Scoring of Injuries
  - Diagnosis and Procedures
  - Outcomes
- 23,450 US military injury patients



# JTTS Components

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

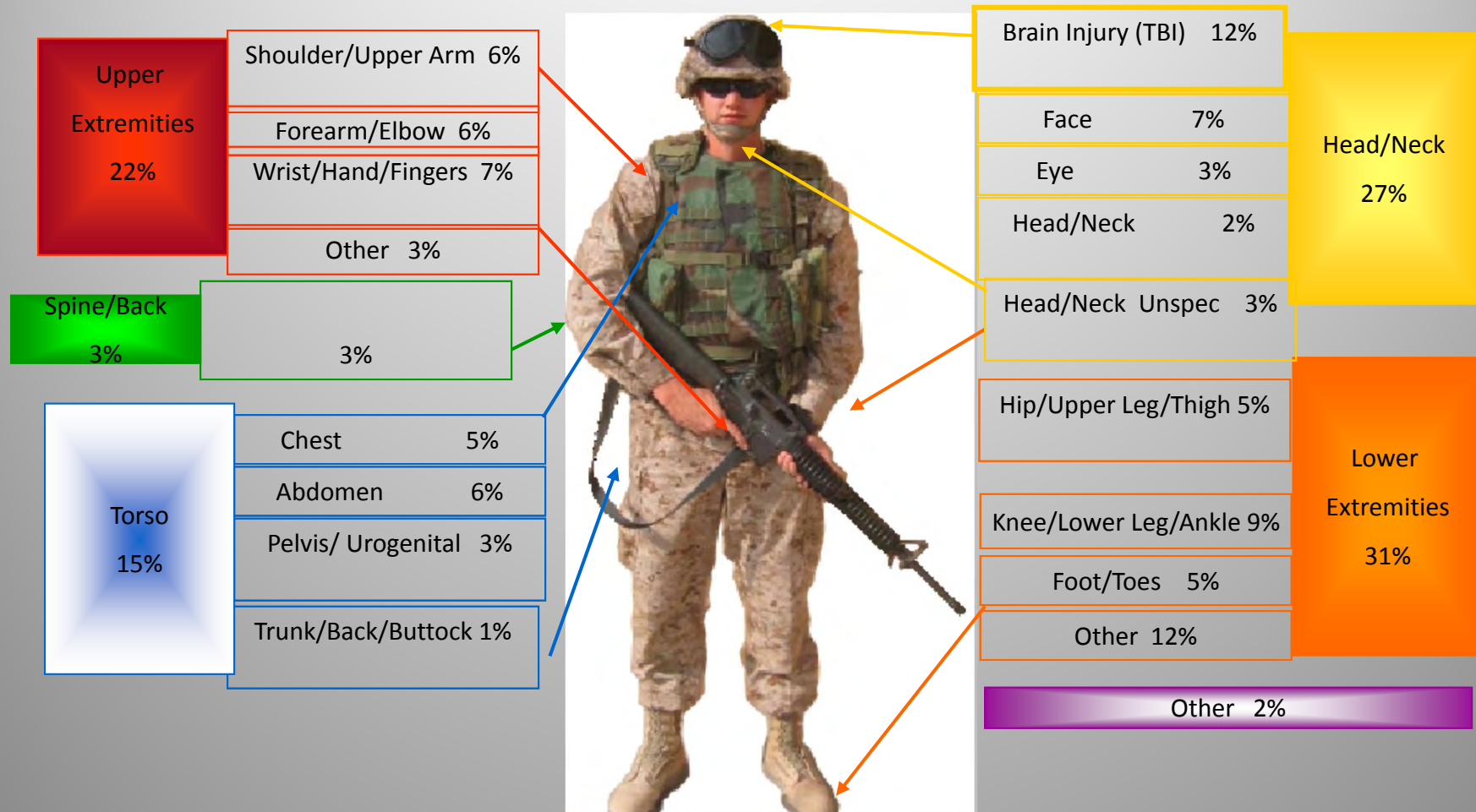
## *Components Across the Continuum of Care*





***Leadership Visibility***  
***Medical Decision Making***  
Data drives doctrine and policy

# Battle Injuries by Body Region

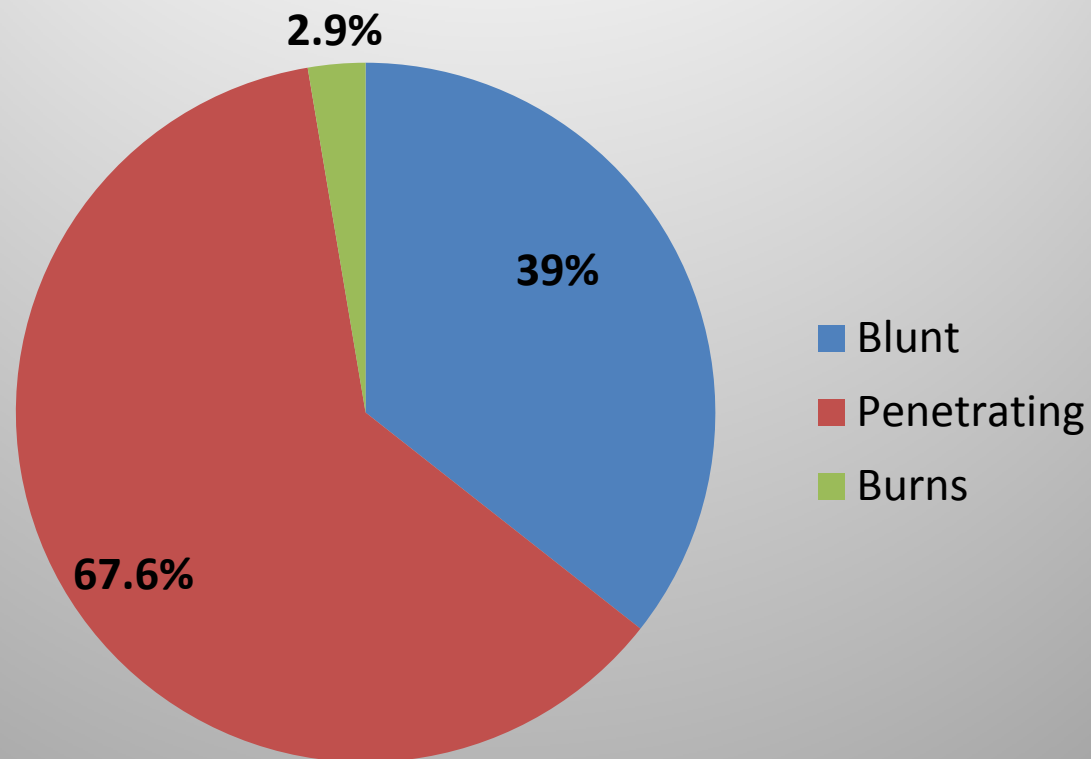


Source: JTTR September 2001 – September 2010

# OEF

## Dominant Mechanism of Injury

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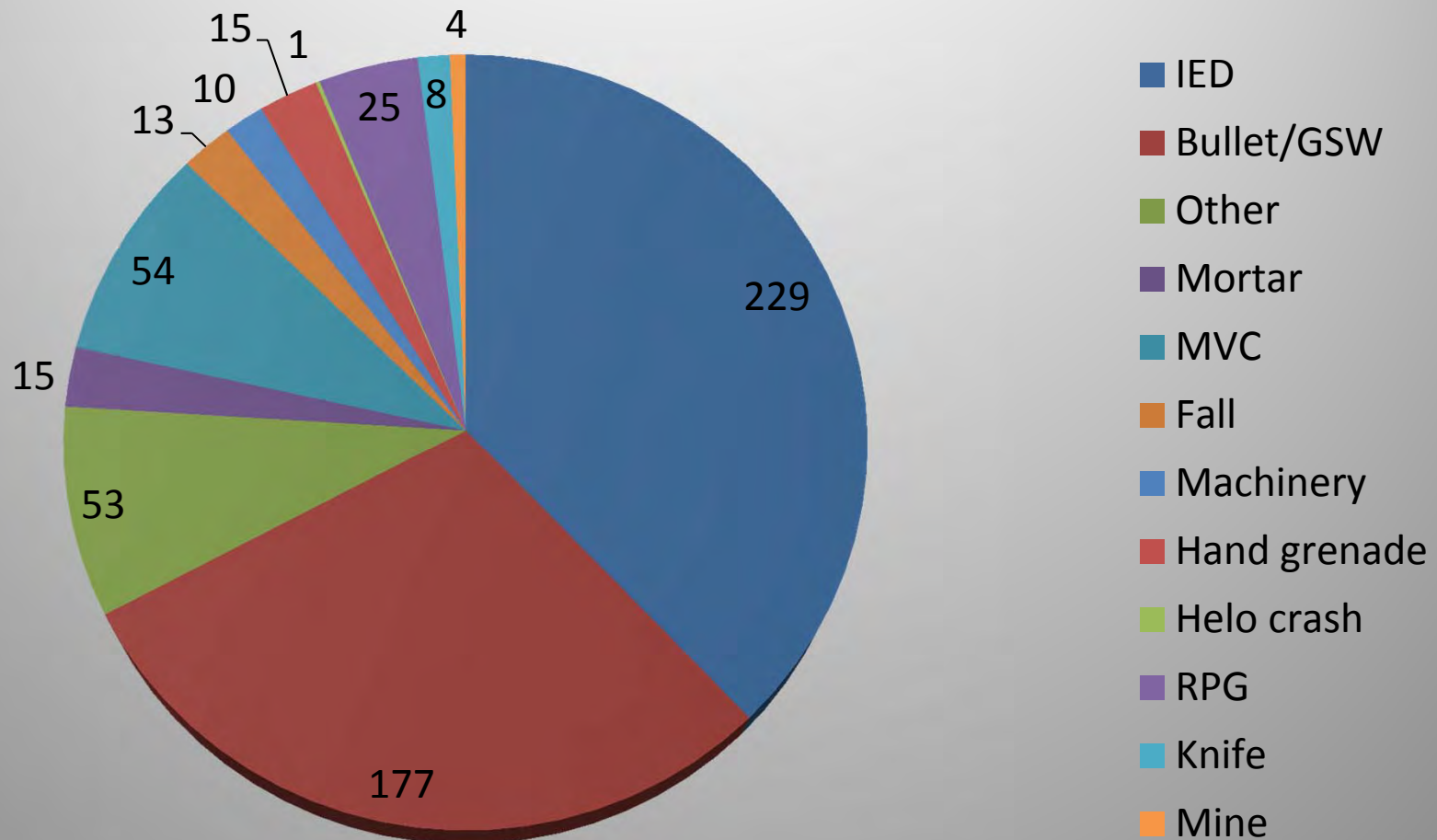
N=7254

*Dec 09 – Nov 10*

# Cause of Injury

## November 2010

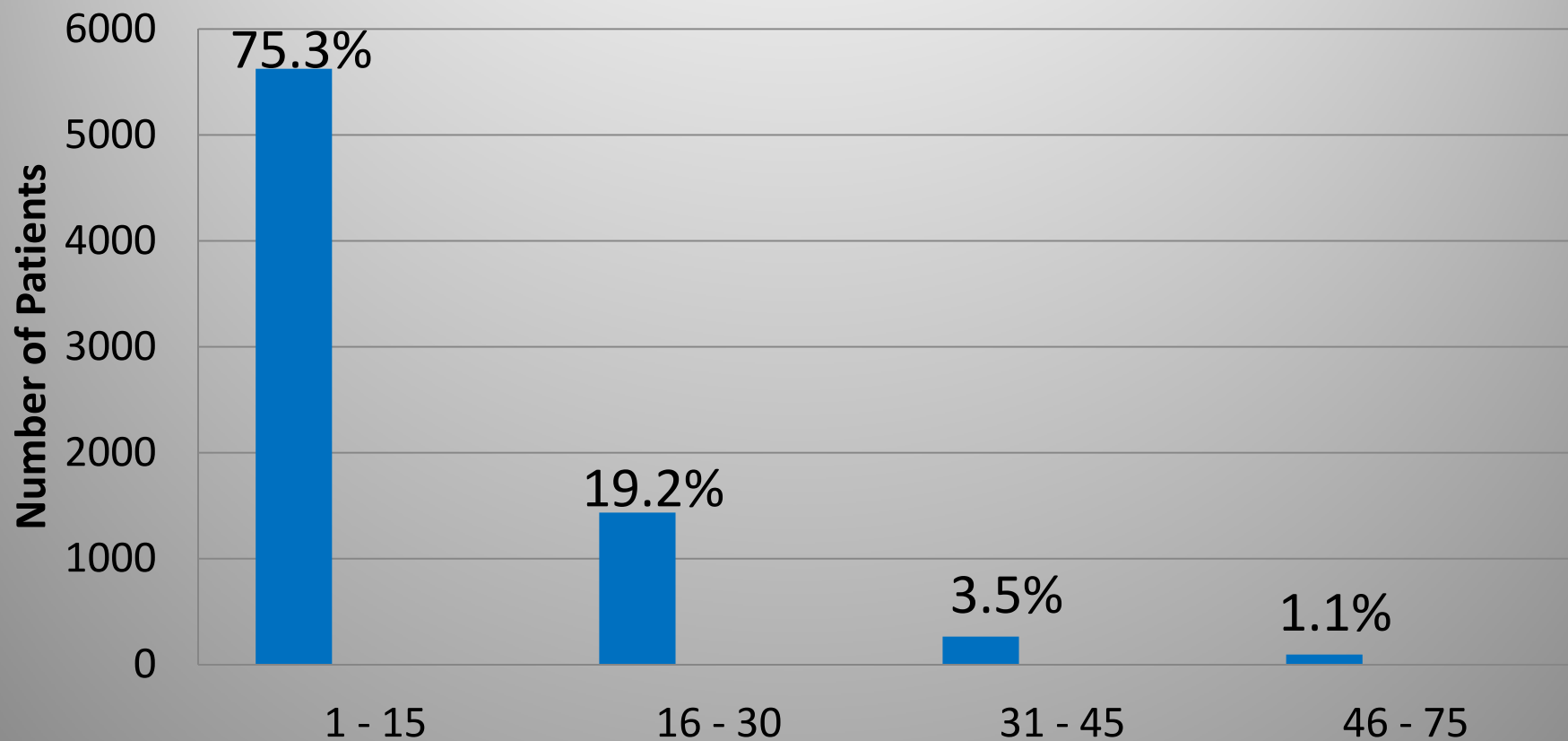
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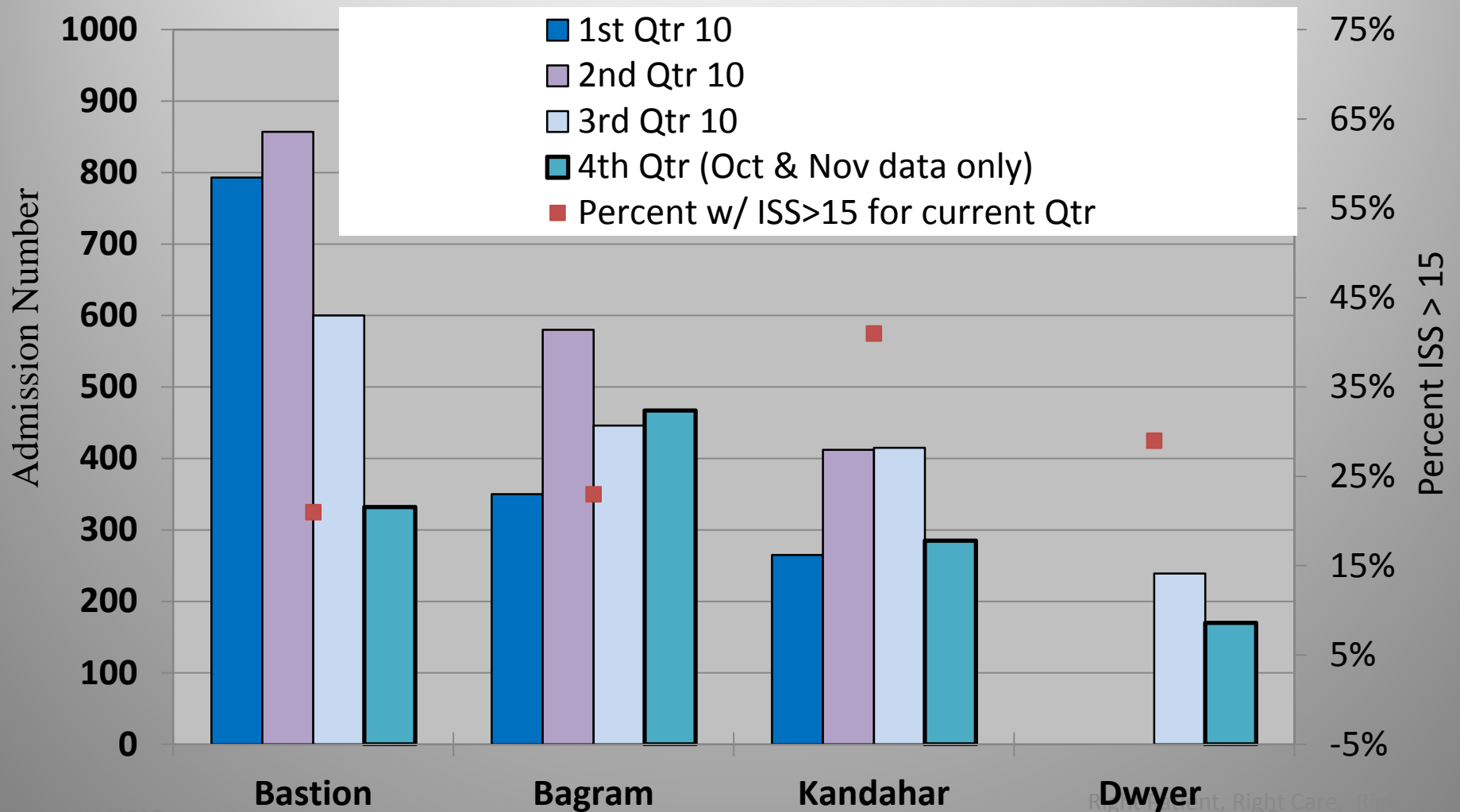
*\*Includes both battle and non-battle injury*

# Injury Severity Score

ISS Score Break-down: Dec 09 – Nov 10

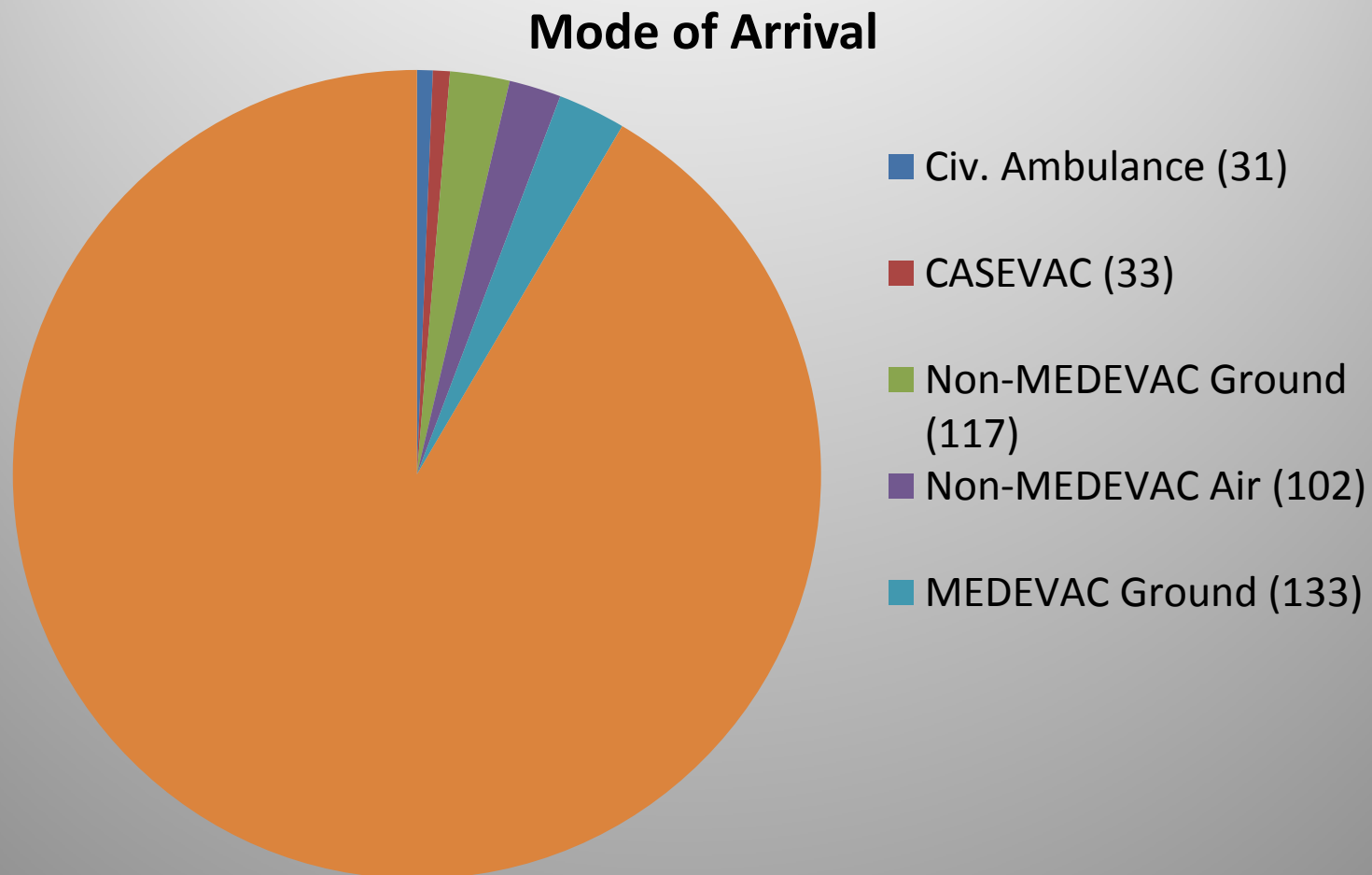


# Admissions, Severity of Injury



# OEF Mode of Arrival

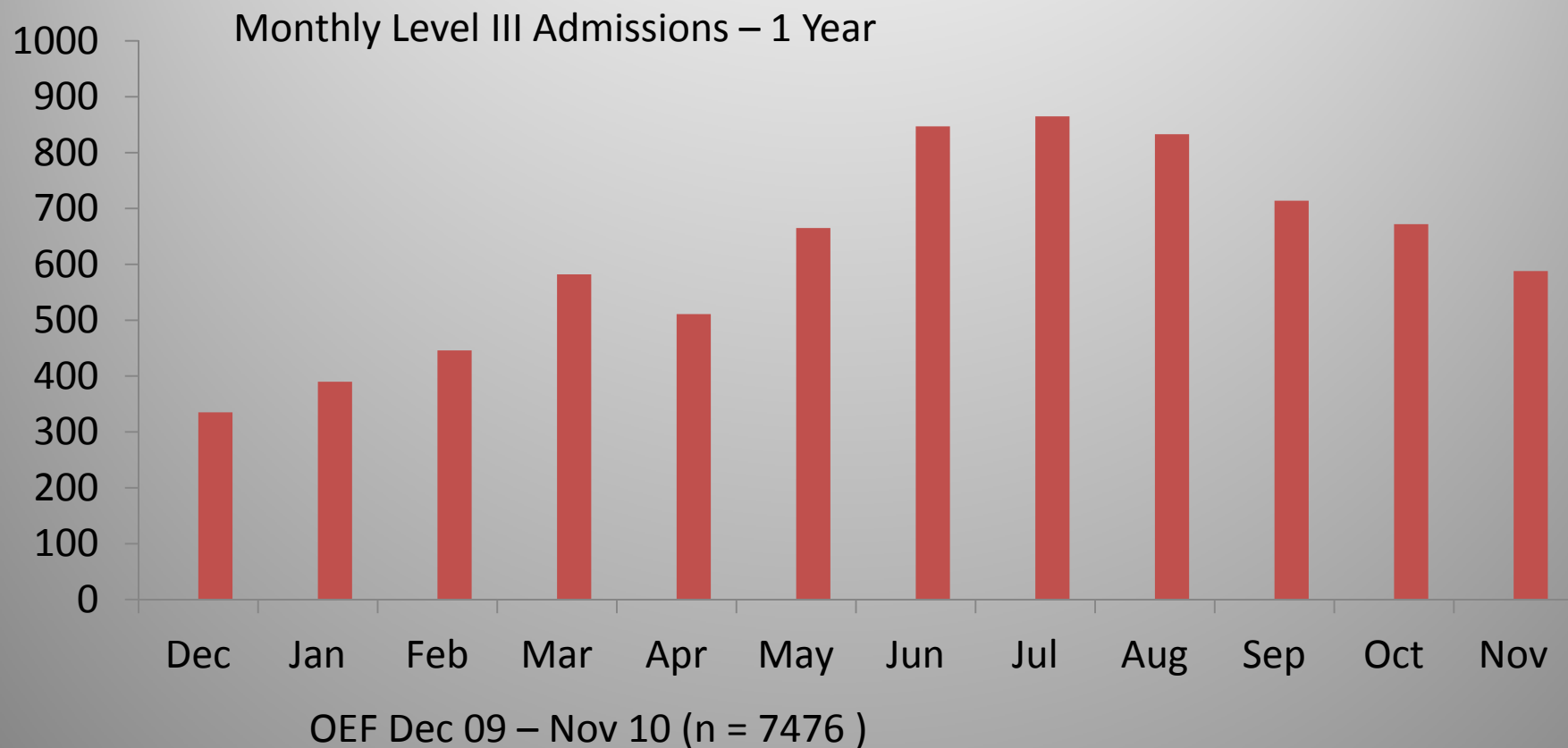
## Dec 09 – Nov 10





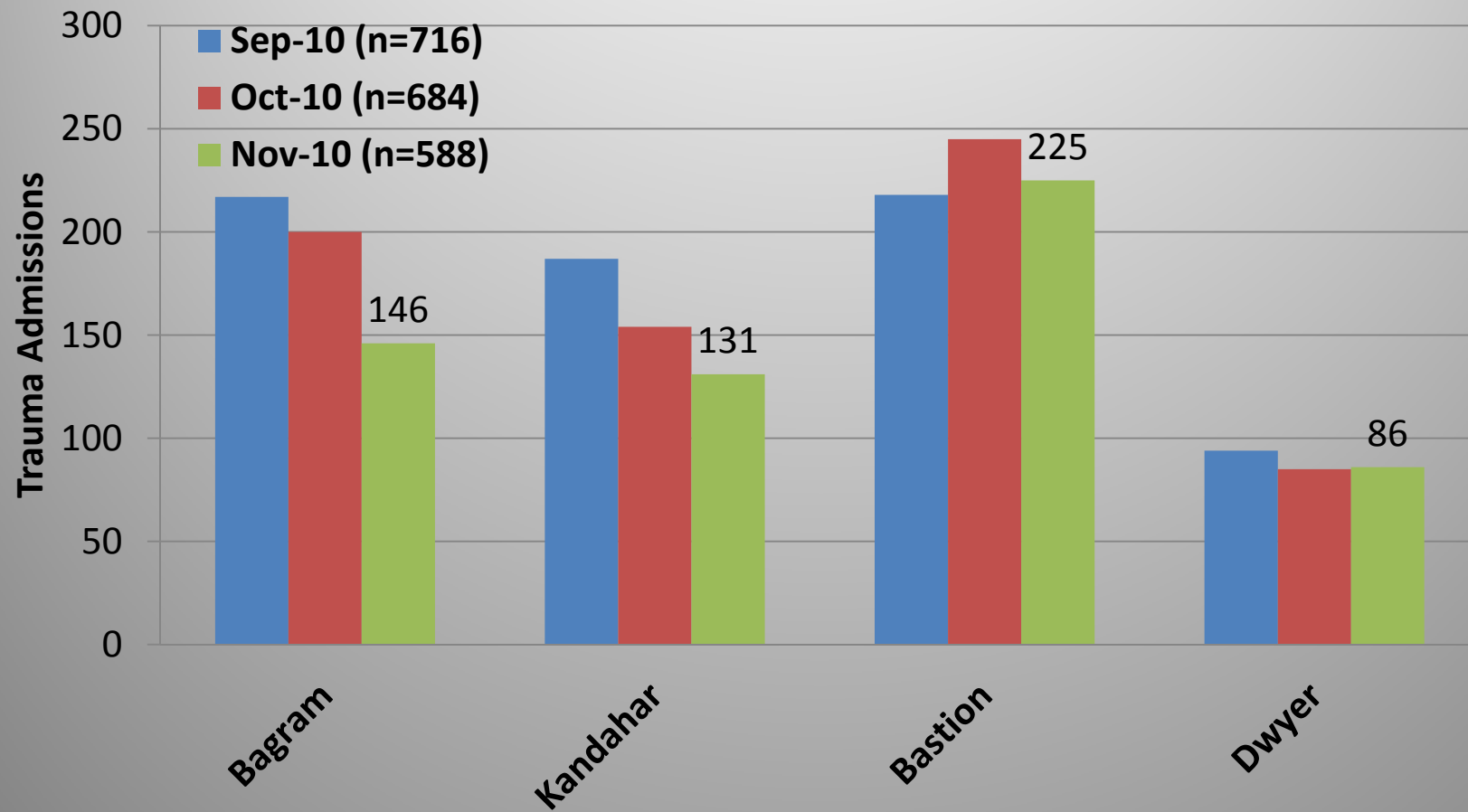
# OEF

## Monthly Admissions



# Monthly Trauma Admissions by Facility

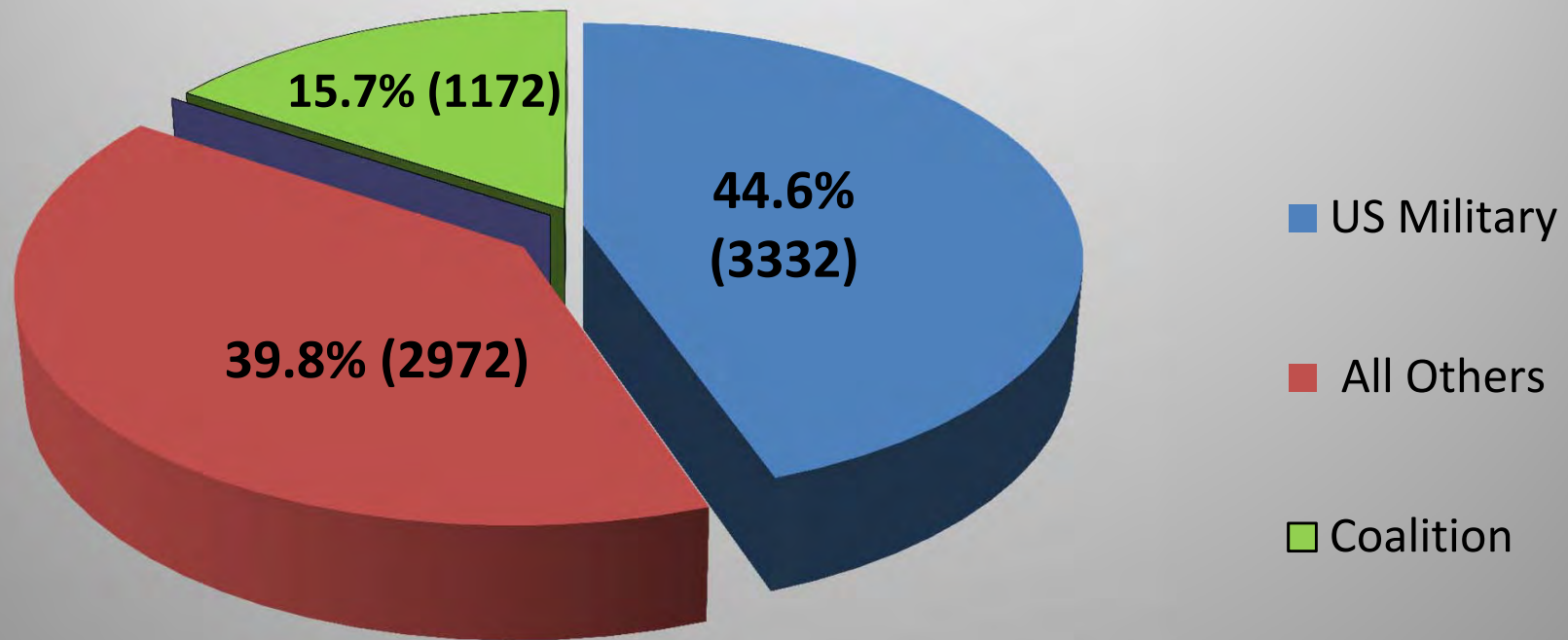
## Admissions: 3-Month Snap Shot



# OEF

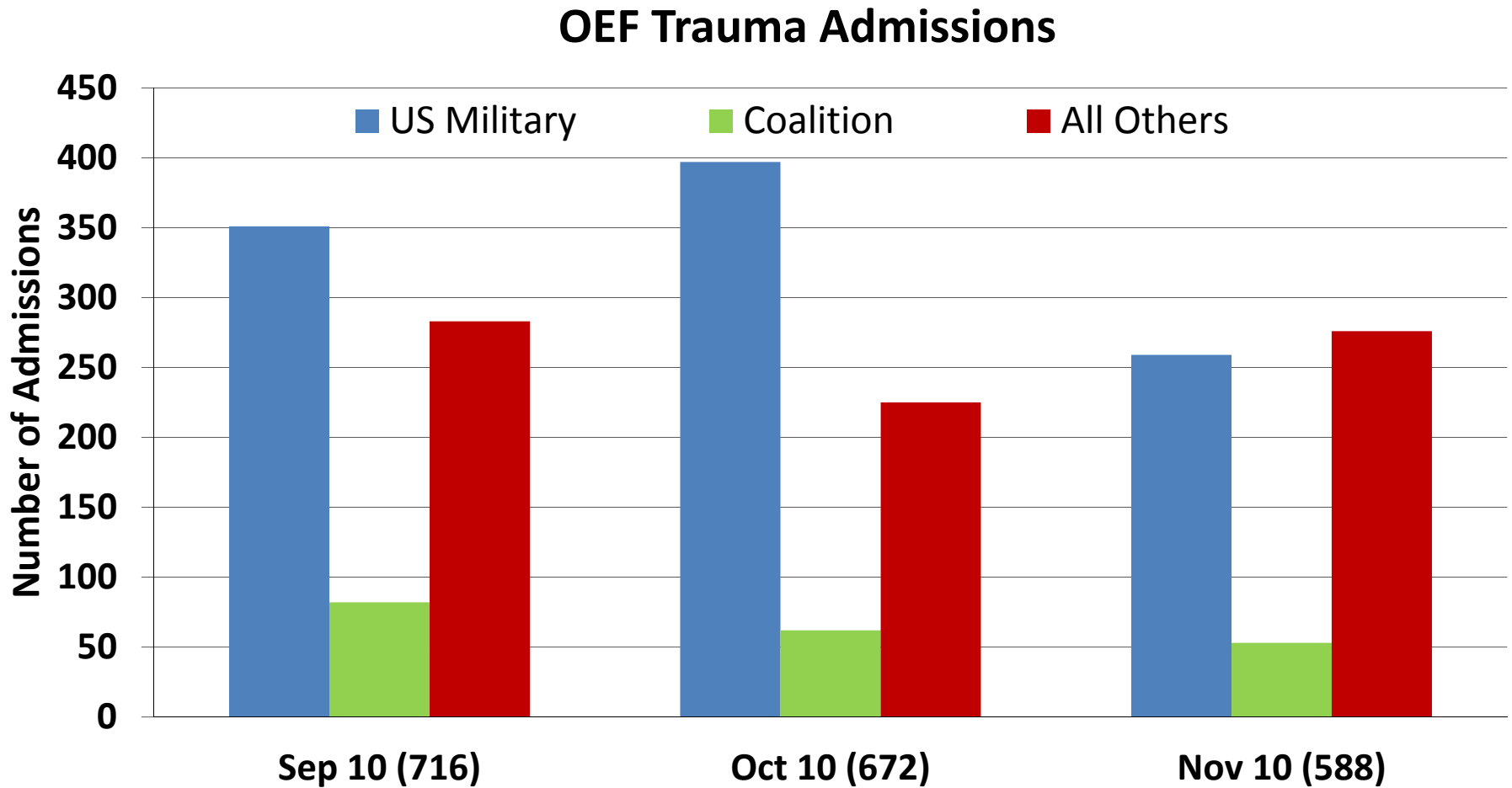
## US Military, Coalition, All Others

Total Admissions (n=7476)



Rolling 12 months: Dec 09 – Nov 10

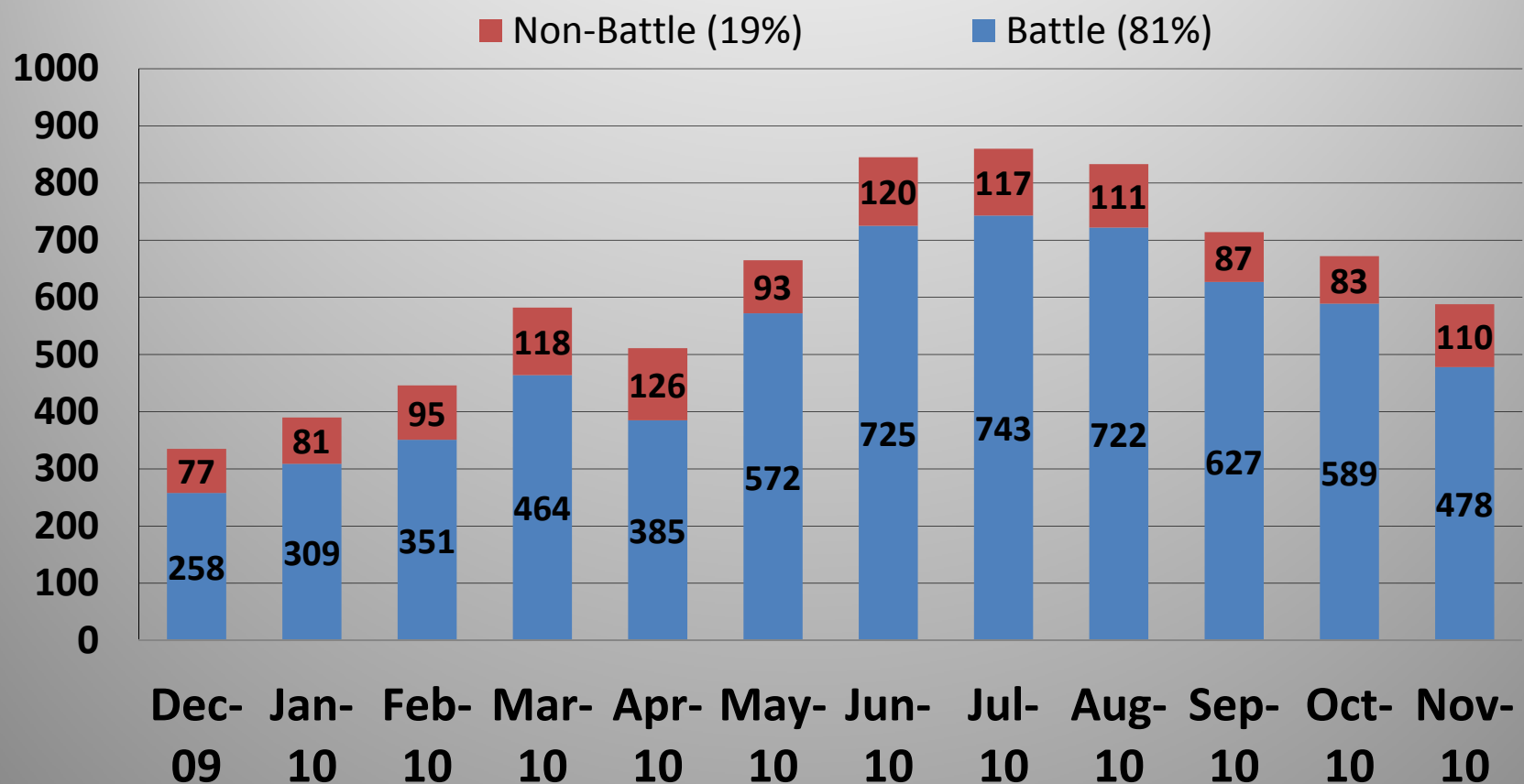
# OEF Admissions



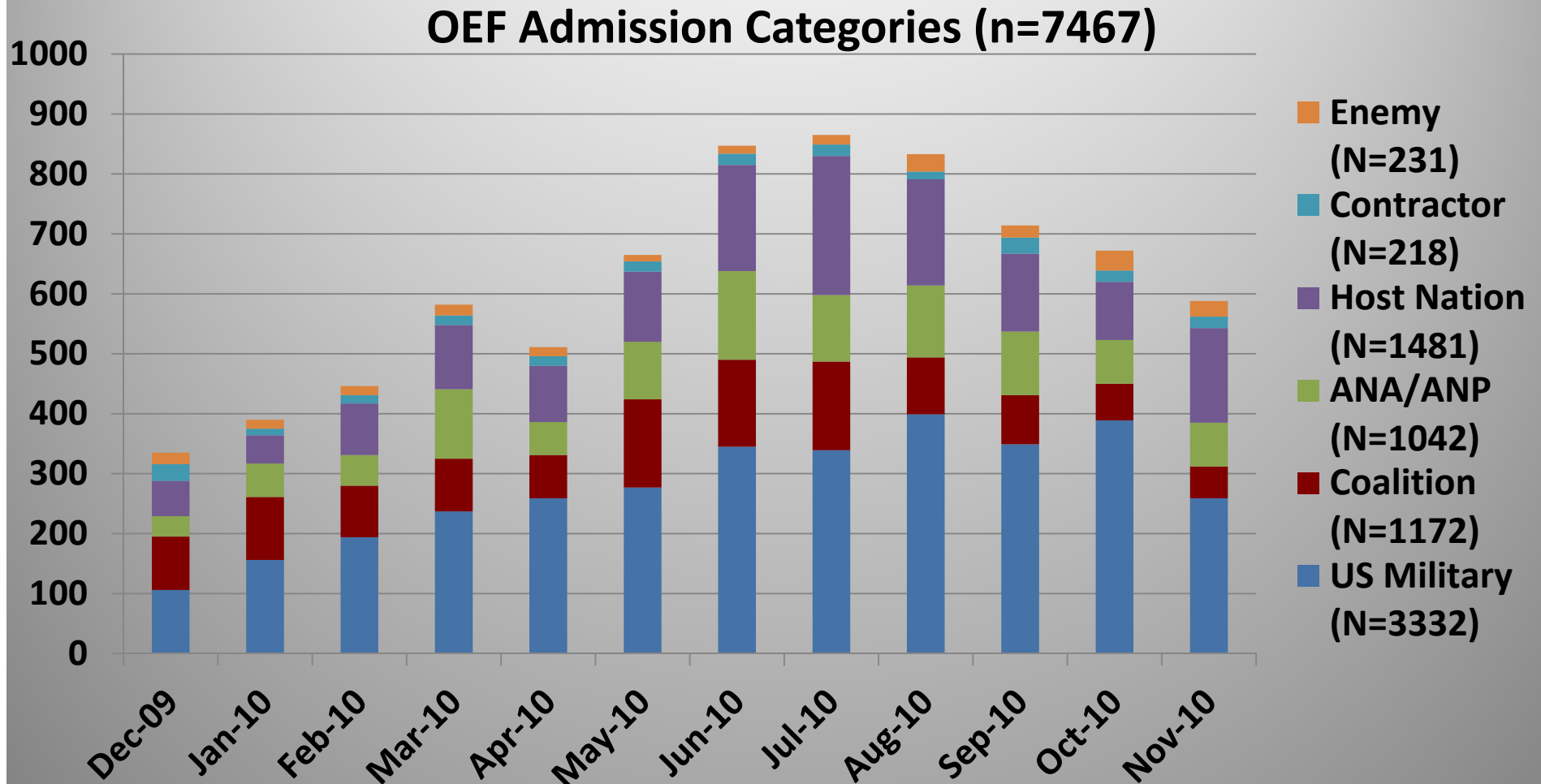
**3 – Month Snap Shot**

# OEF Total Trauma Admissions Battle vs. Non-Battle Injury

## OEF Battle vs. Non-Battle Injury – 1 Year



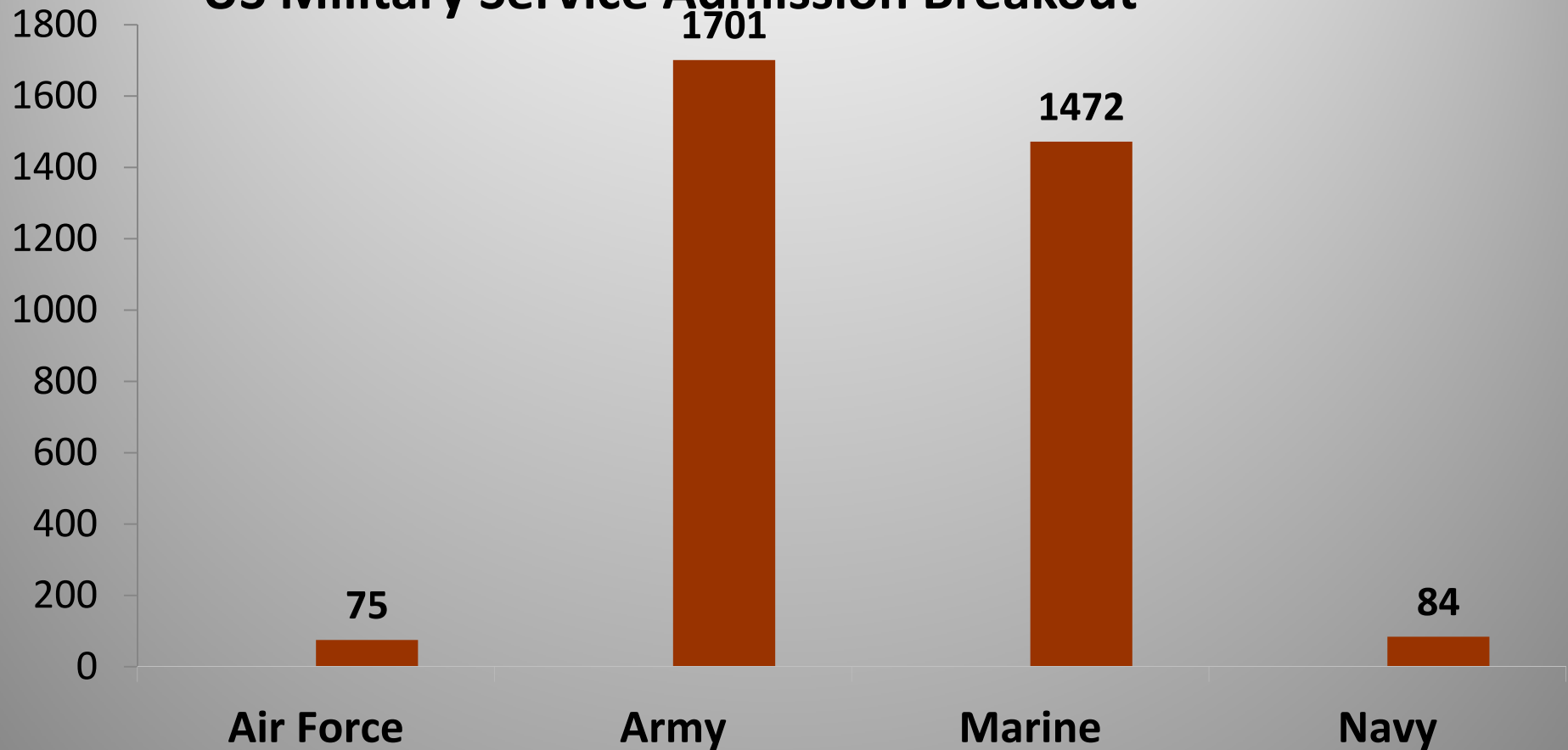
# OEF Admission Category Break-Down



# OEF

## US Military Injured

### US Military Service Admission Breakout



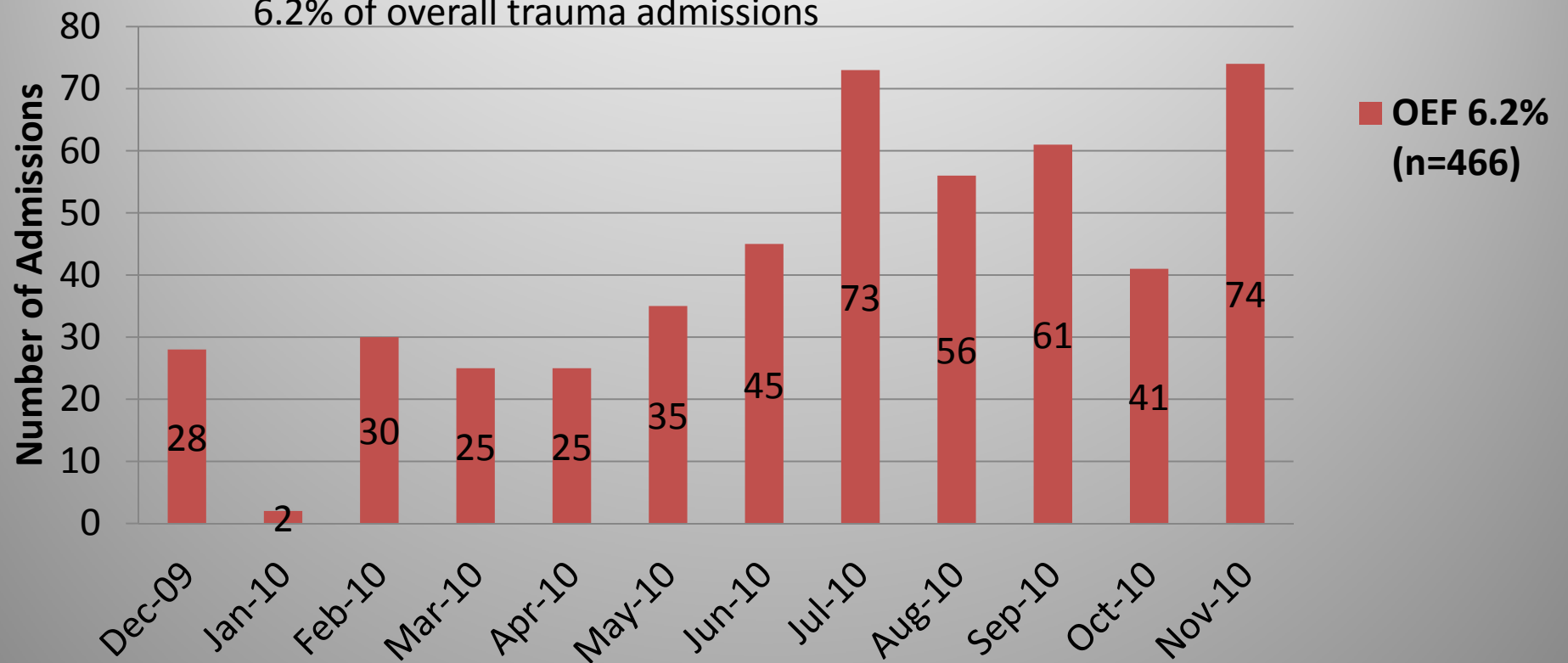
*1-Years Data: OEF Dec 09 – Nov 10*



# OEF Pediatric Admissions

## Pediatric Admissions (<15 years)

6.2% of overall trauma admissions



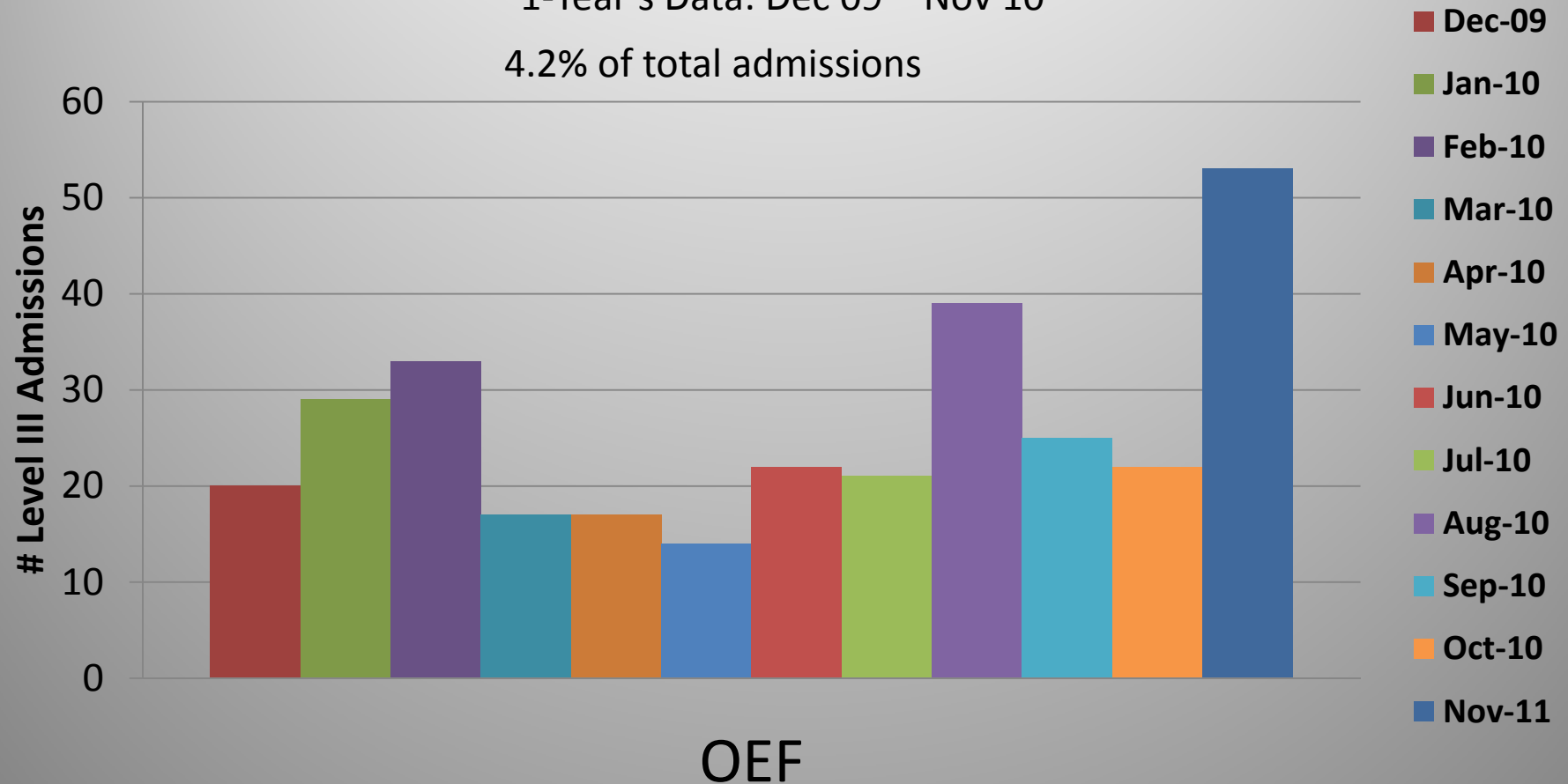
1 Year's Data: Rolling 12 Months

# OEF Theater Hypothermia

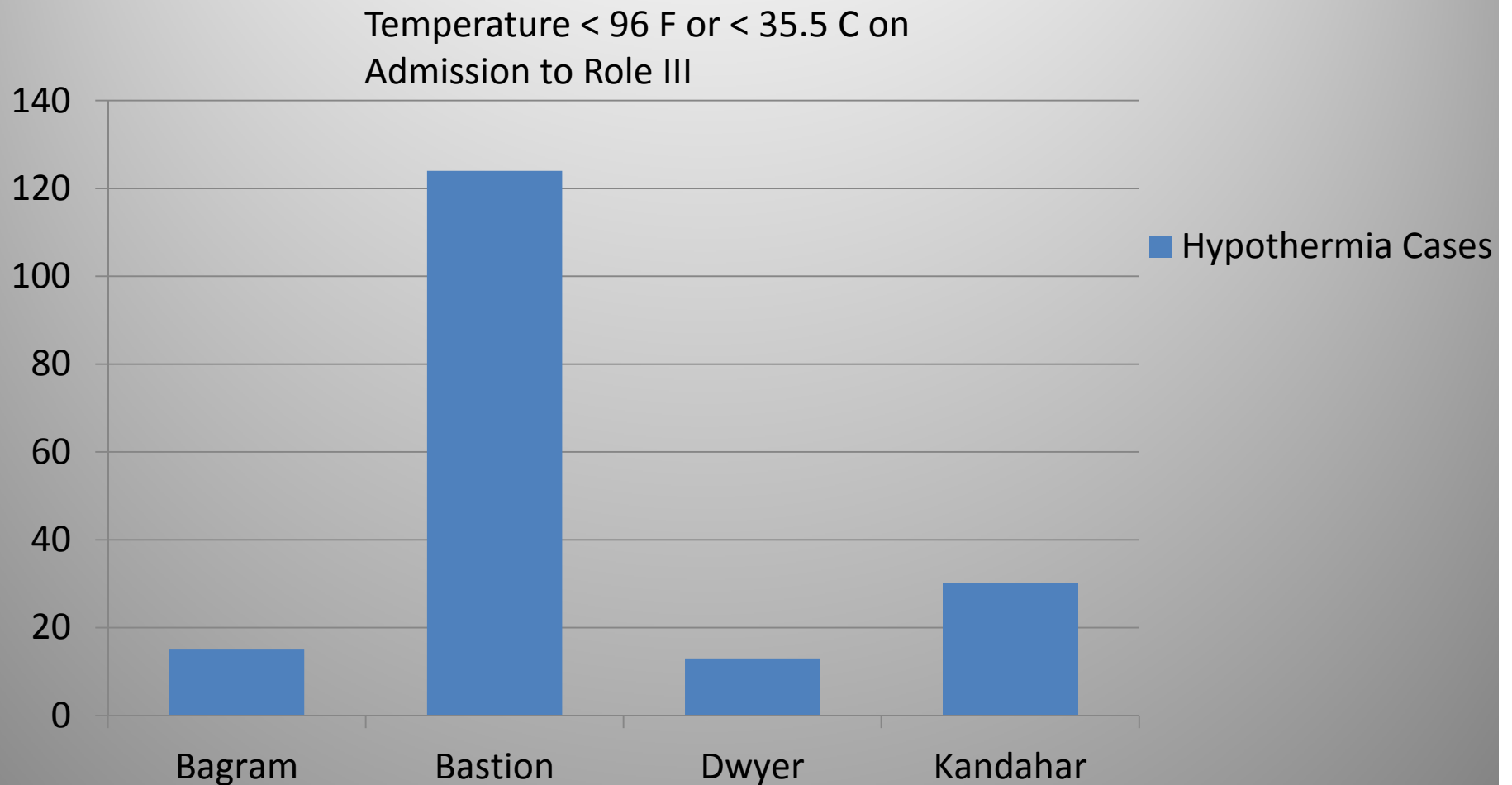
## Admission Temperature < 96 F or < 35.5 C

1-Year's Data: Dec 09 – Nov 10

4.2% of total admissions



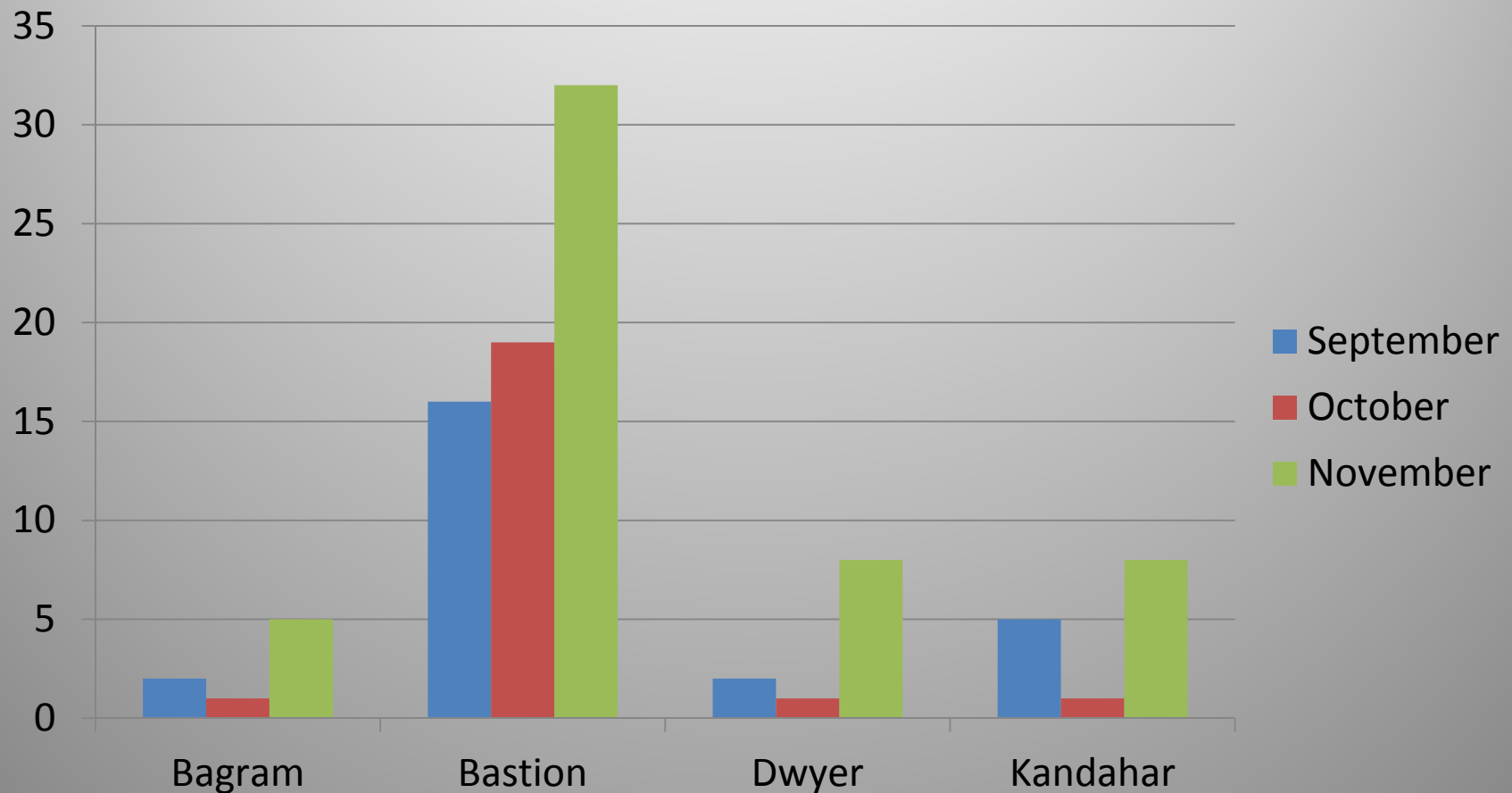
# OEF Hypothermia Cases by Facility



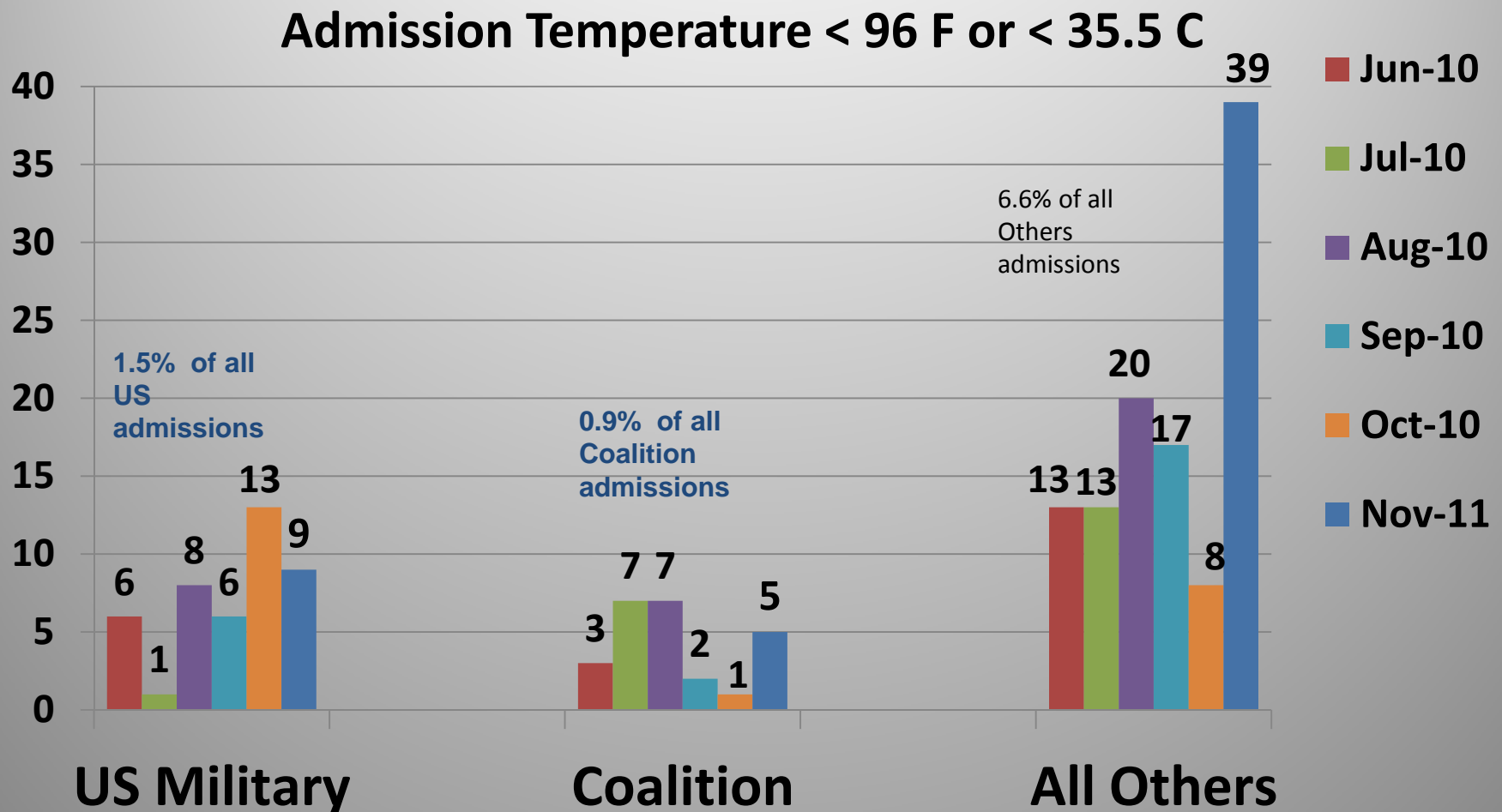
1-Year's Data: Dec 09 – Nov 10

# OEF Hypothermia Cases by Facility

Temperature < 96 F or < 35.5 C on Admission to Role III

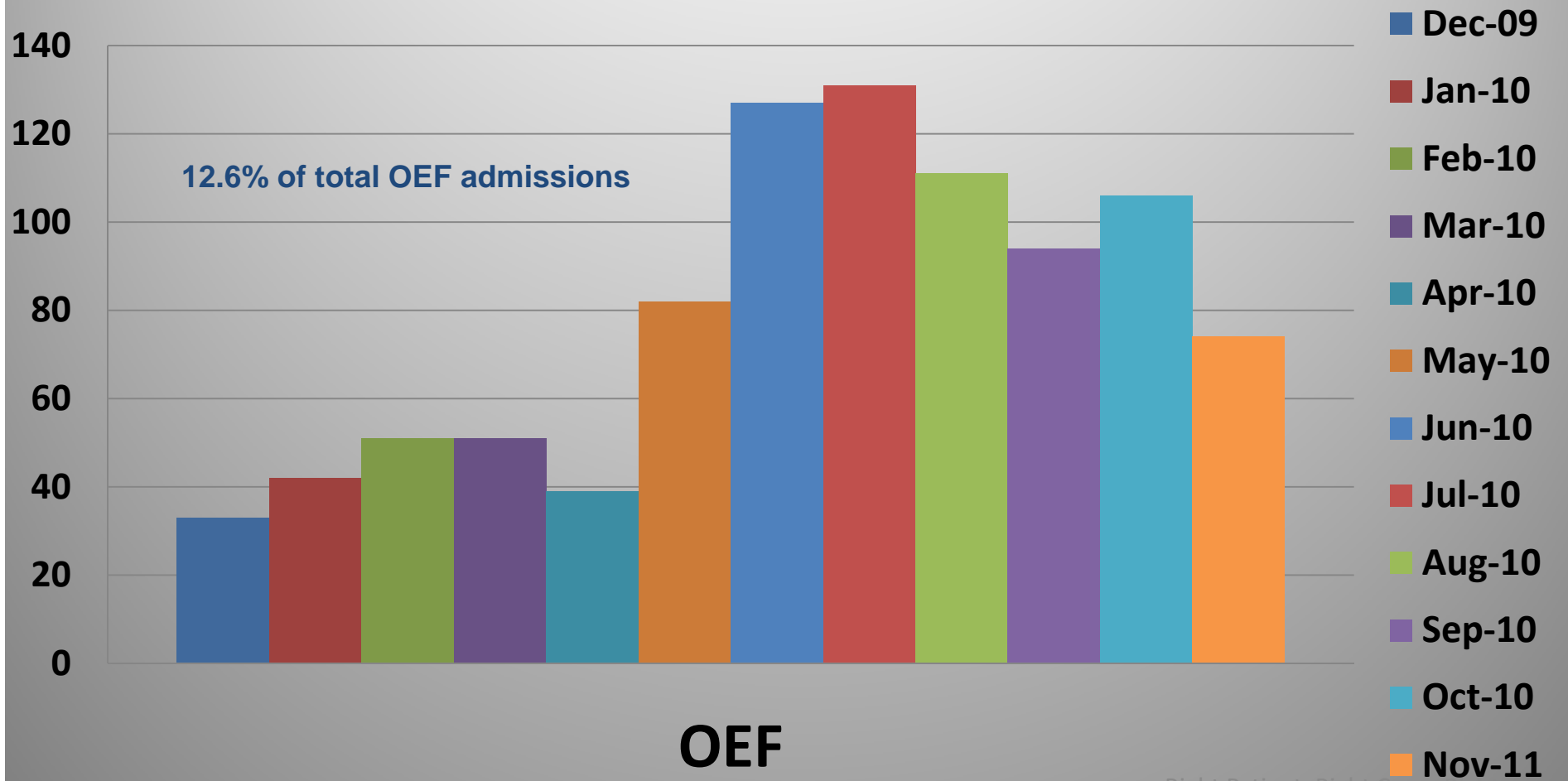


# OEF Hypothermia Breakdown



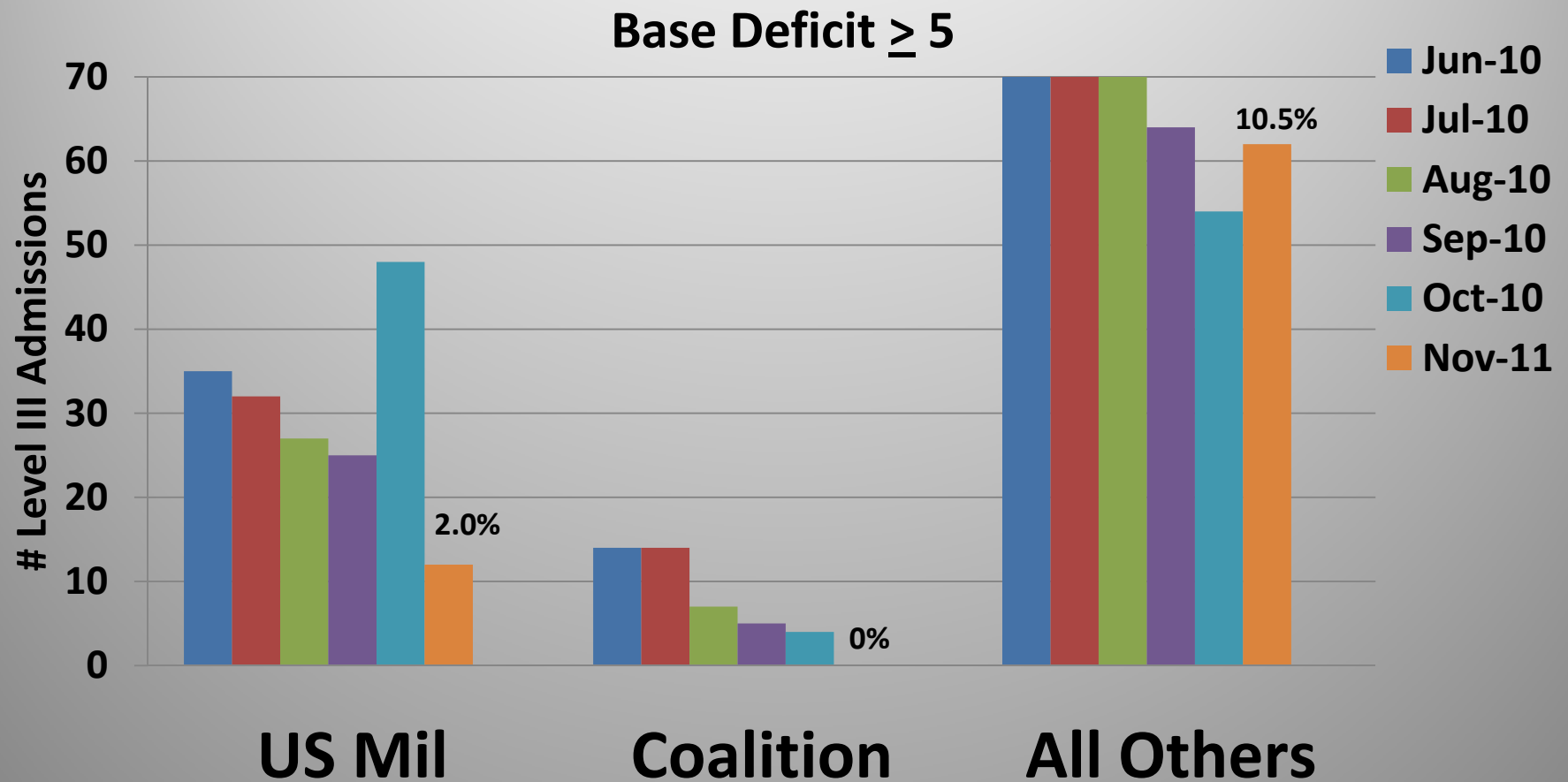
# OEF Shock on Admission (BD > 5)

1-Year's Data: Dec 09 – Nov 10



OEF

# OEF Shock on Admission

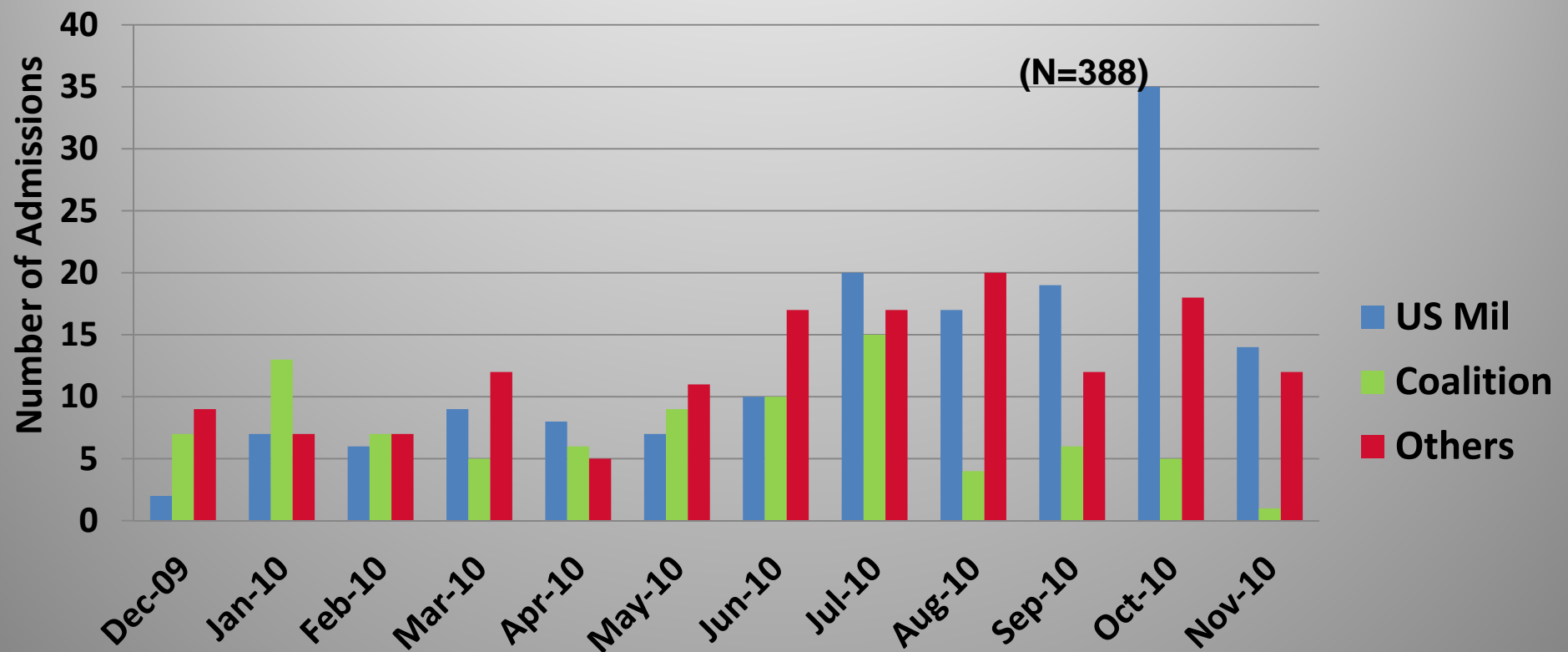




# OEF Total

## Massive Transfusions

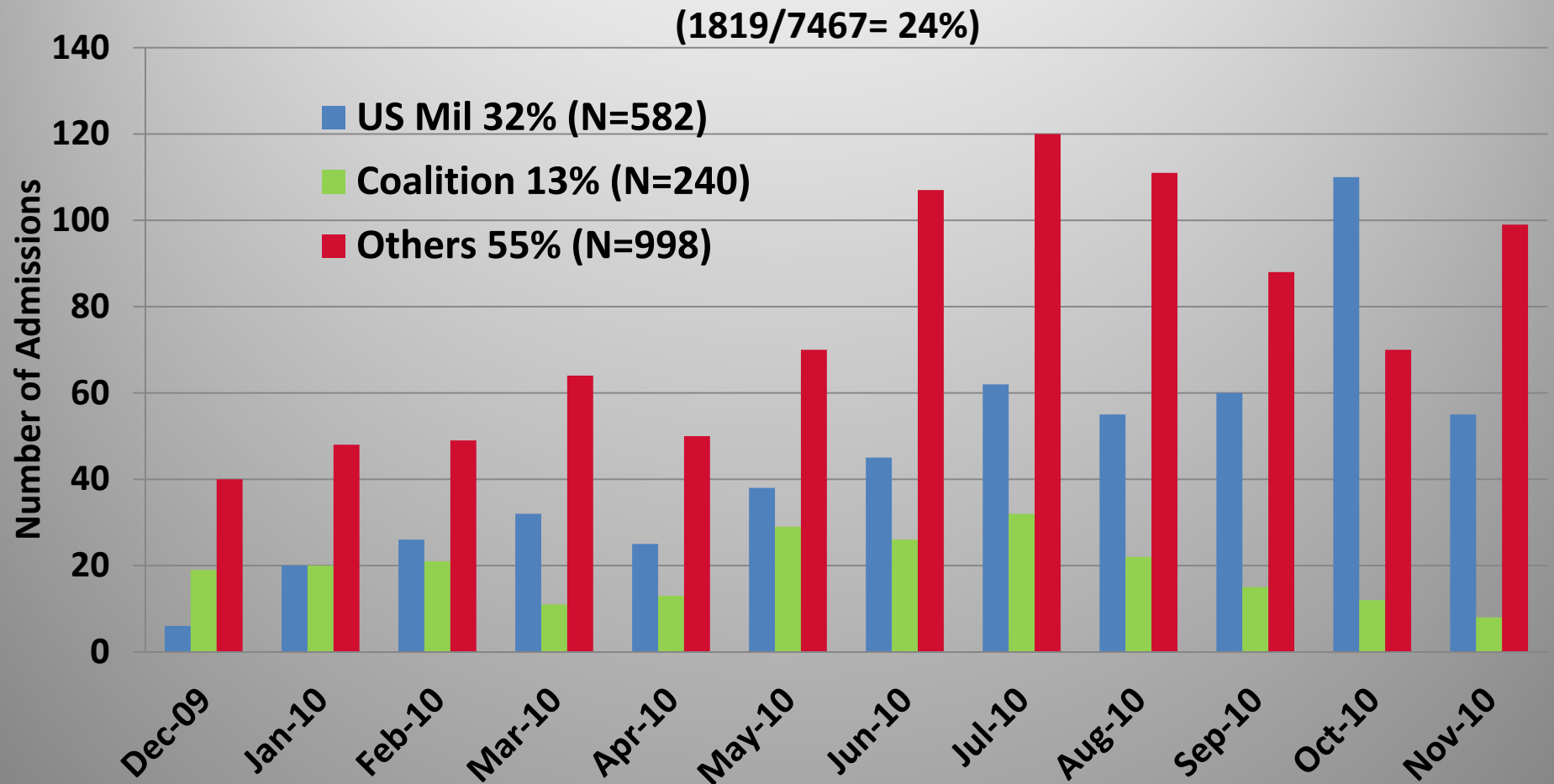
**Massive Transfusions**  
Defined as  $\geq 10$  units PRBCs in 24 hours



**1 Year's Data: Rolling 12 Months**

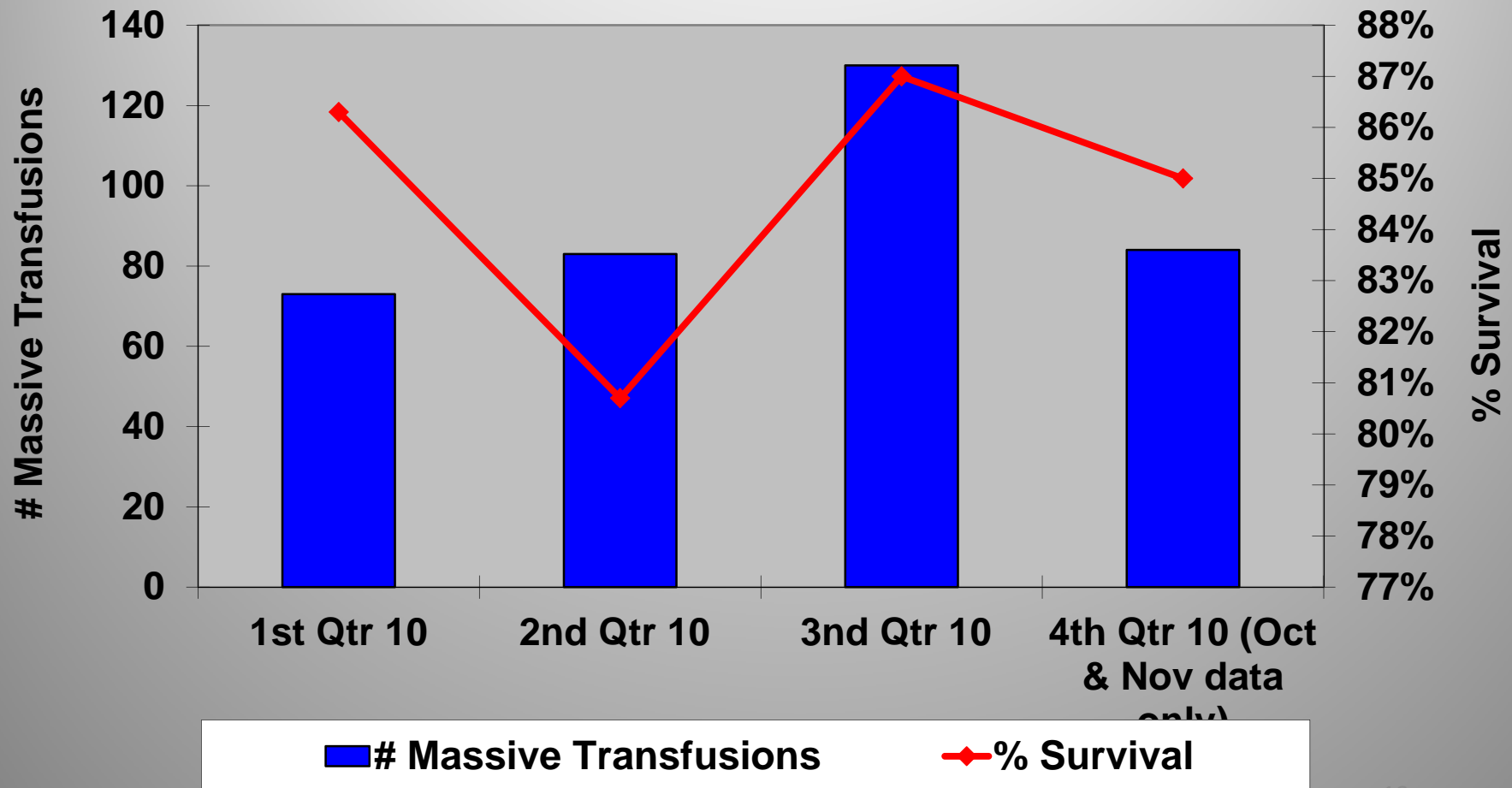
# OEF Total

## Casualties Requiring Blood

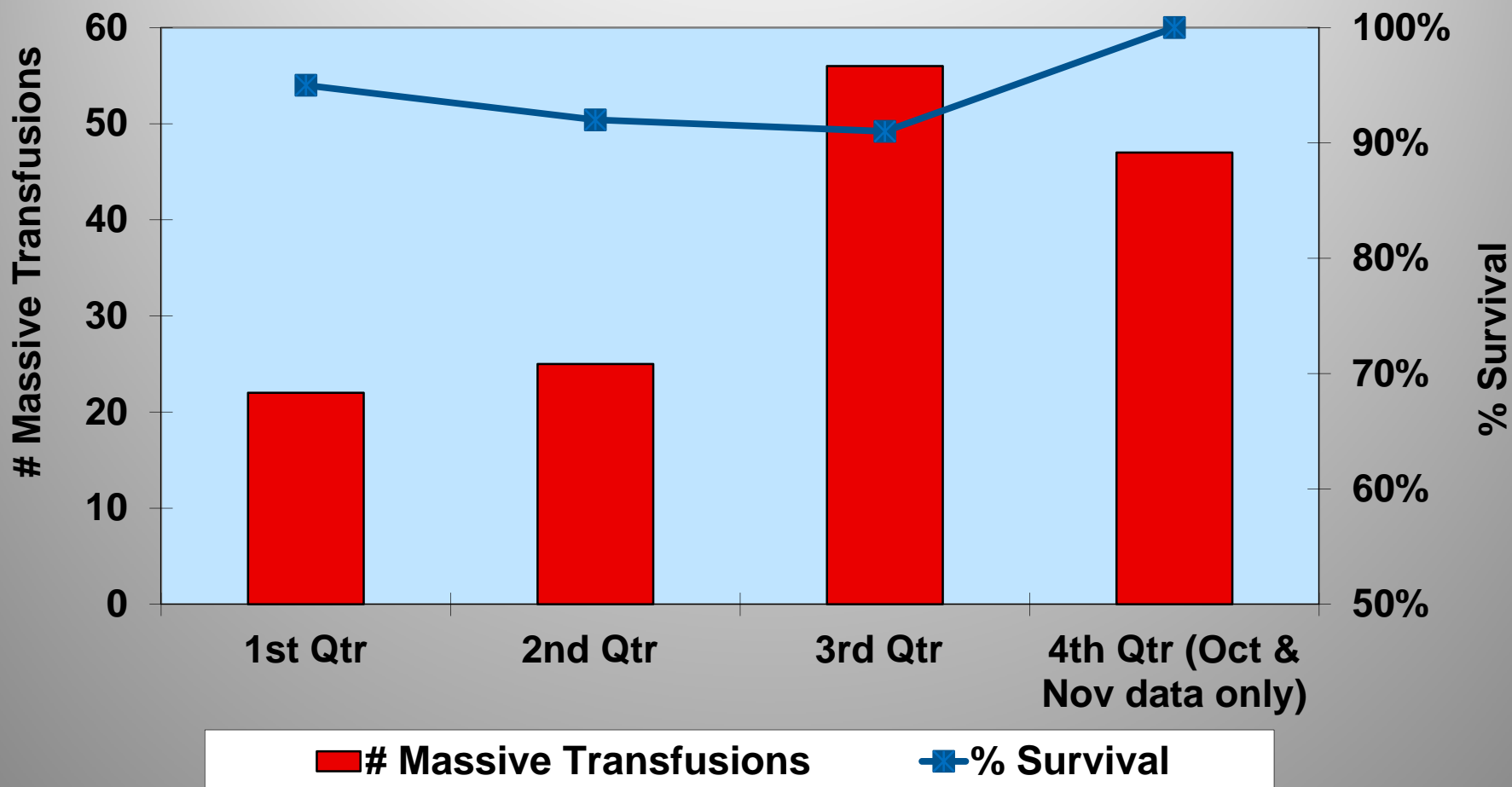


# OEF Level III

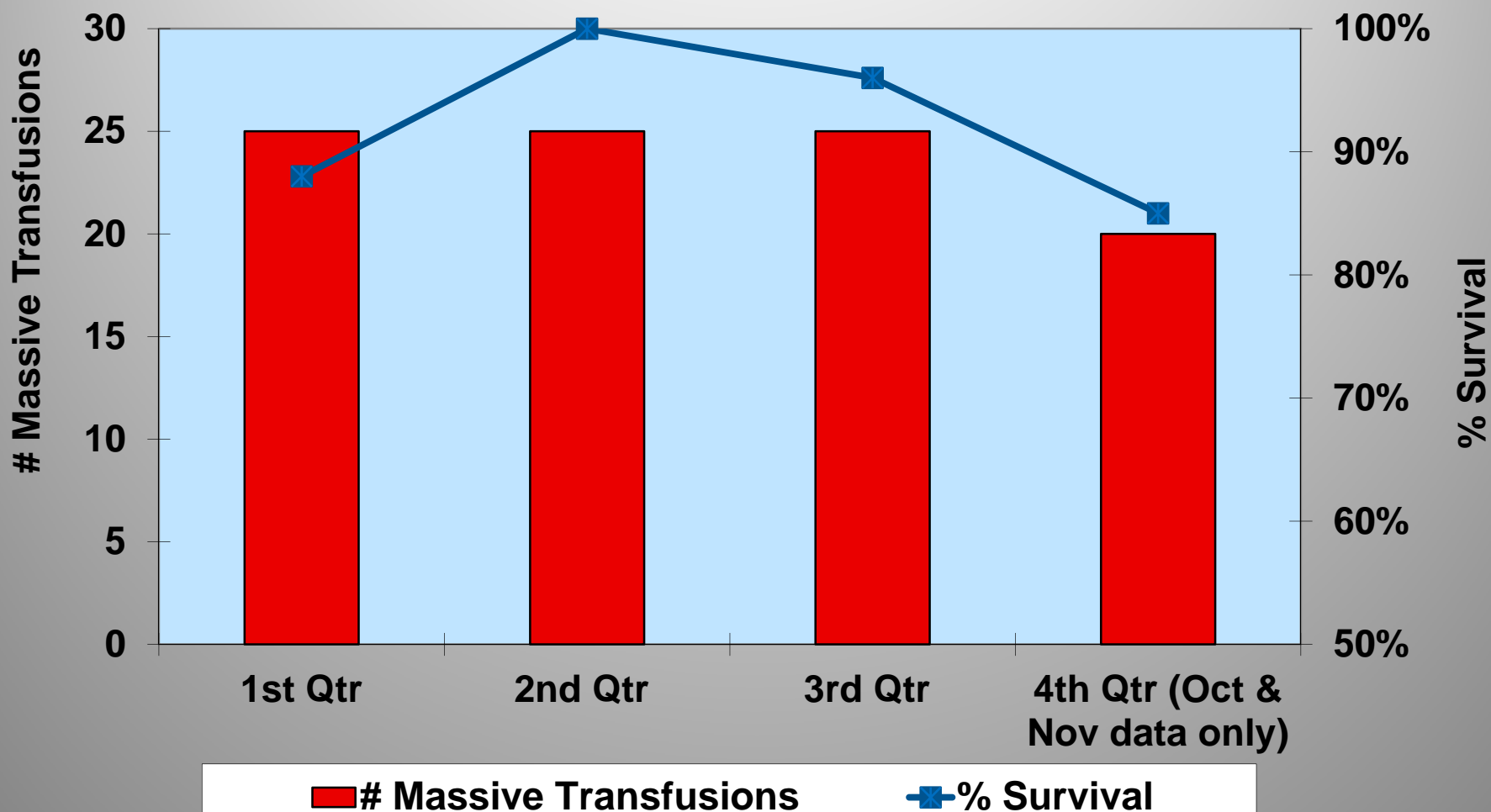
## Massive Transfusion Survival



## OEF Massive Transfusion Survival Long Term US Military Only



## OEF Massive Transfusion Survival Theater Coalition Only

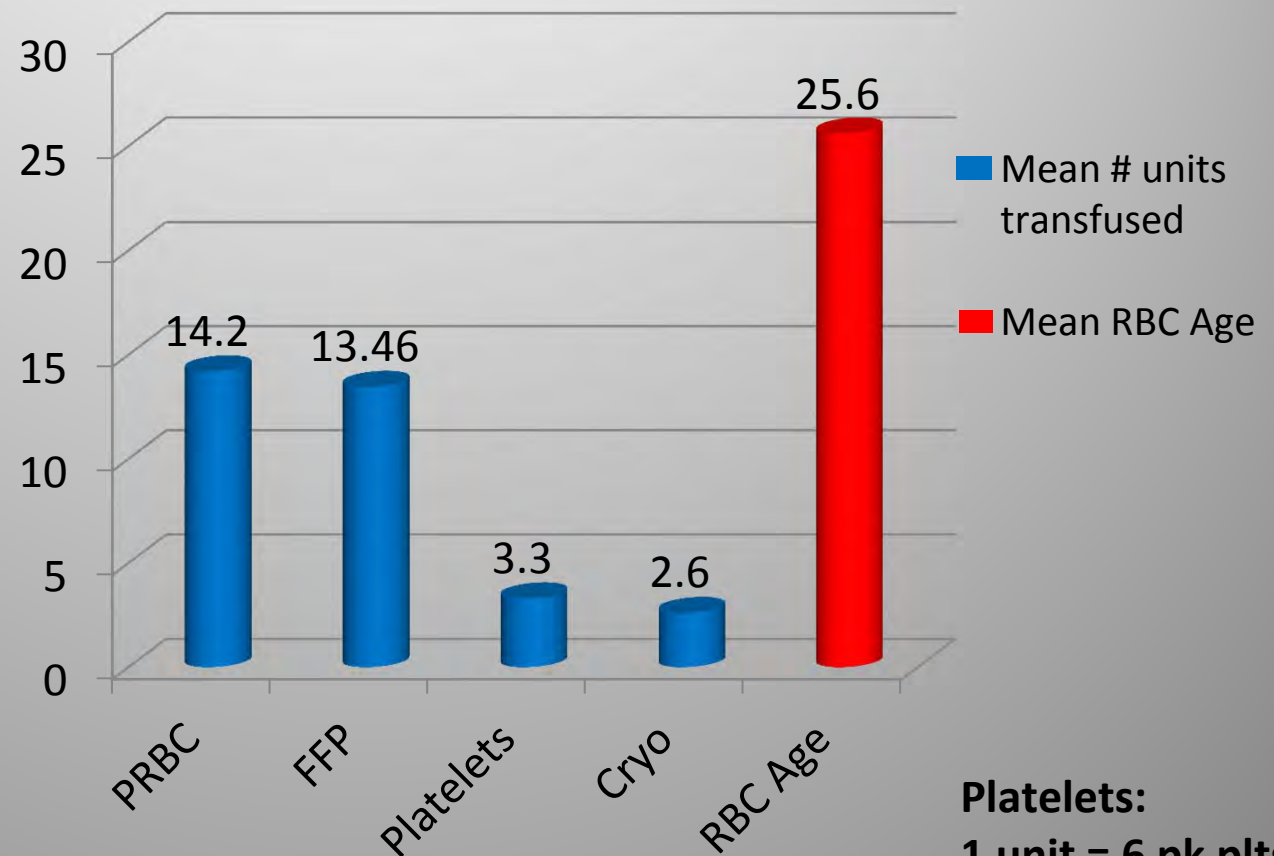


# Massive Transfusion Component Therapy

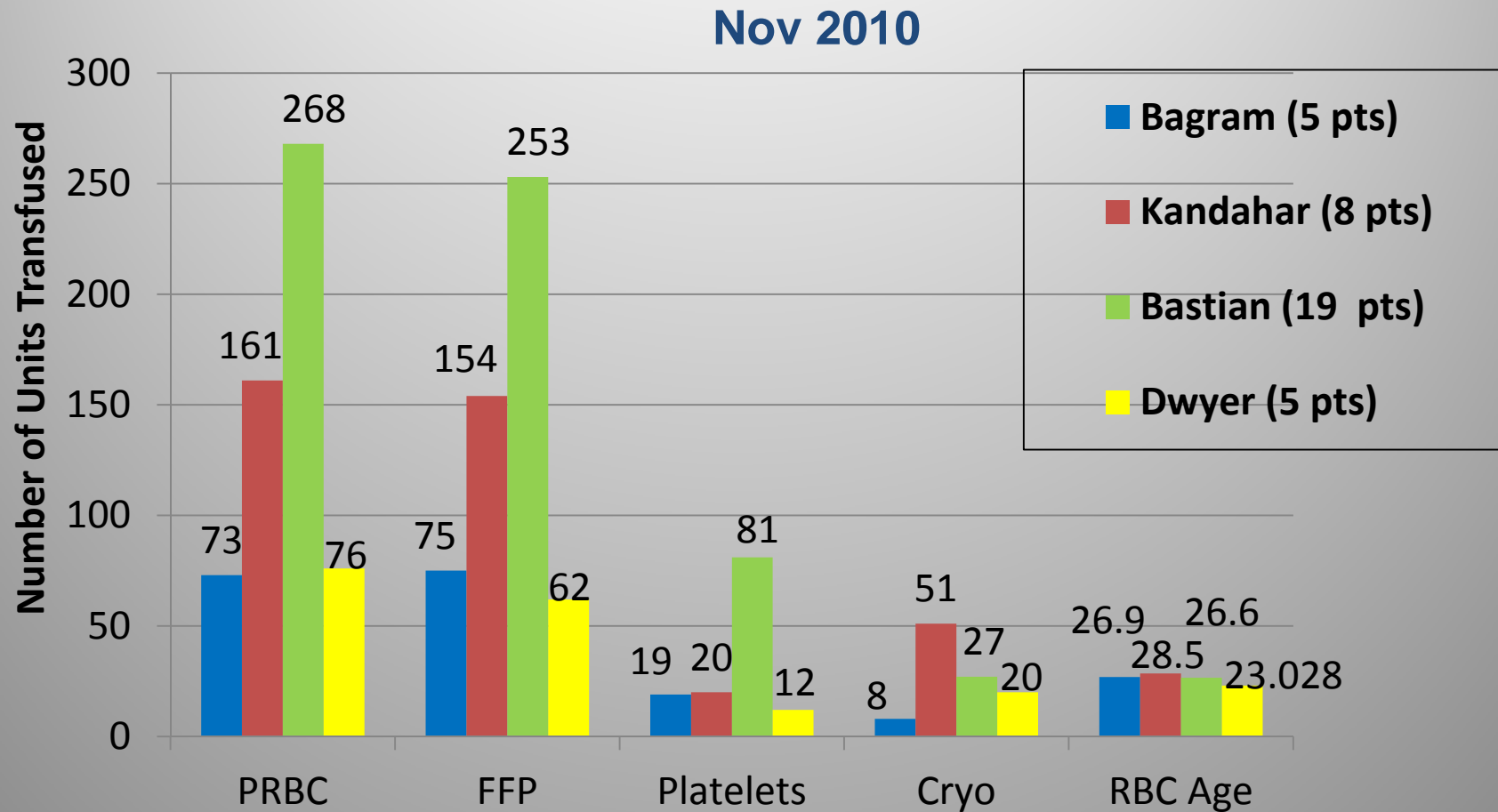


Total Units FWB: 6  
(3 patients)  
Doses of Factor VII: 2  
(Level III Only)

Nov 2010 MT Patients (N= 37)

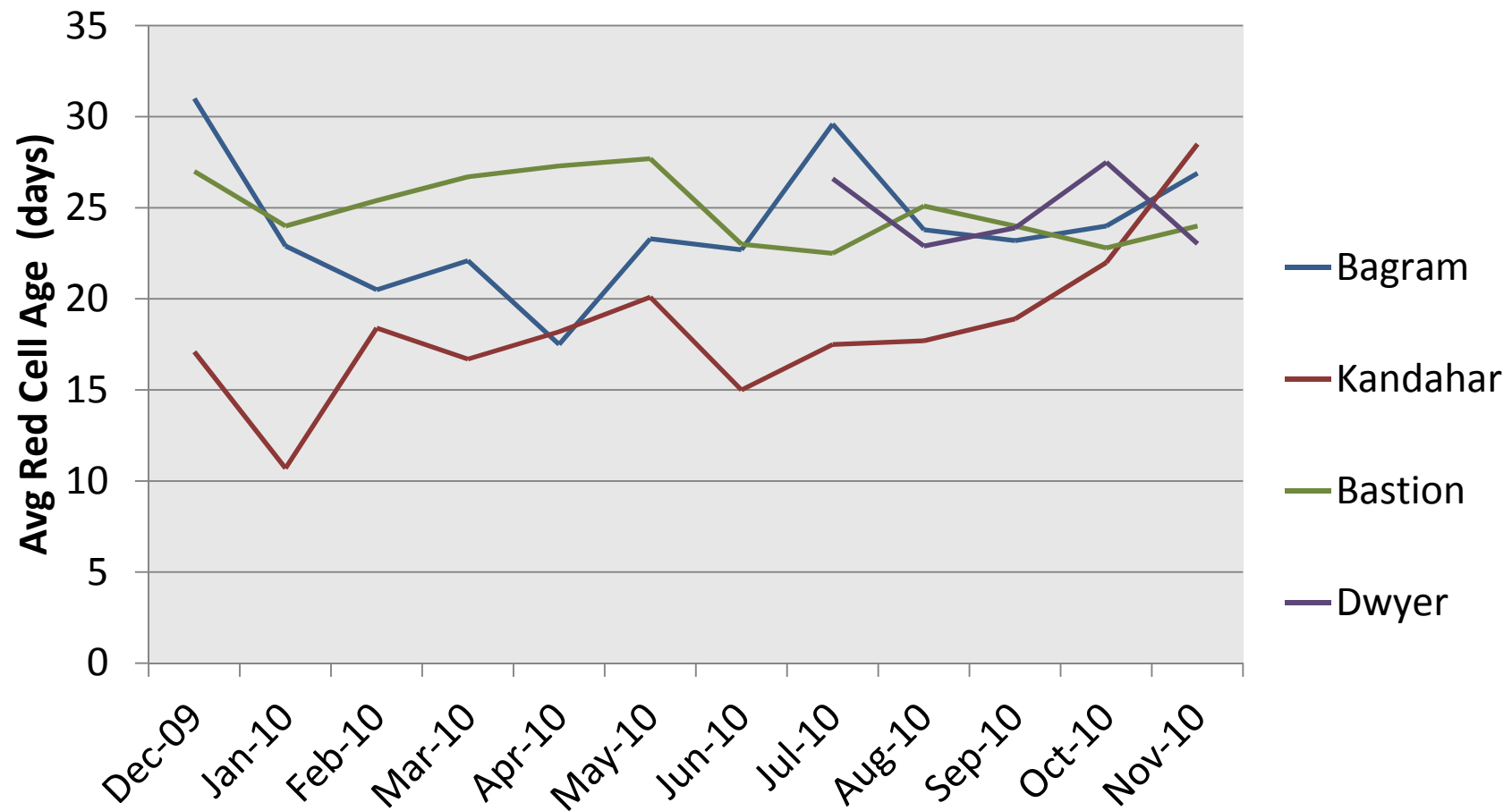


# Massive Transfusion Component Therapy by Site

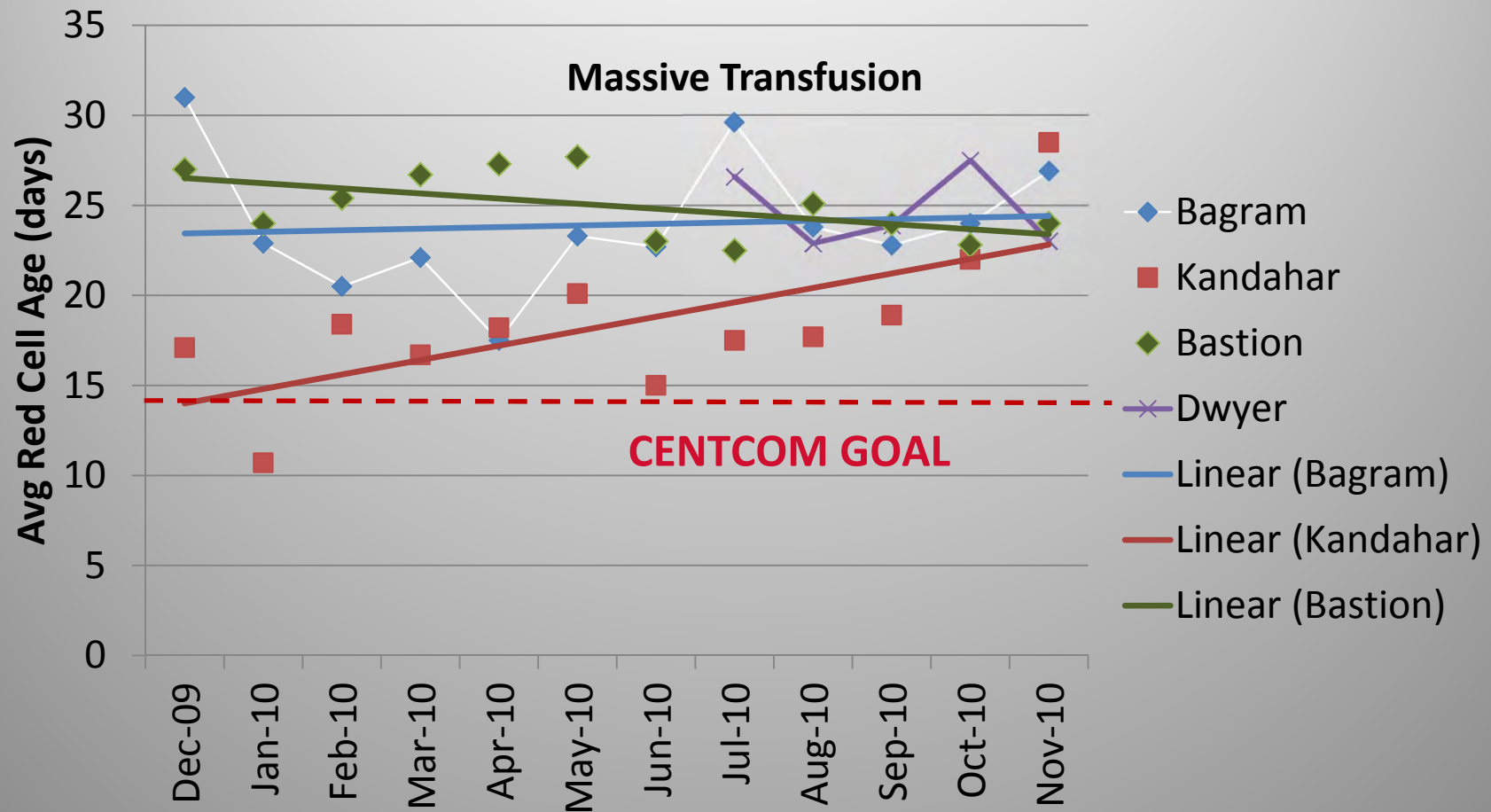




# Red Cell Age in Massive Transfusion



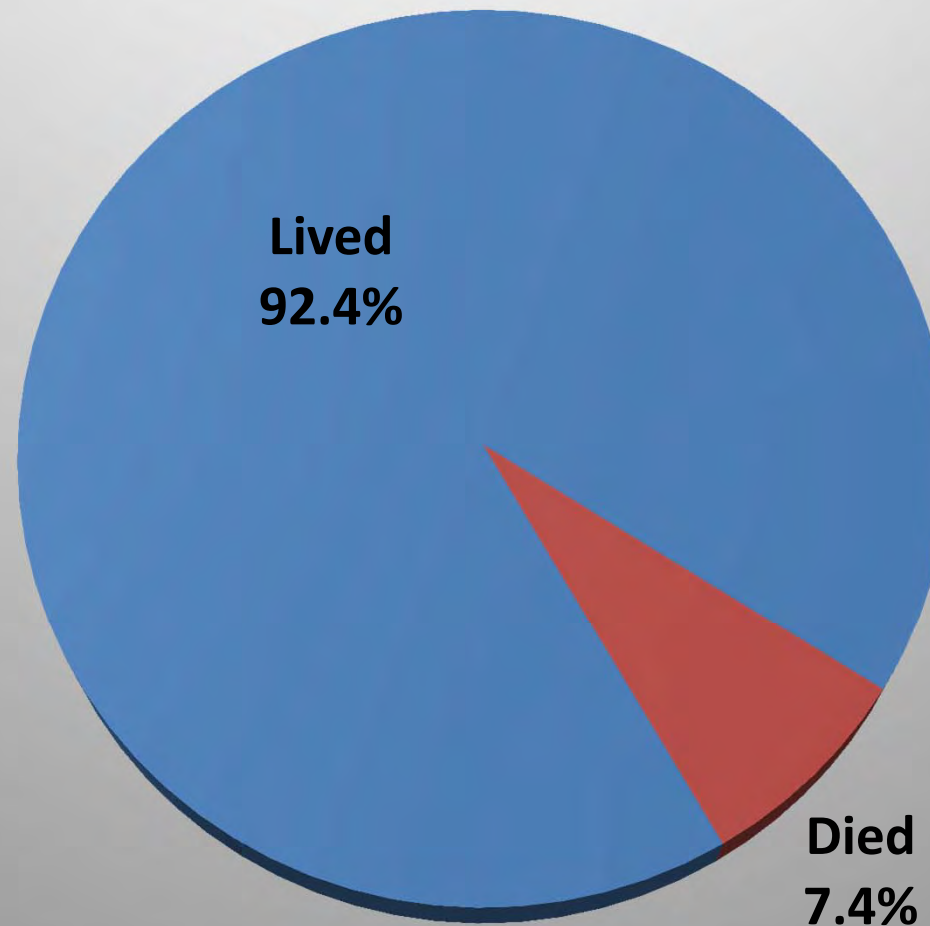
# Trend Line of Red Cell Age in Massive Transfusion



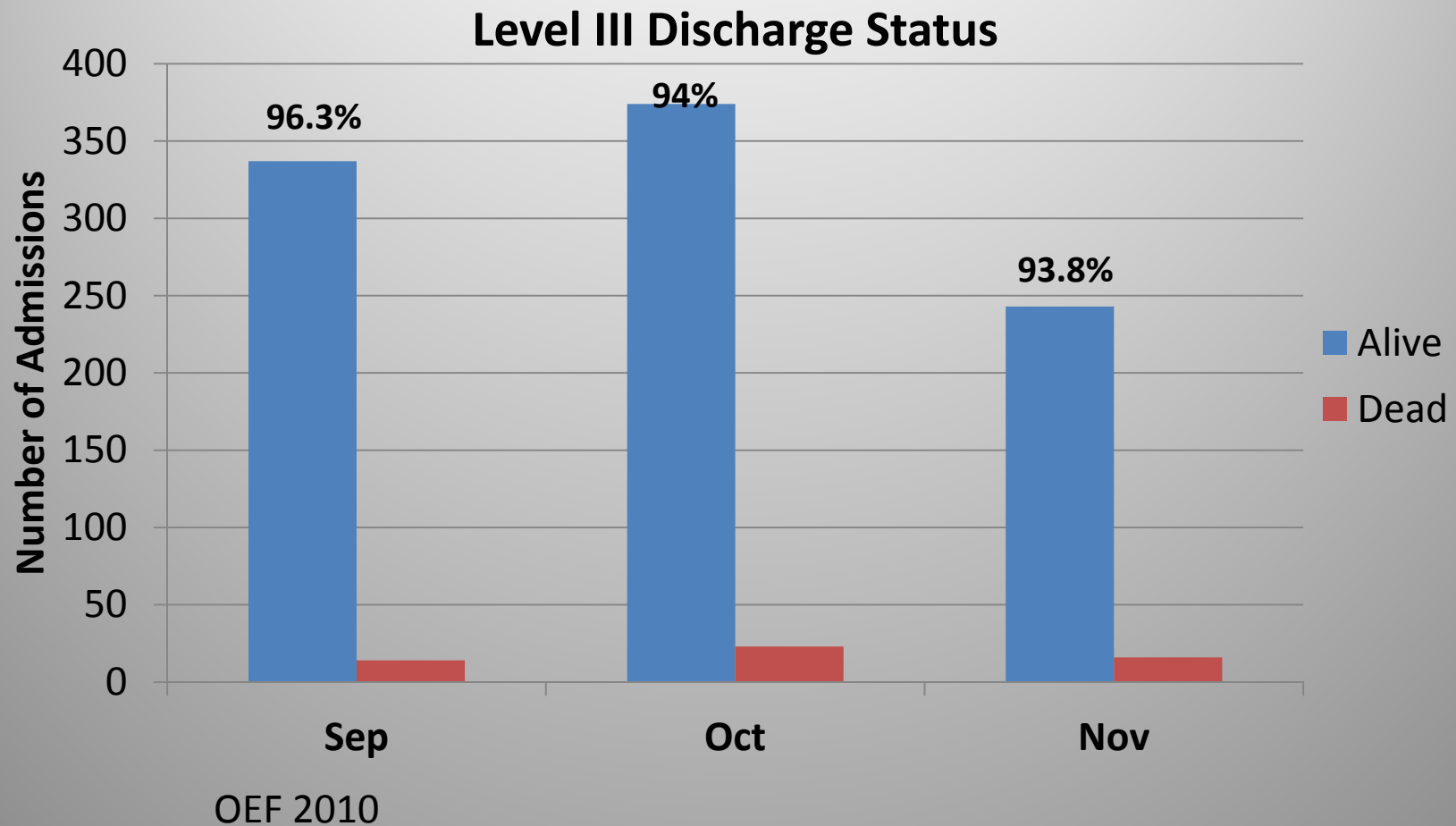
# OEF In-Theater Survival

**Total Level III Admissions Dec 09 – Nov 10**

N= 7476

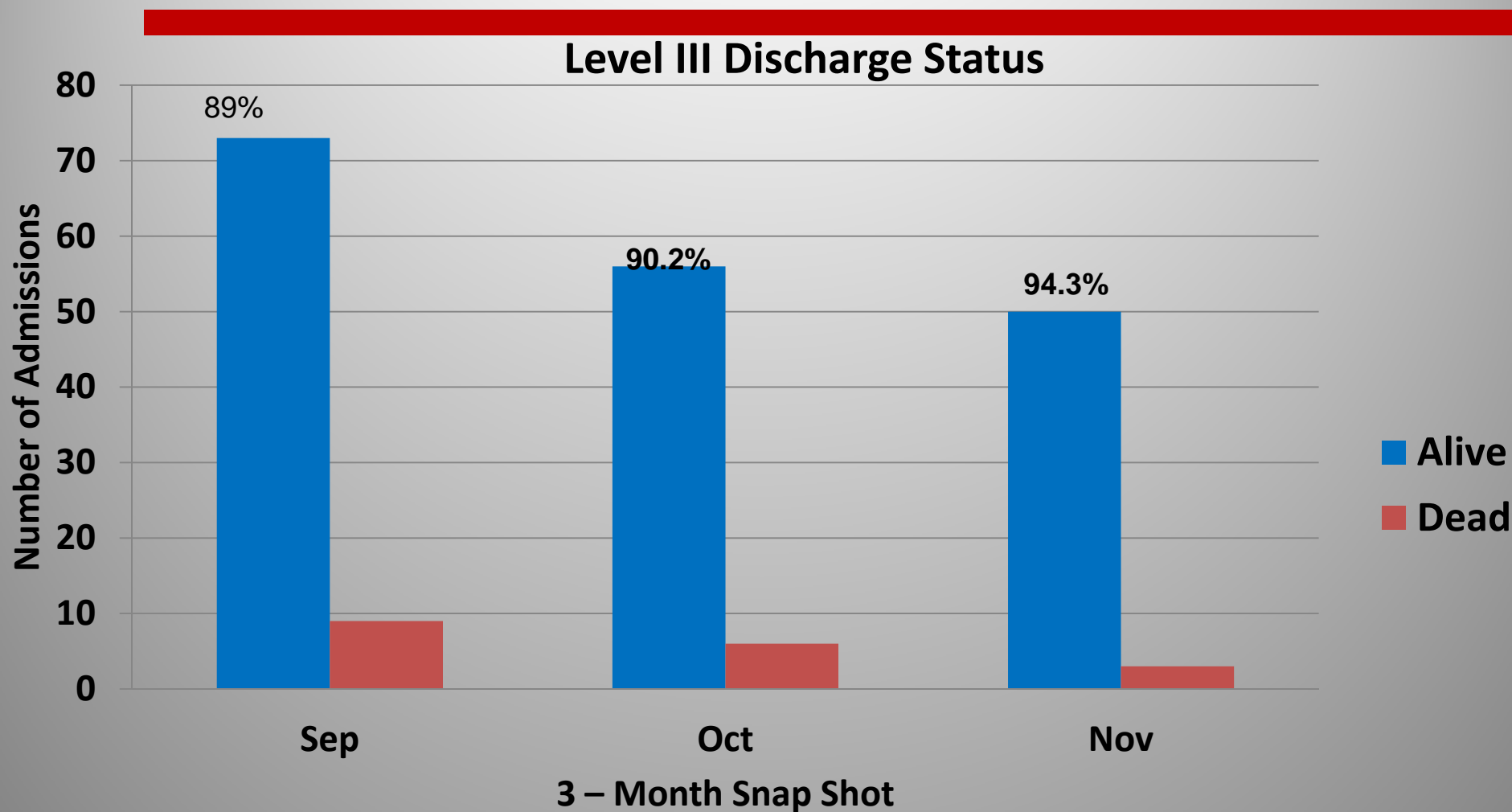


# OEF US Military In Theater Survival



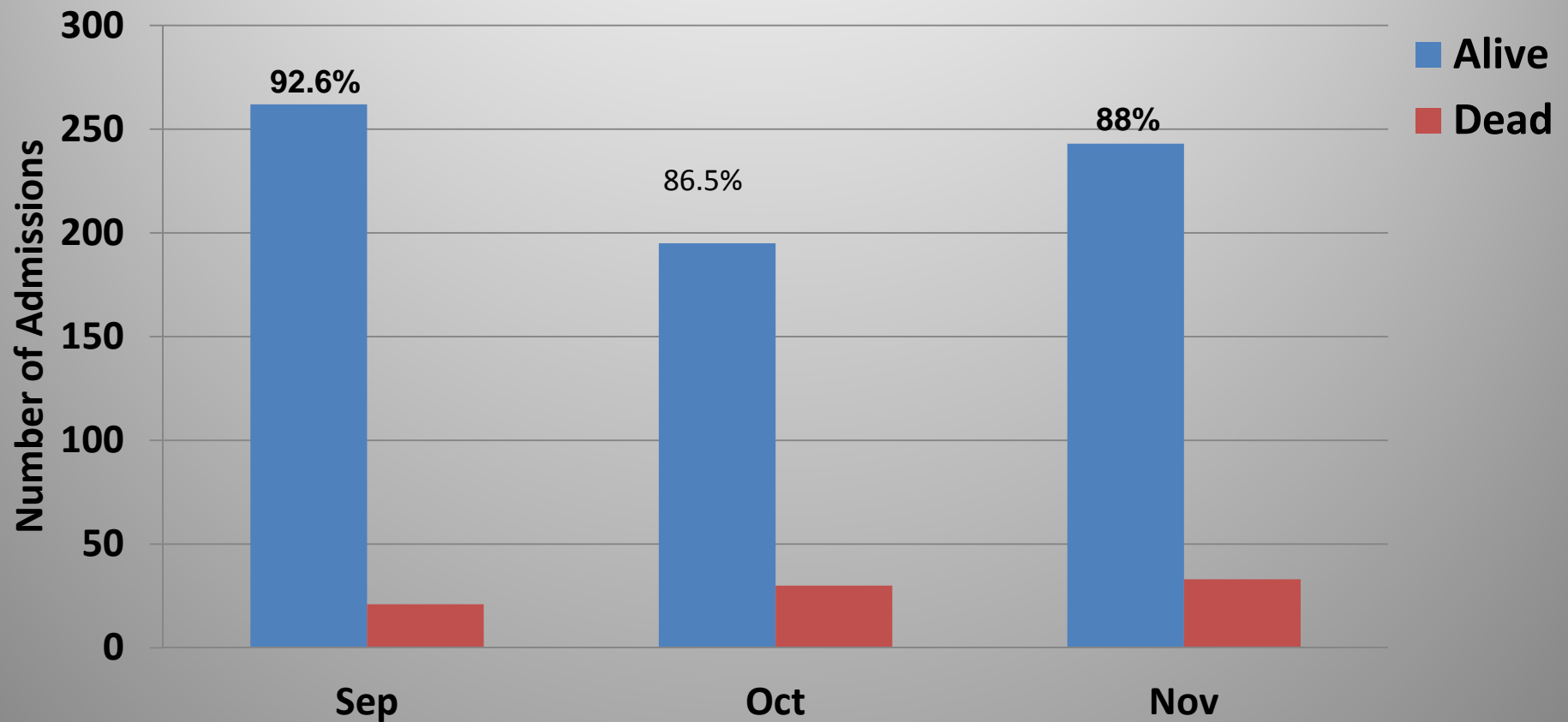
**3 – Month Snap Shot**

# OEF Coalition Military In Theater Survival



# OEF “All Others” In Theater Survival

## Level III Discharge Status



3 – Month Snap Shot

# ***Medical Performance Improvement***

## Data improves clinical patient care

# Performance Improvement

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- 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!!!*



# Scheduled Communications

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- Weekly f/u conf call with Level II+, III, IV and V
  - TMDS (Theater Medical Data Store) to list patients from Theater or beyond Theater
  - VTC/TC from Nursing Conf room 0700 Thursdays
  - M&M conference, share lessons learned
- Weekly Trauma Nurse Coordinators call
  - TC including all theater and LRMC/CONUS
- Monthly System-wide VTC for system issues
  - Includes VA, JPMRC, GPMRC, AMC, CENTAF Forward
  - 59MDW begins hosting Feb 07
- JTTS Directors conference call quarterly
- JTTR Tri-service working group

# Access Trauma CPGs

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## CENTCOM CPG

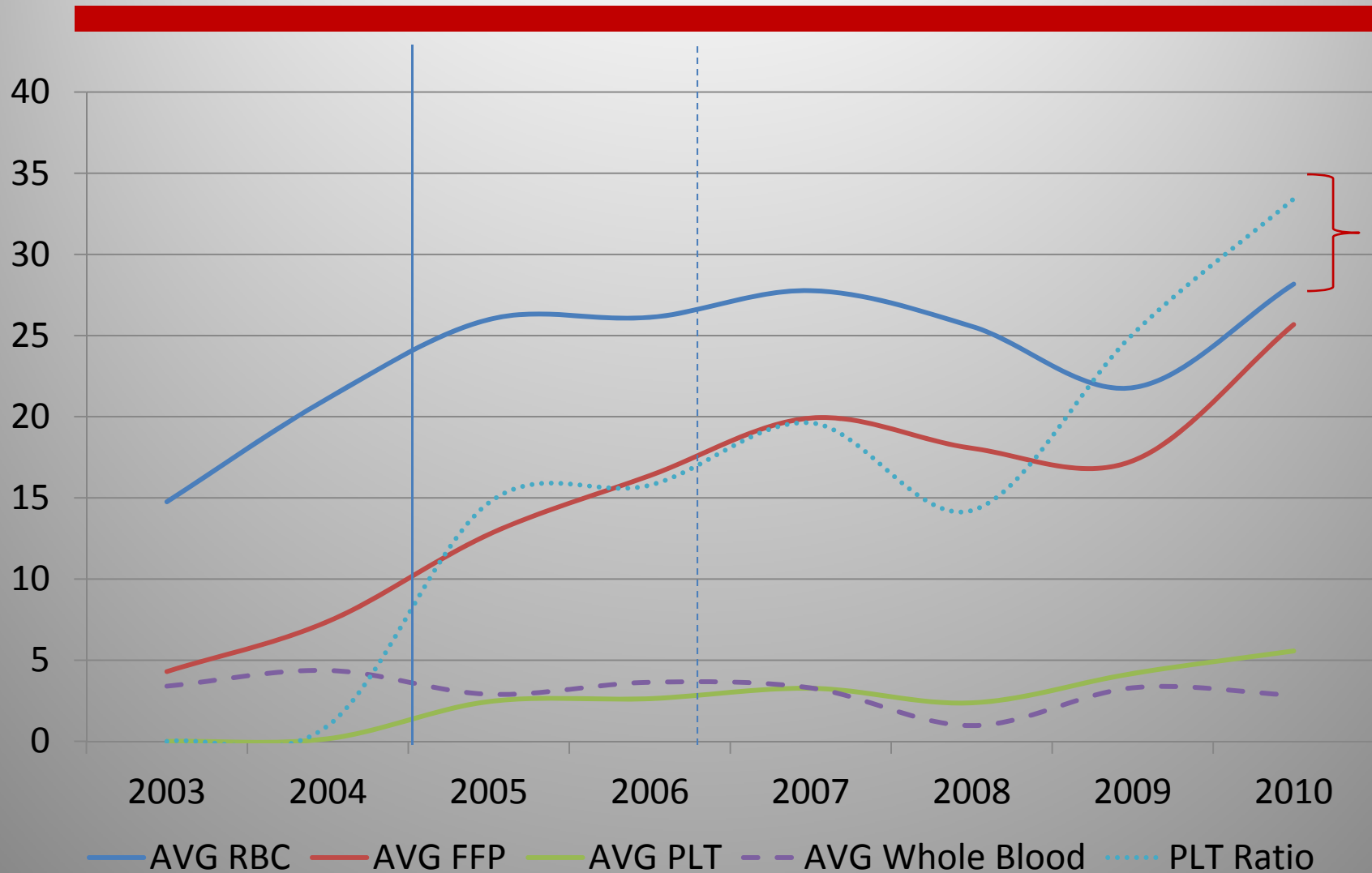
31 CPG

3 Pending (Pain& Sedation, Multiple Amputation,  
Renal Replacement)

- <http://www.usaisr.amedd.army.mil/cpgs.html>
- Migration MHS
- Guidelines / Info
  - TMDS
    - CENTCOM CPG

# Impact CPG

## Massive Transfusion Component Therapy



# CPG “Authority”

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- SME Panel
  - Military
    - Surgeons General Trauma / General Surgery Consultant
    - Medical Commands
  - Civilian
    - ACS Committee on Trauma
- CENTCOM JTTS Director
- JTS Director and Deputy Director
- CENTCOM SG

# *Research*

Data creates new knowledge

# Research Access to JTTR

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- Complete a data application and data use agreement
- Internal Review Board (IRB) document must be completed
- Staff will provide input to requestor to refine final output
- Final data reviewed for any public affairs or OPSEC issues
- Currently >200 peer reviewed manuscripts utilizing JTTR data

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# Contemporary JTTS Issues

JTTS Afghanistan Trauma Conference  
28-29 October 2010

# JTTS Afghanistan Trauma Conference

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- Concept: Evaluate emerging trends in trauma within the Afghanistan AO and develop effective mitigation strategies
- Hosted by KAF Role III
- 50 participants
  - Representation Role III, Role II, RCs
  - US military, coalition military
  - Representation American College of Surgeons
    - Trauma system evaluation



# JTTS Trauma Conference

## Lessons Learned

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- Medevac documentation
- Enroute critical care sustainment
- Optimizing resuscitation
  - Thromboelastography / ROTEM
- Injury patterns
  - Spine fracture management
  - Multiple amputations
    - Massive transfusion ~100%
    - Wound management / increased infection

# DRAFT MEDEVAC Report Template

JTTR ROLE II/ROLE III MEDEVAC REPORT					
MISSION #	BRN	PT LAST NAME	DATE OF MEDEVAC	FLT MEDIC	UNIT
<b>CIRCULATION</b>	Check if appropriate		<b>NEUROLOGICAL</b>	Alert	Verbal
BLEEDING		Select location palpated and document rate	(Circle One)	Pain	Unresponsive
PULSES:	CAROTID		<b>HYPOTHERMIA</b>	Check if appropriate	
	FEMORAL		HPMK		
	RADIAL		OTHER WARMING		
CPR/ACLS			<b>PAIN MANAGEMENT</b>	Check if appropriate	
TOURNIQUET (If Y/time placed)			MEDICATED?		
HEMOSTATIC DRESSING			<b>EQUIPMENT ISSUES</b>	Check if appropriate	
IV ACCESS			ZOLL		
VASOACTIVE MEDS			PROPAQ		
OTHER			VENTILATOR		
<b>BREATHING/AIRWAY</b>	Check if appropriate		SUCTION		
OBSTRUCTED			OTHER		
NEEDLE DECOMPRESSION			<b>HAND OFF ISSUES</b>	Check if appropriate	
ORAL AIRWAY			COMMUNICATION		
NASAL AIRWAY			DELAYED DEPARTURE		
LMA (KING LT/COMBI)			EQUIPMENT EXCHANGE		
EMERGENCY CRICH			RE-SUPPLY		
INTUBATION			OTHER		
VENTILATOR			<b>OTHER ISSUES /NOTES</b>		
SUCTION					

JTTR Draft Form September 2010: MEDEVAC DOCUMENTATION: FOR QUESTIONS REGARDING THIS FORM CALL DSN: 318-431-4430: RECEIVING FACILITY:  
Please scan/email document to: jttsmedevac@afghan.swa.army.mil

# Management Casualties with Bilateral Lower Extremity Injuries

- Bastion or Dwyer (N = 43)
  - bilateral transfemoral (8, 19%)
  - transfemoral-transtibial (18, 42%)
  - bilateral transtibial (17, 39%)
- Median SBP [90/65], HR [131] and T [35.2] were consistent with hemorrhagic shock
- Acidosis [pH 7.14] and BD [11.5] and were normalized during initial operation ( $3.12 \pm 1.91$  hrs)
- Three (7%) presented in cardiac arrest and 5 (12%) required a resuscitative thoracotomy with aortic cross clamping.

# JTTS Trauma Conference

## Lessons Learned

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- Clinical Practice Guideline (CPG)
  - Pain management
    - (Ready for CENTCOM SG)
  - Multiple amputation management
    - (Ready for SME vetting)

# JTTS Trauma Conference

## Lessons Learned

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- New therapies
  - Tranexamic acid (used by UK @ Bastion)
    - Consensus not enough good data to support ubiquitous use
    - Limited use in patients with hyperfibrinolysis?
  - Renal replacement therapy
  - Junctional hemorrhage control

# JTTS Trauma Conference

## Lessons Learned

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- Provider
  - Pre-deployment training
    - Develop / standardize common elements
      - Emergency War Surgery / Joint Forces Combat Trauma Management Course
      - Clinical practice guidelines
      - Familiarization training with theater electronic health record
      - Theater / deployment site specific MROE

# JTTS Trauma Conference

## Lessons Learned

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- Provider
  - Optimal resourcing
    - US services grossly overtaxed @ current force structure
    - Modularity based upon casualty volume
  - Resiliency / compassion fatigue

# Questions

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