

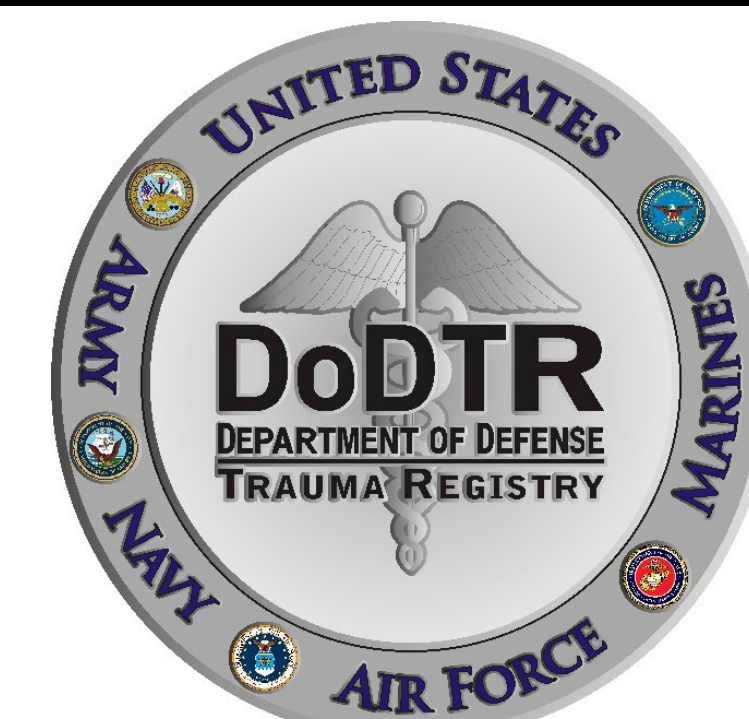


RESOURCE DEMANDS OF MEDICAL VERSUS TRAUMA MEDEVAC DURING STABILITY OPERATIONS IN CENTCOM

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OBJECTIVES

Quantify the distinct resource demands and transport complexities of medical versus trauma MEDEVACs during stability operations in CENTCOM to inform medical and resource planning for current phase and kinetic operations in Combatant Commands.

METHODS

- Design:** IRB-approved retrospective review of data from MEDEVAC missions between **January 2023** and **December 2025**.
- Setting:** CENTCOM AOR (Operation Inherent Resolve).
- Analysis:** Resource utilization, critical interventions, medication profiles, and multi-patient events were compared using Chi-square, Fisher's Exact, and Mann-Whitney U tests for categorical and continuous variables, respectively.

Table 1. Demographics & Baseline Characteristics

Variable	Overall (N=783)	Medical (n=478)	Trauma (n=305)
DEMOGRAPHICS & CONTEXT			
Male Sex ***	663 (84.7%)	386 (80.8%)	277 (90.8%)
Service Branch: US Army ***	538 (68.7%)	363 (75.9%)	175 (57.4%)
Disease/Non-Battle Injury ***	660 (84.3%)	478 (100.0%)	182 (59.7%)
Battle Injury (BI) ***	127 (15.7%)	0 (0.0%)	127 (40.3%)
TRIAGE & PHYSIOLOGY			
Assessed Category: Urgent ***	246 (31.4%)	122 (25.5%)	124 (40.7%)
Systolic BP, median (ns)	125	125	124
GCS - Severe (3-8) ***	50 (6.4%)	7 (1.5%)	43 (14.1%)
INTERVENTIONS (unadjusted)			
Any IV Access *	516 (65.9%)	299 (62.6%)	217 (71.1%)
Any IV Fluid *	271 (34.6%)	182 (38.1%)	89 (29.2%)
Any Analgesic ***	349 (44.6%)	154 (32.2%)	195 (63.9%)
Blood Products ***	41 (5.2%)	2 (0.4%)	39 (12.8%)
Advanced Airway ***	51 (6.5%)	7 (1.5%)	44 (14.4%)

* $p < 0.05$, *** $p < 0.001$, ns = not significant

RESULTS

Overall Cohort Characteristics

Trauma patients were more frequently classified as Urgent compared to medical patients (40.7% vs 25.5%, $p < 0.001$). Despite overall higher severity, instances of over-triage and under-triage were minimal, with an overall triage accuracy of 83.5% across both groups.

Overall, life-saving interventions were 10x higher in trauma patients (20.7% vs 1.9%, $p < 0.001$), including advanced airway placement (14.4% vs 1.5%) and blood transfusion (12.8% vs 0.4%).

Priority-Controlled Resource Utilization

When controlling for evacuation priority, utilization of shared baseline resources converged, while trauma-specific demands persisted.

The Convergence (Baseline Logistics):

- Among urgent patients, basic requirement to establish IV access was statistically equivalent (88.5% Medical vs. 86.3% Trauma, $p = 0.737$).

Fig 1. Baseline Intervention Rates: Medical vs Trauma

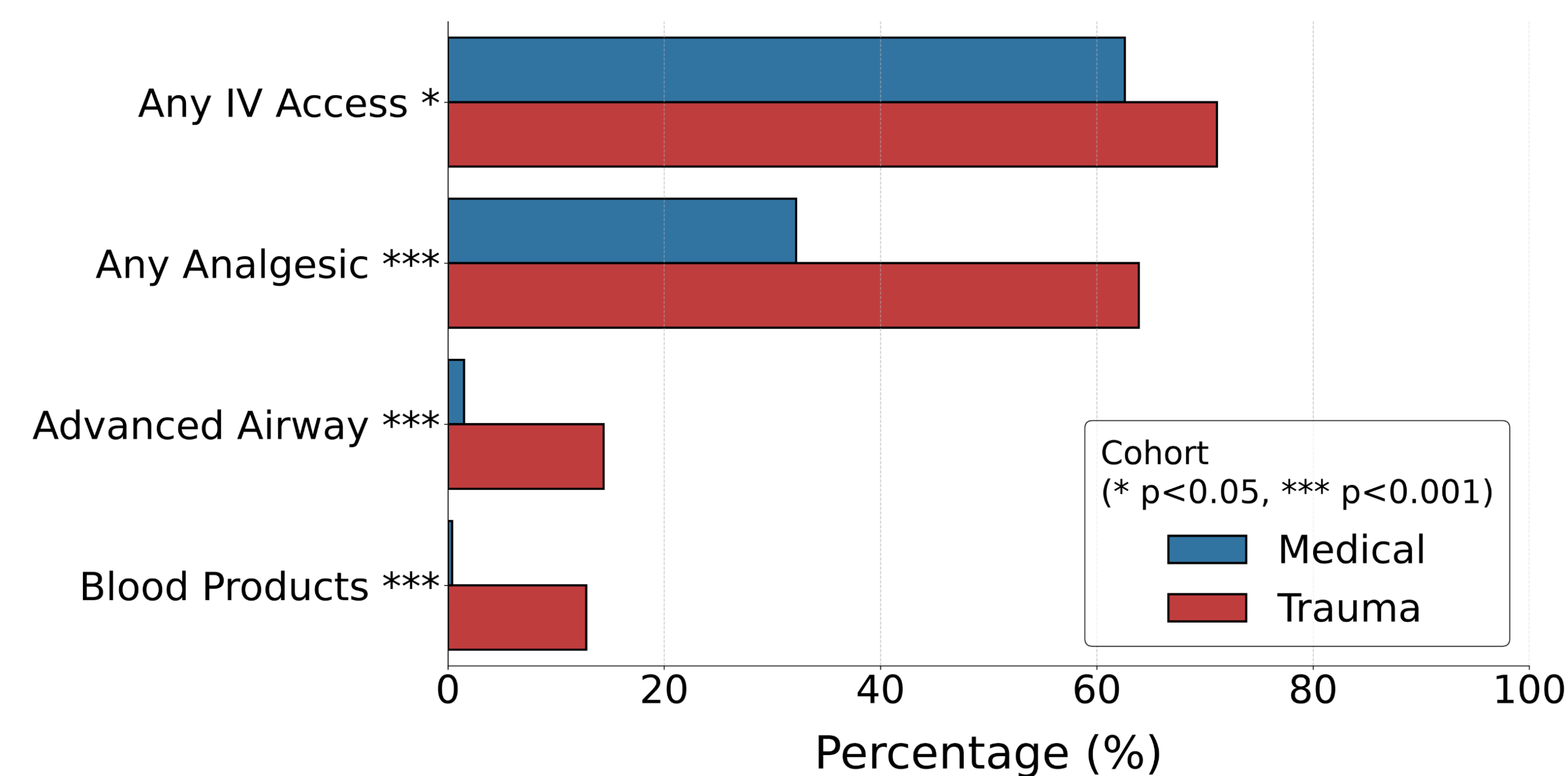


Fig 1. Intervention rates demonstrate a significantly higher operational burden for Trauma incidents, particularly regarding advanced airway management and blood product administration.

Fig 2. Resource Demand Controlled for Triage

(URGENT Category Only)

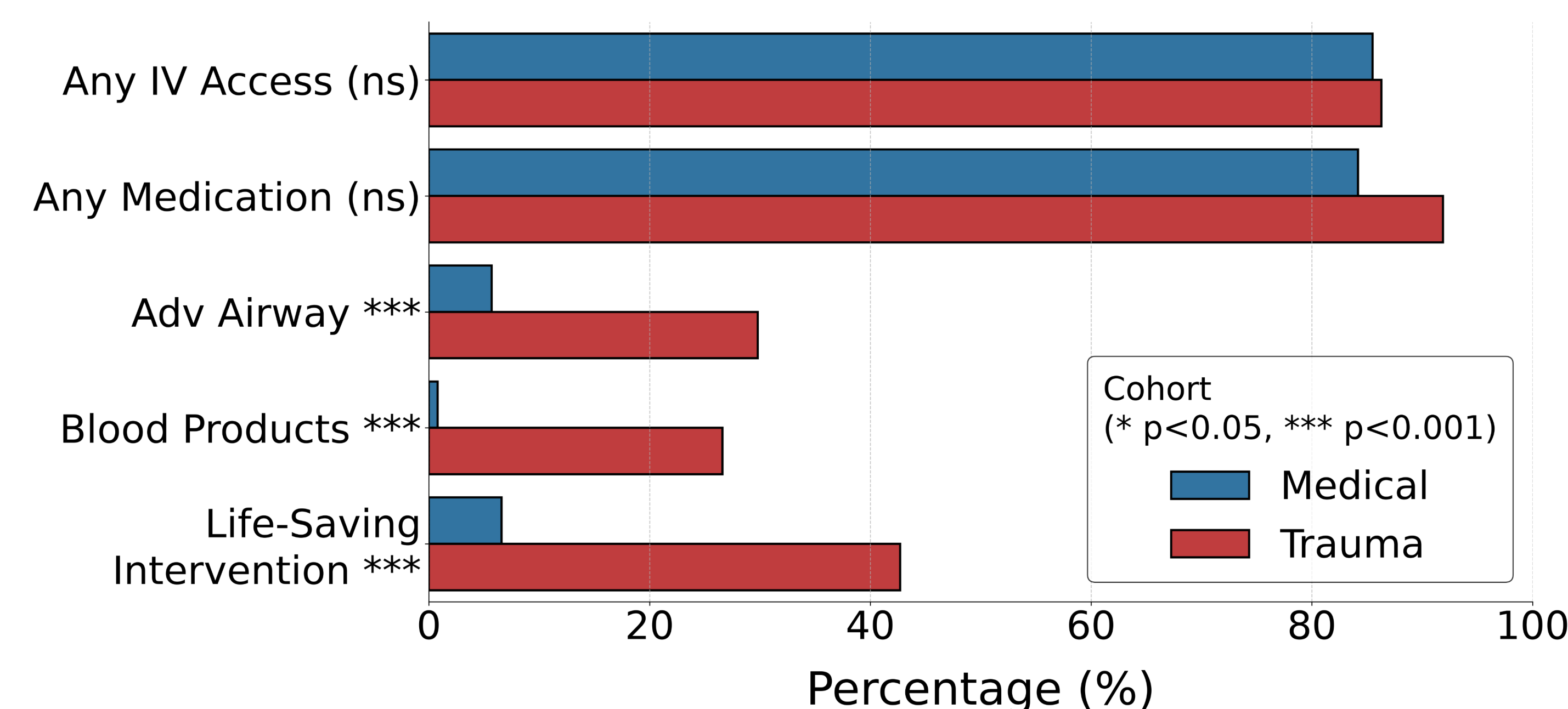


Fig 2. When controlling for patient priority (Urgent assessed category), base-level interventions (IV access, medications) normalize, while the requirement for critical, high-resource interventions remains heavily skewed toward the Trauma cohort.

Fig 3. Transport Complexity Metrics

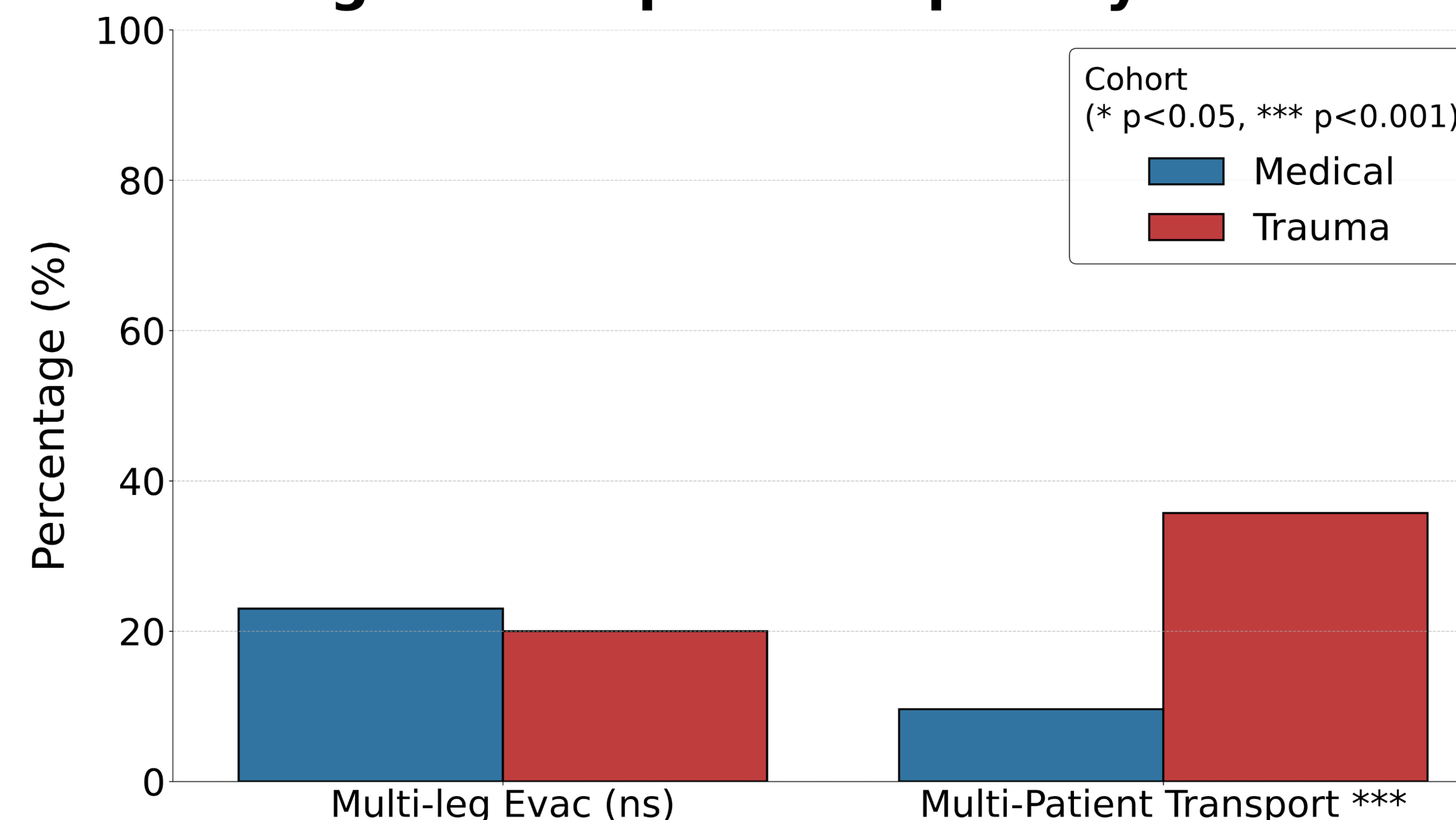


Fig 3. Trauma incidents significantly drive transport complexity, requiring multi-patient evacuation platforms at nearly four times the rate of Medical incidents.

RESULTS

The Divergence (Clinical Demands):

- Pharmacological Profiles:** While medications were administered in over 84% of all urgent patients, the medication profiles were distinct: medical missions were driven by driven by antiemetics (Ondansetron) and crystalloids (Normal Saline), whereas trauma mission heavily demanded analgesics (Fentanyl, Ketamine) and early antibiotics (Cefazolin).
- Life-Saving Interventions:** Demand for life-saving procedures remained significantly higher for urgent trauma patients (42.7% vs 6.6%, $p < 0.001$). Specifically, Urgent trauma patients required drastically more blood products (26.6% vs. 0.8%, $p < 0.001$) and for advanced airway placements (29.8% vs. 5.7%, $p < 0.001$).

Battle Injury & Transport Complexity

Within the trauma cohort, the context of the injury (Battle vs. Non-Battle) drastically altered the resource landscape.

Battle Injury Amplification:

- Trauma Battle Injuries (BI) required significantly more critical interventions than Trauma Non-Battle Injuries (DNBI) (41.7% vs 5.6%, $p < 0.001$).
- Blood product utilization within the BI group was 28.3%, compared to just 1.7% in the DNBI group ($p < 0.001$).

Multi-Patient Transport Surge:

- Multi-patient transports occurred nearly four times more often during trauma missions than medical missions (35.7% vs 9.6%, $p < 0.001$).
- This complexity was heavily concentrated in combat scenarios: 55.9% of all BI incidents involved multiple patients, compared to only 21.3% of DNBI incidents ($p < 0.001$).

CONCLUSIONS

Medical = Logistics: The high volume of Routine and Priority evacuations for non-trauma medical conditions dictates base-level supply chain requirements, requiring a steady sustainment of IV fluids, basic medications, and baseline en route care capabilities.

Trauma = Training & Blood: Trauma drives the absolute demand for life-saving interventions. Pre-deployment training must focus on hemorrhage control, transfusion, and advanced airway management.

LSCO Preparedness: The frequent surge of multi-patient combat trauma events, combined with intense demands for blood and airway management seen even during stability operations, indicates that MEDEVAC platforms in LSCO must be heavily resourced with blood products and staffed by personnel trained for high-capacity, simultaneous critical care over extended evacuation timelines

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