Supplemental Table 2 – Patient Characteristics and Summary of Interventions/Outcomes.

Study	Sample Size	Participant Type	1. ISS* 2. Age* 3. Male (%)	Intervention	Outcomes / Main Findings
Massive Hemorrhage Control					
Smith 2019 [18]	238	Patients with extremity injuries	1. 10.9[a] 2. 34.5[a] 3. 87%	1. Tourniquet 2. No tourniquet	Tourniquet: 1. Associated with ↑ SBP on arrival 2. ↓blood products use 3. ↓ limb related complications
Winstanley 2019 [23]	3792	Injured patients NISS ≥15, with extremity injuries	1. 36.0[a] 2. 24.8[b] 3. 97.2%	1. Hemostatic agent 2. No hemostatic agent	Hemostatic agents: 1. Associated with improved survival in those more severely injured
Duignan 2018 [33]	84	Serious bleeding from extremity injury	1. NR 2. NR 3. 73.8%	1. Tourniquet 2. No tourniquet	Tourniquet: 1. All tourniquet applications were inappropriate 2. No complications resulted
Kauvar 2018 [25]	455	≥1 arterial injury to main lower limb	1. NR 2. NR 3. NR	1. Tourniquet 2. No tourniquet	Field tourniquet: 1. ↑ wound infection 2. ↑ Neuro compromise but not limb loss
Schauer 2018 [29]	28212	Traumatically injured patients	1. NR 2. NR 3. NR	1. Hemostatic 2. No Hemostatic	Hemostatic agents: 1. ↑ use in GSW, traumatic amputations, tourniquet application 2. ↑ blood product use
Schauer 2017 [31]	705	Casualties in Afghanistan	1. NR 2. NR 3. NR	1. QCCG 2. Non-QCCG	QCCG casualties: 1. Had ↑ GSWs vs. baseline population 2. Hemorrhage control success similar to other military and civilian reports
Dunn 2016 [20]	24	Trauma with extremity injuries	1. NR 2. 25.0[a] 3. NR	1. Tourniquet 2. No comparison	Tourniquet: 1. High survivability of patients transported with tourniquet 2. Authors support battlefield tourniquet application
Kragh 2015 [28]	1413	Military casualties in Afghanistan or Iraq	1. 20.0[a] 2. 24.0[b] 3. NR	1. Tourniquet 2. No tourniquet	Tourniquet: 1. Associated with worse shock and ↑ transfusion requirements 2. Survival rates similar to transfused casualties with no tourniquets
Ode 2015 [27]	56	Patients with penetrating limb injuries or open bleeding fractures	1. 9.0[b] 2. NR 3. NR	1. Tourniquet 2. No tourniquet	Tourniquet: 1. Majority of tourniquets applied appropriately to civilians requiring hemorrhage control
Bonner 2011 [61]	167	Military trauma in Afghanistan who had a pelvic x-ray	1. NR 2. NR 3. NR	1. Pelvic binder application 2. No comparator	Pelvic binder: 1. Application above level of greater trochanters is common and does not reduce pelvic fractures 2. Likely to delay cardiovascular recovery
Pozza 2011 [30]	21	Soldiers with GSWs treated with local hemostatic care	1. NR 2. NR 3. 100%	1. Celox 2. No Celox	Celox granules: 1. Quick and efficient haemostatic action producing a stable clot
Pollak 2010 [32]	218	Injured combat patients	1. NR 2. NR 3. NR	1. NPWT during aeromedical evacuation 2. No comparator	Negative pressure wound therapy: 1. Seems safe and feasible 2. Complications due to injury severity, unrelated to NPWT failure.
Clasper 2009 [24]	44	Military combat casualties	1. NR 2. NR 3. NR	1. Tourniquet 2. No tourniquet	Tourniquet: 1. Significant ↑ in deep infection rate (32% vs. 4.5%)

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Cox 2009 [17]	44	Patients with IED injuries or GSWs	1. NR 2. NR 3. NR	1. QuikClot 2. HemCon 3. QuikClot + HemCon	Hemostatic agents: 1. Stop or ↓ bleeding 2. HemCon appears safe, QuikClot may produce superficial burns
Beekley 2008 [19]	165	Patients with amputations and vascular injuries	1. NR 2. NR 3. NR	1. Tourniquet 2. No tourniquet	Tourniquet: 1. ↑ Prehospital hemorrhage control, notably in those ISS>15 2. 57% of deaths preventable with early use 3. No early adverse outcomes
Brodie 2007 [22]	70	Casualties treated at field hospitals in Iraq and Afghanistan	1. 16.0[b] 2. NR 3. NR	1. Tourniquet 2. No comparator	Tourniquet: 1. Prehospital use can be life saving for severe isolated limb injuries, profound hypovolemic shock and need for massive transfusion
Lakstein 2002 [21]	91	Soldiers, civilians and casualties of combat or terrorist attacks	1. NR 2. NR 3. NR	1. Tourniquet applied in prehospital setting 2. No comparator	Tourniquet: 1. Effective and easy method for preventing exsanguination in military prehospital setting
Airway Management					
Schauer 2019 [34]	216	Trauma patients treated in the prehospital setting	1. NR 2. NR 3. 98.14%	1. SGA en-route to military ED 2. CTY en-route to military ED	All interventions: 1. No difference in short-term outcomes comparing both interventions
Hardy 2018 [37]	617	Combat trauma treated in the prehospital setting	1. 14.0[a] (14) 2. 25.0[a] (5) 3. 98%	1. BVM 2. SGA 3. CTY	All interventions: 1. SGA ↑ morbidity 2. No difference in survival between groups
Shavit 2018 [38]	65	Patients treated in the prehospital setting	1.NR 2. 22.0[b] (17-30) 3. 100%	1. ETI 2. LMA	All interventions: 1. In failed ETI, LMA can effectively treat combat casualties during a short transport time
Barnard 2014 [40]	34	Patients with combat trauma	1. NR 2. NR 3. 97.0%	1. CTY 2. No comparator	Cricothyrotomy: 1. Procedural success was higher than previously reported
Lockey 2014 [35]	7256	Patients treated in the prehospital setting	1. NR 2. NR 3. NR	1. Intubation by non-anesthetists 2. Intubation by anesthetists	Intubation: 1. Non-anesthetists 2x more likely to perform rescue airway intervention vs anesthetists
Struck 2011 [39]	23	Patients treated in the prehospital Setting	1. NR 2. NR 3. NR	1. Tracheal intubation via GVSL 2. Conventional laryngoscopy	Intubation adjuncts: 1. GSVL could be a valuable support instrument in the prehospital emergency management of difficult airways
Cobas 2009 [36]	203	Patients requiring emergency prehospital intervention	1. NR 2. 42.0[a] (20) 3. 73%	1. Prehospital intubation (failures) 2. No comparator	Prehospital intubation: 1. 31% failed PHI; no mortality difference between properly vs improperly intubated 2. BVM can adequately manage airways in trauma patients who cannot be intubated
Respiratory/Breathing					
Bozzay 2018 [44]	115	Patients treated in the prehospital Setting	1. 30.8[a] (11.6) 2. 24.7[a] (5.4) 3. 99.1%	1. Thoracostomy tube insertion 2. No comparator	Thoracostomy: 1. Number of TTs placed significantly ↑ RH development (p=0.0439)
Lesperance 2018 [42]	477	Patients treated in the prehospital Setting	1. 29.6[a] (14.6) 2. 41.5[a] (17.6) 3. 77.3%	1. Prehospital needle decompression 2. No comparator	Prehospital needle decompression: 1. Injured chest wall significantly thicker at 2[nd] ICS MCL and 5[th] ICS AAL (both p < 0.005) 2. ↑ chest wall thickness correlated with catheter failure to reach pleural space
Weichenthal 2016 [48]	169	Patients assessed by EMS	1. 71.64[a] 2. 38.0[a] 3. 87%	1. NT 2. No comparator	Needle thoracostomy: 1. Safe when performed by EMS paramedics in most settings

					2. Effective in blunt and penetrating trauma patients, most beneficial when unstable
Blenkinsop 2015 [50]	63	Patients treated in the prehospital Setting	1. NR 2. 24.0[b] (21-27) 3. 100%	1. NCD 2. No comparator	Needle chest decompression: 1. No significant difference between sites 2. 55mm catheter will decompress 99% of tension PTX without complications; >60mm not recommended
Weichenthal 2015 [47]	64	Patients treated in the prehospital Setting	1. NR 2. 40.0[a] 3. 84%	1. NT with >60min Transport time 2. NT with <60min Transport time	Needle thoracostomy: 1. No significant difference in survival in prolonged vs short transport times
Ball 2010 [46]	101	Traumatic injuries requiring prehospital intervention	1. NR 2. NR 3. NR	1. NT placed by HEMS 2. NT placed by GEMS	Needle thoracostomy: 1. Tension PTX decompression using 3.2cm catheter failed in 65% 2. 4.5cm catheter ↓ failure rate
Blaivas 2010 [49]	57	Patients treated on arrival via EMS to ED	1. NR 2. NR 3. NR	1. NT followed by US in Emergency Room 2. No comparator	Needle thoracostomy: 1. 26% of prehospital patients with suspected PTX appeared to not have a PTX originally; patient should be evaluated with bedside US first
Matsumoto 2009 [26]	34	Cardiac arrest patients with blunt trauma	1. NR 2. NR 3. 64.7%	1. Prehospital thoracotomy 2. No comparator	Prehospital thoracotomy: 1. No survivors 2. Early access to an emergency field thoracotomy may improve possibility of survival
Aylwin 2008 [41]	52	Patients requiring either prehospital or ED intervention	1. NR 2. 29.0[b] (22-29) 3. 85%	1. Prehospital thoracostomy 2. No comparator	Prehospital thoracostomy: 1. 61% appropriately indicated for suspected tension PTX 2.14% complication rate; 31% chest tubes poorly placed; 17% required repositioning. 3. Pleural drainage has potential to cause life-threatening injury, especially prehospital
Warner 2008 [51]	28	Patients treated in the prehospital Setting	1. NR 2. NR 3. NR	1. NT 2. No comparator	Needle thoracostomy: 1. EMS NT safe and resulted in four cases of unexpected survival
Davis 2005 [52]	81	Trauma patient requiring intervention by aeromedical crews	1. NR 2. NR 3. NR	1. NT 2. TT	All interventions: 1. ↓ complication rate and a small but significant group of unexpected survivors support use of these by aeromedical staff
Spanjersberg 2005 [45]	149	Patients treated en-route or in ED	1. 23.3[a] 2. NR 3. 82.55%	1. Prehospital TT 2. ED TT	Tube thoracostomy: 1. Infected hemothoraces were non-significantly related to 9% of prehospital and 12% of ED-performed TTs
Circulation					
Boudreau 2019 [65]	116	Patients treated en-route or in ED	1. NR 2. NR 3. NR	1. TXA en-route (HEMS) 2. TXA in ED	Tranexamic acid: 1. No difference in complications or mortality
Cornelius 2018 [64]	133	Trauma patient with hemorrhage ± signs of shock and ISS ≥ 20	1. All ≥20.0 2. NR 3. NR	1. TXA 2. Non-TXA	Tranexamic acid: 1. Non-TXA: less acutely injured, ↓ LOS and improved outcomes 2. Severely injured TXA survived despite high TRISS
Heschl 2018 [58]	1267	Patients treated in the prehospital setting	1. 36.5[a] (15.8) 2. 42.6[a] (20.9) 3. 66.7%	1. Transfusion of RCCs (HEMS) 2. No comparator	RCC transfusion: 1. HEMS RCC transfusion is feasible

Maddry 2018 [43]	650	Trauma patients requiring air transport	1. 27.0[a] (13.3) 2. 27.0[a] (7.4) 3. 98%	1. TV + ARDSNet table compliant 2. TV + ARDSNet table non-compliant	ARDSNet compliant ventilation: 1. ↓ ventilator days, ICU days, and 30-day mortality
Moore 2018 [70]	144	Injured adults with acute blood loss	1. NR 2. NR 3. NR	1. Plasma 2. Usual care	Plasma administration: 1. Use not associated with ↑ survival
Sperry 2018 [55]	501	Injured patients at risk for hemorrhagic shock during air transport	1. 22.0[b] (13-30) 2. NR 3. NR	1. Plasma 2. Standard-care	Plasma administration: 1. Prehospital administration safe and ↓ 30-day mortality and ↓ median PT
Vitalis 2018 [54]	28	Urgently injured or need surgical treatment <90min during combat	1. 25.0[b] (21-38) 2. NR 3. 96%	1. Battlefield blood transfusion 2. No transfusion	Battlefield transfusion: 1. ↓ time to first blood product transfusion for alpha casualties; FLYP is 1st line battlefield blood product
Holcomb 2017 [53]	1058	Trauma patients transported by helicopter	1. 17.0[b] (9-29) 2. 38.0[b] (25-55) 3. 71%	1. Prehospital blood products 2. Crystalloid (no blood products)	Prehospital blood products: 1. Inconclusive results due to imbalance in SBP, GCS, and ISS between groups; unable to compare
Schauer 2017 [68]	272	Patients with hypotension, amputation, or penetrating torso trauma	1. 20.1[a] (18) 2. NR 3. NR	1. TXA 2. No TXA	Tranexamic acid: 1. Overall proportions of patients receiving TXA were low despite emphasis in the guidelines
Shackelford 2017 [60]	502	US military combat casualties	1. NR 2. NR 3. 98%	1. Prehospital transfusion 2. No prehospital transfusion but matched 3. No prehospital transfusion	Prehospital transfusion: 1. Use within minutes of injury associated with ↑ 24hr and 30d survival vs delayed transfusion or no transfusion
Miller 2016 [62]	3071	Adult trauma air transported from the scene to trauma center	1. NR 2. NR 3. NR	1. Prehospital blood transfusion 2. No prehospital blood transfusion	Prehospital blood transfusion: 1. No effect on 24-hr and overall in-hospital mortality
Savell 2016 [69]	1267	US military personnel transported by MEDEVAC teams	1. NR 2. NR 3. NR	1. PIV 2. IO 3. PIV + IO 4. No IV access	Intraosseous access: 1. Successfully used in the combat setting 2. Accounts for ~12% of vascular access in the MEDEVAC population
Auten 2015 [59]	61	Severely battle-injured personnel with ISS ≥15	1. NR 2. NR 3. 100%	1. CTx / FWB 2. CTx	FWB: 1. Early use in resource-limited settings ↓ traumatic coagulopathy
Jansen 2014 [67]	791	Bleeding trauma patients	1. 22.0[b] 2. 22.0[b] (19-25) 3. 99.1%	1. Massive transfusion 2. Non-massive transfusion	Massive transfusion: 1. Massive transfusion ↑ survival vs civilian patients
Nadler 2014 [66]	103	Patients treated at scene	1. 16.0[b] (9-25) 2. NR 3. NR	1. Military personnel TXA 2. Civilian TXA	Tranexamic acid: 1. Administering in the field is feasible in the civilian and the military setting
Perkins 2011 [56]	369	Patients admitted to combat support hospital	1. NR 2. NR 3. NR	1. FWB 2. Apheresis platelets	All interventions: 1. No difference in survival between FWB or aPLT at 24 hours or at 30 days
Borut 2010 [63]	80	Combat soldiers with extremity vascular injuries	1. NR 2. 23.8[a] 3. 100%	1. TVS 2. Non-TVS	Temporary Vascular Shunt: 1. No significant difference in amputation rates in patients

Wade 2010 [57]	2050	US military trauma patients	1. NR 2. NR 3. NR	1. rFVIIa 2. No rFVIIa	rFVIIa use: 1. Not associated with an improvement in survival or an ↑ in complications
Hypothermia Prevention					
Lundgren 2011 [16]	48	Patients with outdoor injury transported by EMS	1. NR 2. NR 3. 39.6%	1. Passive warming 2. Active warming	Warming methods: 1. In mild hypothermia, prehospital passive warming slows rewarming rate and reduces cold discomfort 2. Adding active warming significantly ↑ thermal comfort and ↓ cold induced stress
Cassidy 2001 [71]	20	Hypothermic patients	1. NR 2. NR 3. NR	1. Warmed IVF 2. Non-warmed IVF	IVF: 1. Prehospital IVF can be warmed in the field and can help ↓ morbidity and mortality from hypothermia
E-FAST					
O'Dochartaigh 2017 [76]	299	Patients requiring air medical transport	1. NR 2. NR 3. NR	1. PHUS 2. No comparator	Prehospital Ultrasound: 1. Supported use in medical and trauma patients with markers of higher acuity during HEMS transport
Yates 2017 [77]	190	Blunt and penetrating trauma patients	1. NR 2. NR 3. NR	1. E-FAST by flight crew 2. E-FAST by trauma team	E-FAST examination: 1. ↑ ability to assess patients in austere air medical and prehospital environments, help establish an early diagnosis, and ↓ iatrogenic injury potential
Kirkpatrick 2004 [75]	225	Patients in physiologic extremes and suspected of having PTXs	1. 14.0[b] (5-27) 2. 37.0[b] 3. 74%	1. E-FAST Examination 2. E-FAST and CT scan 3. CT scan vs CXR	E-FAST examination: 1. Comparable specificity to CXR, more sensitive for occult PTX detection 2. + E-FAST findings should be addressed clinically or with CT depending on hemodynamic stability; use CT if detection of all PTXs desired
Mixed					
Meizoso 2015 [73]	3733	Patients arriving via EMS from injury scene	1. 5.0[b] (1-14) 2. 39.0[a] (19) 3. 74%	1. PHI 2. No PHI	Prehospital interventions: 1. ↓ mortality in severely injured trauma patients and do not delay transport to definitive care
Mahshidfar 2013 [74]	60	Patients with possible spinal trauma	1. NR 2. NR 3. NR	1. Long Backboard 2. Vacuum Mattress Splint	All interventions: 1. Long backboard ↑ immobilization, easier to use, and ↓ time to perform
Cancio 2008 [72]	192	Patients air transported to three urban Level I trauma centers	1. NR 2. NR 3. 71.7%	1. LSIs 2. Usual care	Lifesaving interventions: 1. HRC may help identify the severely injured

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Legend: * - mean or median, a – mean, b – median, AAL – anterior axillary line, aPLT – apheresis platelet, BVM – bag valve mask, CTx – component therapy, CTY – cricothyrotomy, CXR – chest x-ray, E-FAST – Extended Focused Assessment with Sonography in Trauma, ETI – endotracheal intubation, FLYP – French lyophilized plasma, FWB – fresh whole blood, GCS – Glasgow coma scale, GEMS – ground emergency medical services, GSVL – Glidescope video laryngoscope, GSW – gunshot wound, HEMS – helicopter emergency medical service, HRC – heart rate complexity, ICS – intercostal space, IDF – Israeli Defense Force, IED – improvised explosive device, IO – intraosseous, IVF – intravenous fluid, LL – lower limb, LMA – laryngeal mask airway, LSI – life saving intervention, MCL – midclavicular line, NCD – needle chest decompression, NISS – new injury severity score, NPWT – negative pressure wound therapy, NR – not reported, NT – needle thoracostomy, PHI – prehospital intervention, PHUS – prehospital ultrasound, PIV – peripheral intravenous line, POCUS – point of care ultrasound, PT – prothrombin time, PTX – pneumothorax, QCCG – QuikClot® Combat Gauze®, RCC – red cell concentrate, RH – retained hemothorax, SBP – systolic blood pressure, SGA – supraglottic airway, TRISS – trauma revised injury severity score, TT – tube thoracostomy, TV – tidal volume, TVS – temporary vascular shunt, TXA – tranexamic acid.

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