Requirements for Blood in Civilian MCE / Large Scale War

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Acknowledgments

- THOR: Phil Spinella, Mark Yazer
- AABB: Srijana Rajbhandary, Dana Devine, Christine Bales
- Red Cross: Dayand Borge
- Working Group: Jim Stubbs, Don Jenkins, Paul Ness, Andre Cap
- Penn Medicine: Ally Hynes, Zhi Geng, Elinore Kaufman, Jessica Guzman, Daniela Schmulevich

War is a laboratory of nightmares, but . . . more than any other recorded events in history, war has advanced the care of the injured.

C. William Schwab

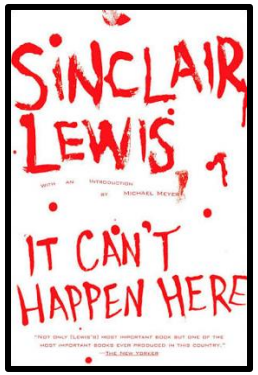
MCI Blood Planning

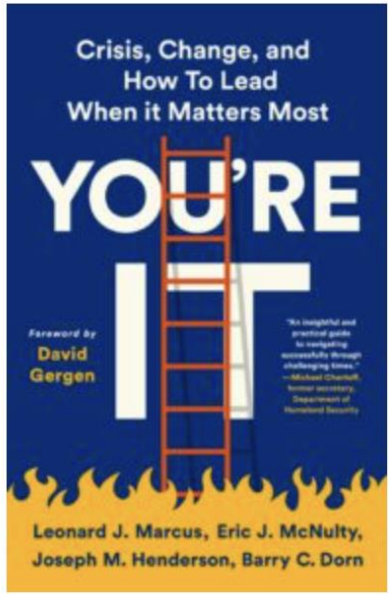
What if…

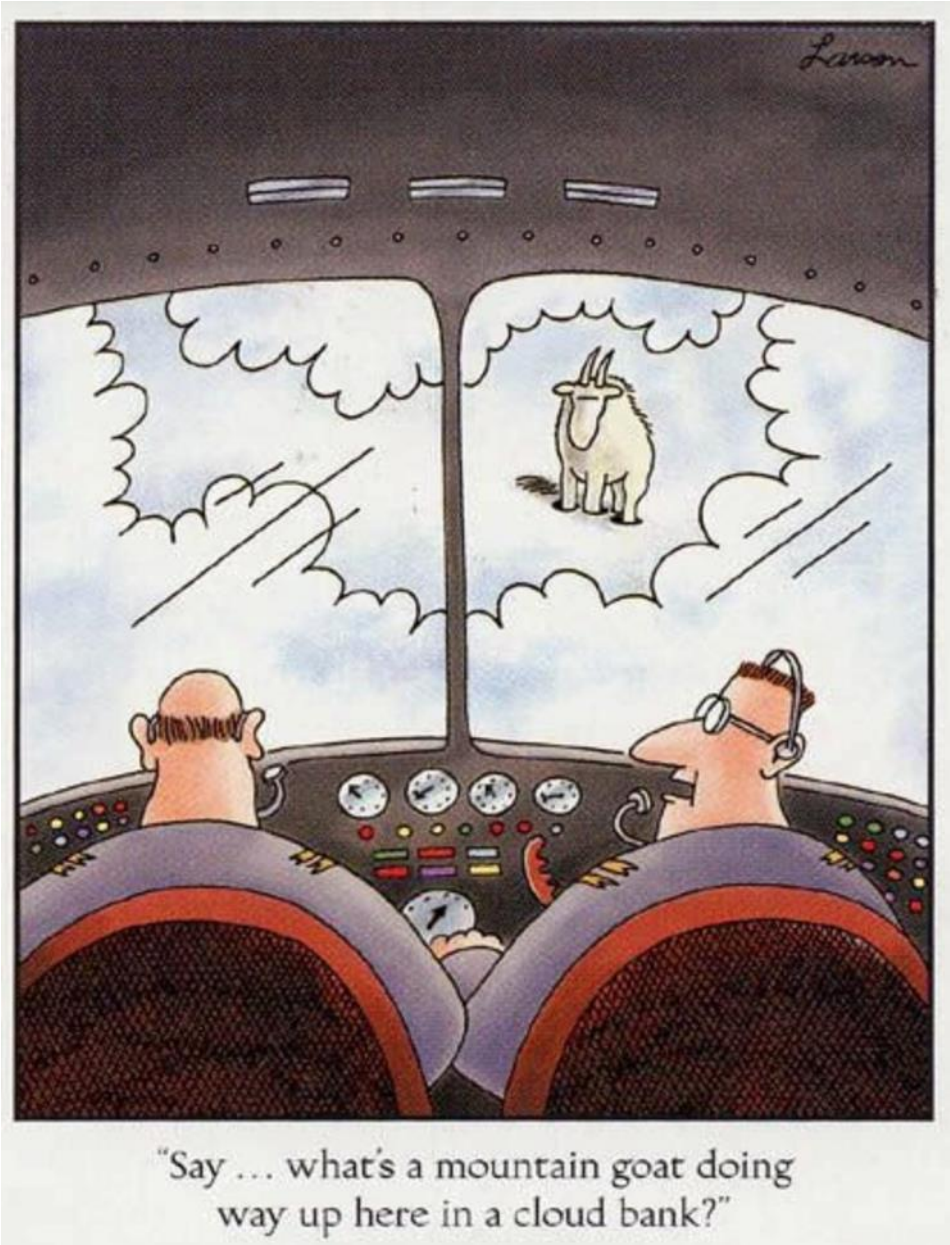
- 1000 lb blast
  - Outhouse
  - Mini Van
- ~2500 casualties
  - 150 Dead on Scene
  - 95 critically injured

Our Nation's Worst Day…

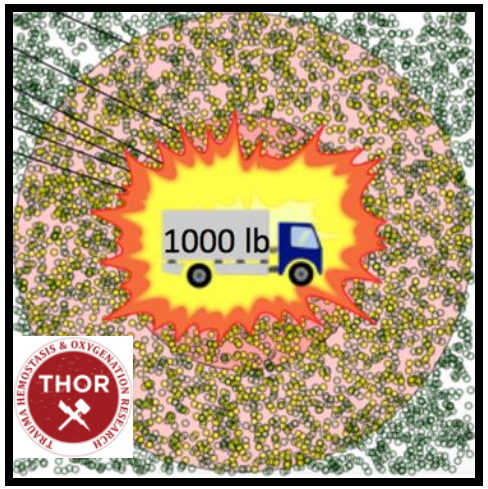
- Are YOU ready?
- Essential Elements for Success
  - Crisis Leadership
  - Anticipating Wicked Problems
- Hope for the best…but PREPARE (EXERCISE) for the worst

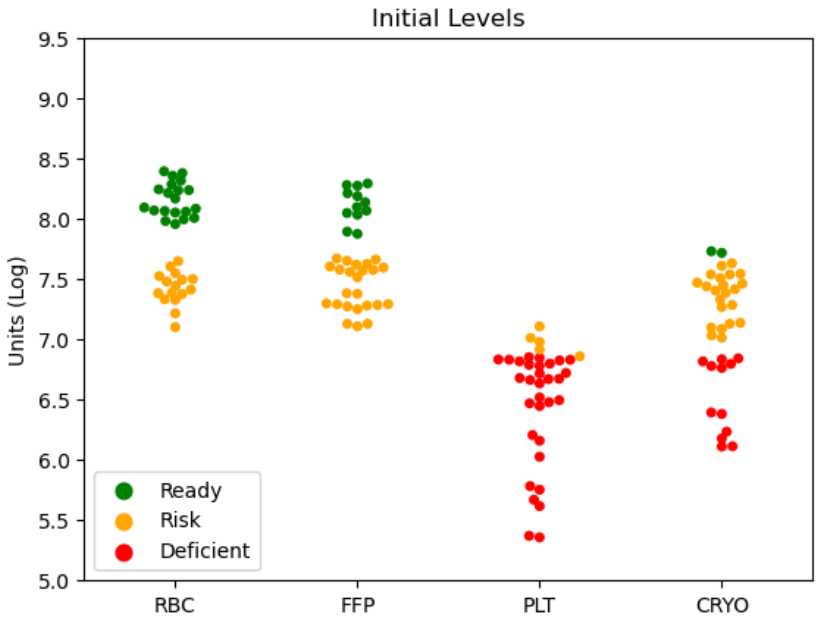






Blood Products: Forgotten Choke Point





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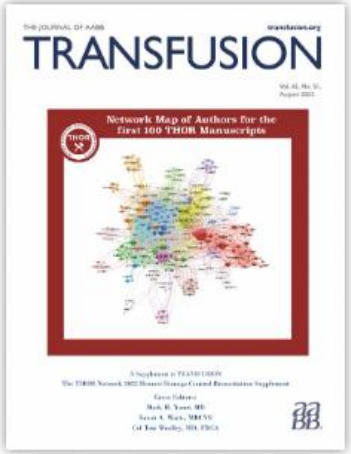
TRANSFUSION

DISASTER PREPAREDNESS | Free Access

U.S. cities will not meet blood product resuscitation standards during major mass casualty incidents: Results of a THOR-AABB working party prospective analysis

Jeremy W. Cannon, Noah M. Igra, P. Dayand Borge, Andrew P. Cap, Dana Devine, Heidi Doughty, Zhi Geng, Jessica F. Guzman, Paul M. Ness, Donald H. Jenkins, Srijana Rajbhandary ... See all authors



	Initial (N = 36)			
	RBC	**FFP**	**PLT**	**CRYO**
Ready	20	12	0	2
Risk	16	24	6 (4-7)	22 (22-26)
Deficient	0	0	30 (29-32)	12 (8-12)

* Value (95% Confidence Interval)

Can these cities manage n=95 critical casualties?

Re-thinking Patient Distribution

302 ± 7 casualties
-- > 57 ± 2 moderately injured (~20%)
-- > 15 ± 2 severely injured (~5%)

Optimizing Mass Casualty Triage: Using Discrete Event Simulation to Minimize Time to Resuscitation

Noah M Igra, BA, Daniela Schmulevich, MCM, Zhi Geng, MD, MPH, Jessica Guzman, MD, Paul D Biddinger, MD, Jonathan D Gates, MD, MBA, FACS, Philip C Spinella, MD, FCCM, Mark H Yazer, MD, Jeremy W Cannon, MD, SM, FACS, the THOR-AABB Workgroup

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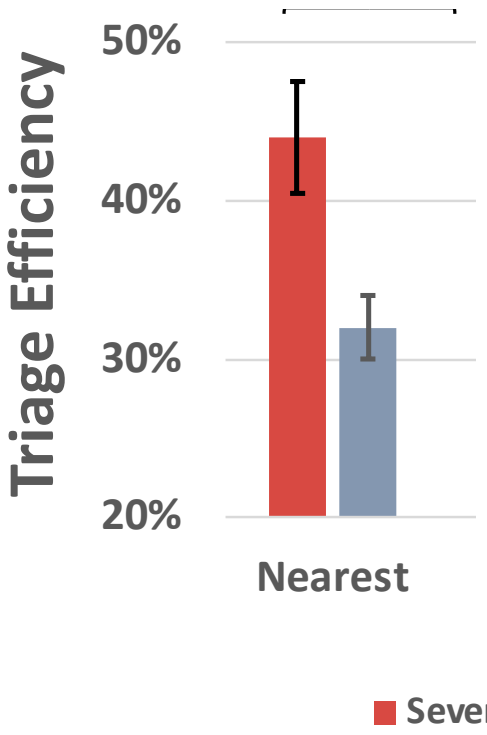
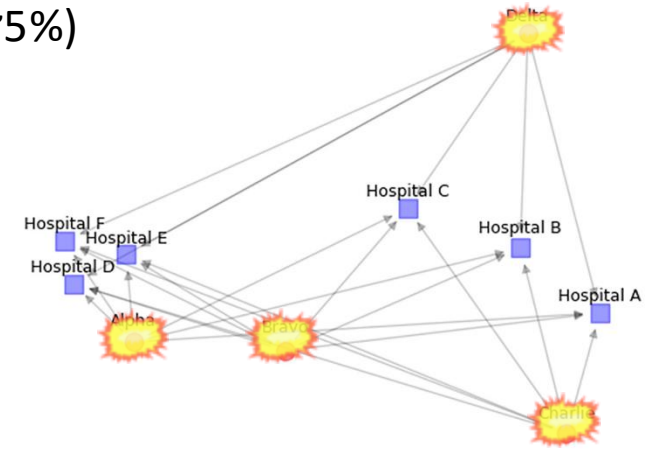




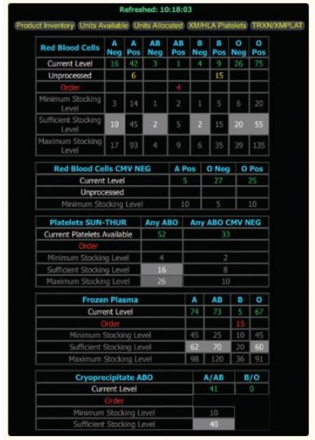
Development and Implementation of Real-Time Web-Based Dashboards in a Multisite Transfusion Service

Jennifer S. Woo[1], Peter Suslow[1], Russell Thorsen[1], Rosaline Ma[1], Sara Bakhtary[1], Morvarid Moayeri[1], Ashok Nambiar[1]
[1]Department of Laboratory Medicine, University of California, San Francisco, CA, USA

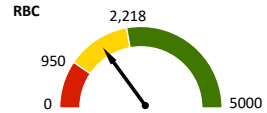
J Pathol Inform. 2019 Feb 7;10:3.

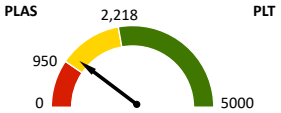
Summary

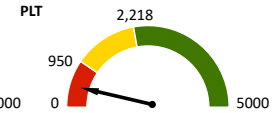
- Equal OR Inventory-based BEST
- Maximize Patient Need Matched to Resources
- Regional Dashboards Needed!



RGB Indicator







LSCO Blood Planning

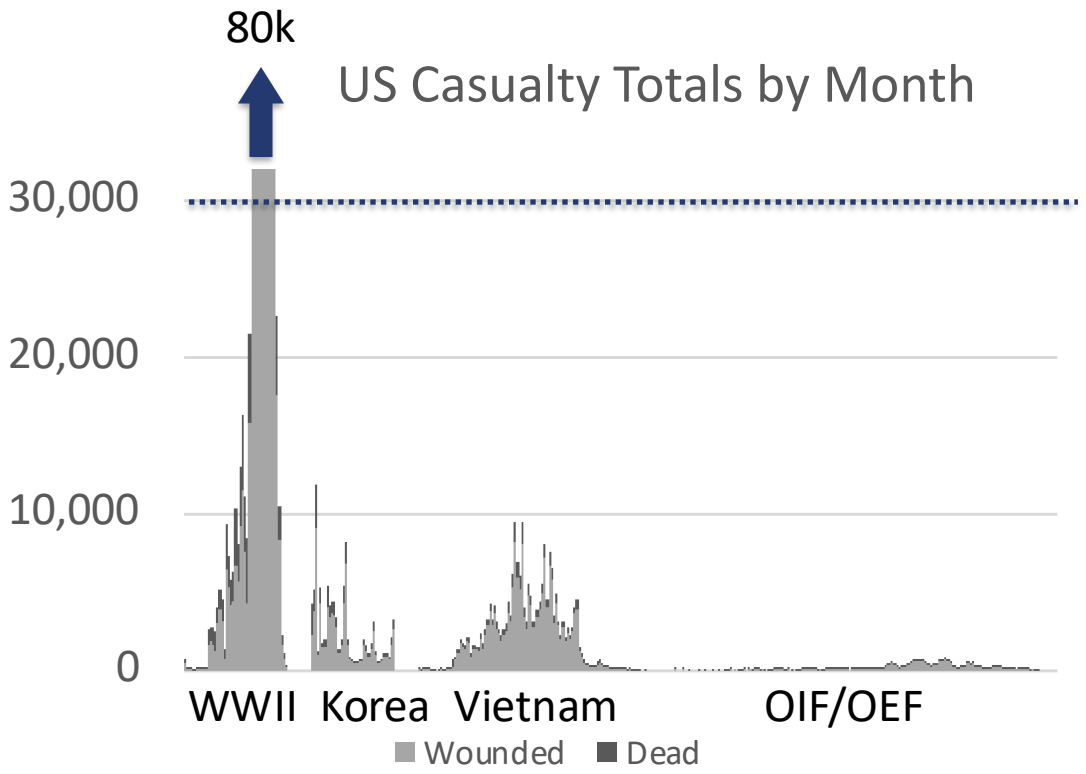
Quantify th

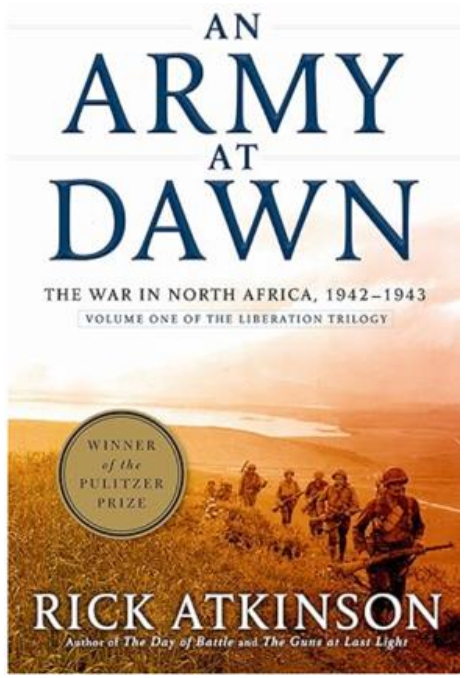
History, the Torch That Illuminates: Lessons from Military Medicine

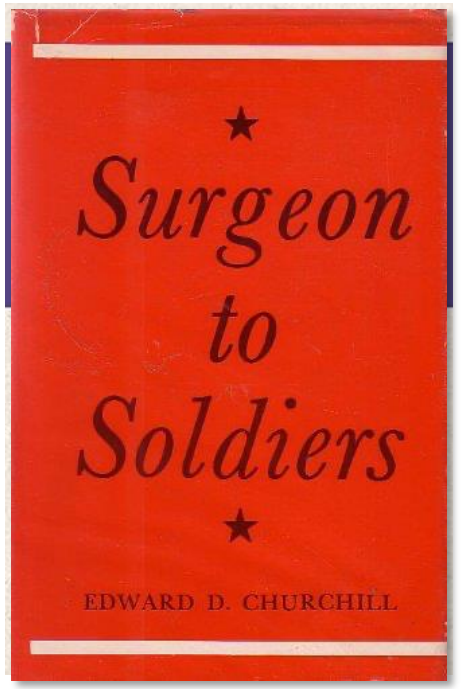
COL Michael E. DeBakey, USAR

MILITARY MEDICINE, 161, 12:711, 1996

- NDMS Pilot: 1K/day x 100++ days == <u>30k/mo x …</u>







Cannon JW, et al. J Trauma Acute Care Surg. 2020; 89(2S Suppl 2):S8-S15.

"The vital role which whole blood played in the care of the wounded in World War II has been adequately dealt with elsewhere, but the essential planning that made possible the provision of over 385,000 pints of whole blood for the treatment of the greater portion of the 386,075 wounded in the European theater of operations is a story that needs to be told "

- COL James B. Mason, June 1948

THE WHITE HOUSE
WASHINGTON

December 10, 1951

TO THE HEADS OF EXECUTIVE DEPARTMENTS AND AGENCIES:

I have asked the Director of the Office of Defense Mobilization to provide within that office a mechanism for the authoritative coordination of an integrated and effective program to meet the nation's requirements for blood, blood derivatives and related substances.

At his direction, the Health Resources Advisory Committee, Office of Defense Mobilization, has established a Subcommittee on Blood for this purpose. This Subcommittee will be concerned with the development of a single National Blood Program encompassing all phases of the problem.

I desire that other departments and agencies of the Federal Government coordinate their activities in the blood field through this mechanism.

Harry Truman

SCUDDER ORATION ON TRAUMA

Blood and War—Lest We Forget

David B Hoyt, MD, FACS

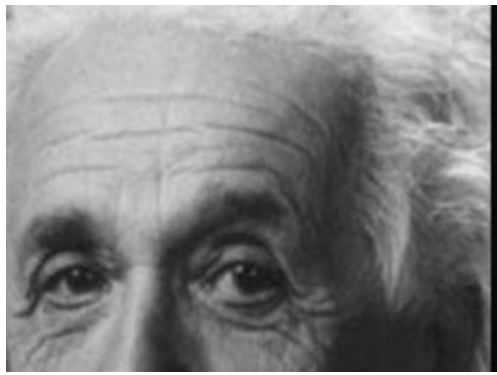
JACS 2009;209(6):681-686

SCUDDER ORATION ON TRAUMA

A Century of Evolution in Trauma Resuscitation

Ronald V Maier, MD, FACS

JACS 2014;219(3):335-345



The only mistake in life is the lesson not learned.

— Albert Einstein —

The thin red line: Blood planning factors and the enduring need for a robust military blood system to support combat operations

Jennifer M. Gurney, MD, FACS, Andrew P. Cap, MD, PhD, John B. Holcomb, MD, FACS, Amanda M. Staudt, PhD, MPH, Matthew D. Tadlock, MD, FACS, Travis M. Polk, MD, FACS, Crystal Davis, MS, Jason B. Corley, MS, MT (ASCP) SBB, Martin A. Schreiber, MD, FACS, FCCM, Andrew Beckett, CD, MD, MSc, FRCSC, FACS, Mary Ann Spott, PhD, Stacy A. Shackelford, MD, FACS, Jan-Michael Van Gent, DO, FACS, Jonathan D. Stallings, PhD, Matthew J. Martin, MD, FACS, *and* **Leslie E. Riggs, MS**, *Houston, Texas*

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TABLE 2. WB Planning Periodic Automatic Resupply (PAR) Recommendations

Theater Medical Assets	Description	Recommended PAR Level (Units WB/ WBE) Per 72 h	Walking Blood Bank
Role 1 (ex: BCT)	3 unit WB per trained medic	3	At least 90% or unit members prescreened
Role 1 or Role 2 non-surgical (ex: ASMC/C-MED)	Nonsurgical resuscitation team	30	At least 50 presecreened donors available
Role 2 (ex: FRSD 20 PAX)	10 surgical cases/day, average 4 units/case	120	At least 100 presecreened donors available
Role 3	24 surgical cases/day, average 6 units/case	240	At least 50 presecreened donors available
MEDEVAC/Air Evacuation/ Critical Care Air Transport	Units per aircraft	8	At least 90% or unit members prescreened

This number best estimates the starting blood level in a new theater of operations. Blood PAR should be adjusted dynamically based on operational activity and resupply availability.

Mitigation Strategies

- No SURGE Capacity
- Think Creatively To Identify Solutions
  - Dried Plasma, Plts
  - Deglys Blood (Collected -- > Sored During MCIs)
- Walking Blood Bank Education

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