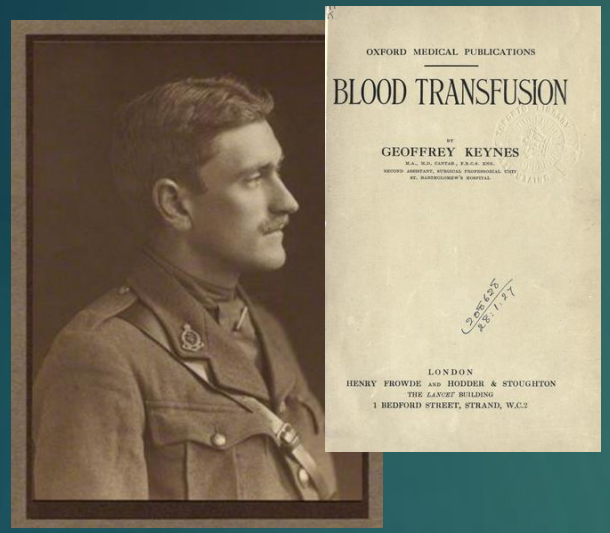
RDCR Training for future operations

"He who wishes to be a surgeon, should go to war."
- Hippocrates

WWW.THORNETWORK.COM

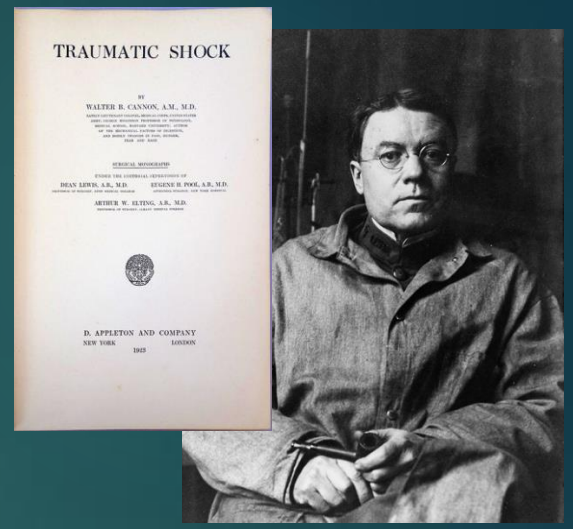
WWI 1914



G. Keynes

Lawrence Bruce Robertson

Oswald Hope Robertson

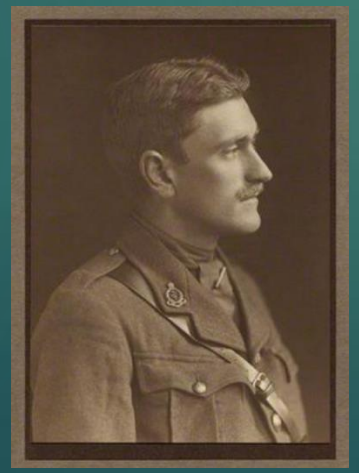


WB Cannon

Training for Medical Staff in resuscitation using Whole Blood

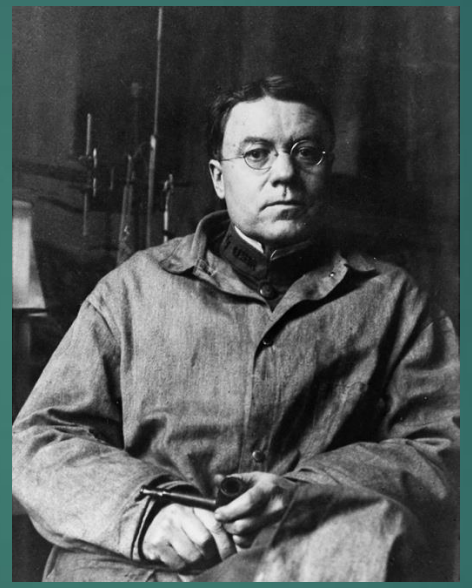
WWII 1941

UK: Whole Blood



G. Keynes

USA: Plasma



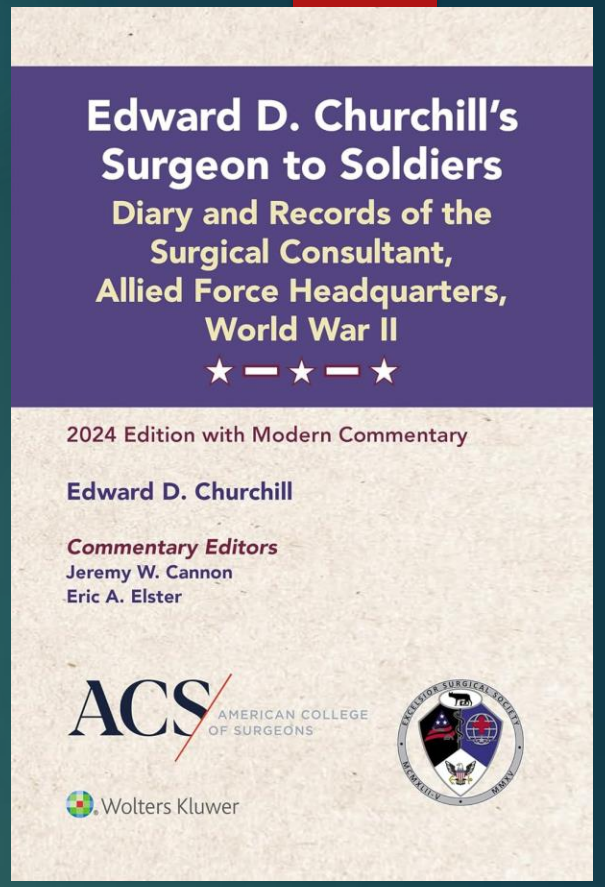
W.B. Cannon

E.D. Churchill

Plasma Alone Not Sufficient

Col. Edward D. Churchill of Boston, Professor of Surgery at Harvard, and now consulting surgeon for troops here, has pioneered in setting up blood banks similar to the Red Cross blood deposits in the United States.

In a report to the surgeon's office Colonel Churchill declared:

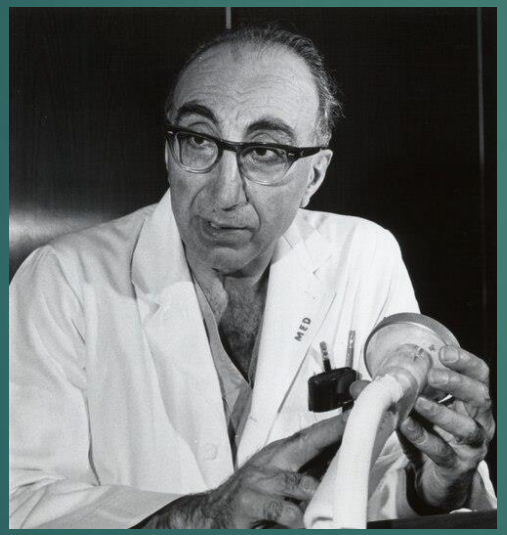


Faught for US Whole Blood

Training in Resuscitation of Combat Trauma using whole blood

Korea 1950

Lesson learnt: Failure of the plasma only program in WW2



M.E. DeBakey


BATTLE CASUALTIES

INCIDENCE, MORTALITY, AND LOGISTIC CONSIDERATIONS

By

GILBERT W. BEEBE, Ph.D.

and

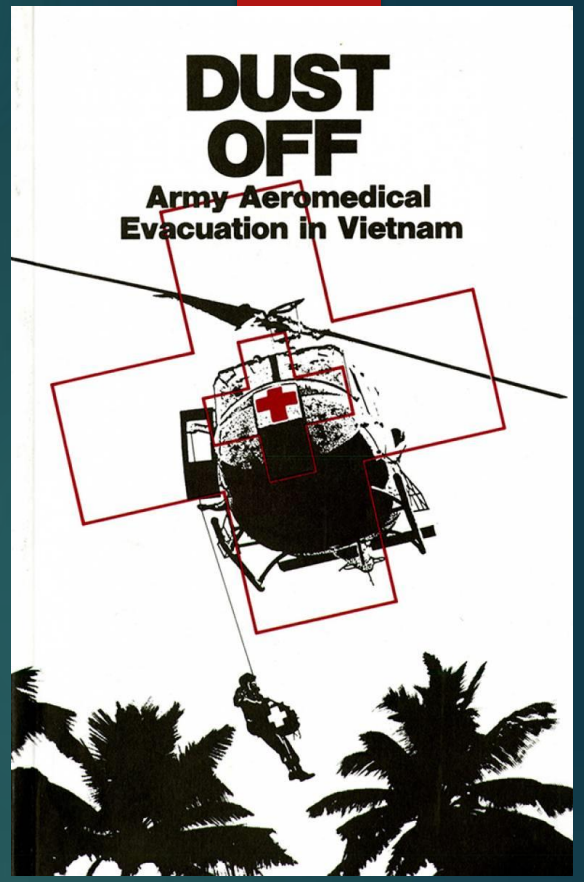
MICHAEL E. De BAKEY, M.D.

CHARLES C THOMAS · PUBLISHER

Vietnam 1965

SOF Medics

Pararescue Jumpers



Medivac

Whole Blood

Walking Blood Banks

Rise of crystalloid use

ATLS - 1976

ATLS®
ADVANCED TRAUMA LIFE SUPPORT

3 for 1 Rule

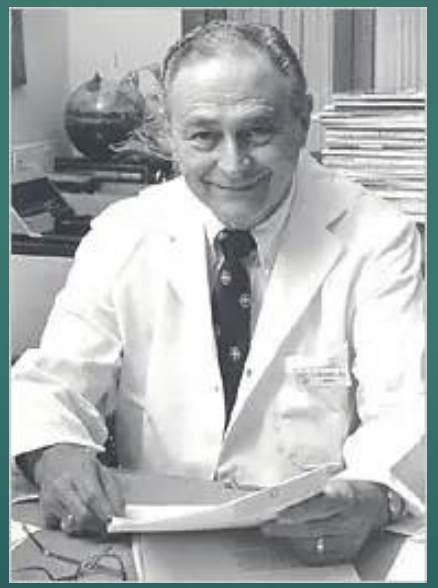
a rough guideline for the total amount of crystalloid volume acutely is to replace each ML of blood loss with 3 ML of crystalloid fluid, thus allowing for restitution of plasma volume lost into the interstitial & intracellular space

> Crit Care Med. 1976 Mar-Apr;4(2):46-54.

Fluid resuscitation following injury: rationale for the use of balanced salt solutions

C J Carrico, P C Canizaro, G T Shires

PMID: 819213



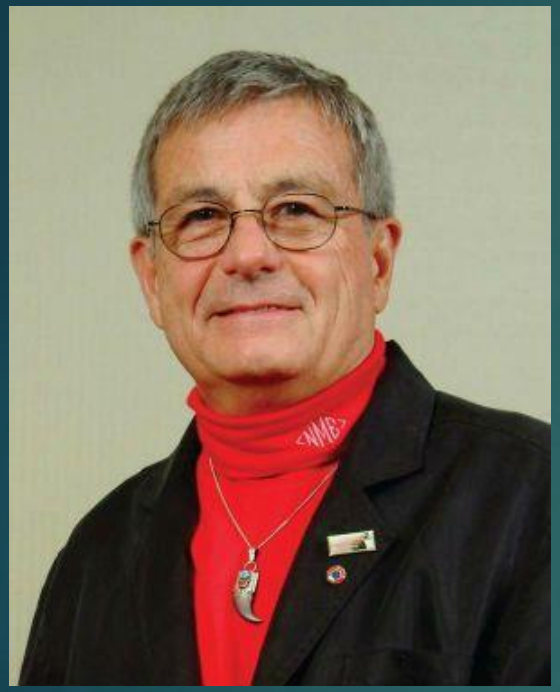
Tom Shires

TABLE 3-1 SIGNS AND SYMPTOMS OF HEMORRHAGE BY CLASS

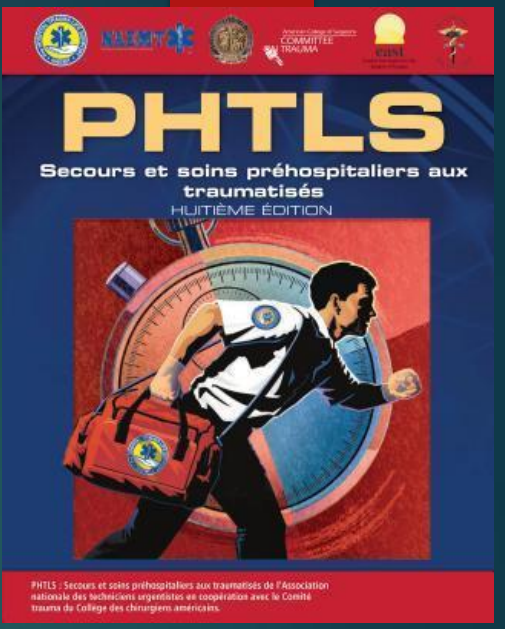
PARAMETER	CLASS I	CLASS II (MILD)	CLASS III (MODERATE)	CLASS IV (SEVERE)
Approximate blood loss	<15%	15–30%	31–40%	>40%
Heart rate	↔	↔/↑	↑	↑/↑↑
Blood pressure	↔	↔	↔/↓	↓
Pulse pressure	↔	↓	↓	↓
Respiratory rate	↔	↔	↔/↑	↑
Urine output	↔	↔	↓	↓↓
Glasgow Coma Scale score	↔	↔	↓	↓
Base deficit[a]	0 to −2 mEq/L	−2 to −6 mEq/L	−6 to −10 mEq/L	−10 mEq/L or less
Need for blood products	Monitor	Possible	Yes	Massive Transfusion Protocol

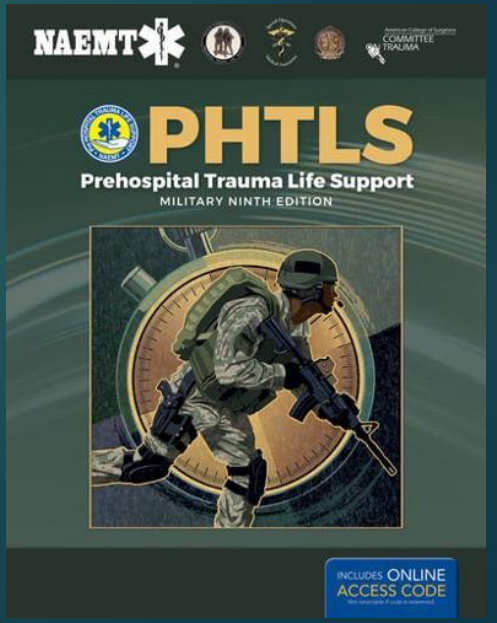
[a] Base excess is the quantity of base (HCO_3^-, in mEq/L) that is above or below the normal range in the body. A negative number is called a base deficit and indicates metabolic acidosis.

PHTLS - 1983



N Mc Swain





TCCC - 1997

ATLS PHTLS – Does not work for Combat Medicine

Frank Butler

John Hagman

MILITARY MEDICINE, 161, Suppl 3, 1996

Tactical Combat Casualty Care in Special Operations

*CAPT Frank K. Butler, Jr., MC USN**
LTC John Hagmann, MC USA†
ENS E. George Butler, MC USN‡

U.S. military medical personnel are currently trained to care for combat casualties using the principles taught in the Advanced Trauma Life Support (ATLS) course. The appropriateness of many of the measures taught in ATLS for the combat setting is unproven. A 2-year study to review this issue has been sponsored by the United States Special Operations Command. This paper presents the results of that study. We will review some of the factors that must be considered in caring for wounded patients on the battlefield with an emphasis on the Special Operations environment. A basic management protocol is proposed that organizes combat casualty care into three phases and suggests appropriate measures for each phase. A scenario-based approach is needed to plan in more detail for casualties on specific Special Operations missions, and several sample scenarios are presented and discussed.

Introduction

Medical training for Special Operations forces (SOF) corpsmen and medics is currently based on the principles taught in the Advanced Trauma Life Support (ATLS) course.[1] The ATLS guidelines provide a standardized, systematic approach to the management of trauma patients that has proven very successful when used in the setting of civilian hospital emergency departments, but the efficacy of at least some of these measures in the prehospital setting has been questioned.[2-29]

Even less certain is the appropriateness of extrapolating ATLS guidelines without modification to the battlefield; some of the shortcomings of ATLS in the combat environment have been addressed by military medical authors.[21,30-36] The prehospital phase of caring for combat casualties is critically important, since up to 90% of combat deaths occur on the battlefield before the casualty ever reaches a medical treatment facility (MTF).[37] The importance of this issue was recognized by the Commander of the Naval Special Warfare Command in 1993 when he called for a study on combat casualty care techniques in Special Operations. The need for this research was validated by the United States Special Operations Command (USSOCOM). A 2-year study of this issue was subsequently funded by USSOCOM and accomplished through literature reviews and multiple workshops with SOF physicians, corpsmen, and medics. This paper presents the results of that study. A parallel and independent effort was found to be underway in the United Kingdom, where a modified ATLS-type course is being developed for use by the British Special Air Service and Special Boat Squadron (personal communication, Dr. John Navein, former Senior Medical Officer, 22nd Special Air Service Regiment).

Figures 1 through 4 describe several representative casualty scenarios that might be encountered in the conduct of Special Operations and illustrate the complexity of the casualty care that must be rendered by SOF corpsmen and medics. The need to consider significant modifications to the principles of care taught in ATLS is obvious when considering the management of these scenarios. Factors such as enemy fire, medical equipment limitations, a widely variable evacuation time, tactical considerations, and the unique problems entailed in transporting casualties that occur in Special Operations all must be addressed. In addition, greater emphasis needs to be placed on the management of penetrating trauma, since most deaths in a combat setting are caused by penetrating missile wounds.[30] Although the Department of Defense is aggressively pursuing new technologies that may result in improved management of combat trauma,[38] the most important aspect of caring for trauma victims on the battlefield is well-thought-out planning for that environment and appropriate training of combat medical personnel.

Initial training for SOF corpsmen and medics is currently conducted at the 18 Delta Medical Sergeants Course taught at Fort Sam Houston in San Antonio, Texas, although a move to the new Special Operations Medical Training Center in Fort Bragg, North Carolina, is planned for the near future. The 18 Delta course structures its trauma care around the principles taught in ATLS. These principles are supplemented by trauma care training in a field environment, but the departures from ATLS appropriate for the battlefield have not been systematically reviewed and presented in the literature. In addition, many of the unique operating environments and missions encountered in Special Operations are not addressed. Another consideration is skills maintenance. After completion of their initial training, SOF corpsmen and medics are generally assigned to small operational units (SEAL platoons or Special Forces A teams), which are required to conduct training in a wide variety of combat skills and to participate in numerous training exercises and operational deployments. Usually lacking from this intense training regimen is an ongoing exposure to victims of penetrating trauma, so the skills learned in their initial combat trauma care training are very infrequently utilized in the absence of armed conflicts. Some individuals attempt to supplement their unit training with rotations in a trauma center or by moonlighting as paramedics, but the intense operational tempo maintained in most SOF units has historically severely limited the effective use of either of these options.

Bearing these considerations in mind, this paper will begin by attempting to describe a basic casualty-management protocol that is appropriate for the battlefield. Necessary modifications to the basic management protocol will then be discussed for each of the four scenarios mentioned previously.

* Naval Special Warfare Command, Detachment Pensacola, Naval Hospital, Pensacola, FL 32512.
† Casualty Care Research Center, Uniformed Services University of the Health Sciences, Bethesda, MD 20814.
‡ Uniformed Services University of the Health Sciences, Bethesda, MD 20814.
The opinions expressed are those of the authors and should not be construed as representing the official positions of the Departments of the Army or the Navy.
This manuscript was received for review in September 1995. The revised manuscript was accepted for publication in March 1996.

A parallel and independent effort was found to be underway in the United Kingdom, where a modified ATLS-type course is being developed for use by the British Special Air Service and Special Boat Squadron

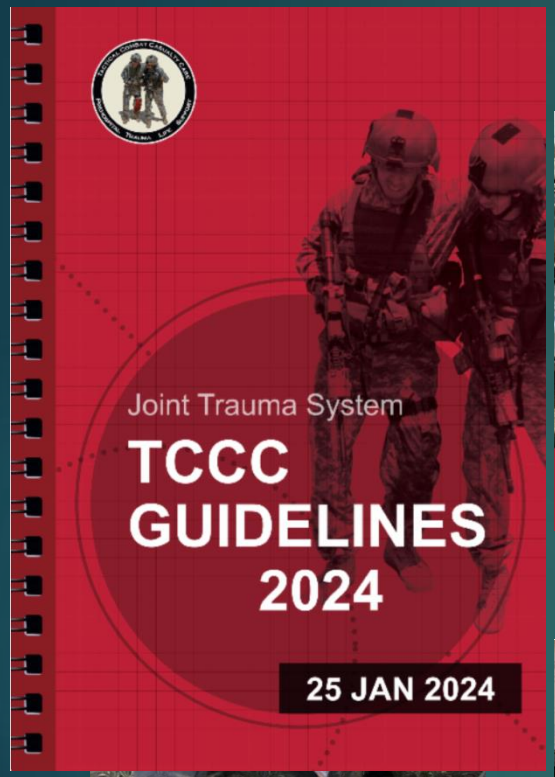
DMI - OEMS

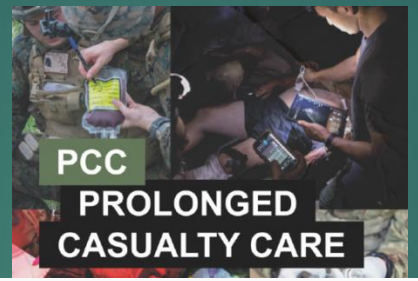
OPERATIONAL EMERGENCY MEDICAL SKILLS COURSE (OEMS)

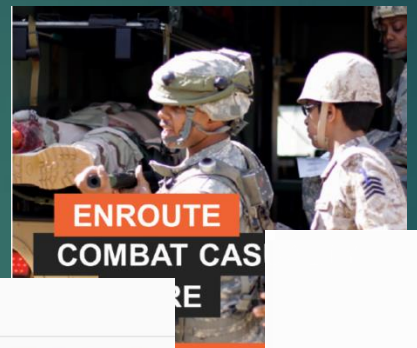
OEMS course is based on current science and actual experience specific to the unique environments and resources of operational units. OEMS builds on previous medical training to define the treatment options in the combat environment based on the best academic medical consensus (Tactical Combat Casualty Care TCCC,

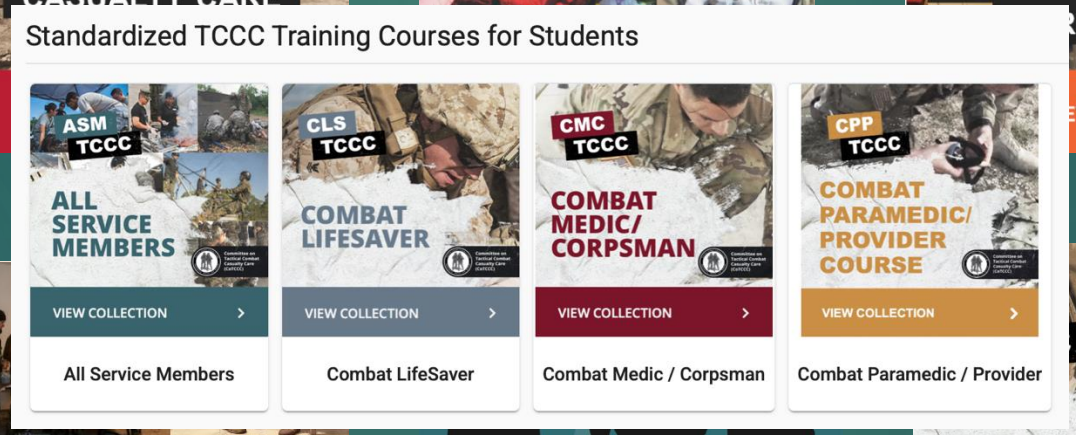
This course of instruction is designed to address the medical theory and science behind the special needs of medical providers in a theatre of war. The OEMS course will augment the skills already given you through your service schools and other training; to present you with innovative lessons learned

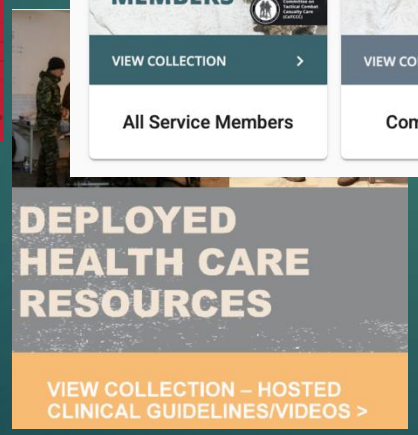
The Rise of TCCC

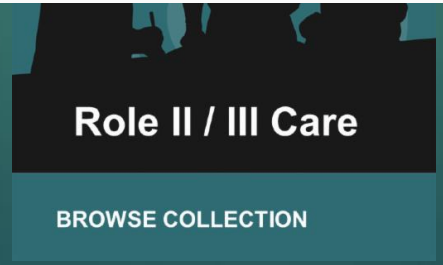


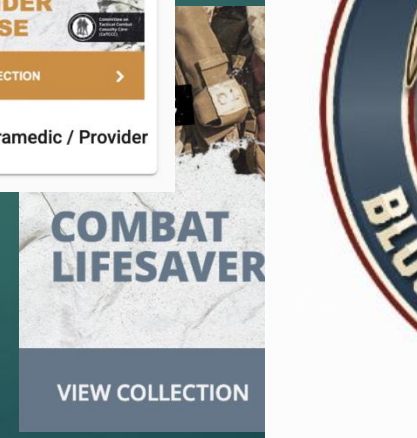


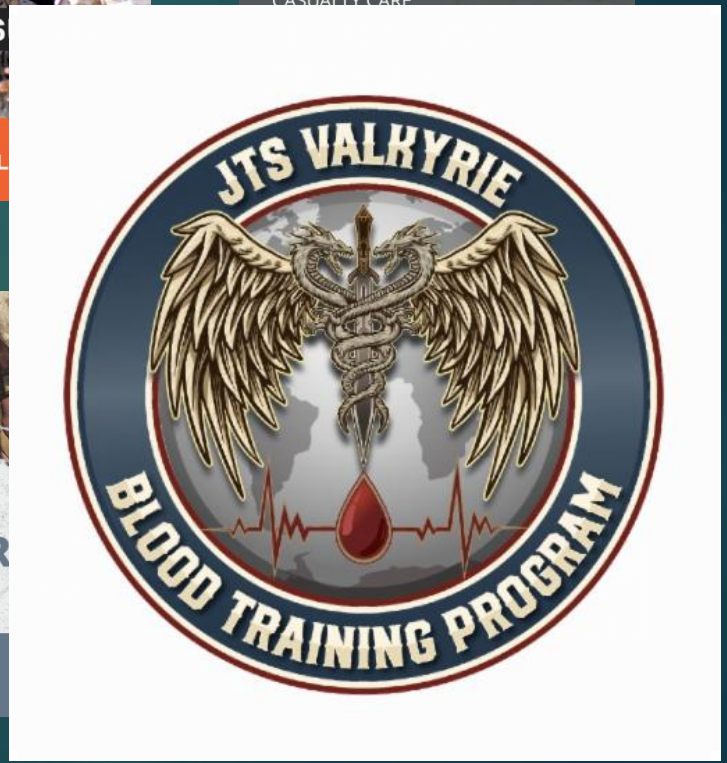












Advanced Resuscitative Care

J Spec Oper Med. 2018 Winter;18(4):37-55. doi: 10.55460/YJB8-ZC0Y.

Advanced Resuscitative Care in Tactical Combat Casualty Care: TCCC Guidelines Change 18-01:14 October 2018

Frank K Butler Jr, John B Holcomb, Stacy A Shackelford, Sean Barbabella, Jeffrey A Bailey, Jay B Baker, Andrew P Cap, Curtis C Conklin, Cord W Cunningham, Michael S Davis, Stephen M DeLellis, Warren C Dorlac, Joseph J DuBose, Brian J Eastridge, Andrew D Fisher, Jacob J Glasser, Jennifer M Gurney, Donald A Jenkins, Jay Johannigman, David R King, Russ S Kotwal, Lanny F Littlejohn, Robert L Mabry, Matthew J Martin, Ethan A Miles, Harold R Montgomery, D Marc Northern, Kevin C O'Connor, Todd E Rasmussen, Jamie C Riesberg, Philip C Spinella, Zsolt Stockinger, Geir Strandenes, Darin K Via, Michael A Weber

PMID: 30566723 DOI: 10.55460/YJB8-ZC0Y

Non-Compressible Torso Hemorrhage

REBOA – Whole Blood

THOR Whole Blood Field Transfusion Course

Whole Blood Field Transfusion Course

20/23 completed

1. Preliminaries

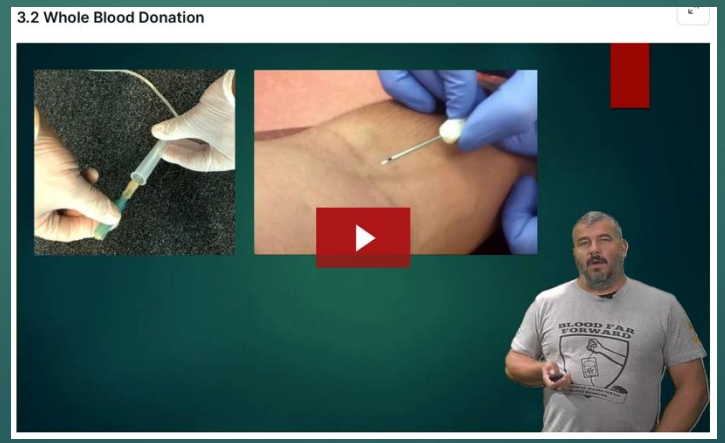
- [x] 1.1 Introduction
- [x] 1.2 History
- [x] 1.3.1 Blood Physiology Part 1
- [x] 1.3.2 Blood Physiology Part 2
- [x] 1.4 Shock
- [x] 1.5 Risk Benefit

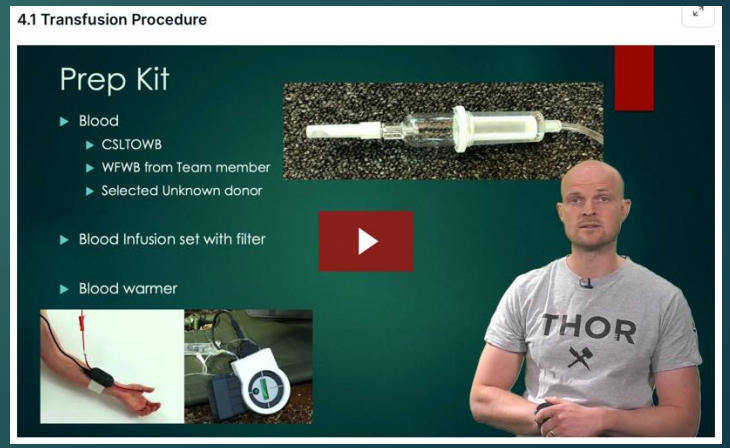
2. Need Blood

- [x] 2.1 Indications & Considerations

3. Get Blood

- [x] 3.1 Donor Options





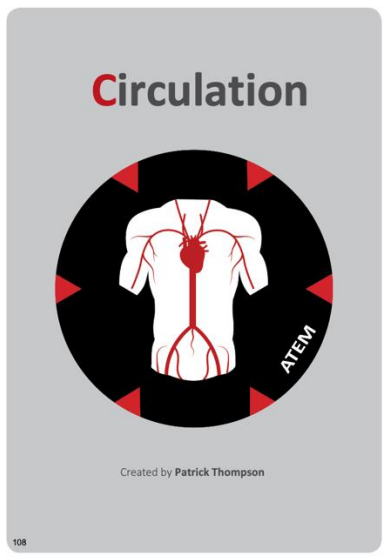
2025 THOR RDCR Course

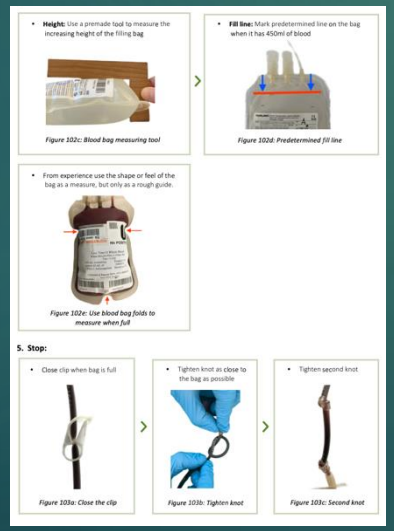
Standardize the THOR Approach to treatment of Hemorrhagic SHock

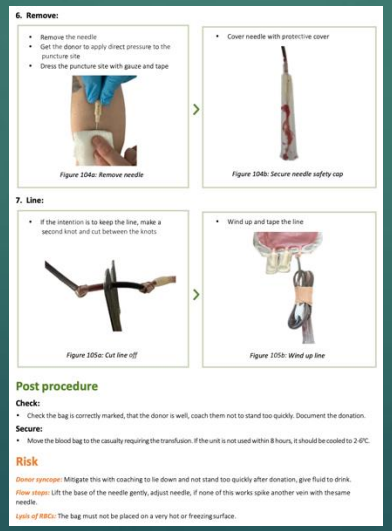
2 Day ATLS type course

Train the trainer

THOR RDCR Manual







THOR

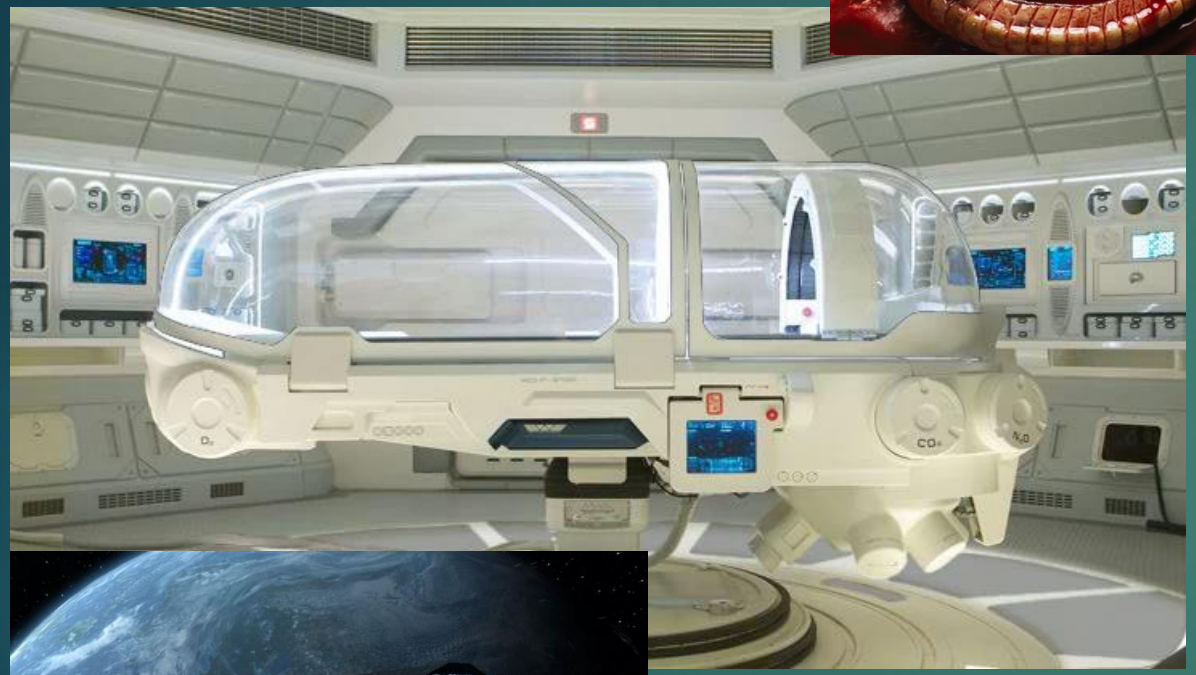
RDCR

Remote Damage Control Resuscition

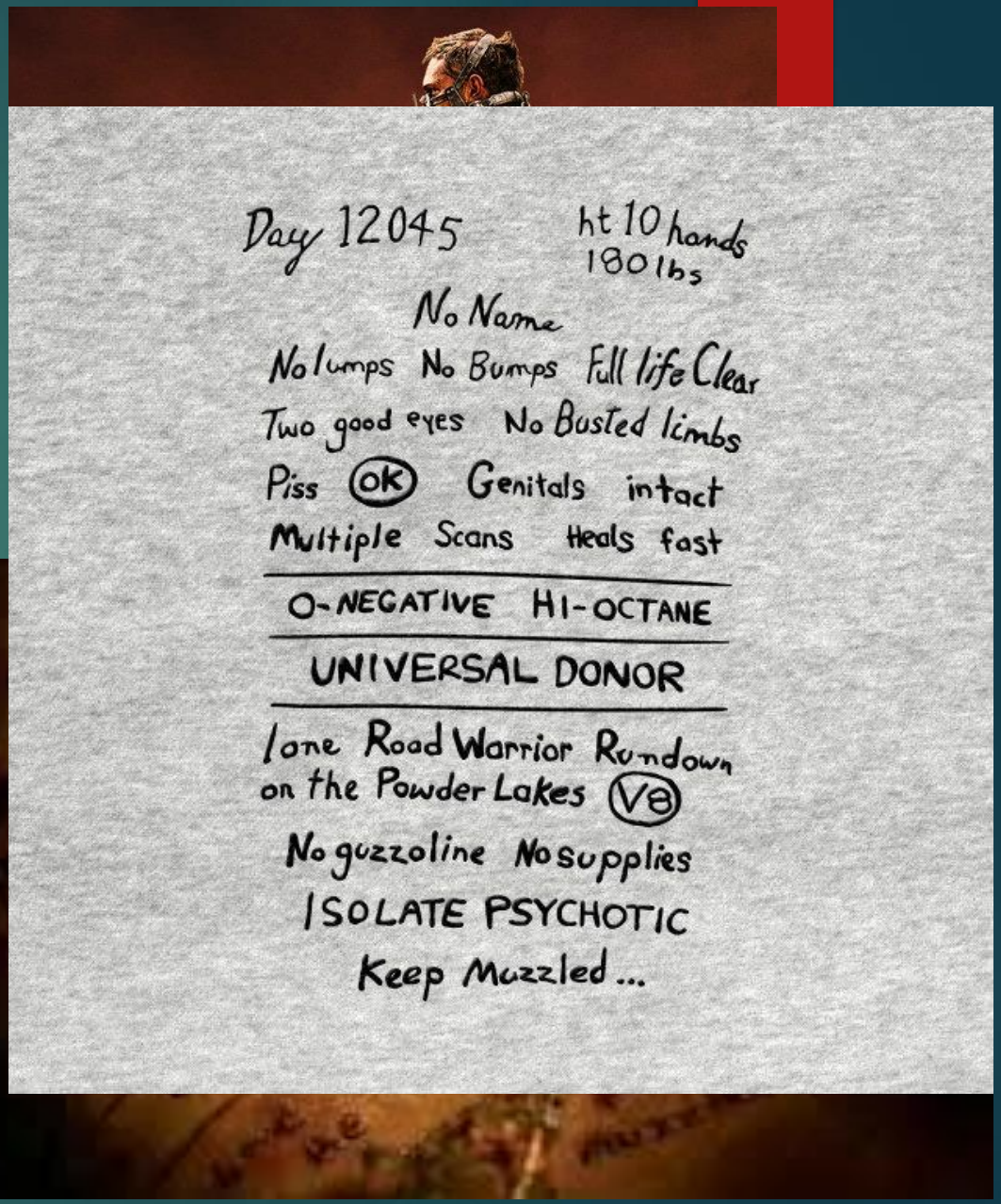
Practical Manual

Created by: Patrick Thompson

The future ?



Alien ?



Mad Max

Bundle of care

JAMA Surg. 2019 Mar 27. doi: 10.1001/jamasurg.2019.0151. [Epub ahead of print]

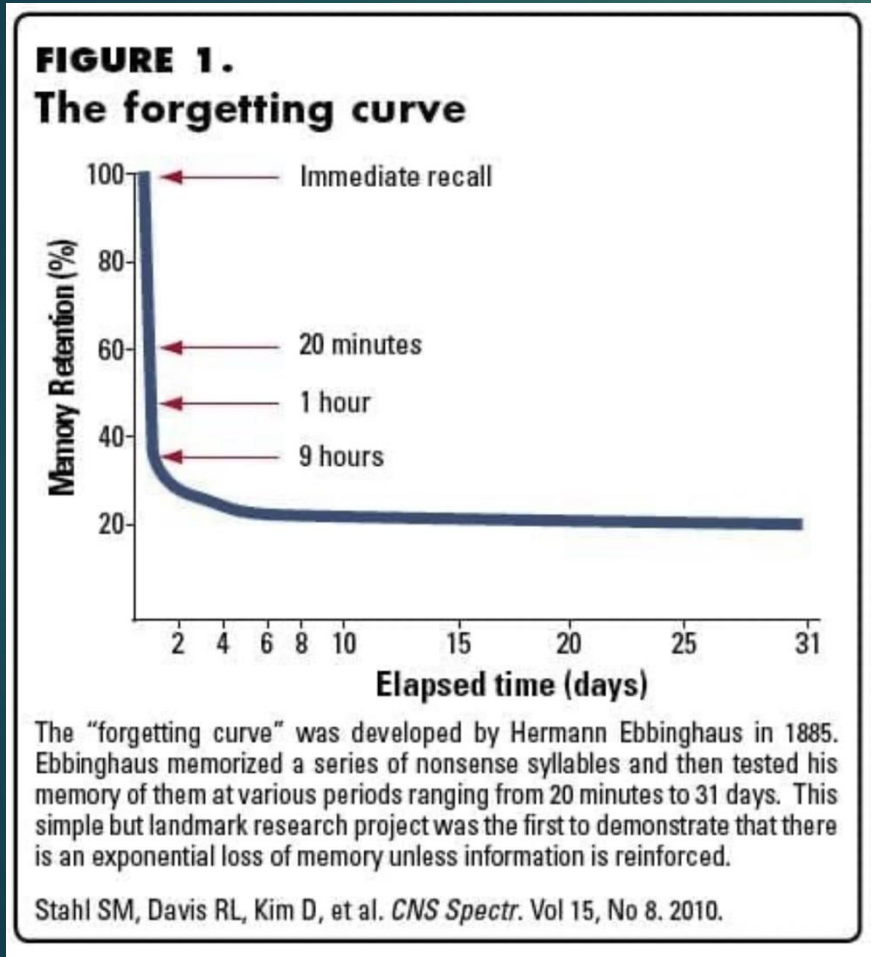
Use of Combat Casualty Care Data to Assess the US Military Trauma System During the Afghanistan and Iraq Conflicts, 2001-2017.

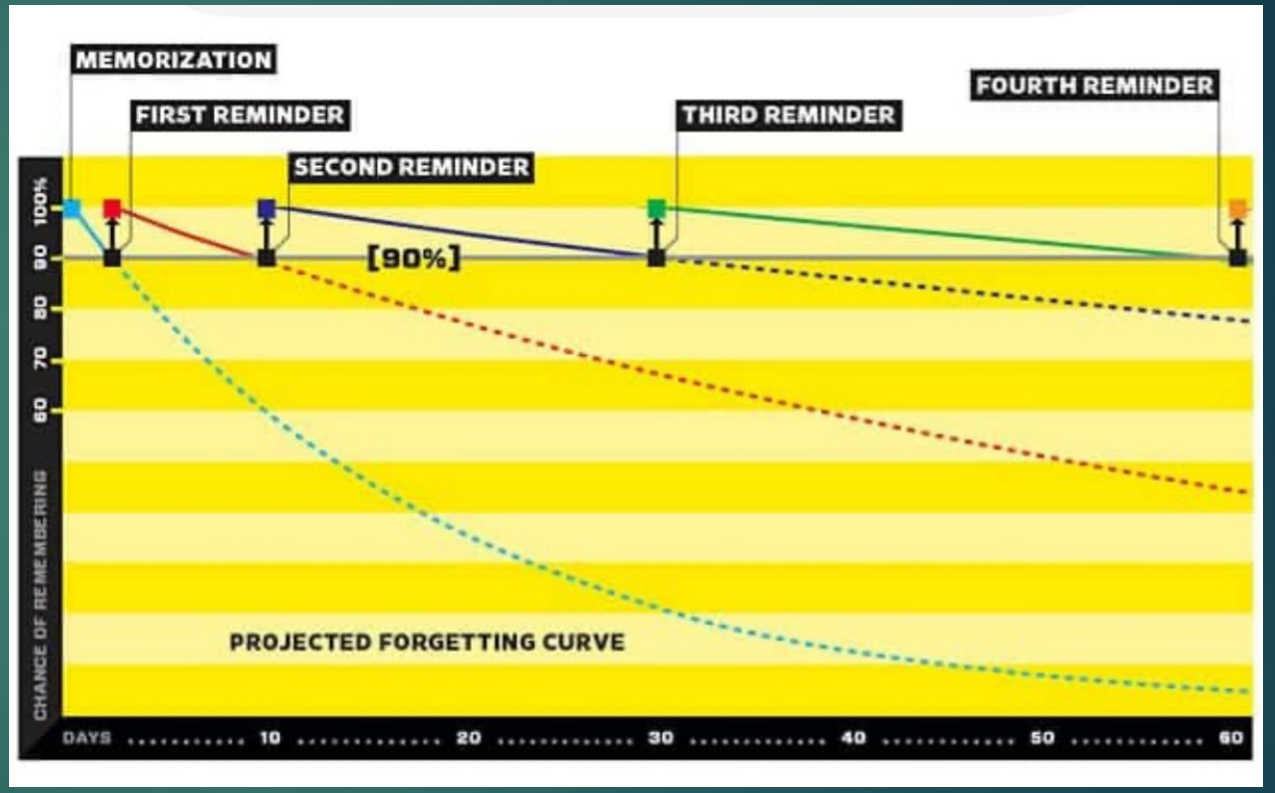
Howard JT[1,2], Kotwal RS[2,3,4], Turner CA[2], Janak JC[2], Mazuchowski EL[2,5], Butler FK[2], Stockinger ZT[2,6], Holcomb BR[7], Bono RC[8], Smith DJ[8].

- October 1, 2001, through December 31, 2017
- 56 763 casualties
- Period-specific ratios compared:
  - TOURNIQUETS
  - BLOOD TRANSFUSIONS
  - TRANSPORT TO A SURGICAL FACILITY IN 60 MINUTES
- Our analysis suggests a 44.2% of total mortality reduction

Improving training

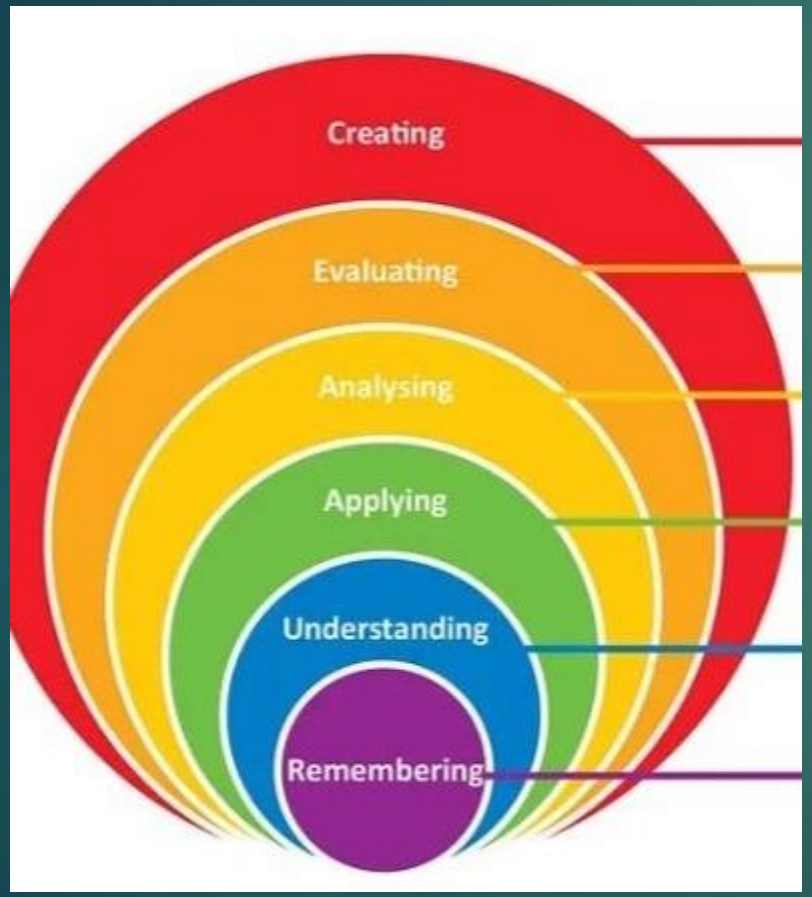
Short intensive training



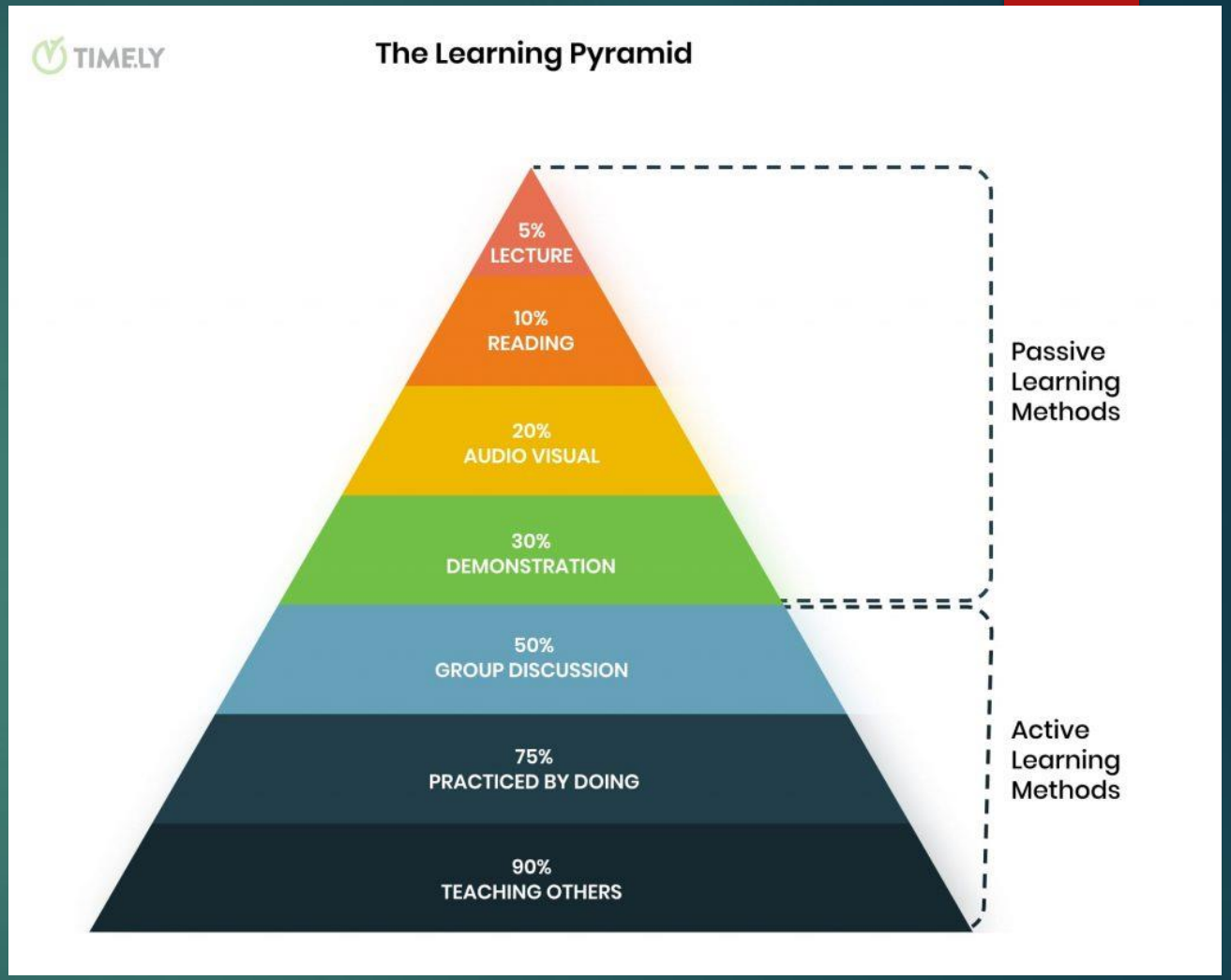


Short refreshers

Learning



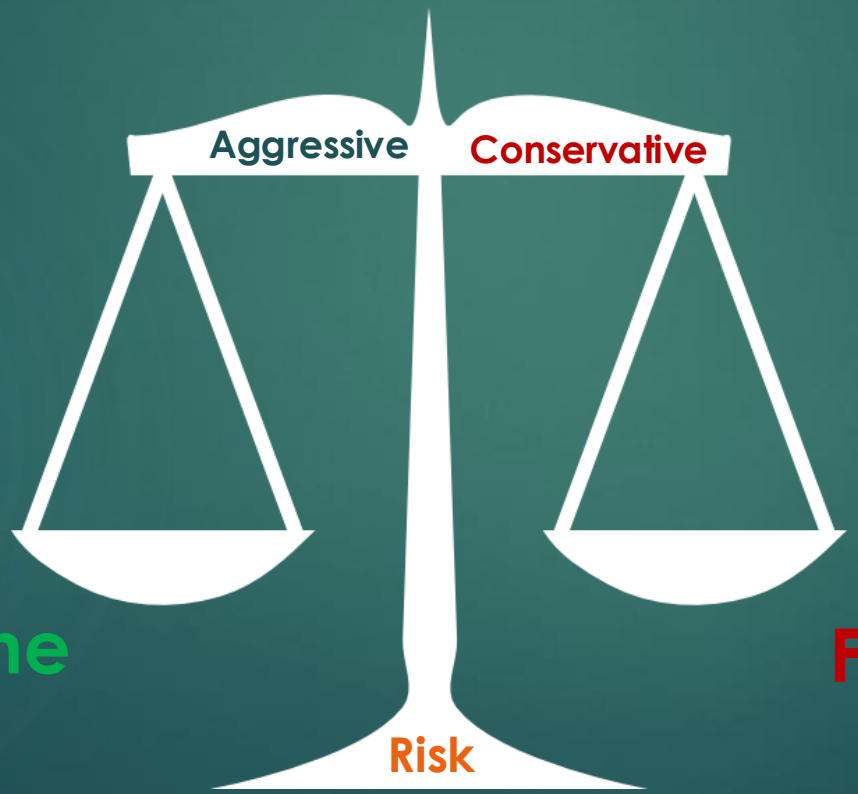
Blooms taxonomy



See 1 : Do 1 : Teach 1

Clinical Judgement

Clinical judgement



In Training

Understanding pathology

Understanding intervention risks

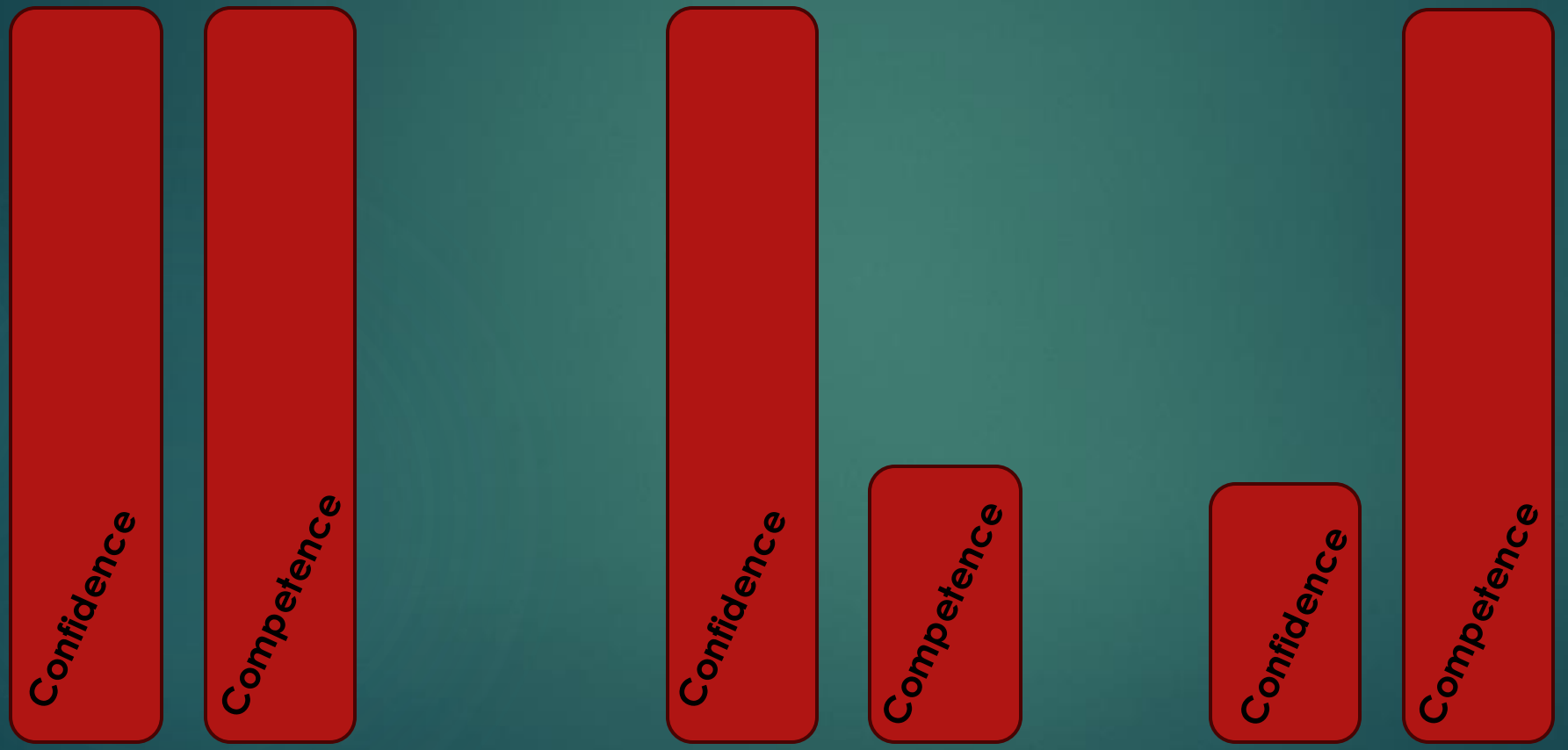
Experience !

Optimize outcome

First do no harm

WARNINGS

Confidence / Competence



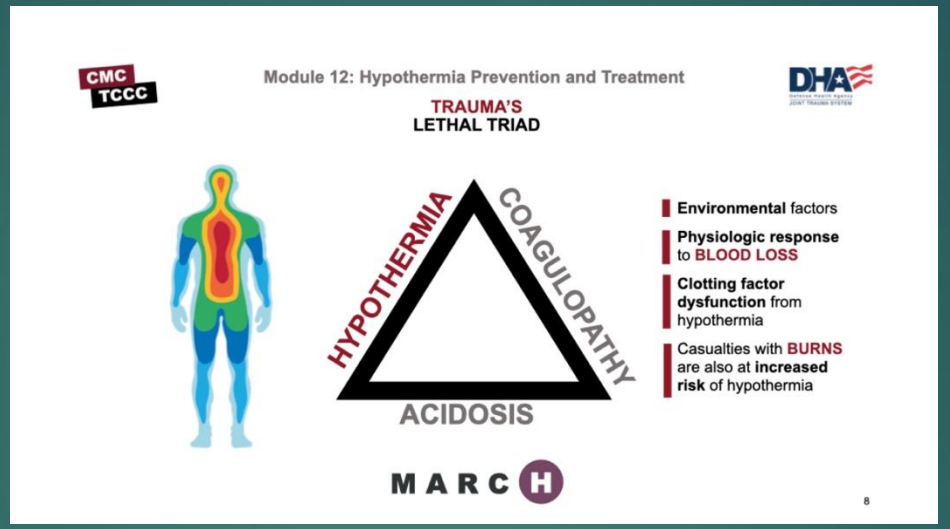
Match

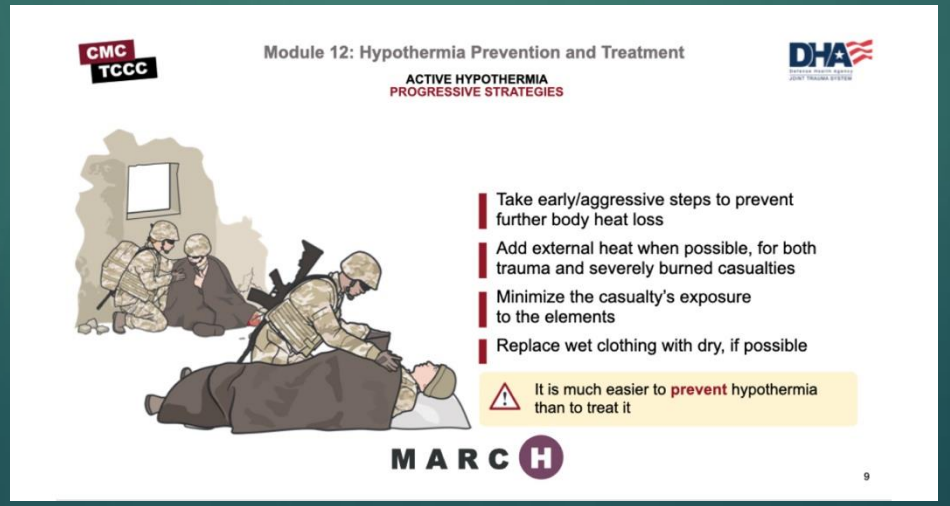
Hubris

Self doubt

Training scars ?

Training emphasis ?





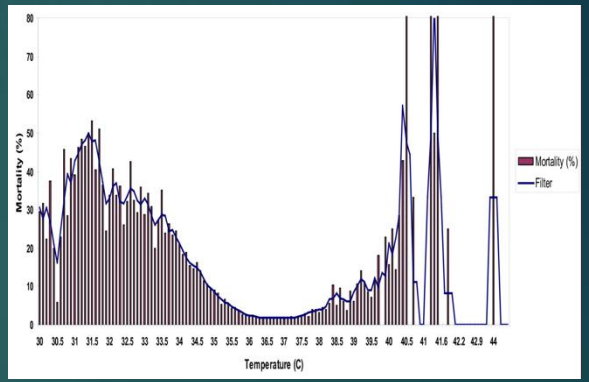
Original Research | Open access |
Published: 23 June 2011

Admission hypo- or hyperthermia and survival after trauma in civilian and military environments

Charles E Wade, José Salinas, ... John B Holcomb + Show authors

International Journal of Emergency Medicine **4**, Article number: 35 (2011) | Cite this article

5618 Accesses | **1** Altmetric | Metrics



Hypothermia: 6.0% (263)
Hyperthermia 7.4% (327) both increase in mortality

Balance

- Time / Money
- Lectures / Skills
- Equipment
- Large variability of personnel

Discussion

www.rdcr.org