How Did We Get Where We Are in Combat Casualty Care?

How Can We Transfer Those Lessons Learned to the USA?

Paul K. Carlton Jr., MD, FACS.
LtGen, USAF, MC, Ret.
ScD(Honorary), U Colorado
Professor of Surgery,
Texas A&M HSC, Retired
13 Aug 2018

Conflict of Interest?

1. I have no conflicts of interest!
2. I am selling ideas, not products!

Combat Casualty Care

Begin with the end in mind

Combat Casualty Care

How did we get where we are today with the highest survival in the history of war?

Could these changes be applied to your medical response system?

Major Advances in US Medicine

Most major medical advances in the US are the result of lessons learned in war:

1. **WWI- need for hospitals in all communities;**
2. **WWII- need for specialists to provide care;**
3. **Korea- importance of early treatment of casualties;**
4. **Vietnam- rotary wing evacuation, sophisticated care near the point of injury;**

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1. WWI- need for hospitals in all communities;
2. WWII- need for specialists to provide care;
3. Korea- importance of early treatment of casualties;
4. Vietnam- rotary wing evacuation, sophisticated care near the point of injury;
5. Global War on Terror-
    1. damage control surgery,
    2. Golden Hour,
    3. Platinum 10 minutes,
    4. resuscitation using blood,
    5. “system” of care,
    6. communications,
    7. use of tourniquets,
    8. trauma specialist.
    9. Core temp as measure of resuscitation.

Major Advances in US Medicine

Most major medical advances in the US are the result of lessons learned in war:

It is now time to bring those lessons learned home to the USA to the general public!

2. **Golden Hour,**
3. **Platinum 10 minutes,**
4. **resuscitation using blood,**
5. **“system” of care,**
6. **communications,**
7. **use of tourniquets,**
8. **trauma specialist.**
9. **Core temp as measure of resuscitation.**

Humor!


HOPE is not a strategy!
"please be dolphins, please be dolphins"

The Rogue's Gallery!

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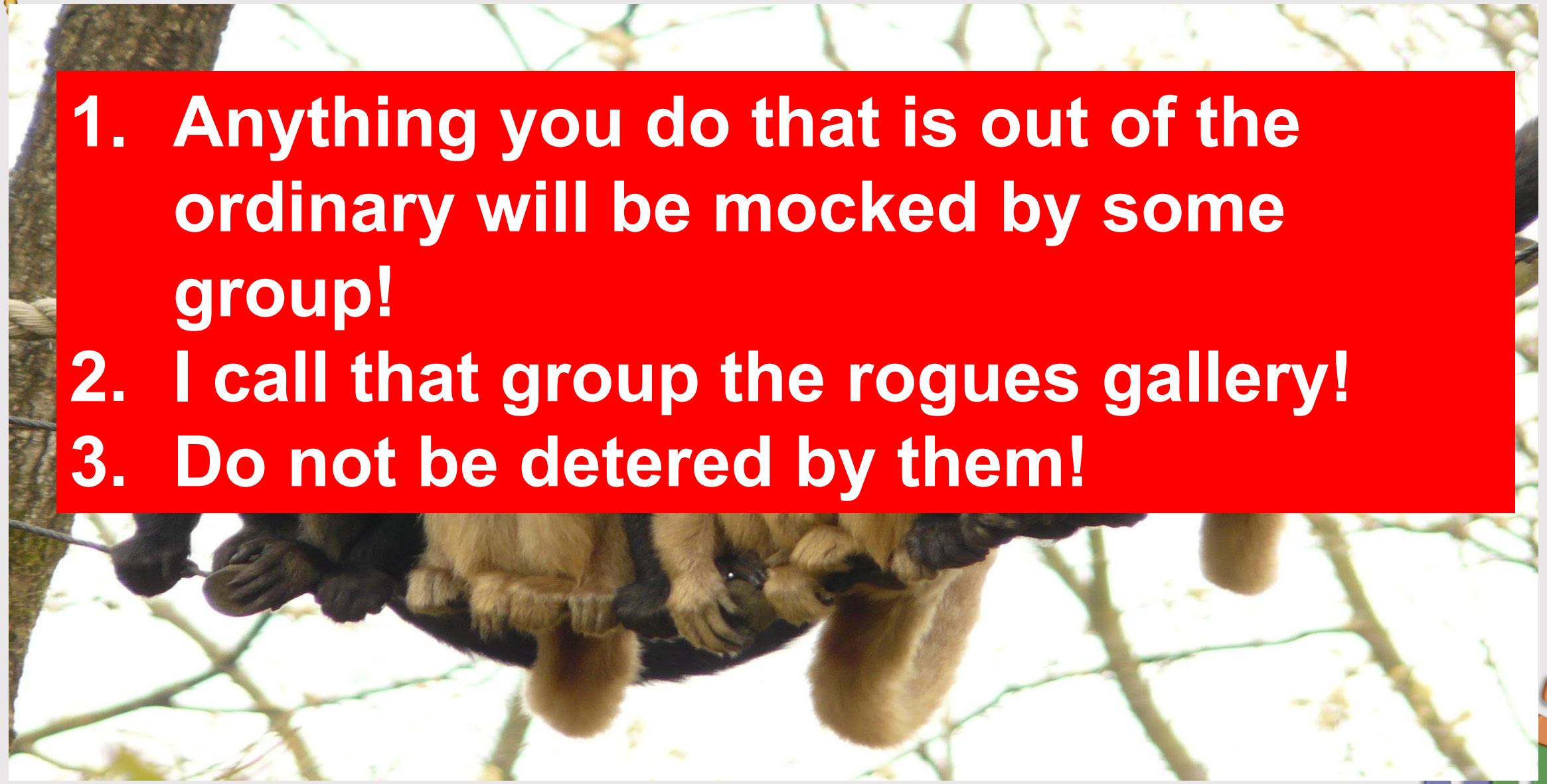
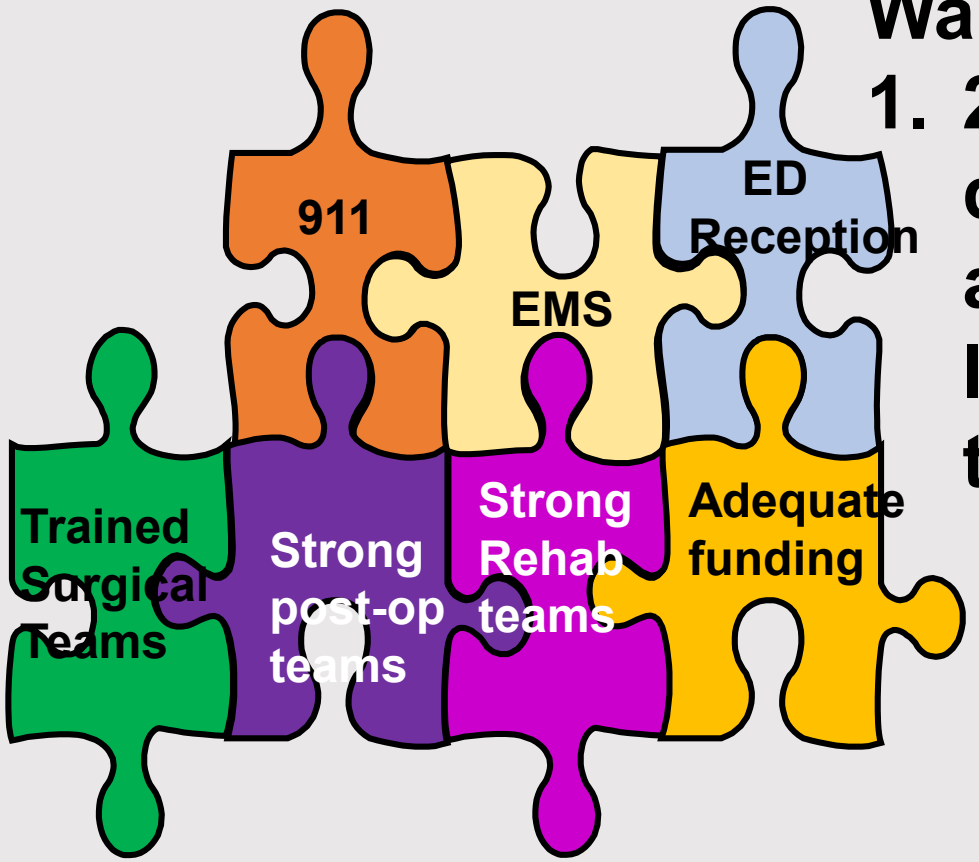


1. Anything you do that is out of the ordinary will be mocked by some group!
2. I call that group the rogues gallery!
3. Do not be detered by them!

We Are Missing a Vital Piece of Our Medical Solution Set

We have built strong reception teams, treatment teams, and rehab teams for emergency medical care.

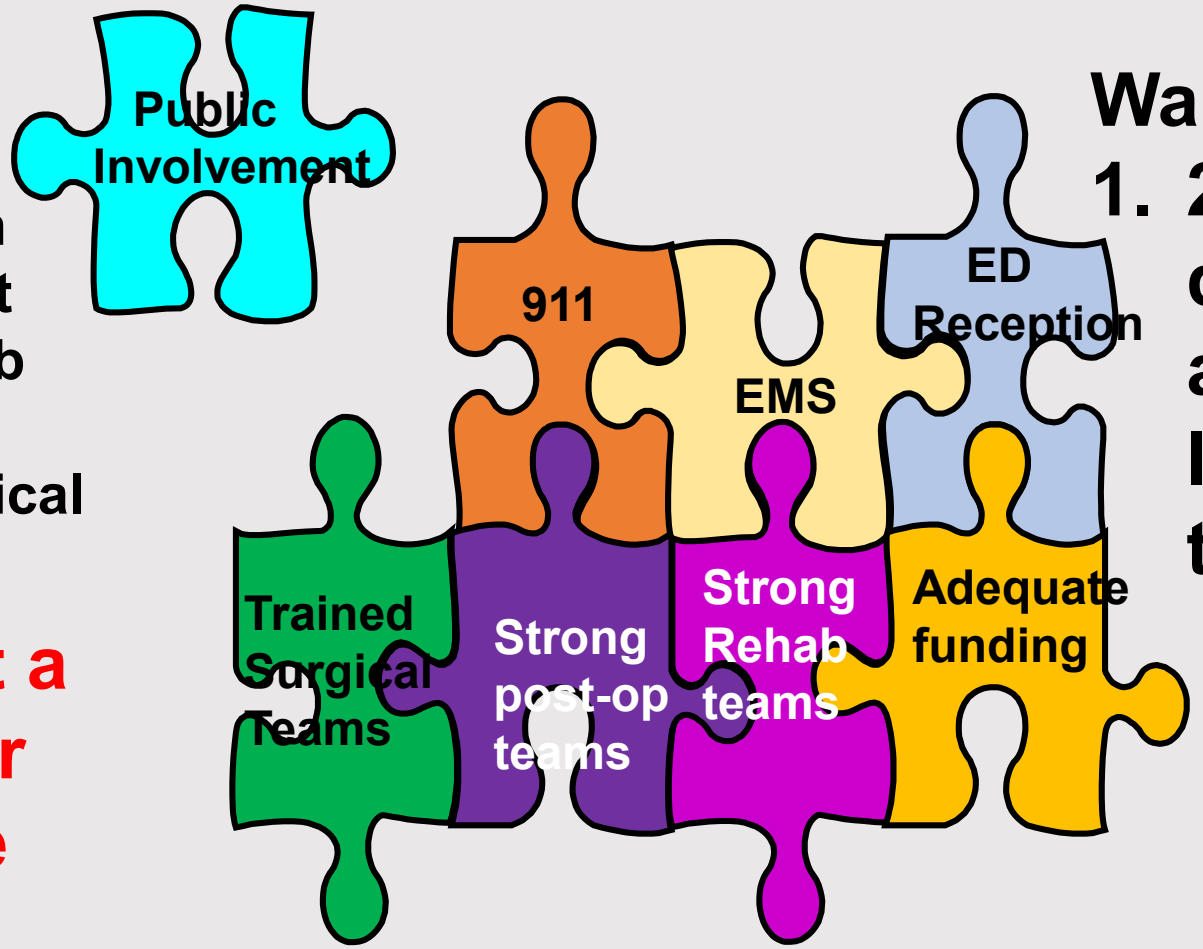


War zone:

1. **24% excess deaths without all trained in life saving techniques!**

We Are Missing a Vital Piece of Our Medical Solution Set

We have built strong reception teams, treatment teams, and rehab teams for emergency medical care. **BUT we have left out a vital member of our whole effort- the public involvement!**



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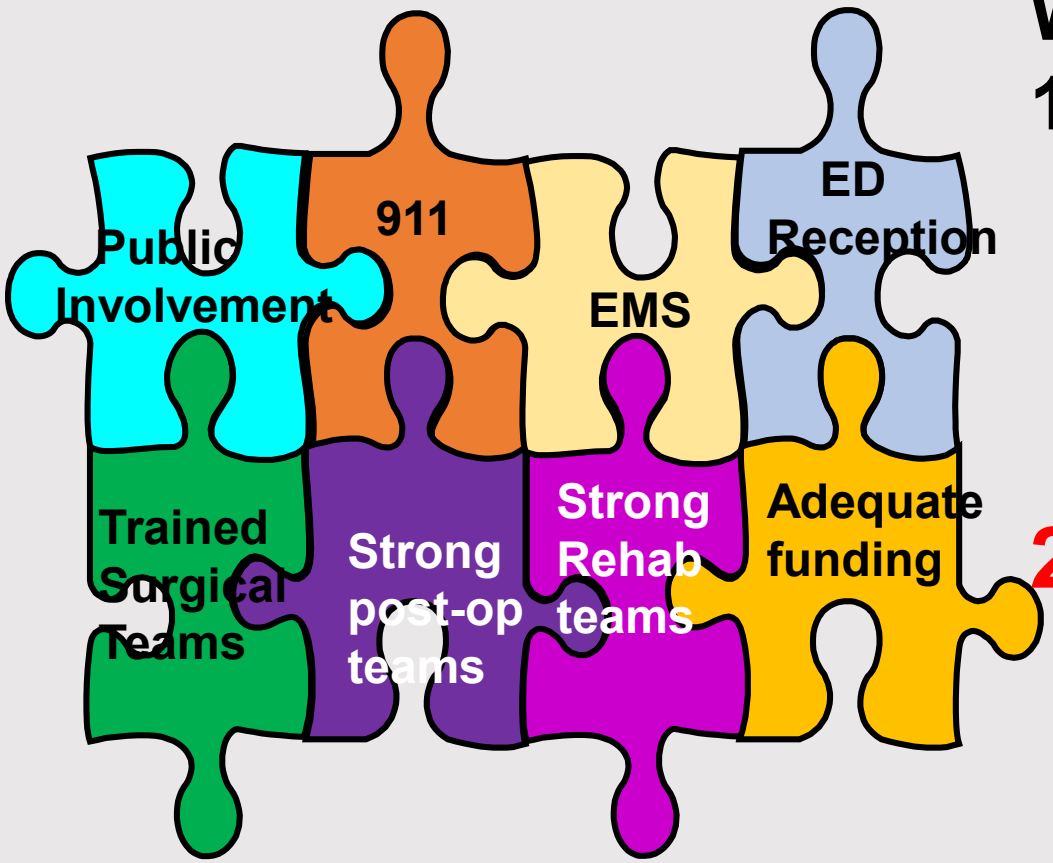
We MUST integrate this element into our medical efforts!



War zone:

1. 24% excess deaths without all trained in life saving techniques!
2. 3% excess deaths when all trained!

Analogy is Real!

1. **24% excess deaths using only the medical system of medics, rotary wing evacuation, and medical reception centers in country!**
2. **3% excess deaths when the public, the rest of the 75th Ranger Battalion, was so trained. The medical system was exactly the same with medics, rotary wing evacuation, and medical reception centers in country!**
3. **8 times better survival should wake up our country on the value of the public involvement!**

“Excess Deaths”

Defined as:

1. **Would the injured person have survived if injured on the front steps of a Level 1 Trauma Center.**
2. **A very high standard!**

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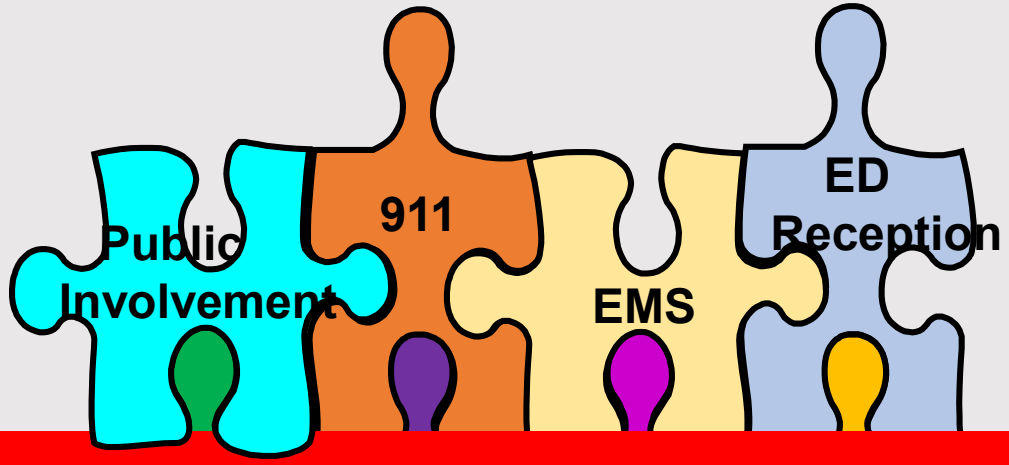

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Rural America by these same standards is running 36% excess deaths!
This is where many of us live!

excess
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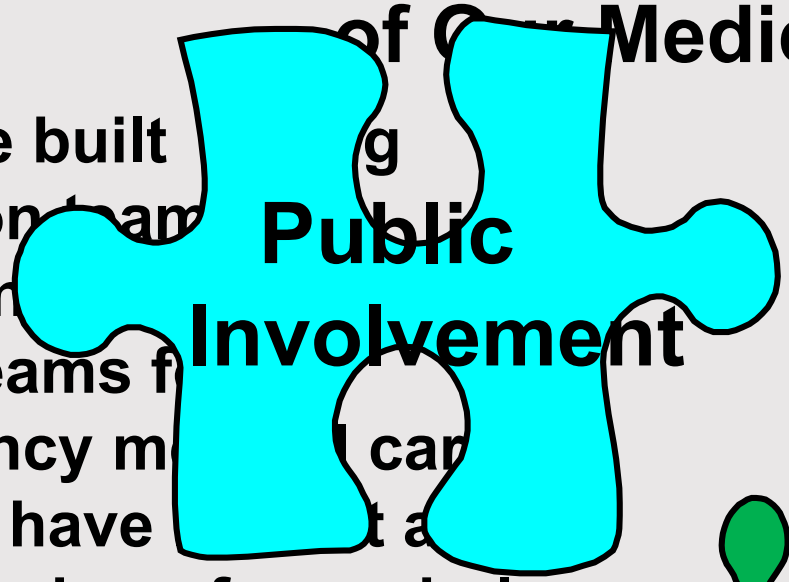

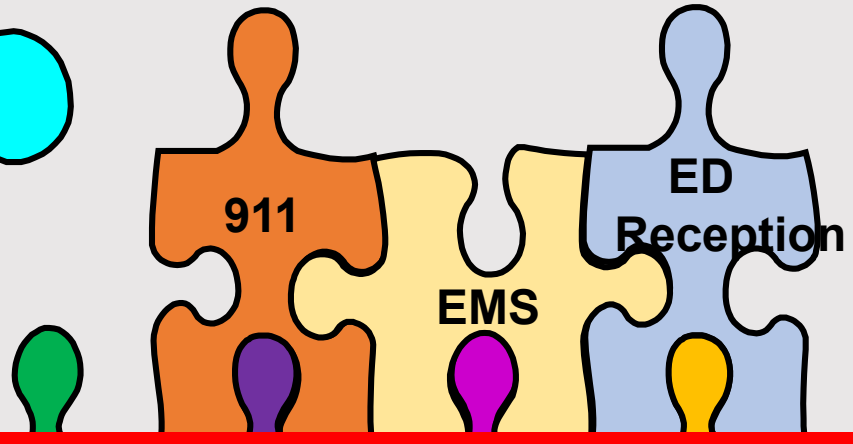

War zone:

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Rural America by thse same standards is running 36% excess deaths!
This is where many of us live!
This may be the most important part!

excess
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For Emergencies Only

Why do we have these as requirements in most buildings and encouraged in most homes?
Because they save lives!
Shouldn't every lay person have the knowledge and equipment to save lives when needed?
In every gathering place where medical emergencies might occur?

Fire Extinguisher, Trauma Kit, and AED Should All Be Together to Save Lives!

This trifecta should be the new normal!

We know that irreversible brain damage begins to occur in four minutes of no or low blood flow.

The average EMS response time in your community then becomes a major determinate to the question of MORAL OBLIGATION for your actions in an emergency medical situation!

IF EMS is not available quickly, do you have a Plan B?

Plan B Operations!

Combat Casualty Care

In the last 15 years of combat operations we have about 1,000 excess deaths, meaning a casualty who could have survived if we could have gotten sophisticated medical care to he or she!

In the last 15 years of trauma deaths in the USA, the same comparison would give us over 450,000 preventable deaths!

Our goal should be ZERO preventable deaths!

Institute of Medicine Report June 2016

1. 17 June 2016 the Institute of Medicine issued a report on how to improve the survival statistics in our country using the initiatives pioneered by the military in the last 15 years of war.
2. Their figures of 147,000 trauma deaths in the USA per year on closer scrutiny reveal that **at least 20%** of those so injured could have survived if appropriate care had been rendered them in a timely manner.
3. Over the last 15 years of war the military has sustained 1,000 excess deaths, defined as could the injured party have survived if injured on the steps of a Level I Trauma Center?
4. By the same criteria, we in the USA have sustained over 450,000 excess deaths in the last 15 year!

Trauma Potential in USA

Medical Facility deaths in war 1%!

1,000 excess deaths that were potentially salvageable in the 15 years of war? 15% of total deaths!

Victims do well once they reach the hospital!

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Victims do well once they reach the hospital!

20% of USA trauma deaths were potentially salvageable out of 147,000 or nearly 30,000 per year!

So by same criteria we have had 450,000 excess deaths over the same 15 years of war in the USA!

Game Plan for ZERO Preventable Deaths!

Medical System

So we start with all medically related people able to do certain trauma actions to prevent death.

Game Plan for ZERO Preventable Deaths!

Medical System

So we start with all medically related people able to do certain trauma actions to prevent death.

We then expand to First Responders- Police, Fire EMS

At this level we believe we will be at around 5% of the population trained in trauma death prevention.

Game Plan for ZERO Preventable Deaths!

So we start with all medically related

At this point we re-assess and see how we are doing.
Figure out how we get into the general population to reach the desired goal of ZERO excess deaths?
Ready to use equipment in Schools? Meeting places? Churches?

trained in trauma death prevention.

Trauma Potential in USA

The goal of this brief is to make you aware of the changes in hospital and pre-hospital care in the theater of war and let you know those tools are available to you so that all of our people can save lives!
Not become trauma specialists, but save lives to get to a medical facility!

So by same criteria we have had 450,000 excess deaths over the same 15 years of war in the USA!

Trauma Potential in USA

I believe the best way to do this is to proceed with "Evidence Based" actions, as outlined by the Tactical Combat Casualty Care Committee. These TCCC actions have been incorporated into a variety of pre-hospitals courses you will hear about!

per year!

So by same criteria we have had 450,000 excess deaths over the same 15 years of war in the USA!

Trauma Potential in USA

We have taught the first classes for medical students at Texas Tech in Lubbock on these skill sets in Sept 16.

UT Rio Grande HSC in April18.

Texas A&M HSC is still debating.

USU teaches this skill set on entry to medical school.

DFW program is under way with the “Stop the Bleeding” Courses.

Other states are moving out as well!

Trauma Potential in USA

This effort drives some ethical questions:

1. **Do we, the medical professionals, have an obligation to save lives outside our walls?**
2. **Is our profession up to the challenge?**
3. **Are we willing to tackle this 450,000 excess deaths?**
4. **Will we use evidence based medicine?**
5. **Or, will we cling to old myths?**

the same 15 years of war in the USA!

The question of the day is:
”What is the **MORAL OBLIGATION** of any place where large numbers of people gather to the people who come to see them from a medical perspective?”
Are we “our brothers keepers?”

Thick Skin!

- As you start any effort to improve trauma management, do not expect to be patted on the back and told what a good job you are doing!
- Our press is not like that!
- All of this will be criticized, it is part of our culture!
- It is not new to have such criticism!

General Robert E. Lee

Generals and Journalists

"It appears we have appointed our worst generals to command forces, and our most gifted and brilliant to edit newspapers!

In fact, I discovered by reading newspapers that these journalists/ geniuses plainly saw all my strategic defects from the start, yet failed to inform me until it was too late.

Accordingly, I'm readily willing to yield my command to these obviously superior intellects, and I'll, in turn, do my best for the cause by writing editorials - after the fact."

August 1863 Editorial in Richmond Times

Facing Reality is Difficult

None of us want to face what lies ahead of us!

We Must!

Breaking Barriers is Hard

Every new barrier takes perseverance and determination to overcome!

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Combat Casualty Care

Improvement never stops!

This is family!

This is your home!

Medical Systems

Emergency Medicine System

Ambulances, EMT, Paramedic, Rotary Wing evac, Communications, 911, etc.

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Ambulances, EMT, Paramedic, Rotary Wing evac, Communications, 911, etc.

Medical System in Hospital

Level I, II, III, IV Trauma Centers, ED, ICU, Operating Rooms, Surgeons constantly available, etc.

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In USA considerable overlap between the two systems!

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The military almost combined them!

Medical Systems

1. My Army colleagues focused on the Combat medic, the 68W and 18D.
2. The Air Force focused on the surgical setting and the transportation piece.
3. Together, these efforts have given us the best survival in the history of war!

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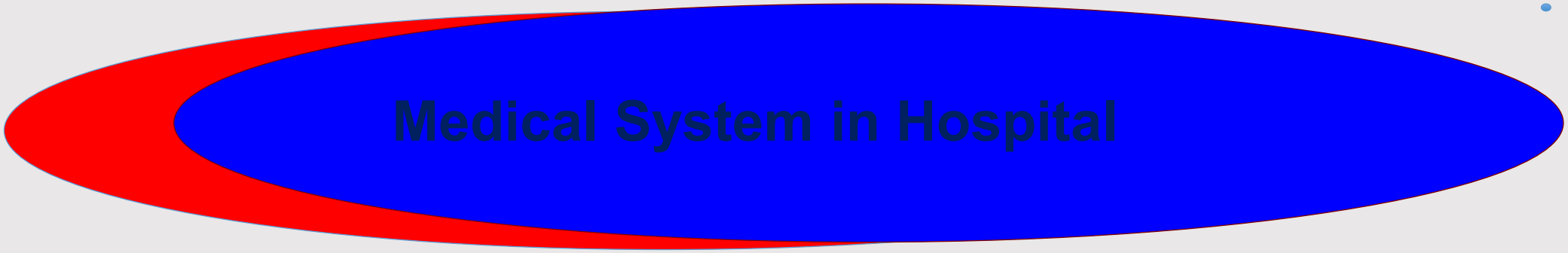
Medical Systems



Ambulances, EMT, Paramedic, Rotary Wing evac,

The question then arises- what can we, in the USA, learn from this effort to lower our own stateside trauma mortality rates?

In USA considerable overlap between the two systems!

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Trauma Survival Numbers to Remember!

Breakdown the increased survival of our injured military members from 76% in Vietnam to 90% today:

1. **In hospital care- 2.8% to 1%!**
2. **Out of hospital care- 12%!**
3. **Total improvement 14%**

Most of the improved survival sits in what was formally called the "out of hospital care" side, which is now virtually combined with the in-hospital care!

Trauma Survival Numbers to Remember!

75th Ranger Battalion regards every soldier as a medic, fully capable of tourniquet application, airway management, and direct pressure on wounds.

This effort is what has given them the best survival in the history of war!

This is similar to the CPR movement of the '70s- every person able to give CPR to those in full arrest.

Could we not move toward this goal- every citizen able to save lives?

Kotwal, JAMA 7Aug13

Trauma Survival Numbers to Remember!

The figures to remember!

3%-24%-36%

Excess mortality defined as if injured on the front steps of a Level I Trauma Center in USA would you have survived?

3% Excess mortality in the combat zone among 75th Ranger Battalion when trained in Combat Lifesaver skills.

24% Excess mortality among regular Army troops not so taught but with exactly the same medical backup.

36% Excess mortality in rural America.

Kotwal, JAMA 7Aug13

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This is similar to the CPR movement of the '70s- every person able to give CPR to those in full arrest.

Could we not move toward this goal- every citizen a medic?

First step would be to make every medical person able to save lives in trauma!

Second step would be for every first responder to be an evidence based best practice medic!

Next step might be our "Stabilize and Ship" mentality from Level II, III, and IV facilities to the Level I facilities for high acuity patients!

That could start the process of lowering the 36% excess mortality!

Kotwal, JAMA 7Aug13

Trauma Survival Numbers to Remember!

The figures to remember!

3%-24%-36%

Understand, we are comparing apples and oranges! The Ranger Battlion is a much healthier population than we find in the normal Trauma Setting, but we can certainly edge this 36% down to something less!

Excess mortality defined as if injured on the front steps of a Level I Trauma Center in USA would you have survived?

Kotwal, JAMA 7Aug13

Today

History Lesson!

So what?

How to Tackle Complexity Using Systems Thinking

Focus on the Military!

How to Tackle Complexity

I want everyone in this room to recognize that "I" did not accomplish what I am about to tell you in combat casualty care!
The military "team" shared the vision and accomplished the mission!
I gave them some top cover, but the military professionals people did the work!
As a team, we used "systems thinking" to obtain the best survival in the history of war!

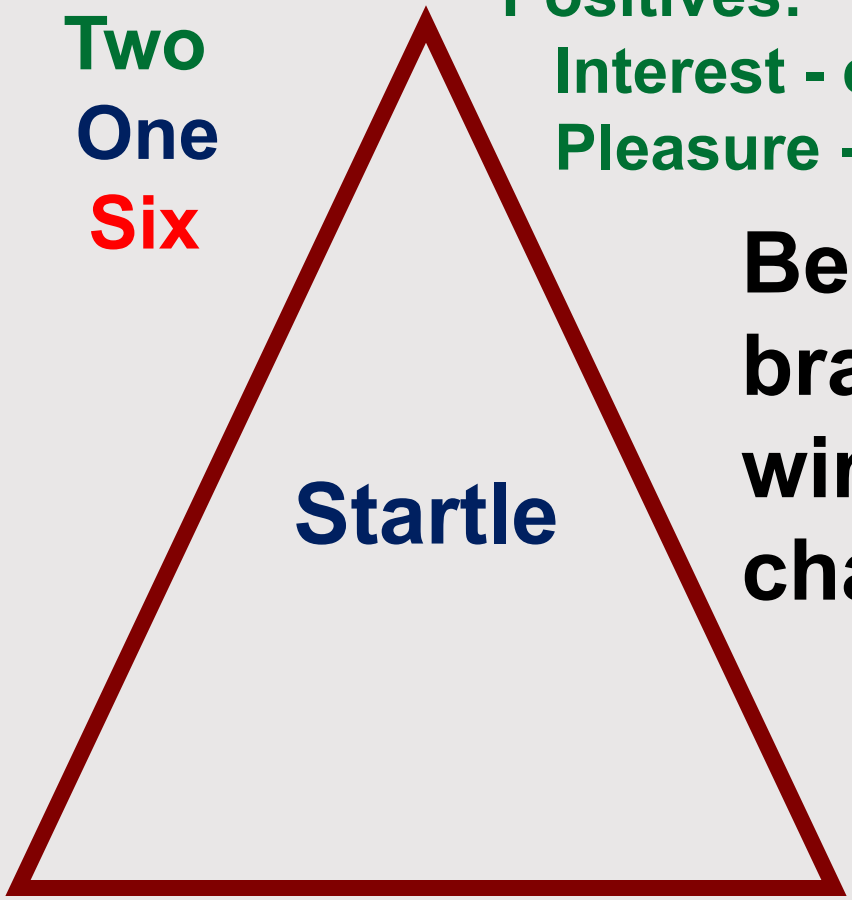
Gov Executive 15Aug13

Combat Casualty Care

1. No one would resist trying to improve the survival of our war wounded!
2. Everyone is trying to do that!
3. WRONG!
4. Any change upsets the status quo, so will be resisted tremendously!

Why is Change So Hard

Positives = Two
Neutral = One
Negatives= Six



Positives:
Interest - excitement
Pleasure - joy

Because our brains are hard wired to resist change!

Negatives:
Anger
Fear
Shame

Distress
Disgust
Dis-smell

Source: Silvan Thompkins

Principles for Change

- Never question motivation
- Many see world differently
- Not wrong
- Must sell your points
- Be recognized expert

Key Statement

Those that disagree are not wrong!

They just see the world differently!

They cannot envision a different reality!

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Lacking to Achieve Vision - 1983

After the Marine Barracks bombing in Beirut in Oct 1983 a group of surgeons sat down at the Wiesbaden Hospital in West Germany and said “this is not good enough for our sons and daughters!”
Since the military is a family, then we knew we had to bring modern surgical practice and transportation methods to the military!

This is that story!

“The Man in the Arena,”

“It is not the critic who counts; not the man who points out

My close friend, Jim Peake, had very similar experiences as the Chief Surgeon for the Grenada operation in 1983, and was clearly in the arena with me from the Army perspective!

in the end the triumph of high achievement, and who at the worst, if he fails, at least fails while daring greatly, so that his place shall never be with those cold and timid souls who neither know victory nor defeat.“

Theodore Roosevelt 1910

1983- After Action report from Marine Barracks Bombing

Is that correct?

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Is there a better way?

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Is that correct?

Is there a better way?

Is that what you want for your son or daughter?

1983- After Action report from Marine Barracks Bombing

Is that correct?

Is there a better way?

Is that what you want for your son or daughter?

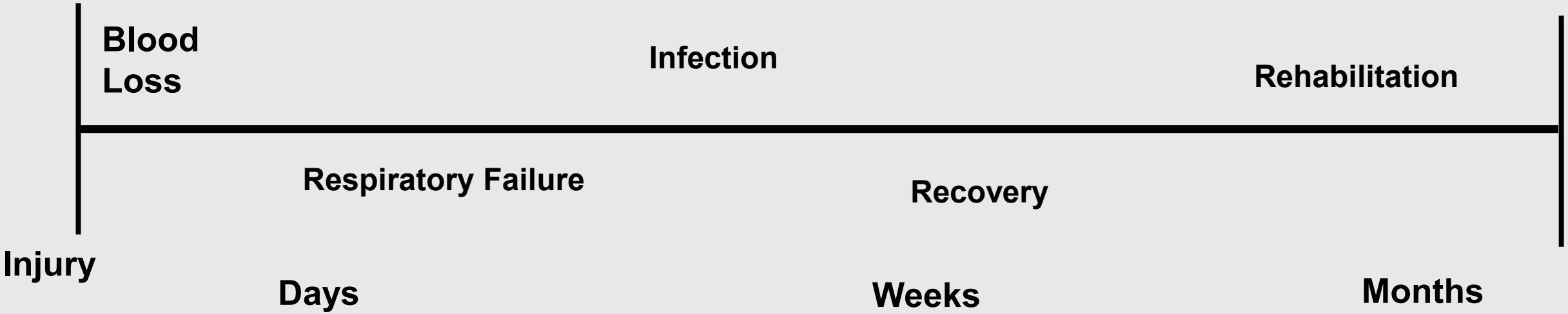
Could you look a grieving friend, parent, spouse, son, or daughter in the eye and say “no one could have done better!”

1983- After Action report from Marine Barracks Bombing

We decided to zero base everything we knew about dying in combat and make sure we were not missing anything!
This effort started with the injury itself.

Post Injury Phases of Illness 1983

Salvageable Mortality From:



1983- After Action report from Marine Barracks Bombing

We decided to zero base everything we knew about dying in combat and make sure we were not missing anything!
This effort started with the injury itself.
Then we asked how we would counter each of those events?

Post Injury Phases of Illness 1983

Salvageable Mortality From:

Salvage Surgery in 1st hour

Secondary Surgery

Definitive Care

Blood Loss

Infection

Rehabilitation

Respiratory Failure

Recovery

Injury

Days

Weeks

Months

Critical Care in the Air

Critical Care in the Air

Post Injury Phases of Illness 1983

Salvageable Mortality From:

Salvage Surgery in 1st hour

Bl d Loss

The only problem with this is that the circled items did not exist!

Injury

Respiratory Failure

Recovery

Days

Critical Care in the Air

Weeks

Critical Care in the Air

Months

Truisms!

Right is right,

even if everyone is against it, and

wrong is wrong,

even if everyone is for it.”

William Penn,

British statesman and philosopher

Combat Casualty Care

1. My personal journey to improve combat casualty care.
2. Potential Applications for your area.

Combat Casualty Care

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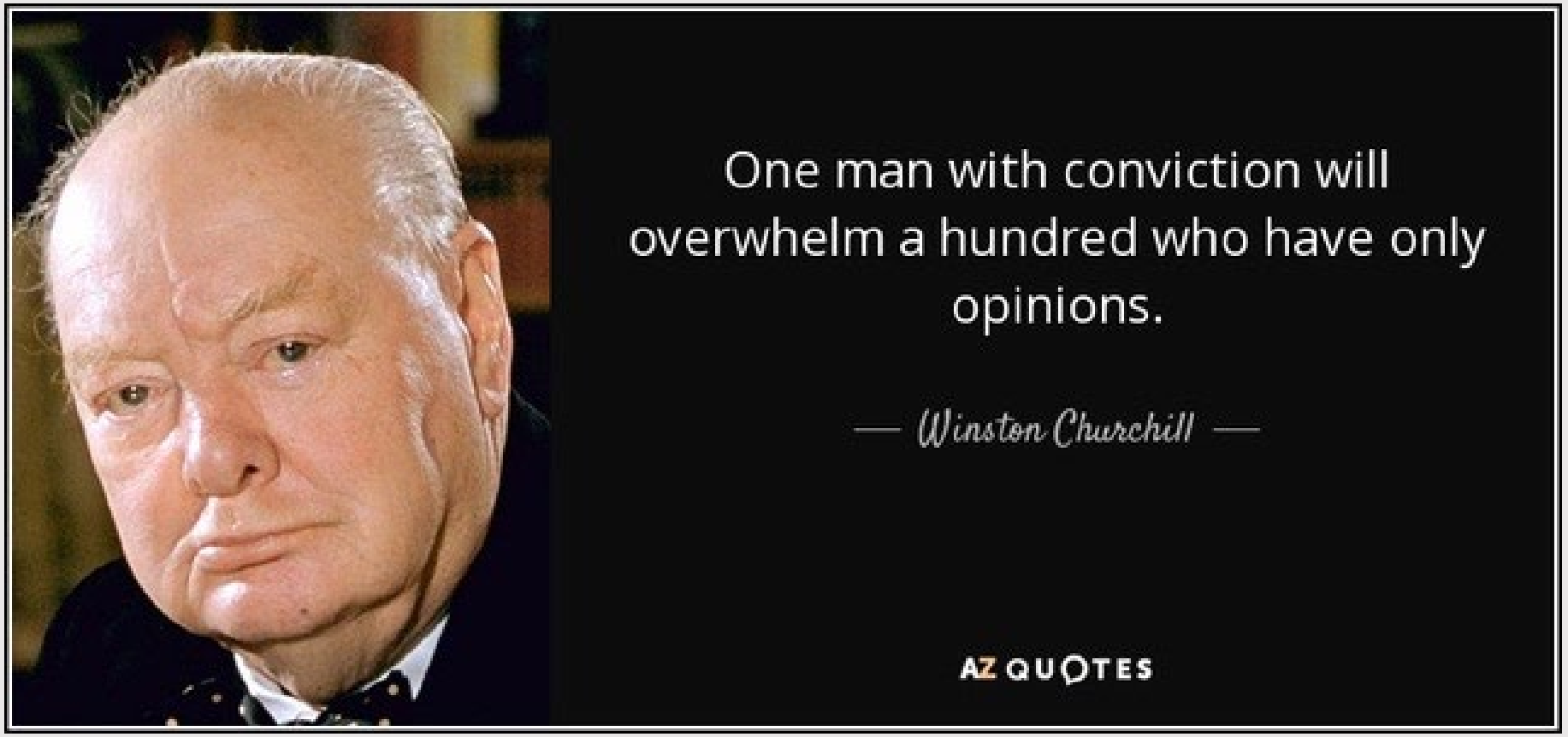
Churchillian Gems



Military Medicine

Measure of Merit for Military Medicine

Soldiers, sailors, airmen and marines at work doing their jobs- protected against environmental hazards and if injured, receiving the very best possible care!

1. **Public Health**
2. **Casualty Management**

Public Health

Best job we have ever done in the history of war

Major improvement over GW I in water, food, sanitation, etc…

Casualty Management in Global War on Terrorism 2001-2018

Combat Casualty Care

Echelons of care prior to 1996:

1. Level I care was Self Aid and Buddy Care.
2. Level II care was the Battalion Aid Station or equivalent.
3. Level III care was at a bigger in country hospital and was the first place surgery could occur.
4. Level IV care was much more sophisticated care, generally in the USA.

Combat Casualty Care

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Echelons of care after 1996:

1.Role I care was self aid and buddy care.

2.Role II care now included operative intervention with surgeons assigned. These were positioned to meet the "Golden Hour" in trauma care.

3.Role III care was now centralized in country and frequently co-located with an AE Hub.

4.Role IV care was in both the USA and Germany.

Combat Casualty Care

Echelons of care prior to 1996:

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Medical Systems

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Level I, II, III, IV Trauma Centers, ED, ICU, Operating Rooms, Surgeons constantly available, etc.

In USA considerable overlap between the two systems!

The military almost combined them!

Combat Casualty Care

The Army combat medic and Navy corpsman for the Marines have done a superb job of incorporating the changes required to bring casualties alive to the medical facility.

1. Tourniquets, airway management, “Quick Clot” dressings, and realistic training are all new and improved!

Germany.

Care of Combat Casualties

Severely injured casualties:

1. **90% die in the first hour after injury.**
2. **50% of these severely injured casualties bleed to death.**

Combat Casualty Care

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I will discuss the formal surgical changes required to treat these casualties like our "family"!

Addressed All Areas as Joint Team 2004

Led to highest survival in history of war –

WWII	Vietnam/GWI	OIF/EF
70%	76%	90%

Result of “Heretical” Thinking

NEJM 9 Dec 04

What does 90% Mean?

11,000+ Injured in Iraq

GW2	**90%**	**9,900**
Vietnam/GW1	**76%**	**8,360**
		1,540

Extra alive because of new thinking!

Source: New England Journal of Medicine 9 Dec 2004

What does 90% Mean?

Number is now updated to over 10,000 extra alive because we were willing to think differently!

Source: New England Journal of Medicine 9 Dec 2004

“Unprecedented” Survival Rates

- Soldier survival rates in Iraq highest in U.S. war history
  - 1/9 soldiers injured died from wounds
  - Wounds as critical as past wars
- Several advances
  - Improved body armor technology (kevlar helmets and vests)
  - On-site treatment by mobile surgical units
- “The average time from battlefield to arrival in the United States is now less than four days. In Vietnam, it was 45 days.” -- Dr. Atul Gawande

Navy Times, Jan 05

Survival Rate for Soldiers Wounded in War

WW II	69.3%
Korea	75.4%
Vietnam	76.4%
Current theaters	90.7%

Combat and Casualty Care Q1 2012

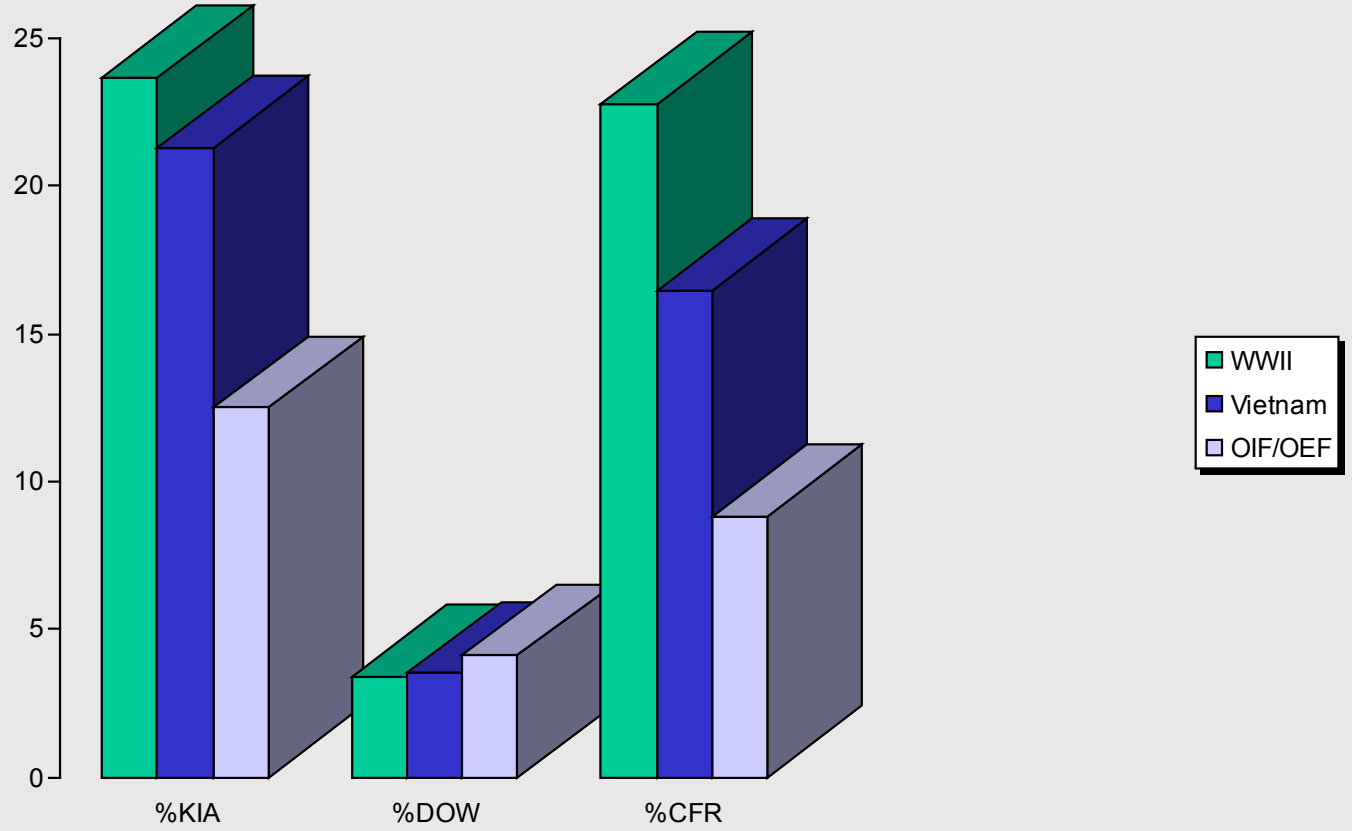
Nomenclature is Important

KIA= Killed in Action, means died before saw a physician.
DOW= Died of Wounds, means died after being seen by a physician.
CFR= Case Fatality Rate, means of the total injured, how many die.

Combat Casualty Statistics

From Stansbury, Holcomb, Champion, Bellamy, 2005

Best we have ever done!



WIA = Wounded in Action (WIA =RTD+ Evacuated+ DOW)
RTD = Returned to Duty in 72 hrs
Evacuated = Not RTD in 72 hrs
DOW = Died of Wounds
KIA = Killed in Action
CFR = Case Fatality Rate

- **%KIA = KIA / KIA + (WIA - RTD)**
- **%DOW = DOW / WIA – RTD**
- **%CFR = KIA +DOW / KIA + WIA**

“In times of change the learners will inherit the world…while the learned will find themselves beautifully equipped to deal with a world that no longer exists”

Eric Hoffer

Lacking to Achieve Vision - 1983

- Critical care in the air
- Modular teams
- Team training
- Joint cooperation
- Trauma Surgeon

Mired in 1960's

MIND SET ISSUE!

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MIND SET ISSUE!

Critical Care in the Air

CCATT

“Their Story”

Heretical Thinking!

Critical Care in the Air

CCATT

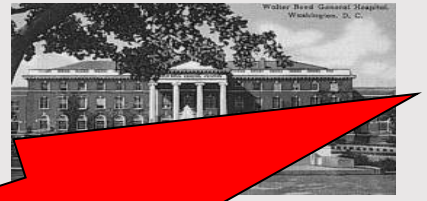
Continuous En Route Care

Historical Route From Injury to Definit[illegible]Care

Vietnam 45 days

OIF 4 days

STRATEGIC EVAC
- Evac Policy -
15 Days



TACTICAL EVAC
- Evac Policy -
7 Days

CASUALTY EVAC
- Evac Policy -
1 Day

Battalion Aid Station
"Level 1"

Field Hospital
"Lev[illegible]

[illegible]ital
"Level 3"

[illegible]Care
"Level 4"

Out of "ME" and into "WE"
JOINT TEAM

Continuous En Route Care

Current Route from Injury to Definitive Care

BAS
Level 1

CASEVAC
1 Hour

Forward Surgical teams
Level 2

TACTICAL EVAC
24 Hours

Combat Support Hospital, EMEDS, Fleet Hospital
Level 3

STRATEGIC EVAC
48-72 Hours

Definitive Care
Level 4

Surgical Capability

Press On, Hold, or Fold?

All of us have to recognize that for every new project there is a time to:

1. Press on!
2. Hold for now!
3. Fold!

The Art of Change is knowing which of the three to do at any given time!

CCATT History

- Conceptualized and executed in USAFE 1983
- rejected by AE-
- "Like trying to catheterize a running race horse! Sit down, shut up, and never bring this up again!" AF SG – three star to LtCol!
- Specifics in 1988
- 1988 – 1999 developed concept, equipment, training
- 2001-2018 proven effective

Against Heavy Opposition

Critical Care in the Air

We have now moved over 12,000 patients on ventilators in these current conflicts!
Over 100,000 total patients.
3 deaths enroute!
We have brought a modern transportation system to the modern battlefield!

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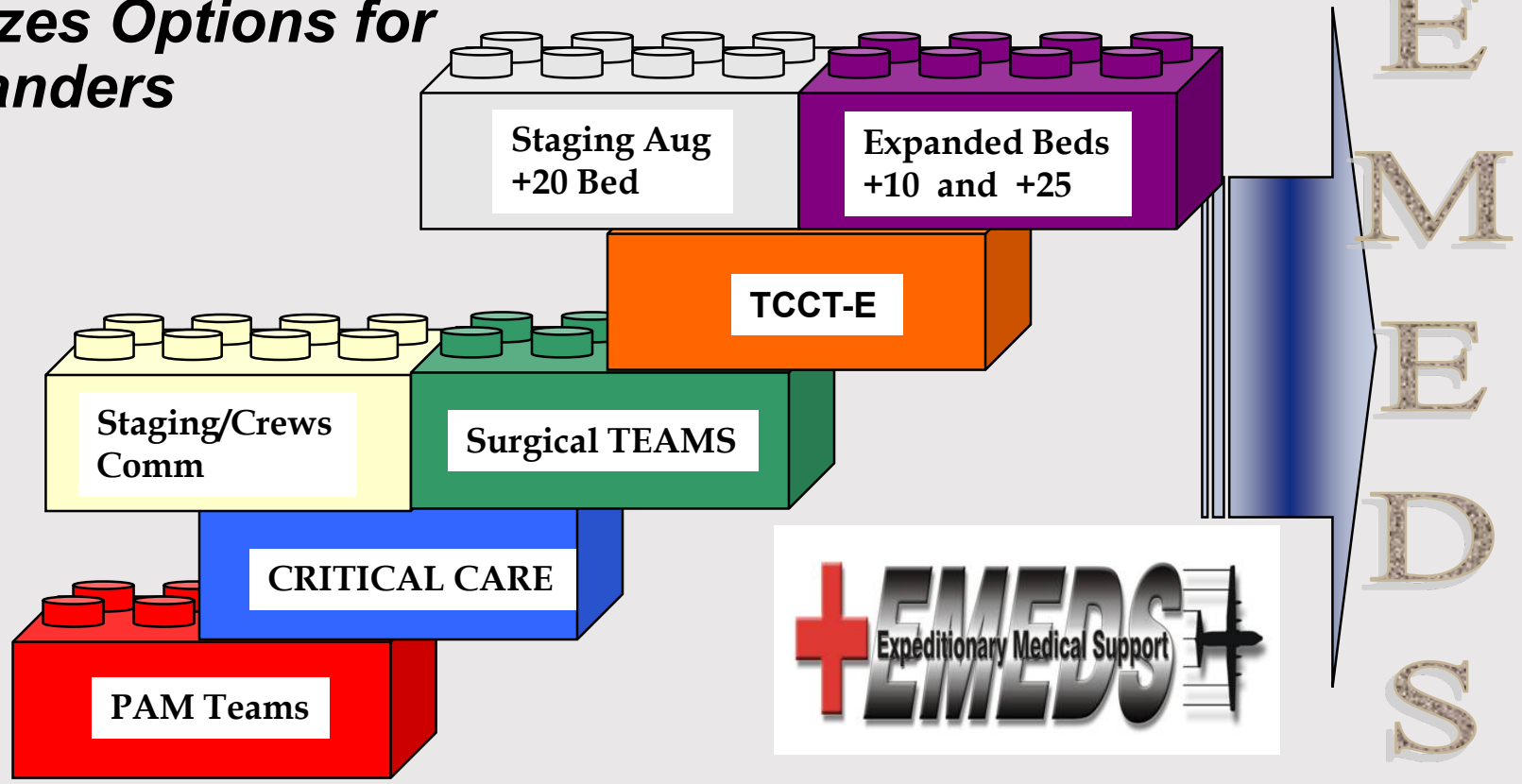
MIND SET ISSUE!

Expeditionary Packages

- Mobile Field Surgical Team (MFST)
  - Rapidly deployable, easily transportable, small surgical team
- A Tactical Critical Care Evacuation Team-Enhanced, or TCCET-E,
  - Deployable within two hours
  - Flexible, broad scope of care for trauma enroute
- Critical Care Air Transport Team (CCATT)
  - For rapid aeromedical evacuation (AE) worldwide
- Expeditionary Medical Support (EMEDS)
  - New version of traditional Air Transportable Clinic / Hospital
- Biological Augmentation Team (BAT)
  - Field identification of pathogens of operational concern
- Prevention and Aerospace Medicine (PAM) Team
  - Designed to prevent disease and non-battle injuries

Modular Units of Capability: Providing What's needed, When needed

- The Crisis Defines the Response
- Optimizes Resources
- *Maximizes Options for Commanders*



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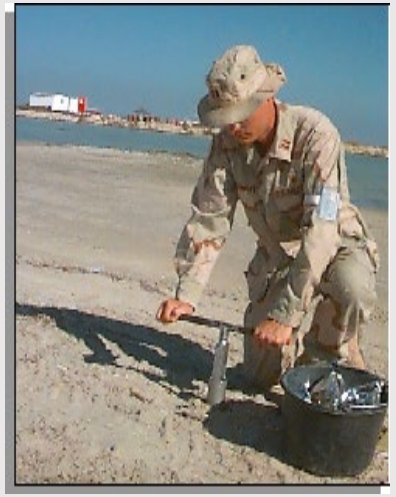
Prevention and Aerospace Medicine Team (PAM)

- Designed to prevent disease and non-battle injuries
- Missions/Tasks
  - Health threat/risk assessment
  - Health hazard surveillance, control, and mitigation of effects
  - Primary/emergency care, flight medicine
- Population at risk; 2-10,000
- 9 personnel in 3 modules
  - Module 1 (Advon) - Aerospace medicine physician, public health officer
  - Module 2 - Bioenvironmental engineer (BEE), independent duty medical technician
  - Module 3- 2 public health technicians, 2 BEE technicians, aerospace physiologist



Critical Care Air Transport Team (CCATT)

- For Aeromedical Evacuation Patients
- Capability: Provides in-flight critical care transport of 3 ICU patients; with 2nd critical care nurse, 5 stabilized patients
- Personnel: 3 - 1 Physician, 1 Nurse,
- 1 Respiratory Tech
- Equipment: Light weight, compact, advanced
- and sophisticated patient management equipment and supplies
- Operating Conditions: Work with 5
- member AE crews to care for stabilized casualties; for tactical and strategic evacuation

Mobile Field Surgical Team (MFST)

Rapidly deployable, easily transportable, small surgical team

Provide lifesaving trauma care within one hour of injury

Personnel: 1-General Surgeon, 1-Orthopedic Surgeon, 1-Emergency Physician, 1-Anesthesiologist, 1-OR Nurse/Tech

Equipment: Manportable 300 lbs of medical equipment and supplies in 5 backpacks, 60lb generator, 1 folding litter

Capability: Care for up to 20 patients in 48 hrs; perform up to 10 life or limb saving/stabilization procedures

Operating conditions: Intended for specialized surgery tasks as stand alone for short periods or as medical augmentation unit; transportable by any means; uses shelter of opportunity; no patient holding capability

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MIND SET ISSUE!

Team Training

Ken Mattox, Don Trunkey and others have advocated for military teams to do “trauma training” programs in preparation for war since 1975

Change Is Hard

"Every revolutionary idea evokes three stages of reaction"

1. You're nuts!
2. It would work, but no reason to change!
3. You like it? – It was MY idea!

2000 - 2018

Training Spread

- **USAF**

Center for Sustainment Training and Readiness Skills (CSTARS)

1. **Baltimore Shock Trauma**
2. **Cincinnati for CCATT**
3. **St. Louis for National Guard and reserves**
4. **Birmingham, Ala., Miami, Fl., and Las Vegas, Nv., for AFSOC surgical teams.**

- **USA – Miami**

- **USN - LA**

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MIND SET ISSUE!

Lacking to Achieve Vision - 1983

Standards Established

RSVP

Readiness

Skills

Verification

Program

RSVP-Dance Card

- What are requirements to go to war?
- Consultants answered those program questions.
- RSVP criteria established for each deployable person

For Example

General surgery

-50 open laps every 2 years

-50 ventilated patient days

-etc…

If not met then go to CSTARS for 4 week update prior to deployment

Certified for deployment!

For Example

CCATT Nurses

- **50 ventilator patient days**
- **Readiness training**
- **Etc…**

If not met then go to CSTARS for 2 week update prior to deployment

Certified for Deployment

Result

- Military teams better prepared for conflicts that started after 11 September 2001
- Patients more challenging in war, but principles are real and applicable
- Learning never stopped–

1. First year in Balad, Iraq, we had an 80% wound infection rate, dropped to less than 1% with use of new technology- the wound vac.

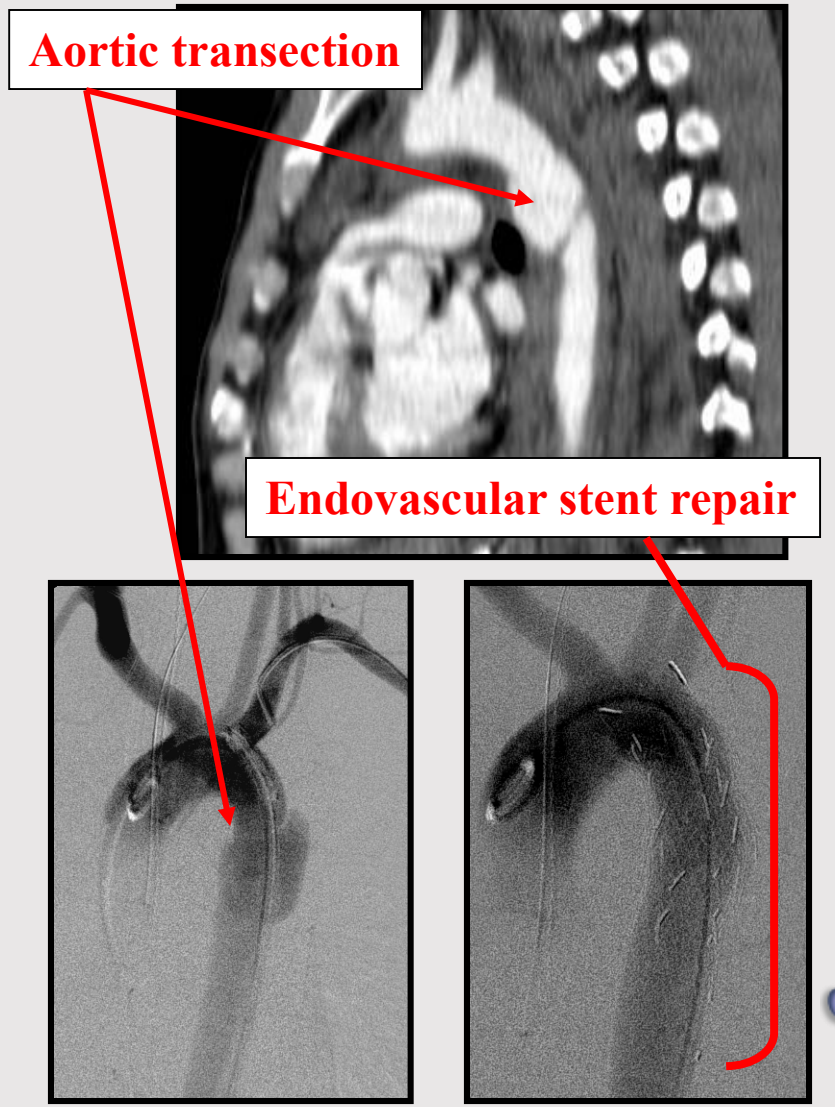
2. Compartment syndromes rose, we countered with aggressive decompressive surgery and changing timing for AE.

1st In-theater Endovascular Repair of Transected Aorta

BALAD, IRAQ — On 12 May 2008, an Iraqi Police Officer was severely injured in a motor vehicle crash near Balad. He was evacuated to the 332nd EMDG where CT scan revealed a thoracic aortic transection, an injury pattern that carries a 95% overall risk of death.

In the operating room the aortic injury was successfully treated with endovascular methods that involved insertion of a covered stent through the femoral arteries accessed via small incisions in the thigh. Positioning and expansion of the stent at the area of aortic transection using angiogram techniques sealed the injury allowing the aorta to heal around the stent. The endovascular approach to this injury is much less invasive than traditional surgery which involves opening the chest and clamping the aorta. The endovascular approach to acute aortic injury in this case reduced complications, blood loss, ICU stay and risk of death.

Endovascular repair of aortic injury is available at only select centers in the US and this case represents the first such repair in the theater of war. The presence of of endovascular capability at the 332nd EMDG demonstrates a sustained commitment to excellence among Air Force medics bringing cutting-edge surgical technology closer to those injured in the wartime setting.[1]



[1] Rasmussen TE, et al. Development and implementation of endovascular capabilities in wartime. J Trauma 2008;64:1169-76.

History is Important

1995- on call one night on call at Wilford Hall Medical Center we were discussing how to speed up our ability to put blood vessels back together over a difficult case.

One item that came up was how to shorten the time to put blood vessels back together again once damaged from trauma.

A bright young resident, Todd Rasmussen, and his staff, David Dawson, brought up the idea of using a shunt to bypass the vessel until you had time to repair it.

History is Important

They asked me to buy them 10 pigs to prove the point that an extremity could survive for 24 hours without damage using such a shunt.

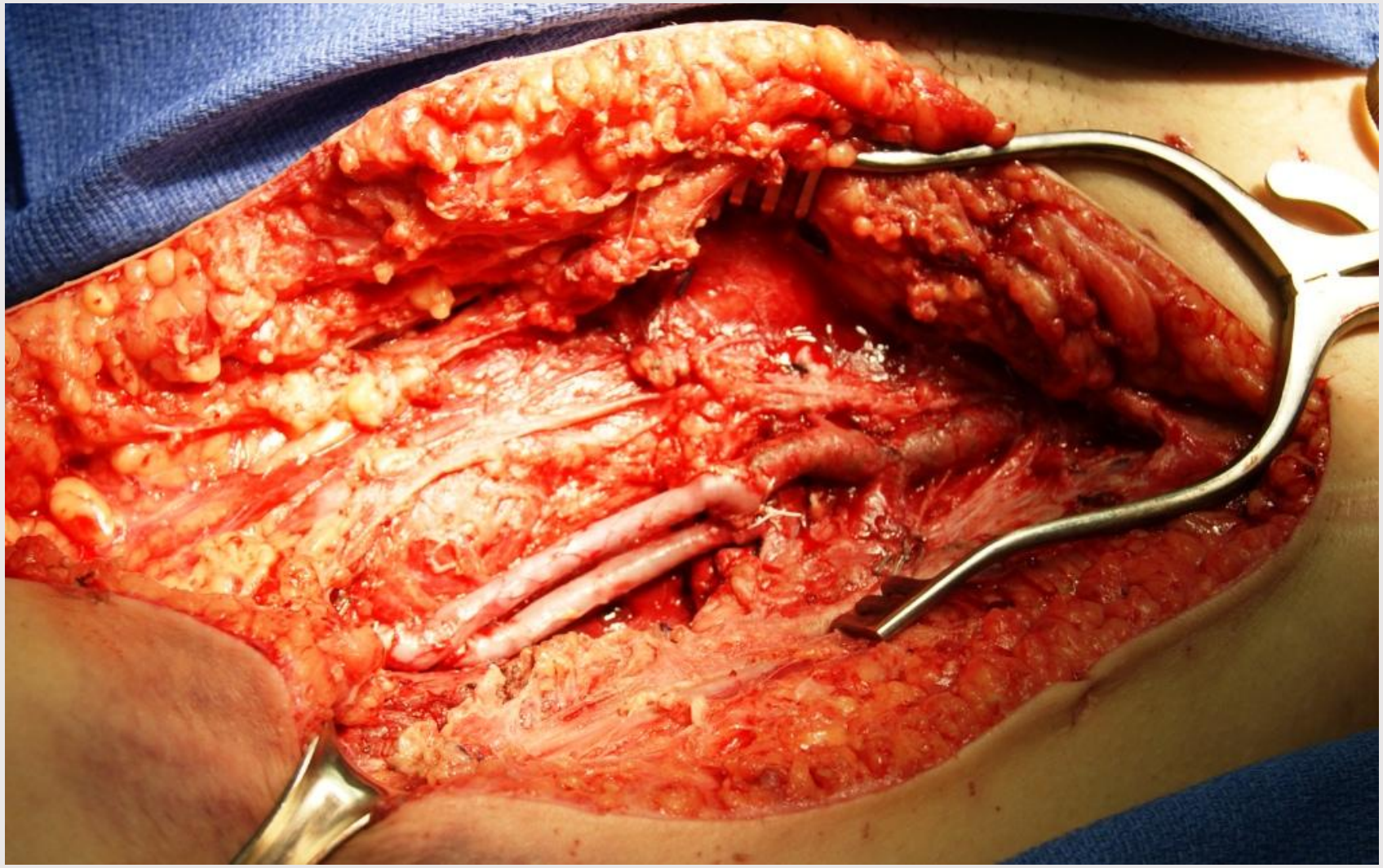
I did and they proved the point, published the paper, and we added the shunt to our surgical back packs.

Fast forward to Feb 2010: Todd Rasmussen is now at the Bagram Hospital in Afghanistan on call. He has just received a young Marine woman who stepped on an IED on patrol.

History is Important

Her right leg was blown off below the knee.
Her left groin took shrapnel and divided both artery and vein to her leg.
Her battle buddy got two tourniquets on for her.
She was resuscitated at a forward surgical station, using two shunts for the dual vascular injury, and shipped to him in about four hours.
He reconstructed the artery and vein after removing the shunt- saving her remaining leg.
He then took this picture, telling me that it was the best investment I had ever made, buying those 10 pigs, for the war wounded!

22 Year Old Marine



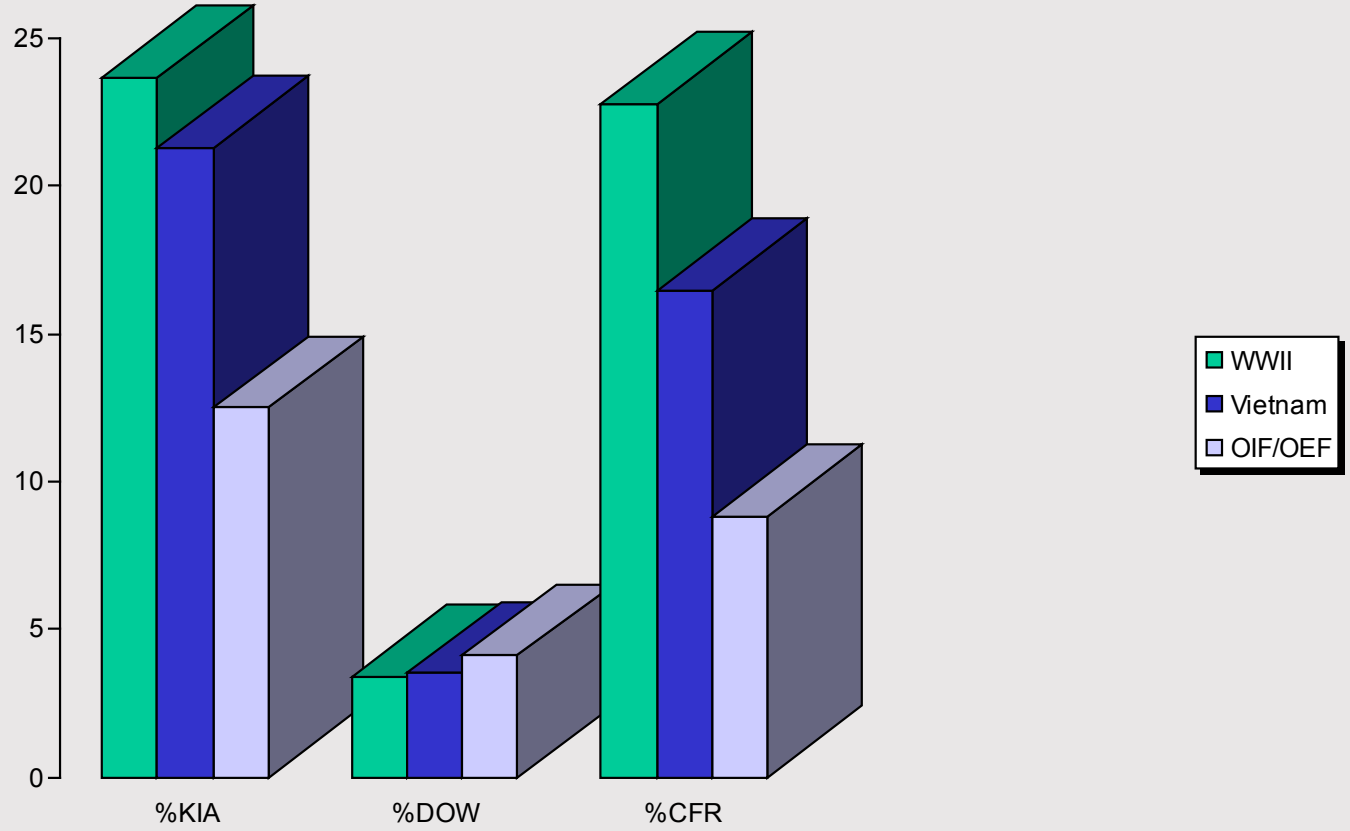
22 Year Old Marine

Dr Rasmussen has now done over 1300 such cases in the current conflicts!

Combat Casualty Statistics

From Stansbury, Holcomb, Champion, Bellamy, 2005

Best we have ever done!



WIA = Wounded in Action (WIA =RTD+ Evacuated+ DOW)
RTD = Returned to Duty in 72 hrs
Evacuated = Not RTD in 72 hrs
DOW = Died of Wounds
KIA = Killed in Action
CFR = Case Fatality Rate

- **%KIA = KIA / KIA + (WIA - RTD)**
- **%DOW = DOW / WIA – RTD**
- **%CFR = KIA +DOW / KIA + WIA**

Combat Casualty Statistics

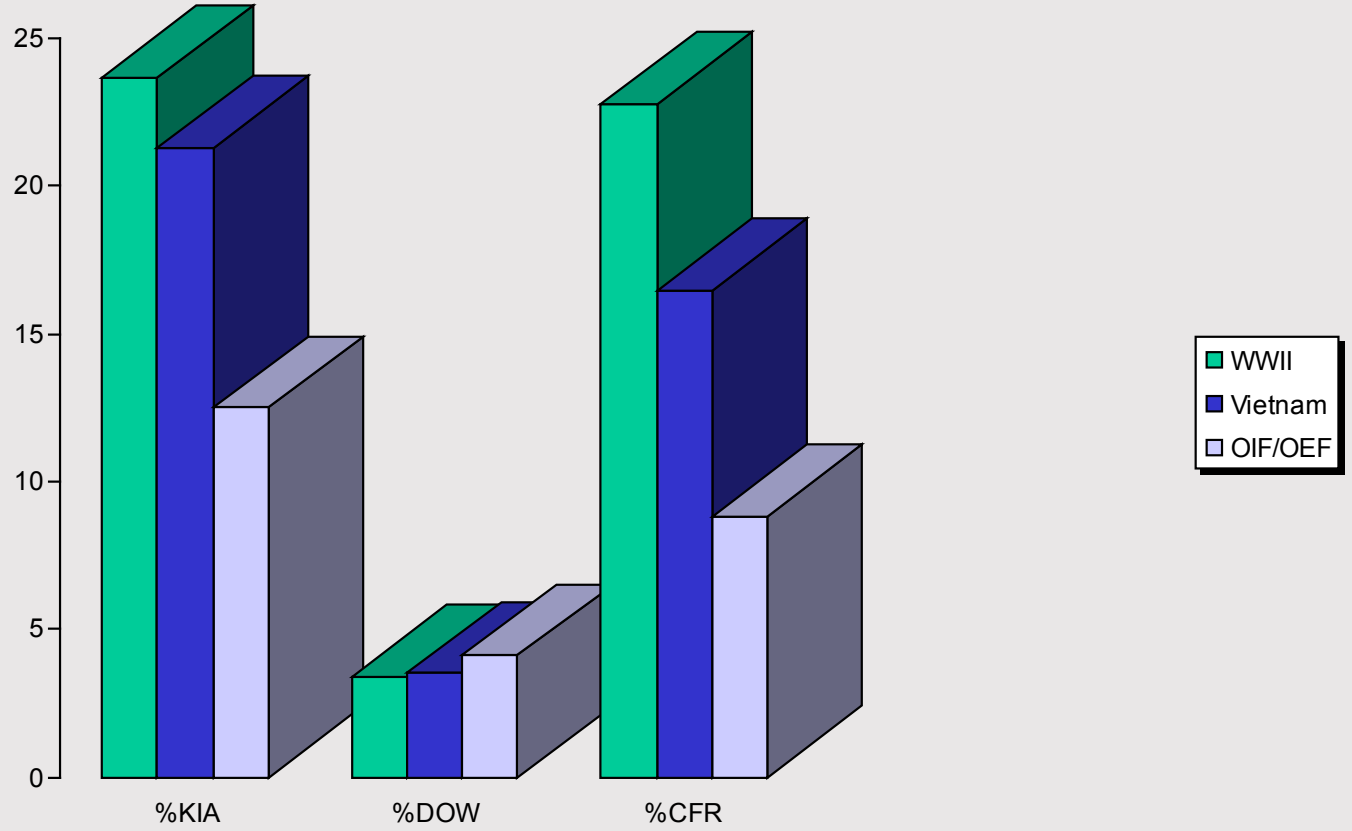
From Stansbury, Holcomb, Champion, Bellamy, 2005

1. This was a deliberate decision to go after the KIA group!
2. By definition that meant died before seeing a physician.
3. That was running 17% in Vietnam.
4. DOW means you saw a physician and then died.
5. The Vietnam hospital medical experience was superb, less than 3% DOW rate!
6. So the biggest opportunity for improvement was in the KIA group!

Combat Casualty Statistics

From Stansbury, Holcomb, Champion, Bellamy, 2005

Best we have ever done!



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Mired in 1960's

MIND SET ISSUE!

Joint Cooperation

- Casualty does not care who takes care of them – Army, Navy, Air Force, Marine Corp
- They care that they get taken care of
- Has required many years to get into "WE" mindset of Jointness!

Focus Areas

Historical Route From Injury to Definitive Care

Press On, Hold, or Fold?

All of us have to recognize that for every new project there is a time to:

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Team

Military

- **US Army**
- **US Air Force**
- **US Navy**
- **US Marine Corp**

All now closely integrated team members

Focus Areas

Historical Route From Injury to Definitive Care

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MIND SET ISSUE!

Trauma Surgeon

It had become clear that we needed a constantly prepared cadre of surgeons who had dedicated themselves to the care of the traumatically wounded in our military to really optimize our surgical care in the military.

The Vietnam cadre had departed and we seemed to have a significant gap of skills between what we trained for peacetime healthcare and what we needed for wartime surgery.

As we worked on these concepts in the military the private sector had come to the same conclusion and were developing the whole concept of a “trauma surgeon”.

Trauma Surgeon

This “trauma surgeon” would be taught in a fellowship program, post general surgery or orthopedic surgery residencies, the intricacies of ICU care, management of the trauma patient, mass casualties, **system thinking for trauma care, and how to integrate all of the pieces of the puzzle into a cohesive team!**

Our military invested in several of these training programs with our best residents. The results have been remarkable! People like Ty Putnam, Don Jenkins, Jay Johanigman, David Kissinger, Warren Dorlac, Ken Kaylor, Mark Richardson, etc. carried this focus on wartime medicine to the best outcomes in the history of war!

Trauma Surgeon

The current wartime strategy is the first ever designed by surgeons and totally focused on survival using modern techniques!

The results speak for themselves!

Leadership Imperatives

- Core Values
- Attitude
- Competence
- Mentorship
- Self Protection

It is all about being family!

Press On, Hold, or Fold?

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Breaking Barriers is Hard

Every new barrier takes perseverance and determination to overcome!

Breaking Barriers is Hard

Every new barrier takes perseverance and determination to overcome!

Continuous Intelligent Inquiry

Update from the Tactical Combat Casualty Care Committee 4Feb09:

1.Potential salvageable percentage of deaths in first two years of the Iraqi conflict– 20%!

2.Potential salvageable percentage of deaths in the last two years of the Iraqi conflict– 0%!

3.We are looking at ourselves hard and it shows in increased survival!

Col. Jay Johanigman 4Feb09

Implications of Combat

Casualty Care for Mass Casualty Events

Care at the Point of Injury

The majority of wartime deaths occur in the **out-of-hospital setting**. The point of injury component of care is termed ***tactical combat casualty care.*** During the past decade, this phase has been transformed to introduce and integrate elements of medical care with military tactics. Combat units are now trained in tactical combat casualty care, a strategy that has reduced preventable death.

JAMA 7Aug13

Implications of Combat Casualty Care for Mass Casualty Events

Care at the Point of Injury

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Kotwal et al reported that the 75th Ranger Regiment's implementation of a system based on tactical combat casualty care was associated with a **historically low 3% incidence of preventable death**. Moreover, none of the regiment's 32 fatalities died of preventable causes during the out-of-hospital phase of care. The critical elements of the protocol include:

1. early control of hemorrhage using tourniquets for extremity bleeding and
2. hemostatic dressings for bleeding not amenable to tourniquets.

Kotwal, JAMA 7Aug13

Implications of Combat Casualty Care for Mass Casualty Events

Lessons From Wartime Trauma Care

We saw this in the superb response to the Boston Marathon Bombings!

helpful in planning responses. The trauma practices that have resulted from more than a decade of combat casualty care and research are transferable to the civilian world. Continuing to translate these lessons from war should provide a foundation to help reduce mortality and morbidity among civilians injured in future mass casualty events.

Kotwal, JAMA 7Aug13

Benefits of This Change in Strategy

1. Best survival in the history of war is exciting.
2. No need for big in-theater medical system.
3. “Stabilize and ship” dramatically reduces your medical footprint.
4. Reduced logistics footprint is also exciting.

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Gulf War One 1991

There were three times as many hospital beds in the Gulf theater than were active in the Vietnam War at its peak:

1. **The Army alone had 13,580 beds in 44 hospital facilities in the theater, in addition to its supplementary staffing in nine host country hospitals.**
2. **The Navy had 2,277 medical officers and 8,943 enlisted medical personnel in the theater on two hospital ships, three fleet hospitals and in three host nation hospitals, plus its medical personnel supporting two Marine Expeditionary Brigades.**
3. **The Air Force had an equally extensive and complex presence with 4,868 medical personnel.**

Medical supply preparation was equivalently extensive. For example, 30,000 units of blood were on hand when active war started.

Journal of the US Army Medical Department Jan-Feb1992

Gulf War One 1991

There were three times as many hospital beds in the Gulf theater than were active in the Vietnam War at its peak:

That is over 30,000 medical personnel and 20,000 hospital beds in theater for the Gulf War One!

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Journal of the US Army Medical Department Jan-Feb1992

Wars Since 2001 in Iraq and Afghanistan

1. We have never had more than 400 beds in either theater of war.
2. “Stabilize and Ship” was the mantra made possible by CCATT!
3. Most of the definitive care was done in Germany or in the USA.
4. More effective fighting force, better medical care, dramatic decrease in medical footprint.
5. Fewer medics killed!

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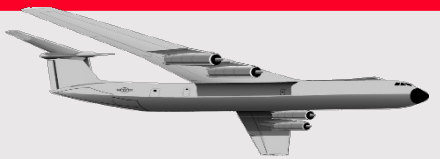

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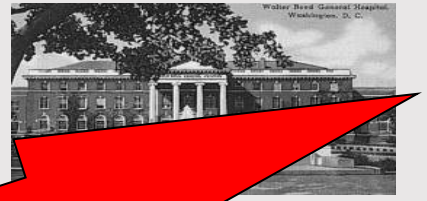

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Out of "ME" and into "WE"
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2. No need for big in-theater medical system.
3. "Stabilize and ship" dramatically reduces your medical footprint.
4. Reduced logistics footprint is also exciting. In the countries involved, bringing what is needed to the fight is extremely difficult!

Today

History Lesson!

So what?

Combat Casualty Care

1. My personal journey to improve combat casualty care.
2. Potential Applications for your area.

Improvement never stops!

This is family!

This is your home!

Improvement never stops!

If the military can do this under fire, you can certainly overcome the tyranny of distance to improve your trauma systems!

This is your home!

The United States of America is now a War Zone!

Humor!

1. We cannot afford to hide in the box!
2. 20% excess deaths may be a low estimate on deaths!
3. It could be as high as 40-50%!

The Threat For Mass Casualties in Our Country is Real!

After Las Vegas shooting, veteran medic pushes more public training on combat tourniquets

Sgt. Anthony Howard of 1st Squadron, 14th Cavalry Regiment, applies a tourniquet to a soldier during a unit readiness exercise held at Forward Operating Base Sweeney, Afghanistan, Jan. 20, 2012.

Army Times 8Oct17

Texas Church Shooting Leaves at Least 26 Dead, Officials Say

SUTHERLAND SPRINGS, Tex. — A gunman clad in all black, with a ballistic vest strapped to his chest and a military-style rifle in his hands, opened fire on parishioners at a Sunday service at a small Baptist church in rural Texas, killing at least 26 people and turning this tiny town east of San Antonio into the scene of the country's newest mass horror.

The gunman was identified as Devin Patrick Kelley, 26, according to two law enforcement officials who spoke on the condition of anonymity because the investigation was continuing. Mr. Kelley, who lived in New Braunfels, Tex., died shortly after the attack.

NY Times 5Nov17

Shooting at Tennessee Church Leaves One Dead and Seven Wounded

Members of the Burnette Chapel Church of Christ in Antioch, Tenn., after the shooting on Sunday.

New York Times 25Sep17

Annapolis newsroom shooting leaves 5 people dead; suspect in custody, officials say

At least five people were killed and several others were "gravely injured" during a shooting at the newsroom of the Capital Gazette in Annapolis, Maryland, Thursday afternoon, local officials said, in one of the deadliest attacks involving journalists in U.S. history.

An unidentified suspect is in custody and a possible motive was unclear, Anne Arundel Sheriff Ron Bateman told Fox News.

Law enforcement was called to the scene at Bestgate Road around 2:40 p.m. following word of an active shooter, Anne Arundel County Police Lt. Ryan Frashure told reporters. An investigation is underway but "at this point we believe that it is one suspect," he said.

Fox News 28June2018

Kentucky school shooting leaves at least two dead and 17 others injured, officials say

A shooting at Marshall County High School in Benton, Ky., left at least two people dead and 17 others injured after a student opened fire on Tuesday, officials said.

During an evening news conference, Kentucky State Police Commissioner Richard Sanders said the alleged shooter, a 15-year-old male student, was in custody and will be charged with two counts of murder and several counts of attempted murder.

Authorities were seen escorting a handcuffed individual away from the scene earlier in the day.

Fox News 23Jan18

Kentucky school shooting victim's family was able to say goodbye to son before he died!

This was the 11th school shooting since the new year in the USA!

We see lots of reasons for it, but it is still a tragedy!

Fox News 27Jan18

17 killed in mass shooting at high school in Parkland, Florida

The teen gunman accused of opening fire with a semi-automatic rifle at his former high school in Parkland, Florida, has been charged with 17 counts of premeditated murder, officials said Thursday.

Authorities said the suspect, identified as 19 year old Nikolas Cruz,, concealed himself in the crowd fleeing Marjory Stoneman Douglas High School following the massacre on Wednesday afternoon. He was arrested in nearby Coral Springs.

Fourteen others were wounded, five with life-threatening injuries, hospital officials said.

Fox News 15Feb18

17 killed in mass shooting at high school in Parkland, Florida

Recent school shootings

NBC News has compiled a list of shooting incidents that have resulted in injuries and/or deaths at elementary, middle and high schools since the beginning of 2018. As of Feb. 14, a total of 20 people have been killed and more than 30 have been injured in these shootings.

Timeline

Fox News 15Feb18

Texas high school shooting leaves 8-10 dead, 1 suspect in custody, 1 detained

“Heidi and I are keeping all the students and faculty at Santa Fe High School in our prayers this morning, along with all first responders on the scene. Please be safe and heed warnings from local officials,”he said.
Aerial footage from the scene showed students standing in a grassy field while officers inspected their backpacks. At least three life-flight helicopters landed at the school.

Fox News 18May18

School Shootings in USA

break-down 21st century total

From the commencement of the 21st to the most recently occurring shooting (of February 1, 2018), the number of shootings is 211:

During the 1st decade there were 63 (2000 (5 shootings), 2001 (5), 02 (7), 03 (4), 05 (5), 06 (11), 07 (5), 08 (11), 09 (7))

During the 2010's (to February 1, 2018) there were 148 shootings (during 2010, 11 shootings, 2011 (7), 12 (11), 13 (26), 14 (36), 15 (21), 16 (15), 17 (9), 18 (6)).

Wikipedia 2018

Living in a Time of Twitter and Mass Murder in the US

I carry a tourniquet, hemostatic bandage and a chest seal in my briefcase every day, and I also carry Stop the Bleed kits in each of my vehicles. It is certainly possible to use improvised items in an emergency, but with first aid gear so compact and inexpensive, it makes sense to carry the real deal.

Active Shooter Preparation the Role of Healthcare Facilities Leaders

In today's unpredictable environment, the days of "It won't happen here" are falling by the wayside. Preparing for the threat of an active shooter is a top priority at healthcare facilities, regardless of size or location.

Healthspace 14June2018

Active-Shooter Response at a Health Care Facility

Since that time, active-shooter incidents have been on the rise throughout the United States. Defining such incidents as situations in which "an individual [is] actively engaged in killing or attempting to kill people in a confined and populated area," the **Federal Bureau of Investigation (FBI) has identified 160 discrete incidents that occurred between 2000 and 2013, in which 160 people were killed and an additional 557 were wounded**. In the first half of that period, there were an **average of 6.4 active-shooter incidents per year; the number more than doubled, to more than 16.4, in the latter half of the period.** The most recently released FBI data reveal that the **rate increased to incidents 20 incidents per year in 2014 and 2015.**

NEJM 9Aug18

Active-Shooter Response at a Health Care Facility

Hospitals and particularly trauma centers have always been an integral part of the response to these catastrophes, providing lifesaving care to the injured. The grim reality, however, is that while being prepared to care for incoming victims of an active-shooter incident remains critical, it is no longer sufficient. Health care facilities are themselves high-risk targets and must also be prepared as potential sites of attack. To quantify the risk, Kelen et al. examined all U.S. hospital shootings between 2000 and 2011 in which there was at least one injured victim. They identified 154 incidents in 40 states causing death or injury to a staggering 235 people.

NEJM 9Aug18

Active-Shooter Response at a Health Care Facility

Kits containing essential supplies for hemorrhage control, including tourniquets, gauze, and gloves, should be located inside all these areas. Arguably, these kits would also be installed in all public-access areas, just as automated external defibrillators have been. **Efforts should be made to train all hospital workers, whatever their area of expertise, in basic bleeding-control techniques.** Bleeding is the most common potentially preventable cause of death from the types of injury likely to be encountered in such scenarios, so it's a high-yield target for educational initiatives. **The American College of Surgeons Committee on Trauma Bleeding Control course (www.bleedingcontrol.org) is a short, simple, effective program designed for both medical and nonmedical personnel and is well suited for this purpose.**

NEJM 9Aug18

Active-Shooter Response at a Health Care Facility

Conclusions

As outlined in a recent study by Jacobs and Burns, **an active-shooter plan and drills are critical for all healthcare facilities.** A core component of such planning is the **mental and physical preparation of the health care professionals** who would, if faced with such an attack, have to make personal choices about how to respond. **More than half of respondents to Jacobs and Burns's survey believed that health care workers have a duty to protect their patients, and 39% of laypeople and 27% of health care professionals indicated that physicians and nurses should accept a high or very high degree of personal risk in caring for patients who cannot get out of harm's way.**

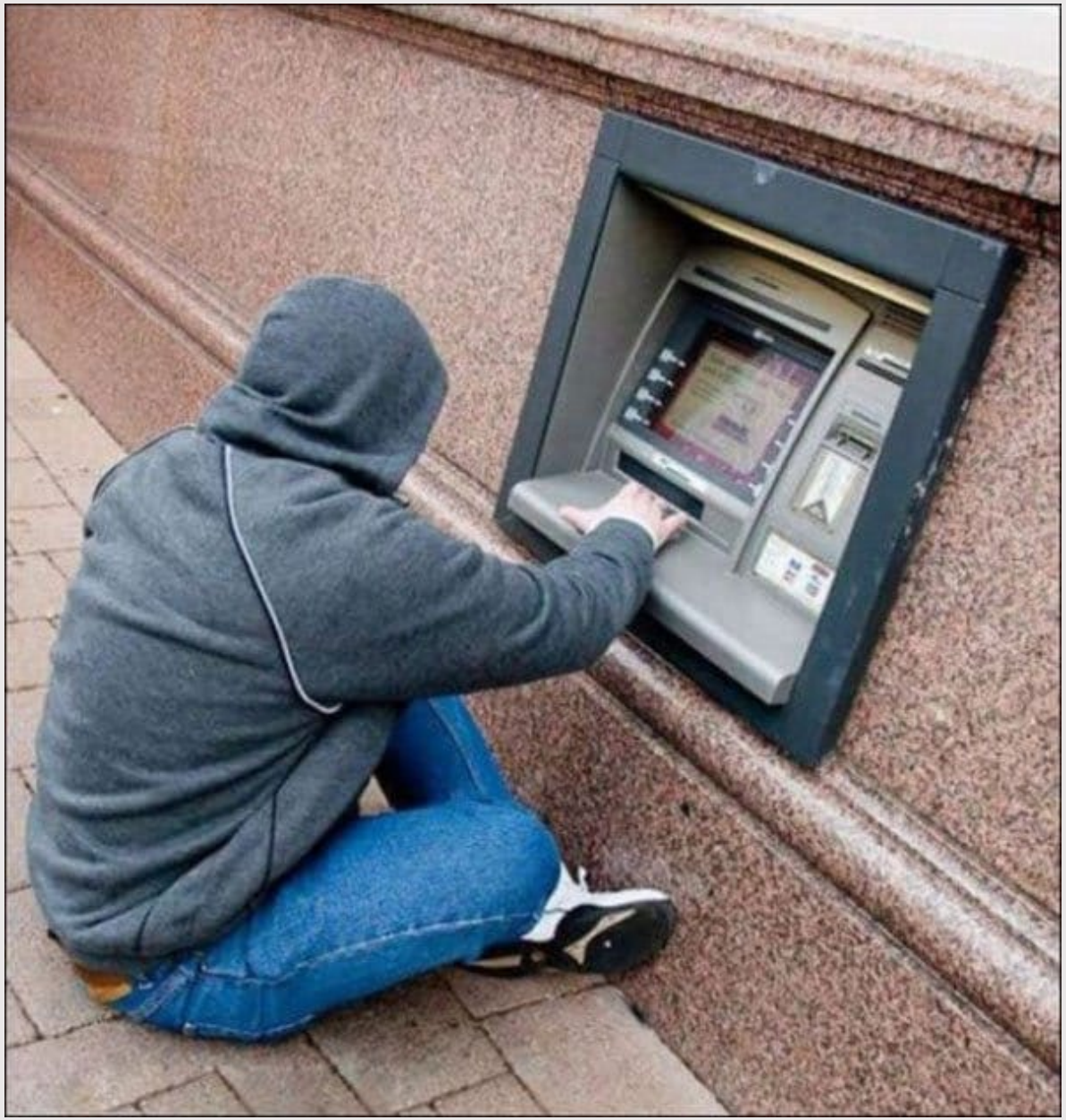
NEJM 9Aug18

Prior Planning
Prevents Poor Performance!

We Have To Think Through Every Action!

We Cannot Put anything Out of Reach!

But We Cannot Set The Bar Too Low!



The Threat For Mass Casualties in Our Country is Real!

So We Must Prepare Ourselves For These New Challenges!

Humor!

We must have these concerns addressed in a meaningful way, no smoke and mirrors!

We Are Missing a Vital Piece of Our Medical Solution Set

We have built
reception
treatmen
rehab tear
emergency m
BUT we have
vita
eff
inv
We
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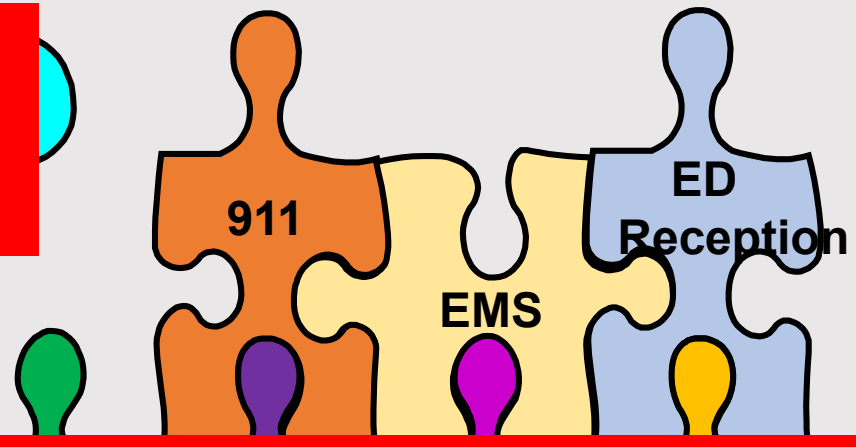
eff

Public Involvement



War zone:

1. 24% excess deaths without all trained in life saving
niques!
excess
ths when
rained!

Rural America by thse same standards is running 36% excess deaths!
This is where you live!
This may be the most important part!

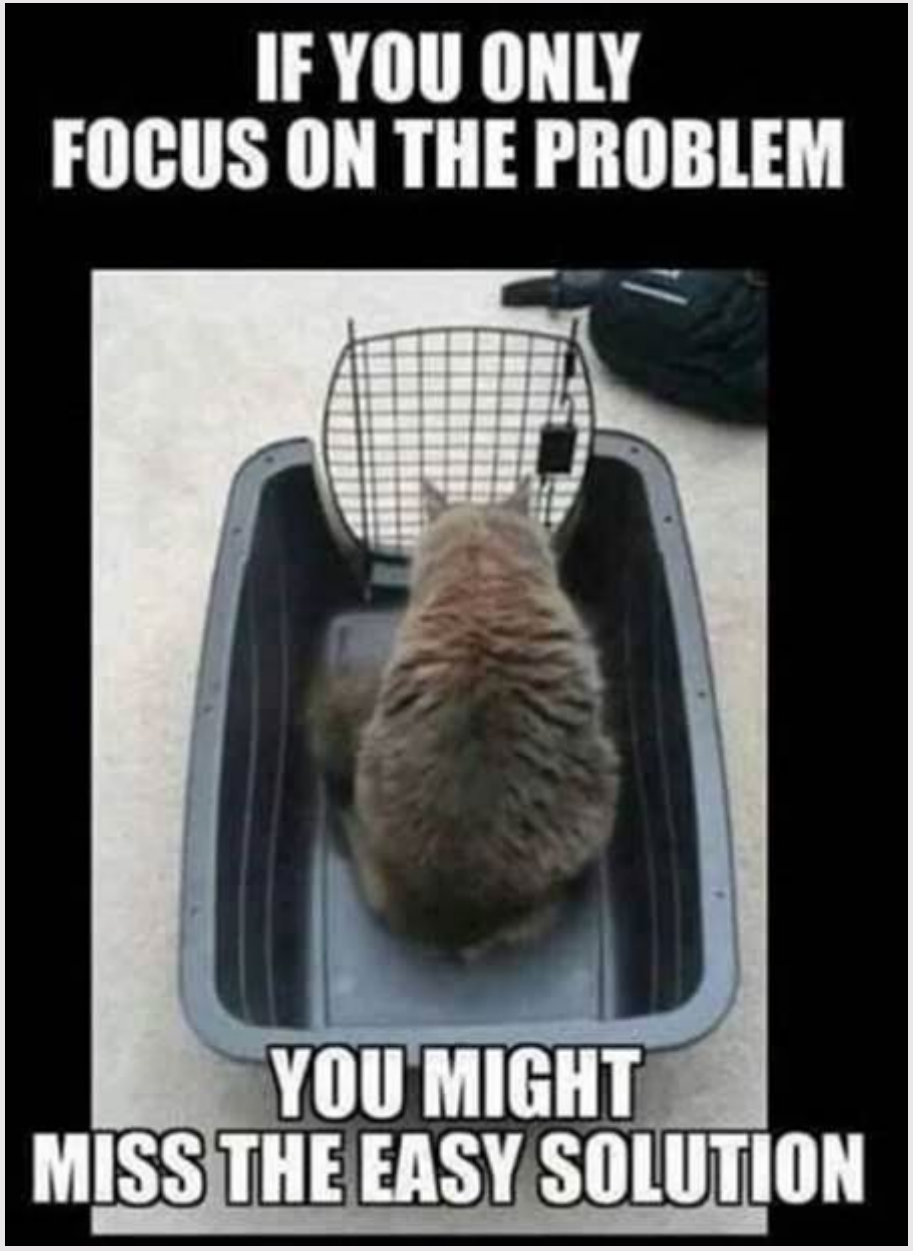
Threat!

The threat is real from any number of aspects!

The only question is what do we do about it?

Humor!

1. We look at ourselves very critically in many different ways!
2. We have a superb system.
3. We need to look to the bigger picture- the public- if we expect to lower our Preventable Deaths!

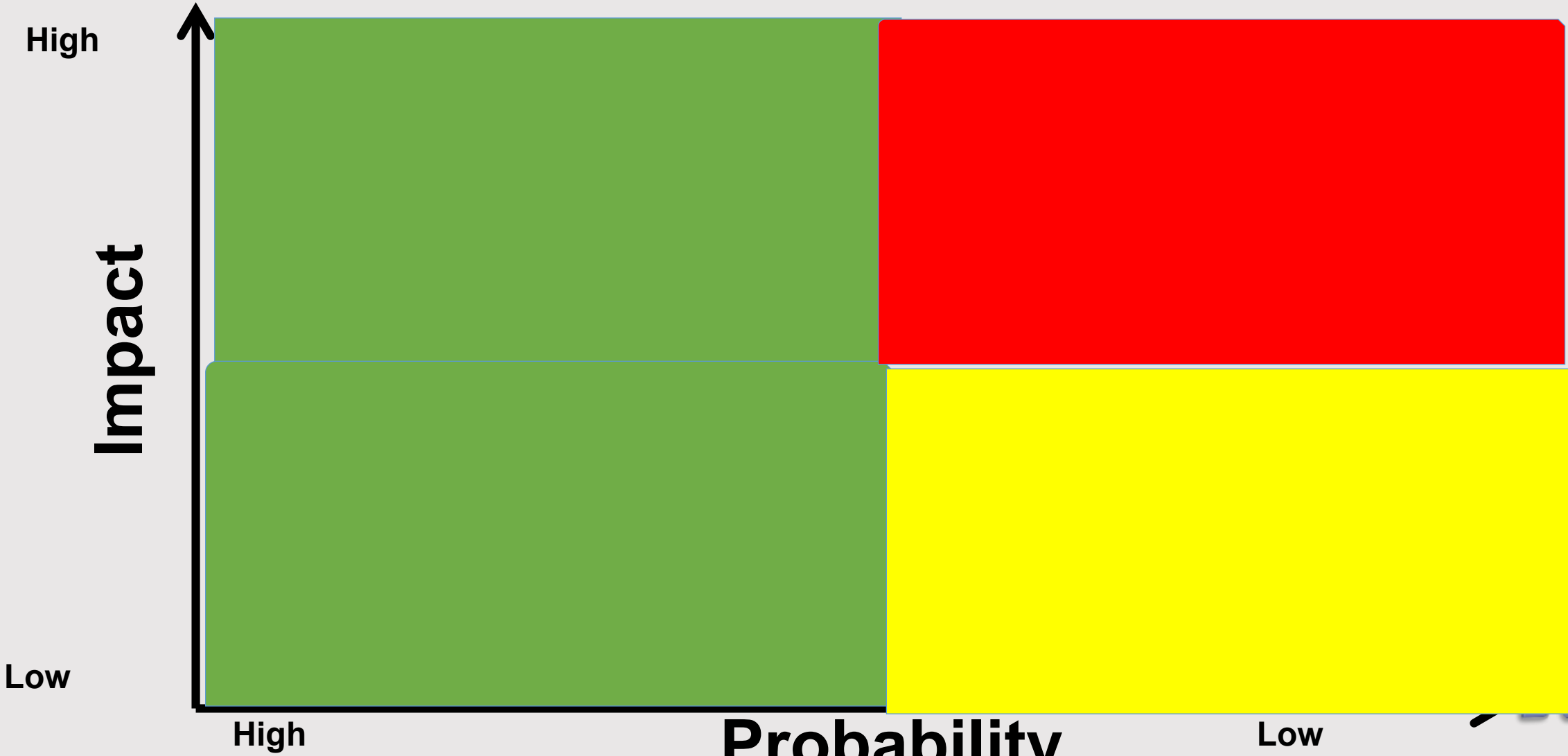


How do we rationally address this threat?

An impact vs probability matrix seems appropriate?

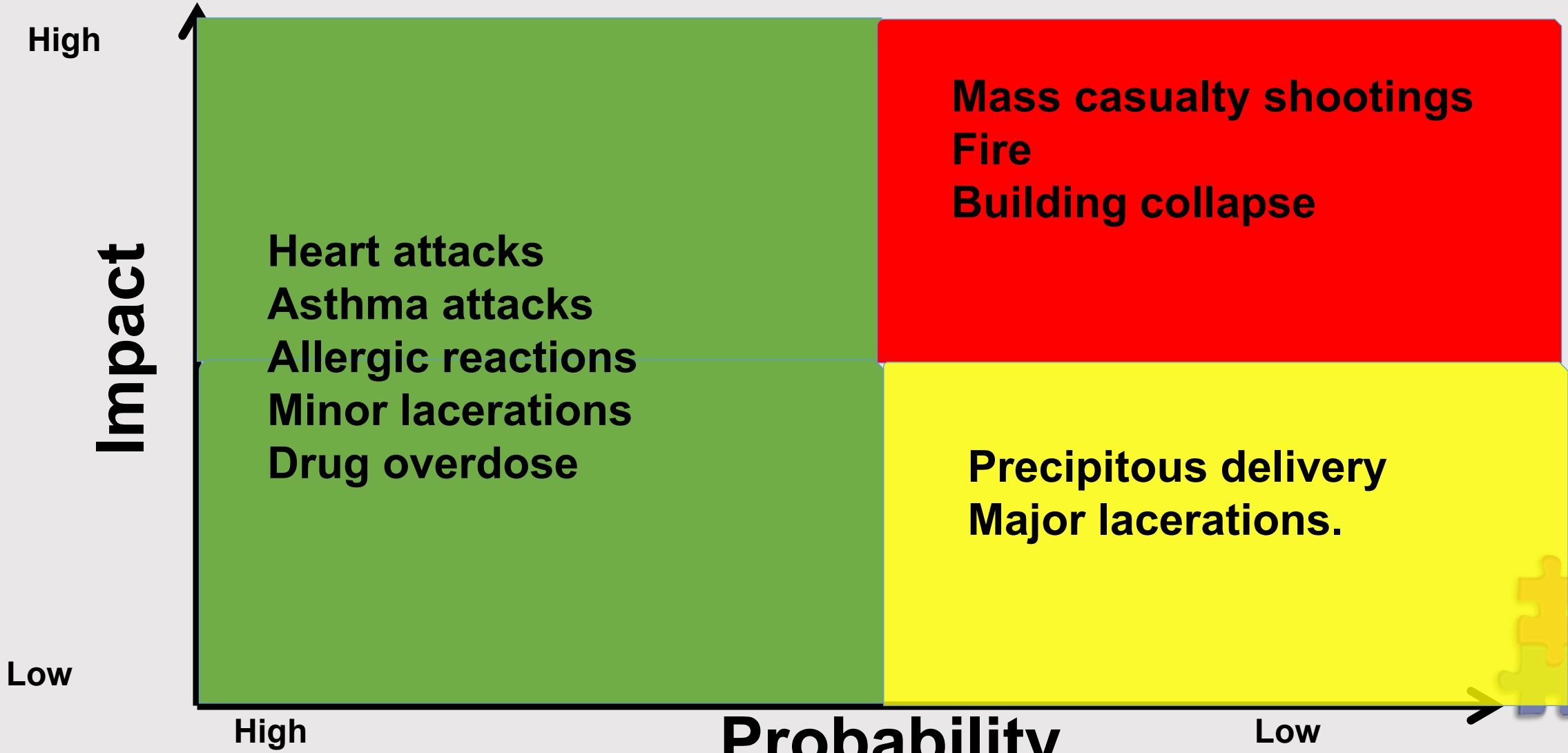
Threat Specific Training and Equipment

Civilian Impact vs Probability Assessment



Threat Specific Training and Equipment

Civilian Impact vs Probability Assessment



Threat Specific Training and Equipment

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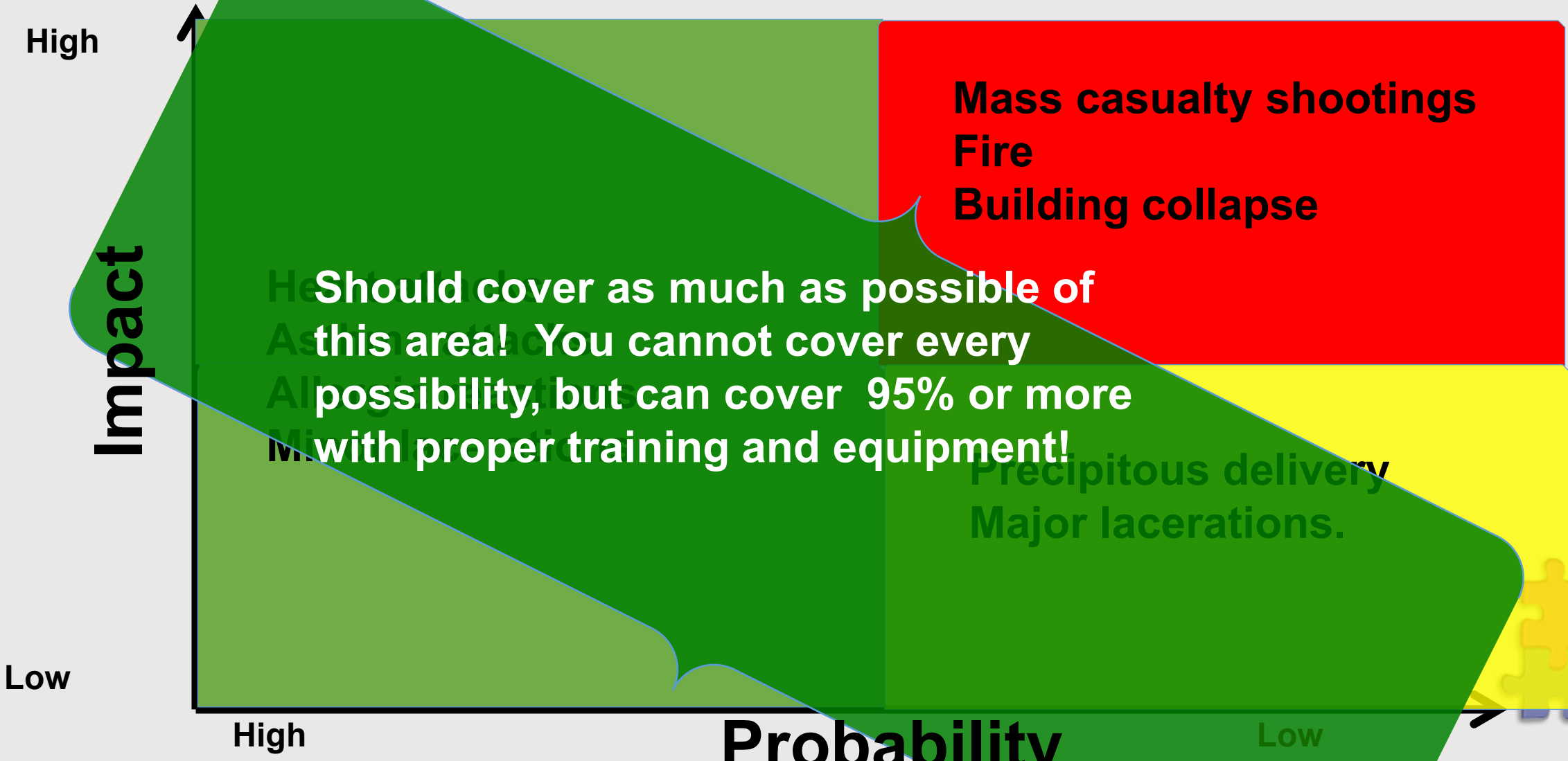


3-24-36%

3% Excess Mortality in the combat zone in the 75th Ranger Bn.

24% Excess Mortality in the regular Army combat zone, same time frame

36% Excess Mortality in Rural America

Kotwal, JAMA 7Aug13

3-24-36%

3% Excess Mortality in the combat zone in the 75th Ranger Bn.

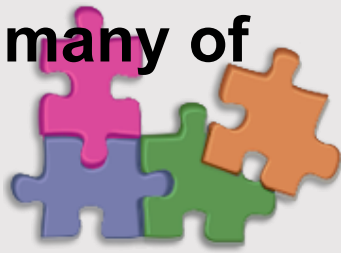
The only educational course that separates these figures is the COMBAT LIFE SAVER COURSE

24% Excess Mortality in the regular Army combat zone, same time frame

So of course the Regular Army is now training its soldiers in this course before going to the war zone.!

36% Excess Mortality in Rural America

We, in America, must look at these tenets of field care and adapt as many of them as possible!



Kotwal, JAMA 7Aug13

Trauma Survival Numbers to Remember!

75th Ranger Battalion regards every soldier as a medic, fully capable of tourniquet application, airway management, and direct pressure on wounds.

This effort is what has given them the best survival in the history of war!

This is similar to the CPR movement of the ‘70s- every person able to give CPR to those in full arrest.

Could we not move toward this goal- every citizen able to save lives?

Kotwal, JAMA 7Aug13

Zero Preventable Deaths from Trauma

The Combat Life Saver Course is a 32 hour course taught at our Uniformed Services University medical students.

It started life as a course designed to make every soldier able to care for his or her buddy on the battlefield if injured.

Could we make this similar to the CPR wave of enthusiasm in the early 1970s and make every citizen able to save lives in trauma?

We would start with the medical community, then First Responders- Police, Fire, EMS- and expand from there!

What training and equipping would be required?

Potential Applications in Your Area

The Institute of Medicine release of a 17June2016 Study is recommending that the White House take up the charge of lowering preventable trauma death rates to zero!

This would occur by equipping every citizen with the basics of how to respond to emergencies of any type, focused on trauma.

Institute of Medicine Report June 2016

Committee on Military Trauma Care's Learning Health System and Its Translation to the Civilian Sector

Donald Berwick (*Chair*), Institute for Healthcare Improvement
Ellen Embrey, Stratitia, Inc., and 2c4 Technologies, Inc.
Sara F. Goldkind, Goldkind Consulting, LLC
Adil Haider, Brigham and Women's Hospital, and Harvard University
COL (Ret) John Bradley Holcomb, University of Texas Health Science Center
Brent C. James, Intermountain Healthcare
Jorie Klein, Parkland Health & Hospital System
Douglas F. Kupas, Geisinger Health System
Cato Laurencin, University of Connecticut
Ellen MacKenzie, Johns Hopkins University School of Hygiene and Public Health
David Marcozzi, University of Maryland School of Medicine
C. Joseph McCannon, The Billions Institute
Norman McSwain, JR., (until July 2015), Tulane Department of Surgery
John Parrish, Consortia for Improving Medicine with Innovation and Technology (CIMIT); Harvard Medical School
Rita Redberg, University of California, San Francisco
Uwe E. Reinhardt, (until August 2015), Princeton University
James Robinson, Denver Health EMS-Paramedic Division
Thomas Scalea, R. Adams Cowley Shock Trauma Center, University of Maryland
C. William Schwab, University of Pennsylvania
Philip C. Spinella, Washington University in St. Louis School of Medicine

The National Academies of

IOM Report 17Jun16

Institute of Medicine Report June 2016

Committee on Military Trauma Care's Learning Health System and Its Translation to the Civilian Sector

This is the basis for the "ZERO Preventable Deaths" effort!

Jorie Klein, Parkland Health & Hospital System
Douglas F. Kupas, Geisinger Health System
Cato Laurencin, University of Connecticut
Ellen MacKenzie, Johns Hopkins University School of Hygiene and Public Health
David Marcozzi, University of Maryland School of Medicine
Thomas Scalea, R. Adams Cowley Shock Trauma Center, University of Maryland
C. William Schwab, University of Pennsylvania
Philip C. Spinella, Washington University in St. Louis School of Medicine

The National Academies of

IOM Report 17Jun16

Potential Applications in Your Area

Institute of Medicine report released 17Jun16 outlined an effort to:

1. **Bring military level survival to the civilian medical community- 3% to 36%.**
2. **Train Pre-hospital care to level of military care.**
3. **Focus on lessons learned that transfer easily.**
4. **In essence, this effort will exceed the CPR effort of the ‘60s and ‘70s.**
5. **Every person a first responder!**
6. **The trauma burden in the USA is 148,000 deaths from trauma/year, 20% or more are potentially survivable, $670B/yr!**

Threat Specific Training and Equipment

The goal would be to have every citizen armed and equipped with the specific knowledge of how to act in an emergency!
This could enable them to extent the “Golden Hour” and the “Platinum 10 Minutes” until the emergency system could arrive to assume responsibility for a survivor.
The key is John Q. Public!
Every Citizen a First Responder!
The analogy is CPR of the 1960s and 1970s movement!

Threat!

The threat is real from any number of aspects!

The only question is what do we do about it?

Always Be Ready!

Threat!

The threat is real from any number of aspects!

The only question is what do we do about it?

We do not want to over-react or face the potential to limit learning for those that need it the most!

Threat!

The threat is real from any number of aspects!

The only question is what do we do about it?

We do not want to over-react or face the potential to limit learning for those who need it most?

But we cannot ignore the threat entirely!

Threat!

The threat is real from any number of aspects!

The only question is what do we do about it?

We do not want to over-react or face the potential to limit learning for those who need it most?

But we cannot ignore the threat entirely!

So a balanced approach seems most reasonable!

We Cannot Hide from This Threat!

Sometimes a Beam of Light Hits Your Brain and Great Ideas Come Through!

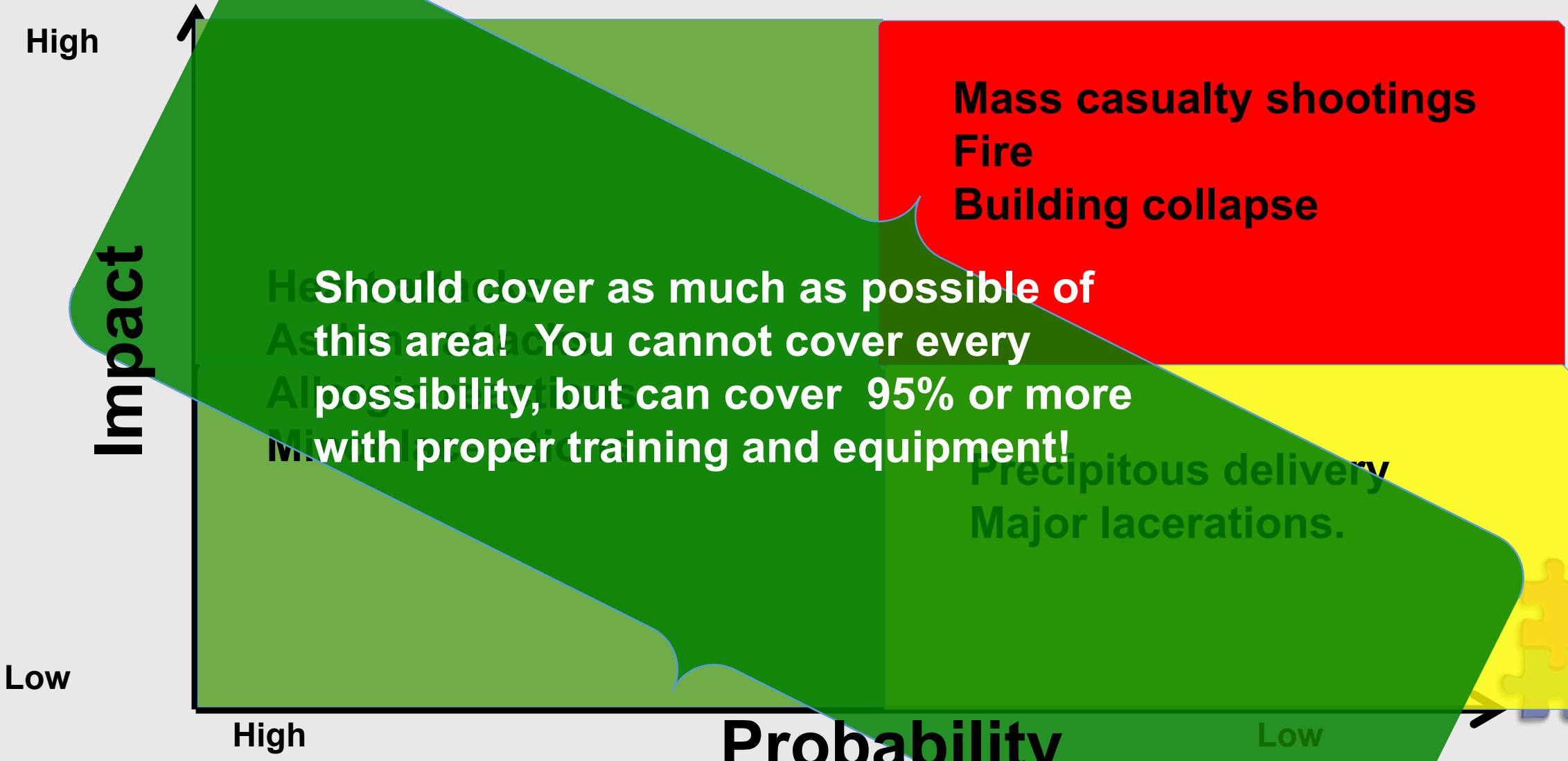
I call this “The Clue Bird” has landed!

How do we rationally address this threat?

An impact vs. probability matrix seems appropriate?

Threat Specific Training and Equipment

Civilian Impact vs Probability Assessment



Threat Specific Training and Equipment

In the military we call this mission tailored medical support!

We could do exactly the same thing for every specific area who wants to be better protected!

1. **Church.**
2. **Restaurant.**
3. **Movie theaters.**
4. **Bars.**
5. **Public places.**
6. **Schools.**
7. **Camps.**
8. **Business activities where people gather.**

Threat Specific Training and Equipment

Most common medical challenges in a location where large numbers gather that need emergent action:

1. Heart attacks.
2. Allergic reactions to bee stings and peanuts.
3. Asthma attacks.
4. Minor trauma in the shop.
5. Airway obstruction.
6. Drug overdose.
7. Less frequent challenges include
    1. Precipitous deliveries.
    2. Major lacerations.
    3. Mass casualties of any sort.

What training and equipping would be required?

Course Menu

1. LEFR (Law Enforcement First Responder) course, the one-day course for LEOs The CoTCCC worked with Dr. Peter Pons from Denver to develop it and it has been very well received by the Denver PD. They have documented 6 lives saved with LEO-applied TQs in the first two years of the program. Three of those lives saved were LEOs.
2. Two day Pre-Hospital Trauma Life Support Course, incorporates all of the TCCC guidelines.
3. 32 hour Combat Life Saver Course, first given to the IDF in 1972 and the basis of the excellent survival in the 75th Ranger Regiment. Taught to Uniformed Services Medical Students first month.
4. BCON, 1 hour course sponsored by the American College of Surgeons teaching how to keep an injured person alive to help.

Course Menu

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4. BCON, 1 hour course sponsored by the American College of Surgeons and DHS teaching how to keep an injured or sick person alive until help arrives. It covers the most common causes of preventable traumatic death- exsanguinating hemorrhage. This is the equivalent course to CPR for civilians.

Two Broad Categories

1. **Trauma Care with “Stop the Bleeding”**
2. **Heart Care with how to work the Automatic External Defibrillator, AED**

STOP THE BLEED℠

SAVE A LIFE

Bleeding Control (B-Con) Basic

HARTFORD CONSENSUS™ SAVE A LIFE STOP THE BLEEDING

BLEEDINGCONTROL.ORG

THE COMMITTEE ON TRAUMA

AMERICAN COLLEGE OF SURGEONS
Inspiring Quality:
Highest Standards, Better Outcomes
100+*years*

This educational program is the product of a cooperative effort by:

The Hartford Consensus

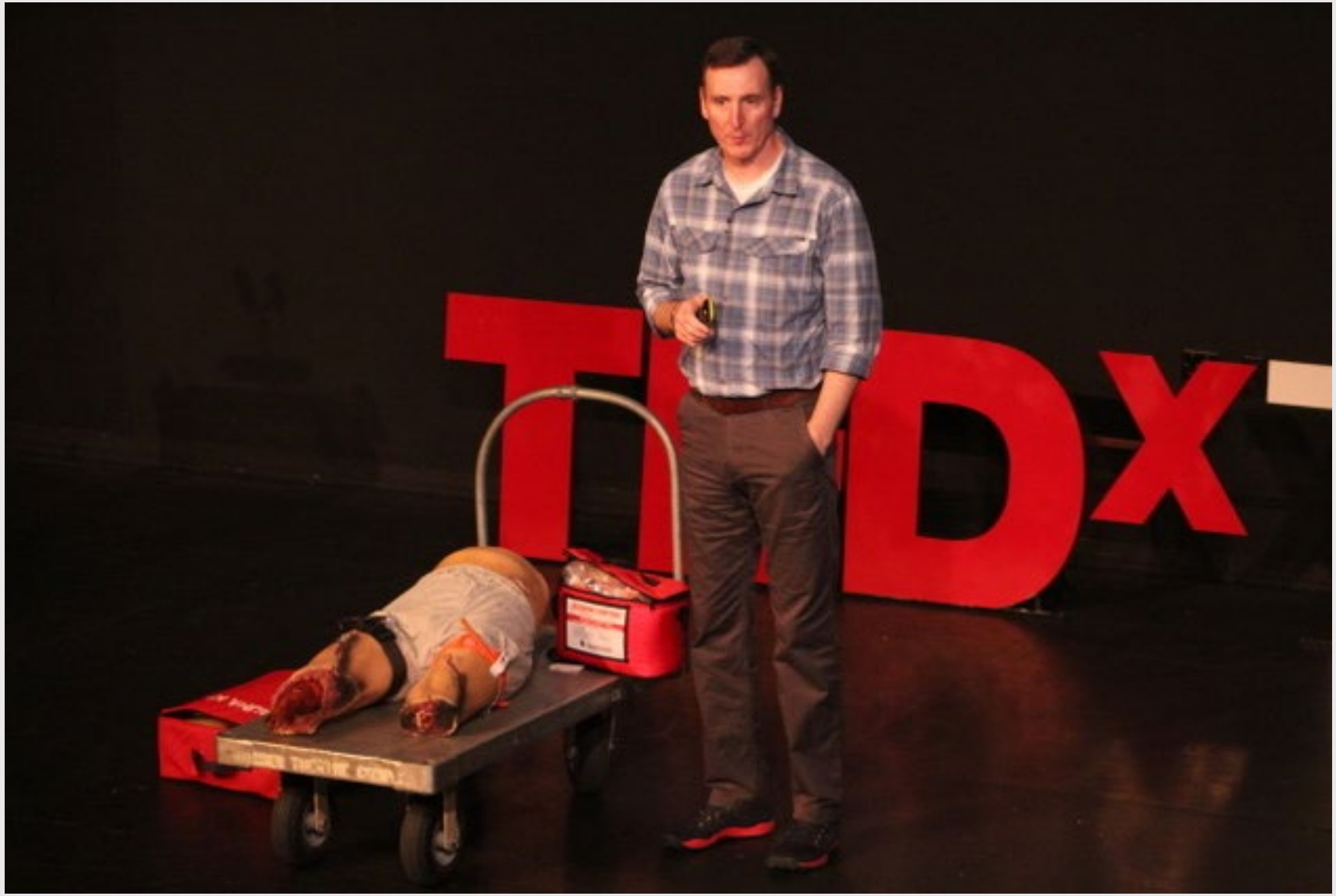
The American College of Surgeons Committee on Trauma

The Committee on Tactical Combat Casualty Care

The National Association of Emergency Medical Technicians

BLEEDINGCONTROL.ORG

Teaching “B-Con”’



Picture taken 22April 2017

American College of Surgeons

The American College of Surgeons (ACS) is extremely distressed by the continuing violence at our nation's schools, churches, and other places where people should feel safe. At its most recent meeting, the **ACS Board of Regents unanimously approved a plan to expand the College's focus from the very successful Stop the Bleed® program**, which has trained and equipped thousands of people to stop severe bleeding from any cause, to a broader prevention initiative that focuses on strategies that include research, advocacy, and strategic collaborations. A specific action plan is under development that will ultimately lead to open dialogue on the issues standing in the way of meaningful change and the eradication of these tragic events. We will keep you apprised of further developments.

ACS 15Feb18

Course Menu

1. LEFR (Law Enforcement First Responder) course, the one-day course for LEOs The CoTCCC worked with Dr. Peter Pons from Denver to develop it and it has been very well received by the

Cost of the course is time only.
We teach it for free and the medical schools are starting to consider the course as well.
It is sponsored by the Dept of Homeland Security and the American College of Surgeons.

course to CPR for civilians.

Active-Shooter Response at a Health Care Facility

Kits containing essential supplies for hemorrhage control, including tourniquets, gauze, and gloves, should be located inside all these areas. Arguably, these kits would also be installed in all public-access areas, just as automated external defibrillators have been. **Efforts should be made to train all hospital workers, whatever their area of expertise, in basic bleeding-control techniques.** Bleeding is the most common potentially preventable cause of death from the types of injury likely to be encountered in such scenarios, so it's a high-yield target for educational initiatives. **The American College of Surgeons Committee on Trauma Bleeding Control course (www.bleedingcontrol.org) is a short, simple, effective program designed for both medical and nonmedical personnel and is well suited for this purpose.**

NEJM 9Aug18

We Are Missing a Vital Piece of Our Medical Solution Set

1. This brief is not just for the traumatic event!
2. The estimate for excess deaths in the USA is officially 20%, it may well be twice that?
3. The delay in treating any sudden emergency is real.
4. A short lecture and skill station will teach you how to handle any common emergency!
5. I would recommend you also have available the equipment to go along with the lecture!

What training and equipping would be required?

Reality!

1. For the cardiac event, the AED has saved lots of lives!
2. It should be part of every large gathering that could host a cardiac victim!
3. For the trauma or sickness event, small or large, there are easy ways to prepare!
4. Take the BCON, Stop the Bleeding Course.
5. Have equipment commensurate with your training!

Two Broad Categories

1. Trauma Care with “Stop the Bleeding”
2. Heart Care with how to work the Automatic External Defibrillator, AED

Threat Specific Training and Equipment

Heart attack example:

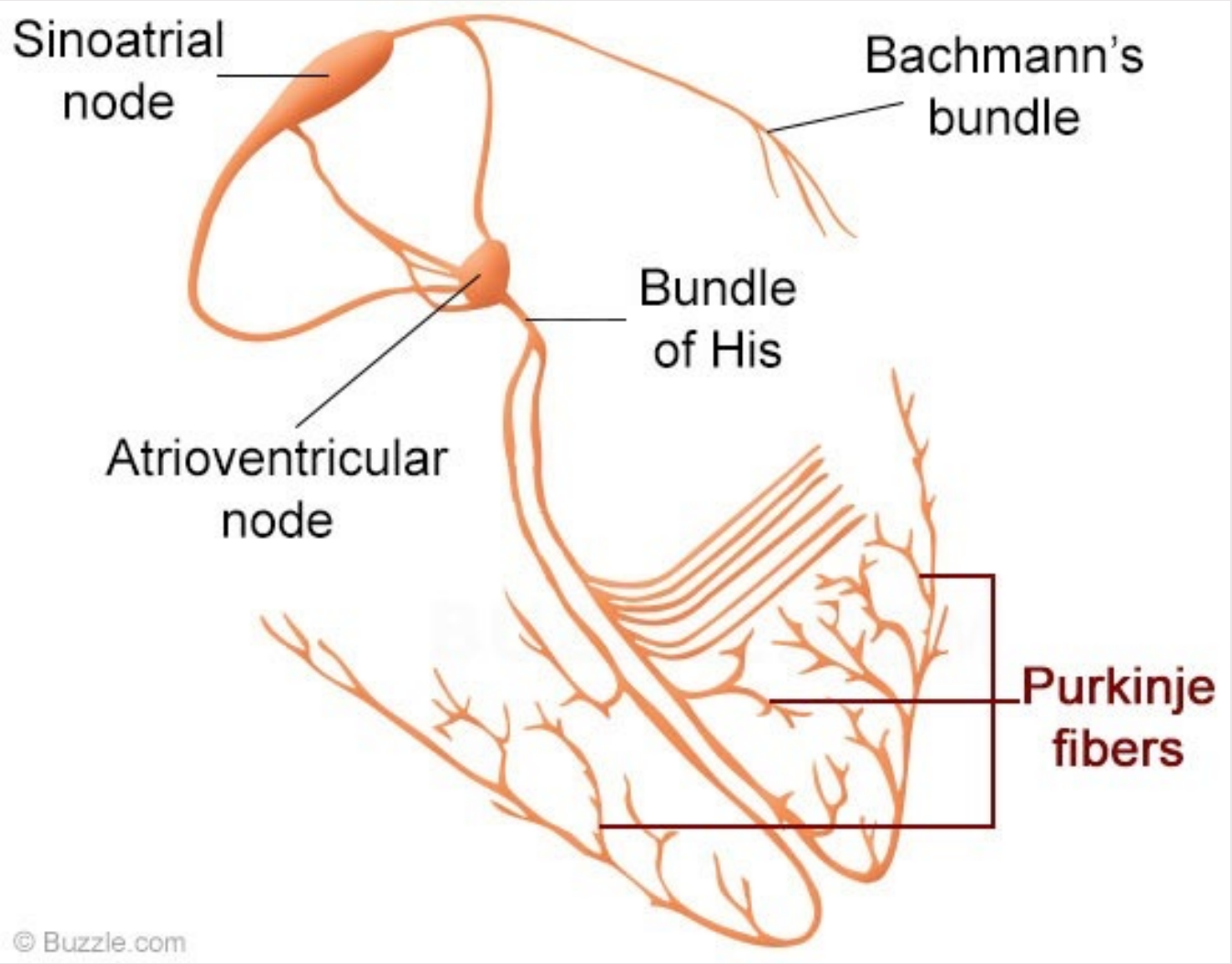
1. When someone drops dead of a heart attack it is from a bad rhythm, not lack of heart muscle. It is called fibrillation, an ineffective heartbeat so no blood ejection occurs.

2. CPR returns only 1% to normal living.

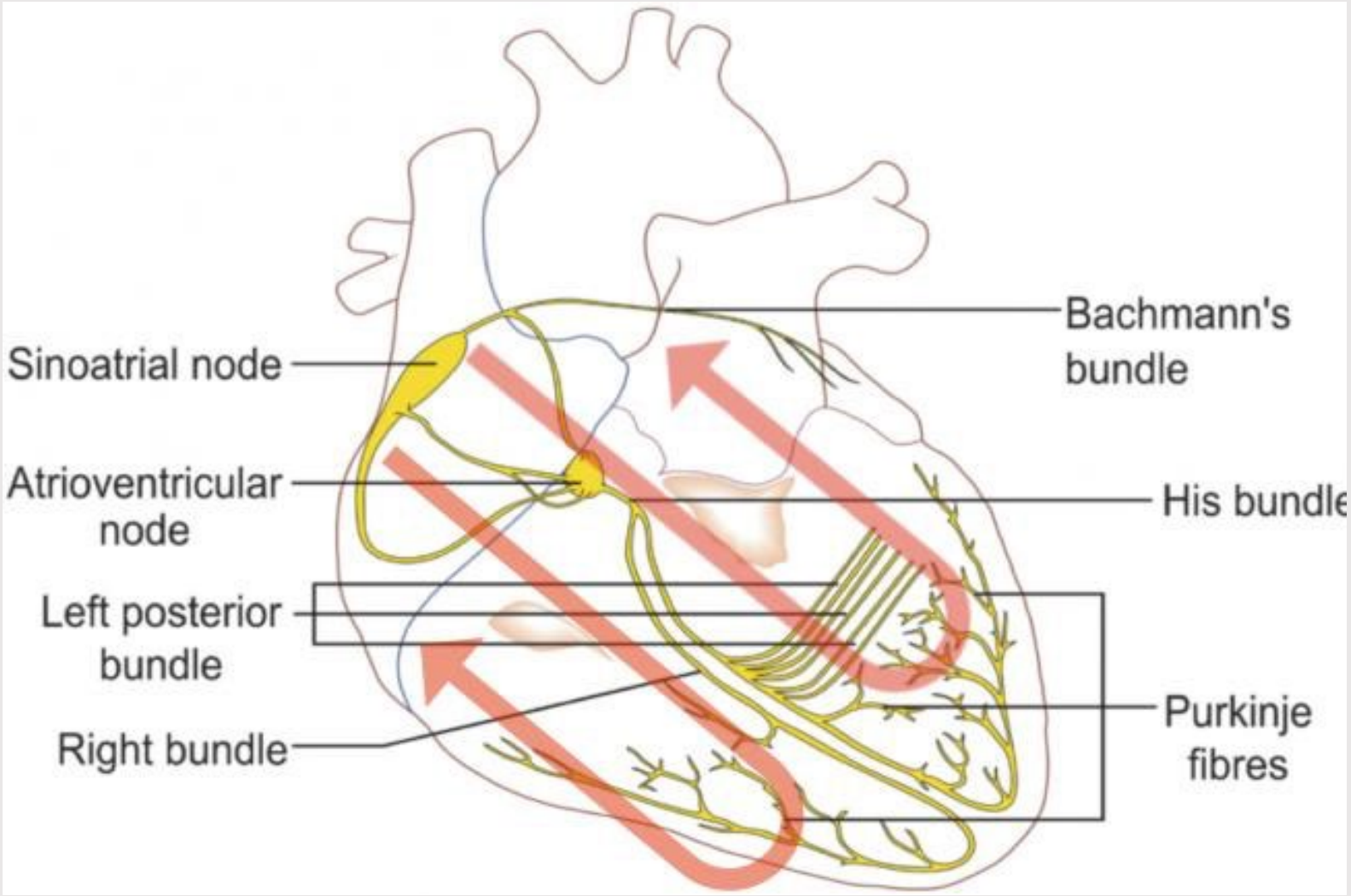
3. The AED returns over 20% because it establishes a normal rhythm again.

4. Lack of oxygen to the brain causes damage is about 4 minutes.

Electrical System of the Heart

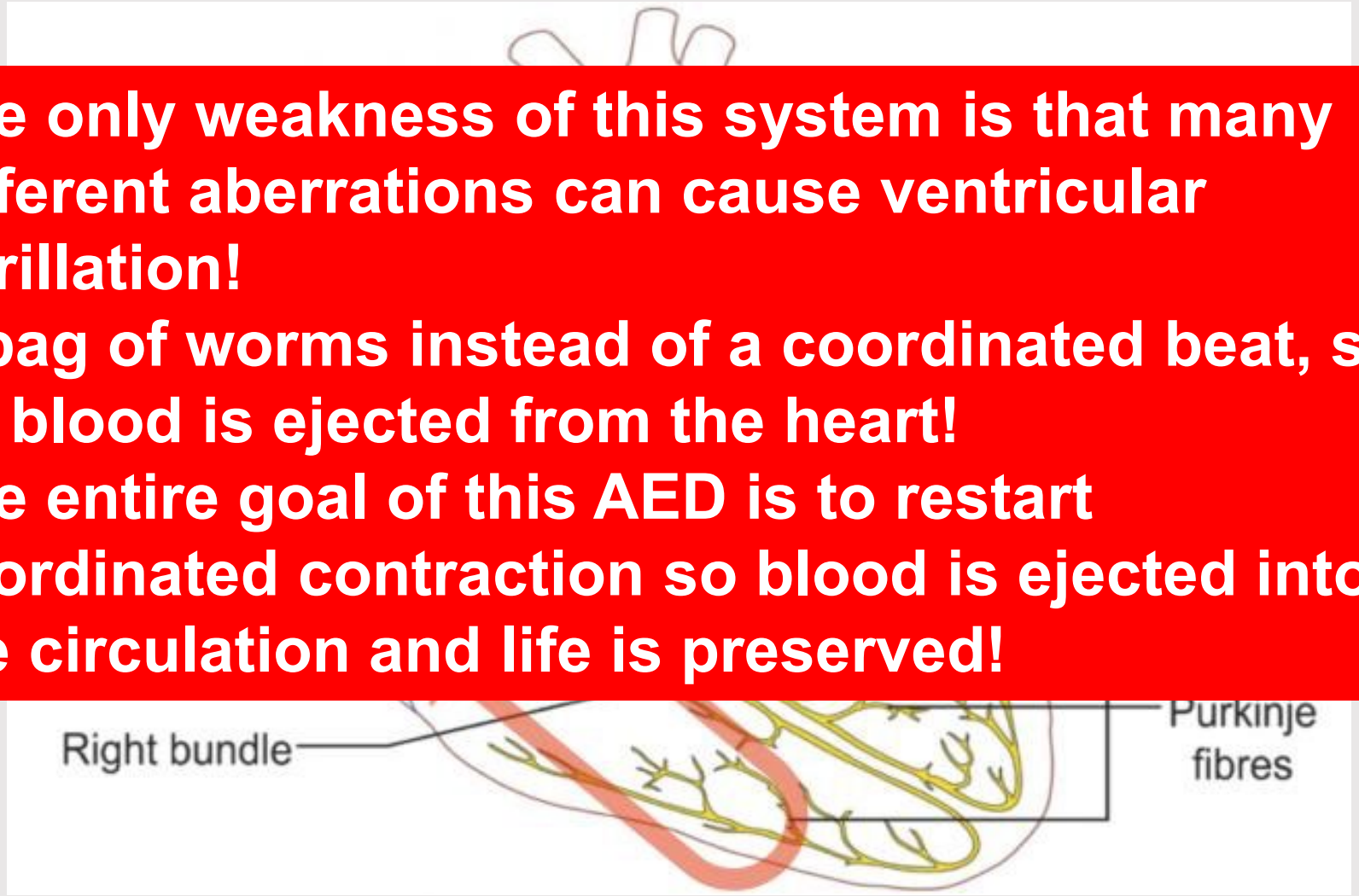


Electrical System of the Heart



Electrical System of the Heart

The only weakness of this system is that many different aberrations can cause ventricular fibrillation!
A bag of worms instead of a coordinated beat, so no blood is ejected from the heart!
The entire goal of this AED is to restart coordinated contraction so blood is ejected into the circulation and life is preserved!



Electrical System of the Heart

AEDs in Every Business

1. These cost between $700 and $1500 each.
2. They come with specific instructions.
3. They are nearly failsafe!

What training and equipping would be required?

Threat Specific Training and Equipment

Potential Example Large Gathering Kit?

Active-Shooter Response at a Health Care Facility

Kits containing essential supplies for hemorrhage control, including tourniquets, gauze, and gloves, should be located inside all these areas. Arguably, these kits would also be installed in all public-access areas, just as automated external defibrillators have been. **Efforts should be made to train all hospital workers, whatever their area of expertise, in basic bleeding-control techniques.** Bleeding is the most common potentially preventable cause of death from the types of injury likely to be encountered in such scenarios, so it's a high-yield target for educational initiatives. **The American College of Surgeons Committee on Trauma Bleeding Control course (www.bleedingcontrol.org) is a short, simple, effective program designed for both medical and nonmedical personnel and is well suited for this purpose.**

NEJM 9Aug18

For Emergencies Only

Why do we have these as requirements in most buildings and encouraged in most homes?
Because they save lives!
Shouldn't every lay person have the knowledge and equipment to save lives when needed?
In every gathering place where medical emergencies might occur?

Life Stations, AEDs, as Well as Fire Extinguishers?

This trifecta should be the new normal!

AEDs in Every Large Gathering Place

1. These cost between $700 and $1500 each.
2. They come with specific instructions.
3. They are nearly failsafe!

Community-based automated external defibrillator only resuscitation for out-of-hospital cardiac arrest patients

Findings:

Survival to hospital discharge occurred in 39(41.4%) of the 95 patients treated by Progetto Vitaand in 193(5.9%) of the 3271 EMS patients. At 13-year follow-up, the Kaplan-Meier estimates of survival were 31.8% when AEDs only were used and 2.4% for standard EMS/CPR response. Estimates of survival are significantly better for Progetto Vita AED-only therapy when survival was stratified by time to respond, gender, location of cardiac arrest, and shockable rhythm. Relative to the 95 EMS patients with the fastest response times, Progetto Vita intervention was associated with a **more than 2-fold increased rate of survival.**

Interpretation:

This is the **first demonstration of excellent long-term survival from out-of-hospital cardiac arrest by promoting speed and ease of lay AED response without CPR. (Am Heart J 2016;172:192-200.)**

American Heart Journal Feb 2016

Life Stations, AEDs, as Well as Fire Extinguishers?

For all emergencies, we must expand our thinking beyond AEDs! A companion kit would cover all common emergencies, medical and surgical!

Personal bleeding control kits

BLEEDINGCONTROL.ORG

Wall-mounted bleeding control kits

BLEEDINGCONTROL.ORG

Life Stations, AEDs, as Well as Fire Extinguishers?

For all emergencies, we must expand our thinking beyond AEDs! A companion kit would cover all common emergencies, medical and surgical!

Life-Station-Advanced

Provides public access to critical life-saving supplies...

The Chinook Life Station Advanced includes:

1. **5 individually vacuum-sealed Advanced LIFE Kits and 1 casualty extraction litter housed in the LIFE Pack.**
2. **The 5 Advanced LIFE Kits are easily accessed through the unique dispensing system on the front of the LIFE Pack.**

Companion Kit to AED for All Emergencies!

In the “Life Kit”, to cover all types of emergencies, I would add:

1. Small oxygen dispenser. $8.
2. Pulse oximiter. $35.
3. Epi pen(peds and adult). $300 or $30?
4. SL Nitroglycerin. $5.
5. Baby ASA. $1.
6. Oral benadryl. $1.
7. Narcan nasal spray $45.

Life Kit Cost

Basic: $548.95

Intermediate: $665.95

Advanced: $719.95

1. **Small oxygen dispenser. $8.**
2. **Pulse oximiter. $35.**
3. **Epi pen(peds and adult). $300 or $30?**
4. **SL Nitroglycerin. $5.**
5. **Baby ASA. $1.**
6. **Oral benadryl. $1.**
7. **Narcan nasal spray $45.**

Total cost between $844.95 and $1,114.95.

Life Kit Cost

Basic: $548.95

Intermediate: $665.95

Recurrent cost less than $100/year.

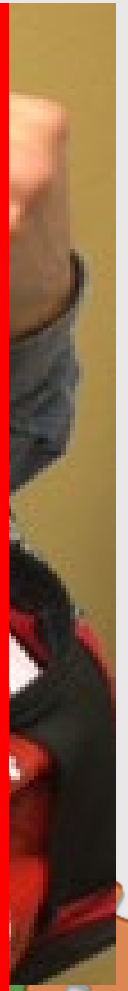
1. Small oxygen dispenser. $8.
2. Pulse oximiter. $35.
3. Epi pen(peds and adult). $300 or $30?
4. SL Nitroglycerin. $5.
5. Baby ASA. $1.
6. Oral benadryl. $1.
7. Narcan nasal spray $45.

Total cost between $844.95 and $1,114.95.

Life Stations, AEDs, as Well as Fire Extinguishers?

I would group these items into individual kits with specific instructions for use with each kit:

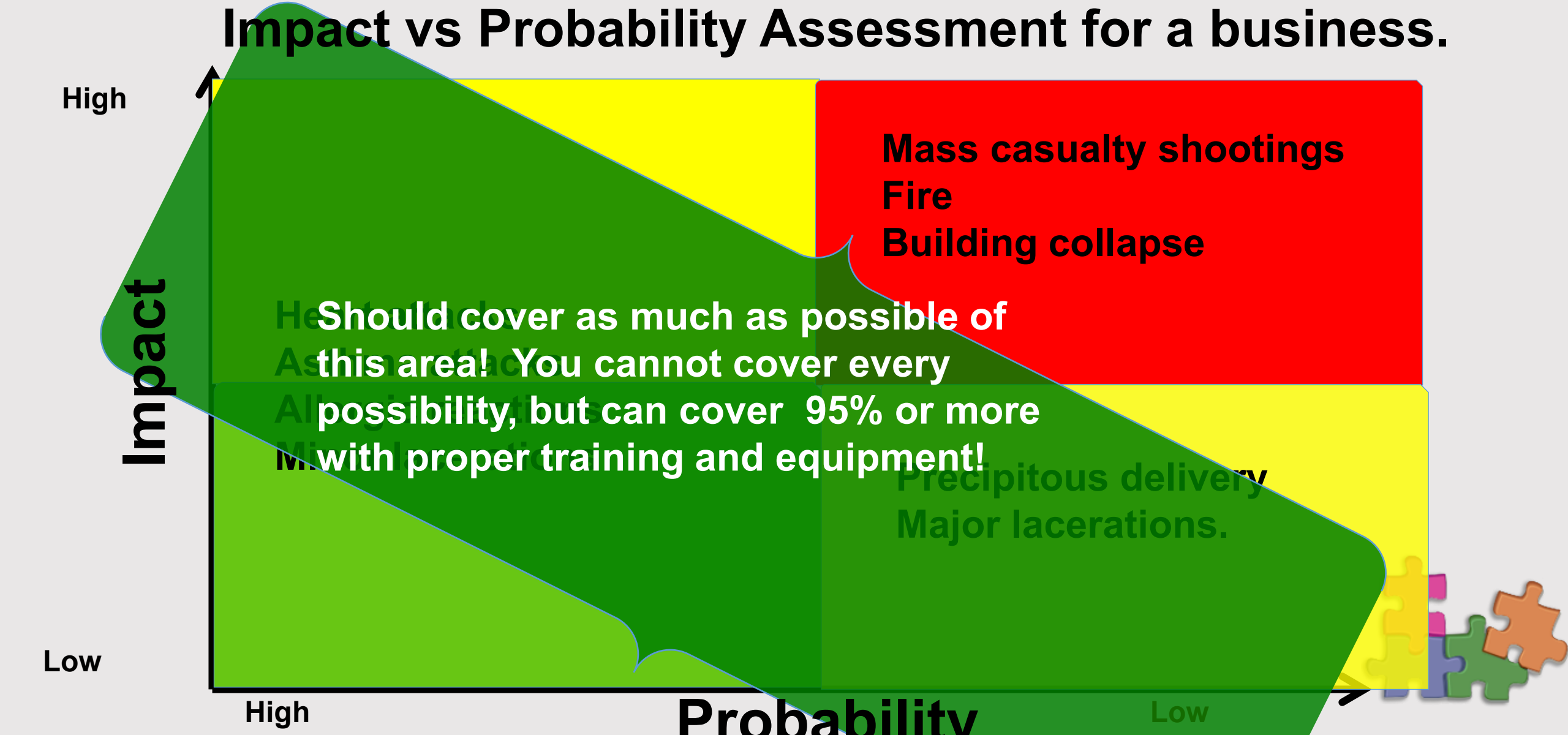
1. Heart attack kit.
2. Asthma kit.
3. Allergy kit.
4. Precipitous delivery kit.
5. Pediatric kit.
6. Drug overdose kit.
7. Mature adult kit.



in the current kit.

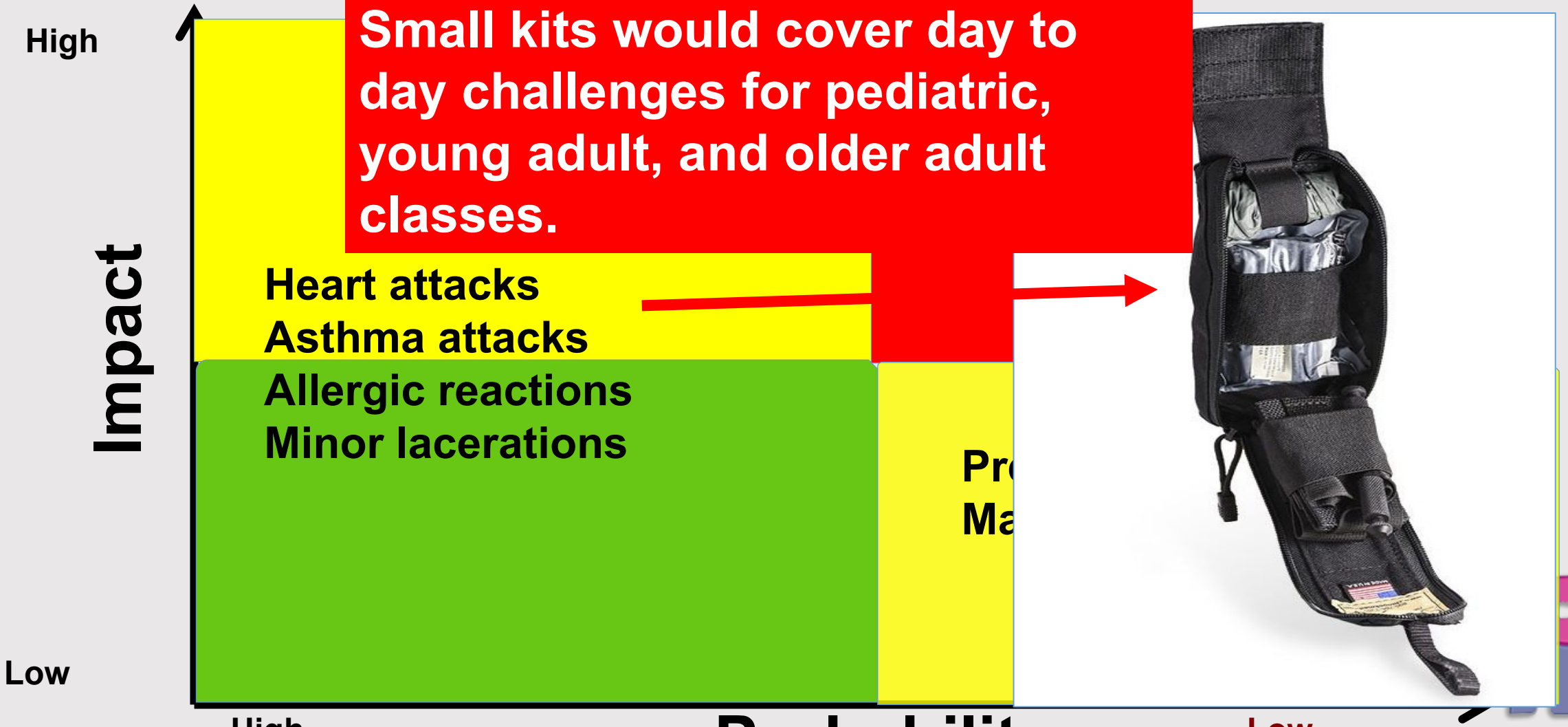
Threat Specific Training and Equipment

Impact vs Probability Assessment for a business.



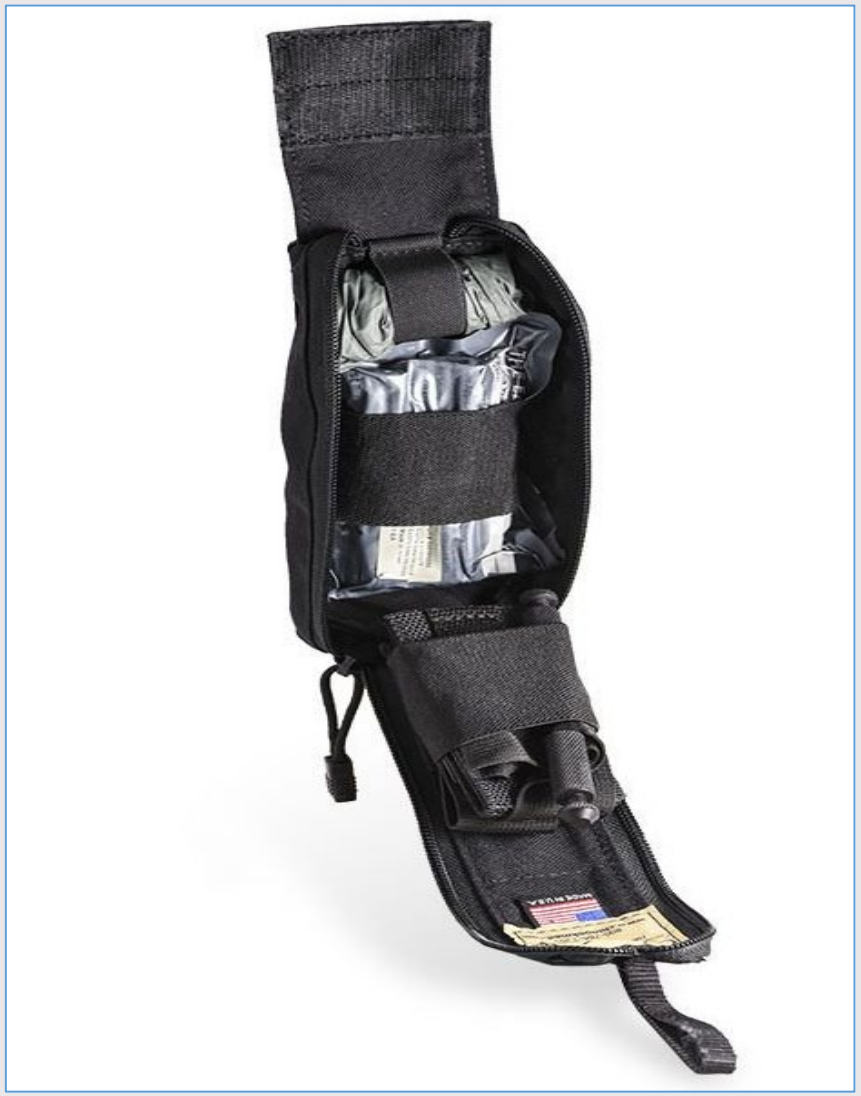
Threat Specific Training and Equipment

Impact vs Probability Assessment for a business.



Mature Adult Kit

1. Oxygen
2. Baby ASA
3. Pulse Oximiter
4. Sharpie pen
5. Flashlight
6. Life savers
7. Convenient kit
8. Total cost $92!



Response Kits Could Contain!

1. Tourniquet.
2. Combat gauze.
3. Narcan nasal spray.
4. Convenient kit to hold it in.

Individual Response Kits

1. Tourniquet- $29.
2. Combat gauze- $15.
3. Narcan nasal spray- $45.
4. Convenient kit to hold it in- $43.
5. Total Cost $132.

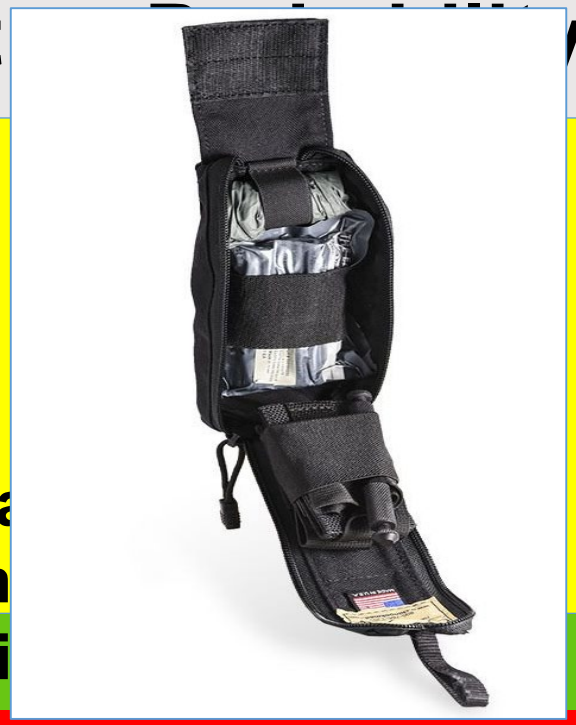
Individual Response Kits

These would be for individual carry, car, or home protection!

1. Tourniquet- $29.
2. Combat gauze- $15.
3. Narcan nasal spray- $45.
4. Convenient kit to hold it in- $43.
5. Total Cost $132.

Threat Specific Training and Equipment

Impact [illegible] Assessment for a business.



High

Low

mpact

Heart a
Asthm
Allergi

Mass casualty shootings
Fire
Building collapse

Precipitous delivery
Major lacerations.

Small kits would cover day to day challenges for precipitous delivery and major lacerations.

High

Probability

Low

Threat Specific Training and Equipment

Impact vs Probability Assessment for a business.

High

Big kits would be used for real big problems!

Mass casualty shootings
Fire
Building collapse

Precipitous delivery
Major lacerations.

Lo

High

Probability

Low

Threat Specific Training and Equipment

Most common medical challenges in a church setting that need emergent action:

Such equipment would cover over 95% of the medical challenges we face in any large gathering setting and addresses the infrequent events to a lesser but real degree!
This is threat tailored medical support!
Big kits for big events.
Small kits for day to day events.

Threat Specific Training and Equipment

The goal would be to have every citizen armed and equipped with the specific knowledge of how to act in an emergency!
This could enable them to extent the “Golden Hour” and the “Platinum 10 Minutes” until the emergency system could arrive to assume responsibility for a survivor.
The key is John Q. Public!
Every Citizen a First Responder!
The analogy is CPR of the 1960s and 1970s movement!

Threat Specific Training and Equipment

We have an excellent 911 system, but know that the first 10 minutes of any life threatening medical event are the most critical!

No one can have a system that good in all areas, but if we equip the public with that knowledge and equipment, then it is attainable and lives will be saved!

CPR was an all out effort!

Emergency Response needs to be that wide spread!

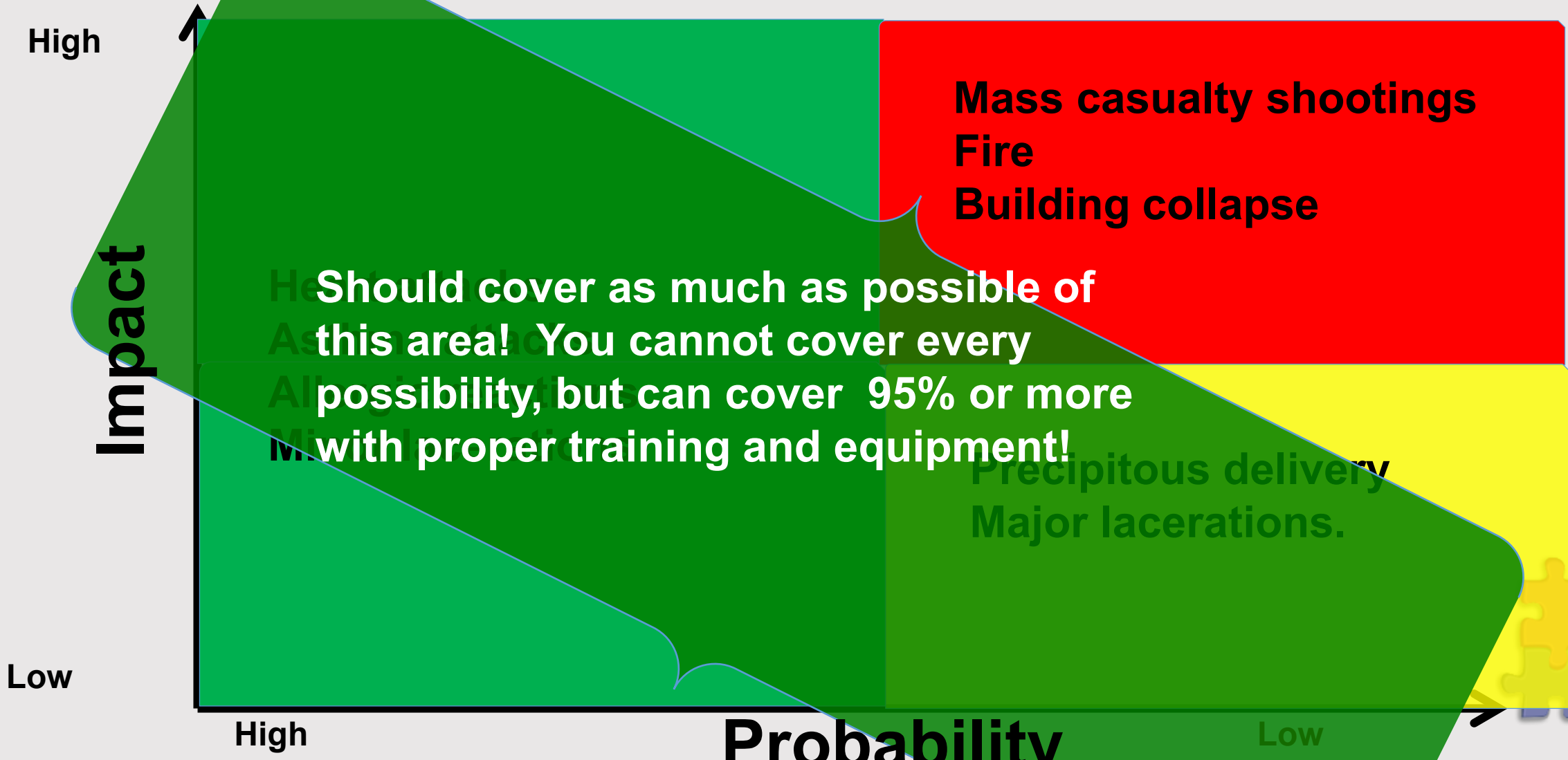
Threat Specific Training and Equipment

Most common medical challenges in a business setting that need emergent action:

1. Heart attacks.
2. Allergic reactions to bee stings and peanuts.
3. Asthma attacks.
4. Minor trauma in the shop.
5. Airway obstruction.
6. Drug overdose.
7. Less frequent challenges include
    1. Precipitous deliveries.
    2. Major lacerations.
    3. Mass casualties of any sort or cause.

Threat Specific Training and Equipment

Impact vs Probability Assessment for a business.



Reality!

1. For the cardiac event, the AED has saved lots of lives!
2. It should be part of every large gathering that could host a cardiac victim!
3. For the trauma or sickness event, small or large, there are easy ways to prepare!
4. Take the BCON, Stop the Bleeding Course.
5. Have equipment commensurate with your training!

Life-Station-Advanced

The Air Force Recruiting Service just purchased 1,700 of these kits to have in every Recruiting office in the USA!
The threat is real to all of us!

1. 5 individually vacuum-sealed Advanced LIFE Kits and 1 casualty extraction litter housed in the LIFE Pack.
2. The 5 Advanced LIFE Kits are easily accessed through the unique dispensing system on the front of the LIFE Pack.

Combat Casualty Care

Begin with the end in mind

Combat Casualty Care

How did we get where we are today with the highest survival in the history of war?

Could these changes be applied to your medical response system?

Combat Casualty Care

In the last 15 years of combat operations we have about 1,000 excess deaths, meaning a casualty who could have survived if we could have gotten sophisticated medical care to he or she!

In the last 15 years of trauma deaths in the USA, the same comparison would give us over 450,000 preventable deaths!

Our goal should be ZERO preventable deaths!

Questions

PK Carlton, Jr., MD, FACS

Lt Gen, USAF (Ret), AF Surgeon General

Texas A&M Professor of Surgery, (Ret)

13 August 2018

3-24-36%

3% Excess Mortality in the combat zone in the 75th Ranger Bn.

24% Excess Mortality in the regular Army combat zone, same time frame

36% Excess Mortality in Rural America

Kotwal, JAMA 7Aug13

3-24-36%

3% Excess Mortality in the combat zone in the 75th Ranger Bn.

The only educational course that separates these figures is the COMBAT LIFE SAVER COURSE

24% Excess Mortality in the regular Army combat zone, same time frame

So of course the Regular Army is now training its soldiers in this course!

36% Excess Mortality in Rural America

We, in rural America, must look at these tenets and adapt as many of them as possible!

Kotwal, JAMA 7Aug13

Trauma Survival Numbers to Remember!

75th Ranger Battalion regards every soldier as a medic, fully capable of tourniquet application, airway management, and direct pressure on wounds.

This effort is what has given them the best survival in the history of war!

This is similar to the CPR movement of the ‘70s- every person able to give CPR to those in full arrest.

Could we not move toward this goal- every citizen able to save lives?

Kotwal, JAMA 7Aug13

Zero Preventable Deaths from Trauma

The Combat Life Saver Course is a 32 hour course taught at our Uniformed Services University medical students.

It started life as a course designed to make every soldier able to care for his or her buddy on the battlefield if injured.

Could we make this similar to the CPR wave of enthusiasm in the early 1970s and make every citizen able to save lives in trauma?

We would start with the medical community, then First Responders- Police, Fire, EMS- and expand from there!

Course Menu

1. LEFR (Law Enforcement First Responder) course, the one-day course for LEOs The CoTCCC worked with Dr. Peter Pons from Denver to develop it and it has been very well received by the Denver PD. They have documented 6 lives saved with LEO-applied TQs in the first two years of the program. Three of those lives saved were LEOs.
2. Two day Pre-Hospital Trauma Life Support Course, incorporates all of the TCCC guidelines.
3. 32 hour Combat Life Saver Course, first given to the IDF in 1972 and the basis of the excellent survival in the 75th Ranger Regiment. Taught to Uniformed Services Medical Students first month.
4. “Stop the Bleeding” is a four hour course aimed at First Responders.

Today

History Lesson!

Case Studies.

So what?

Combat Casualty Care

1. My personal journey to improve combat casualty care.
2. Example Cases.
3. Potential Applications for your area.

Give Me Examples!

1. Index case #1- first Nova Lung use.
2. Index case #2- first survivor of a traumatic pneumonectomy in wartime.
3. Index case #3- first survivor using ECMO in wartime.
4. REBOA used in trauma laparotomy with limited blood supply.

Give Me Examples!

1. Index case #1- first Nova Lung use.
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3. Index case #3- first survivor using ECMO in wartime.
4. REBOA used in trauma laparotomy with limited blood supply.

Index Case #1

1. 21 year old male, blown up in IED explosion in Iraq, 2006.

2. Severe lung injury resulting in an inability to oxygenate him on the ventilator, despite all the tricks known.

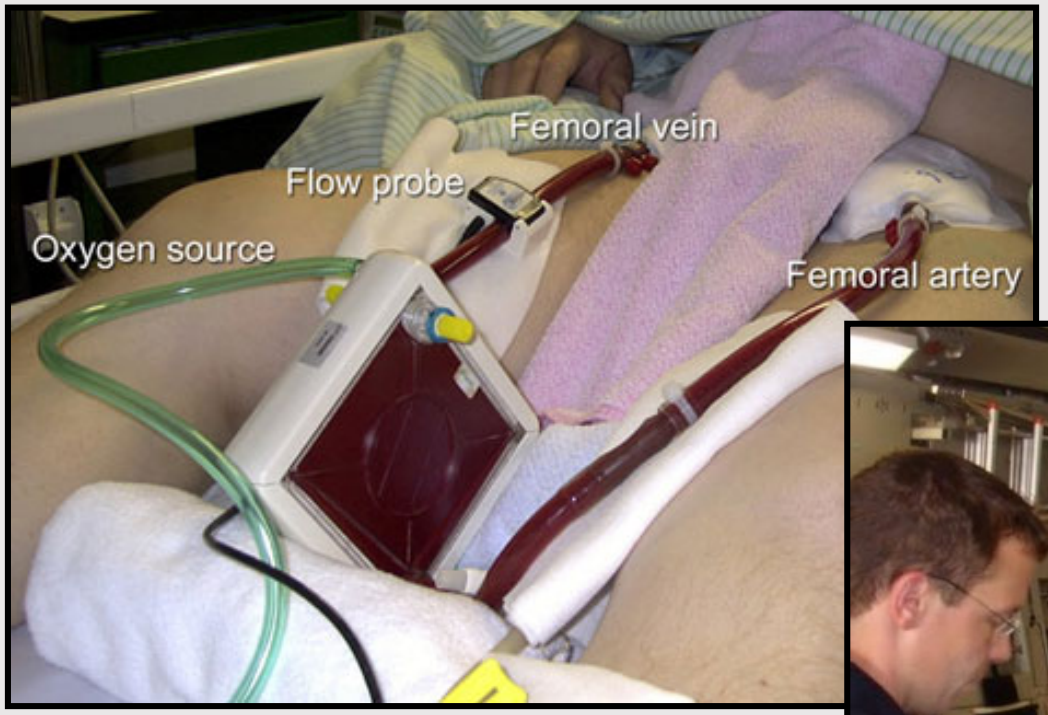
3. Dying quickly from this injury!

Index Case #1

4. Call to Landstuhl Trauma Team- is there nothing we can do?

5. Landstuhl launched the new NovaLung Team to Baghdad, hooked the man up to the Nova Lung, flew him back to Germany, took him to a German hospital on the Nova Lung, where he spent two weeks on this device.

EVOLUTIONARY ADVANCES NOVALUNG



Led to court-martial attempt on the provider on the first patient we used this on in Iraq- not FDA approved!

Index Case #1

21 year old male, blown up in IED explosion in Iraq, 2006.
Severe lung injury resulting in an inability to oxygenate him on the ventilator, despite all the tricks known.
Dying quickly from this injury!
Call to Landstuhl Trauma Team- is there nothing we can do?
Landstuhl launched the new NovaLung Team to Baghdad, hooked the man up to the NovaLung, flew him back to Germany, took him to a German hospital on the NovaLung, where he spent two weeks on this device.

He graduated to a conventional ventilator, was sent back to Landstuhl, and is now home with his family- stone cold normal in his physiology!

Give Me Examples!

1. Index case #1- first Nova Lung use.
2. Index case #2- first survivor of a traumatic pneumonectomy in wartime.
3. Index case #3- first survivor using ECMO in wartime.
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Index Case #2

1. 19 yo Male, shot at close range with AK-47.
2. Bullet entered his right side, went through the hilum of the right lung, and left him in shock!
3. This is the type of person who coughed blood up once or twice and died in any previous conflict!
4. Brought to a forward operating location where he was addressed surgically.
5. When the surgeon saw the extent of his injury he knew he was in trouble.
6. He had to remove the entire right lung, a traumatic pneumonectomy.

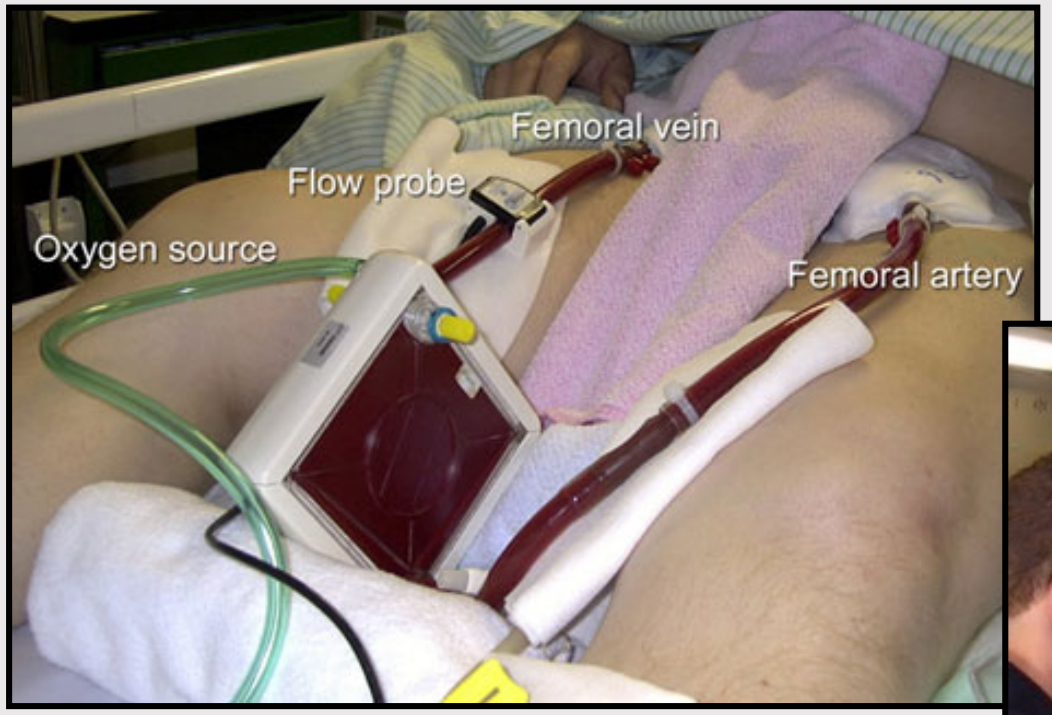
Index Case #2

7. There had never been a survivor of this in war!

8. He called the Trauma Czar and asked for help!

9. The Trauma Czar mobilized the Nova Lung team from Germany, met them in Bagram, flew to the forward operating location, hooked the man up to the Nova Lung, and transported him back to Germany.

EVOLUTIONARY ADVANCES NOVALUNG



Led to refusal to allow the surgeon on the airplane because he did not have the right paper work!

Index Case #2

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7. There had never been a survivor of this in war!
8. He called the Trauma Czar and asked for help!
9. The Trauma Czar mobilized the NovaLung team from Germany, met them in Bagram, flew to the forward operating location, hooked the man up to the NovaLung, and transported him back to Germany.

10. **This gentleman spent several weeks on the Nova Lung and then went home.**
11. **He is doing well at home now with no complications.**

Give Me Examples!

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2. Index case #2- first survivor of a traumatic pneumonectomy in wartime.
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Index Case #3

1. 19 yo Male, shot at close range with AK-47.
2. Bullet entered his right side, went through the hilum of the right lung, proceeded across the mediasteinum, took off the top of his left lung, and left him in shock!
3. This is the type of person who had no chance for survival in any previous conflict!

Index Case #3

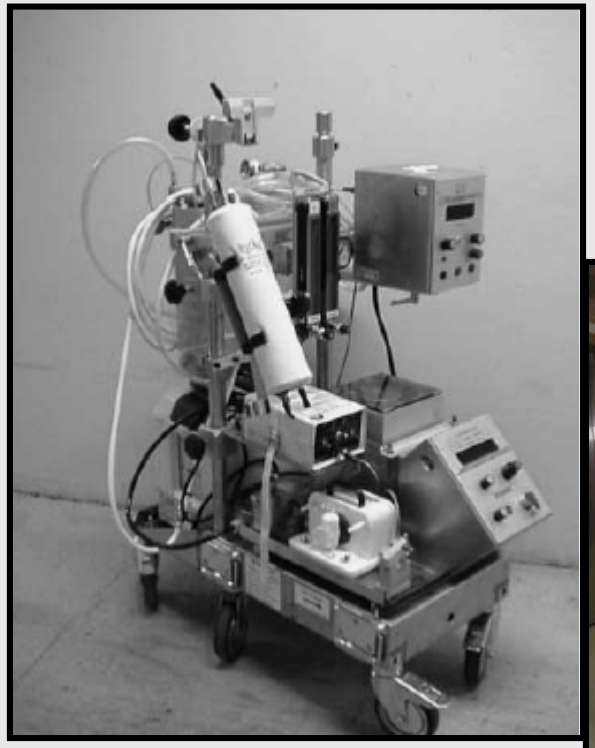
4. His buddies got him to a Far Forward Surgical team in Afghanistan very quickly.
5. The surgeon addressed him surgically, had to remove his right lung and a portion of his left lung.
6. The surgeon called the “Trauma Czar” as he started, asking for help!
7. The “Trauma Czar” was well experienced, had taken care of the first survivor of a traumatic pneumonectomy in history and knew what would happen to the patient- his right heart would fail within 24 hours.

Index Case #3

8. The “Trauma Czar” called for the ECMO team to come from Germany to pick this young man up, giving them a very short window to arrive.
9. They arrived at the 16 hour mark, traveled with the Czar to the forward location, and hooked up the patient to the heart lung machine at the 20 hour mark as he was entering florid right heart failure.

EVOLUTIONARY ADVANCES:

EXTRACORPOREAL MEMBRANE OXYGENATION



We had to work this one for our people on Okinawa in the NICU!

This was certified for AE use on 1 Oct 2010. It was used on this patient for the first time two weeks later.

Index Case #3

10. They then flew this young man back to Germany, kept him on the machine for two weeks to allow his heart to accommodate his new circulation, and he is home now with his family!
11. He has a normal life expectancy!

Index Case #3

10. They then flew this young man back to Germany, kept him on the machine for two
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11. He

That is what we mean by "nothing is too good for those in uniform!"

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AFSOC Surgical Team July 2016

1. Team of six members placed far forward to support coalition efforts in Syria area of operations.
2. Team saw 757 patients in three week period.
3. Team did 123 trauma resuscitations.
4. Team did 23 trauma laparotomies
    1. Four with REBOA stabilization pre-laparotomy to stabilize bleeding
    2. All four patients survived to next echelon of care.

Improvement never stops!

This is family!

This is your home!

Combat Casualty Care

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Could these changes be applied to your trauma system?

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In the last 15 years of combat operations we have about 1,000 excess deaths, meaning a casualty who could have survived if we could have gotten sophisticated medical care to he or she!

In the last 15 years of trauma deaths in the USA, the same comparison would give us over 450,000 preventable deaths!

Our goal should be ZERO preventable deaths!

Institute of Medicine Report June 2016

1. 17 June 2016 the Institute of Medicine issued a report on how to improve the survival statistics in our country using the initiatives pioneered by the military in the last 15 years of war.
2. Their figures of 147,000 trauma deaths in the USA per year on closer scrutiny reveal that at least 20% of those so injured could have survived if appropriate care had been rendered them in a timely manner.
3. Over the last 15 years of war the military has sustained 1,000 excess deaths, defined as could the injured party have survived if injured on the steps of a Level I Trauma Center?
4. By the same criteria, we in the USA have sustained over 450,000 excess deaths/year!

Trauma Potential in USA

Medical Facility deaths in war 1%!

1,000 excess deaths that were potentially salvageable in the 15 years of war? 15% of total deaths!

Victims do well once they reach the hospital!

Trauma Potential in USA

Medical Facility deaths in war 1%!

1,000 excess deaths that were potentially salvageable in the 15 years of war? 15% of total deaths!

Victims do well once they reach the hospital!

20% of USA trauma deaths were potentially salvageable out of 147,000 or nearly 30,000 per year!

So by same criteria we have had 450,000 excess deaths over the same 15 years of war in the USA!

Game Plan for ZERO Preventable Deaths!

Medical System

So we start with all medically related people able to do certain trauma actions to prevent death.

Game Plan for ZERO Preventable Deaths!

Medical System

So we start with all medically related people able to do certain trauma actions to prevent death.

We then expand to First Responders- Police, Fire EMS

At this level we believe we will be at around 5% of the population trained in trauma death prevention.

Game Plan for ZERO Preventable Deaths!

So we start with all medically related

At this point we re-assess and see how we are doing.
Figure out how we get into the general population to reach the desired goal of ZERO excess deaths?
Ready to use equipment in Schools? Meeting places? Churches?

trained in trauma death prevention.

Trauma Potential in USA

The goal of this brief is to make you aware of the changes in hospital and pre-hospital care in the theater of war and let you know those tools are available to you so that all of our medical people can save lives!
Not become trauma specialists, but save lives to get to a medical facility!
Then we will move into the bigger groups as a next step!

Trauma Potential in USA

I believe the best way to do this is to proceed with "Evidence Based" actions, as outlined by the Tactical Combat Casualty Care Committee. These TCCC actions have been incorporated into a variety of pre-hospitals courses you will hear about!

per year!

So by same criteria we have had 450,000 excess deaths over the same 15 years of war in the USA!

Trauma Potential in USA

We have taught the first classes for medical students at Texas Tech in Lubbock on these skill sets in Sept 16.
Texas A&M is scheduled for April 17.
USU teaches this skill set on entry to medical school.
Perhaps you would be interested in continuing the program already started by John Phelps from UTHSC/SA with the EMTs in San Angelo?

Trauma Potential in USA

This effort drives some ethical questions:

1. **Do we, the medical professionals, have an obligation to save lives?**
2. **Is our profession up to the challenge?**
3. **Are we willing to tackle this 450,000 excess deaths?**
4. **Will we use evidence based medicine?**
5. **Or, will we cling to old myths?**

the same 15 years of war in the USA!

Questions

PK Carlton, Jr., MD, FACS

Lt Gen, USAF (Ret), Surgeon General

Texas A&M Professor of Surgery, (Ret)

8 April 2017