



Changing the Paradigm: Tactical Emergency Casualty Care Guidelines for High Risk Scenarios

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Just another day....

- Dispatch for fire at Rosslyn, VA metro station
- Initial dispatch as Box Alarm
 - 4 engines, 2 trucks, 1 rescue, 1 medic unit, 1 battalion chief, 1 EMS supervisor, 1 battalion aide



Scenario

- First arriving units report smoke from underground entrance and injured persons at entrance
 - Victims reporting large blast occurred as train entered station



Scenario

- Scenario recognized as likely IED detonation on crowded metro
- Reports of multiple injured persons in need of rescue
- What now?

High Threat Mass Casualty

- What is the traditional teaching on operational medical response for the recon and subsequent rescue in scenarios with known wounded but active threats?
 - Do rescuers stage and wait for the all clear?



High Threat Mass Casualty

- If they decide to effect life rescue and enter the scene, are they carrying the right equipment?



High Threat Mass Casualty

- Are they knowledgeable about and trained to do the appropriate care prior to and during evacuation?



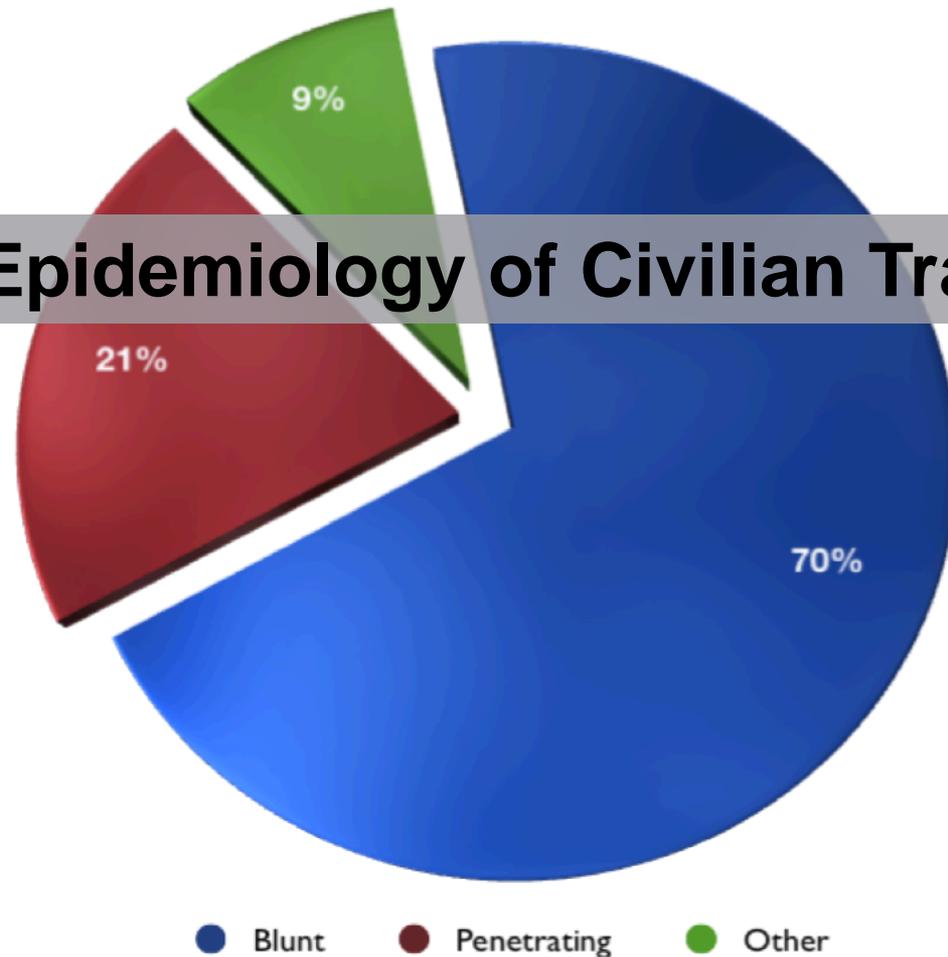
Defining the problem

- Is there a currently gap in how civilian first responders train to and respond to the high risk operational scenarios, both in medical tactics and medical actions?

Absolutely

Basis for Training Conventional EMS

Epidemiology of Civilian Trauma



Tamin H, Joshep L, Mulder D, et al: Field Triage of Trauma Patients: Improving on the Prehospital Index
Am J of Emerg Med Vol 20(3) 2002

Why is this important???

- We have dedicated a lot of training for WMD and disaster medical response over the past 20 years
 - **BUT** both threat and practice environment are evolving
- Well documented evidenced based medical guidelines currently in use in GWOT



The New Reality

- Traditional WMD
 - Difficult to acquire
 - Difficult to deliver
 - Requires extensive training and resources

- New tactics
 - Improvised explosives
 - High velocity ballistics
 - Lone wolf active shooters
 - Dynamic coordinated small unit attacks



New Threat Environment

- May initially seem routine but must be quickly recognized as atypical
 - 'Disturbance' at a school
 - Fire on a metro bus
 - 'Trouble unknown' at a mall
 - Fight at a restaurant

New Threat Environment

- Characterized by a multi-lateral spectrum of potential threats
 - One or more perpetrators willing to die
 - Military style tactics and coordination
 - Multi-capacity high velocity weapons
 - Atypical threats such as home-made IEDs
 - Potential for toxic hazards
 - Austere conditions due to operational limitations and geography

New Threat Environment: Impact on delivery of medical care

- Medical first responder must maintain enhanced situational awareness while simultaneously providing appropriate and effective patient care
 - Must change care protocols from what can be done to only that which **MUST** be done for life-saving
 - Not an altered or relaxed standard of care
 - A new standard of care specific to environment

New Threat Environment: Impact on delivery of medical care

- Restrictions to care in this environment:
 - Supplies and equipment limited to what is brought into scene
 - Unable to 'run back out to the rig'
 - Limited personnel operating on scene
 - Need for rapid mitigation
 - Potential for prolonged horizontal and vertical extraction of casualties

New Threat Environment: Impact on delivery of medical care

- Casualty profile shifted towards significant traumatic morbidity and mortality
 - Multiple victims each with multiple wounds
 - Combination of blunt and penetrating injury
 - Blast injury
 - Burns
 - Delayed time to care
 - Potential for contamination

New Threat Environment: Impact on delivery of medical care

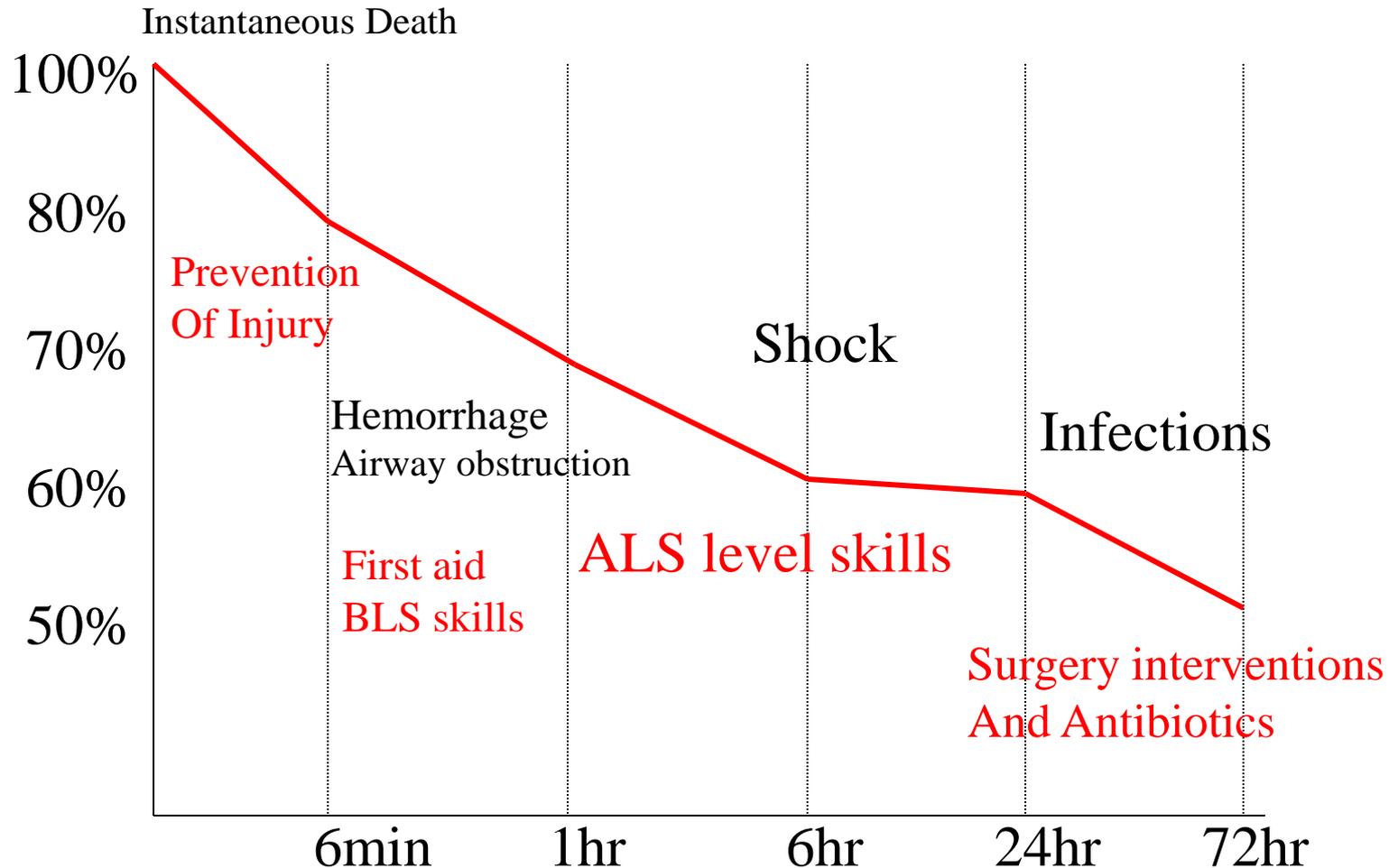
- Medical decision-making must be based on risk-benefit assessment
 - Benefits of proposed medical interventions **MUST** be weighed against potential for further harm to patient or first responders
 - Care must be tailored to the relationship between the provider and the dynamic threat

Stage and Wait? Time Counts!

- Systematic review of combat casualty data showed that the majority of fatal combat injuries die within 30 minutes
 - Every minute with uncontrolled injury decreases chance of survival!!!

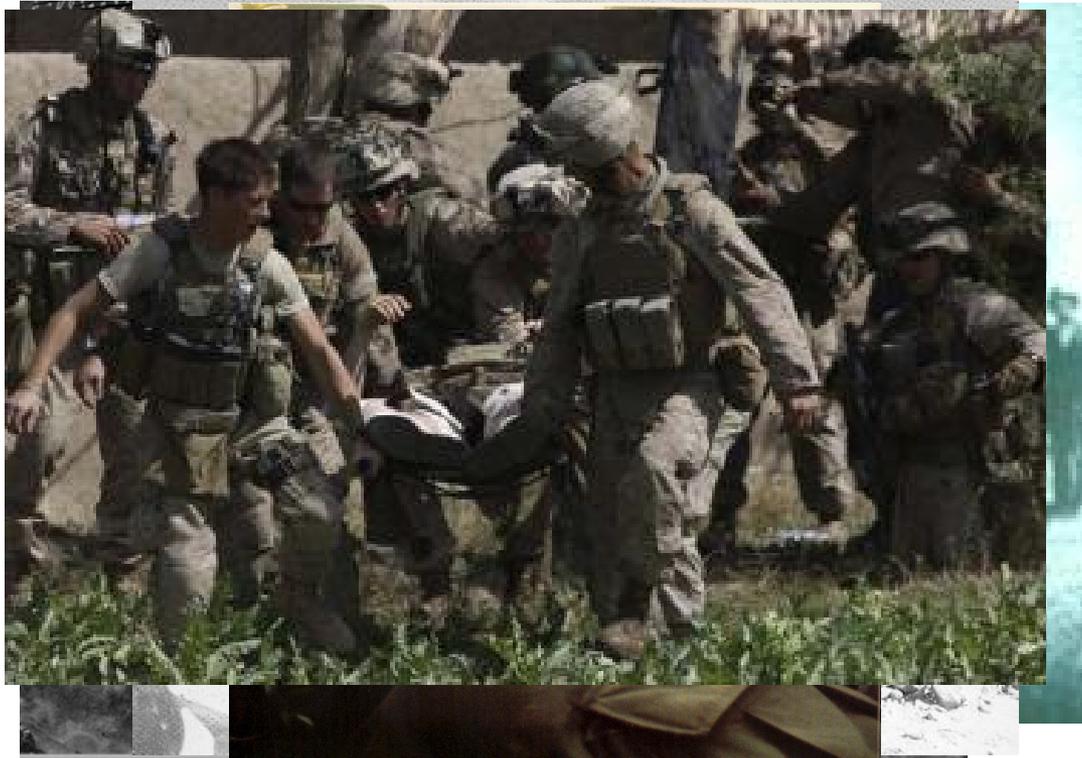


Death Curve for Penetrating Trauma (in combat)



Concept of Point-of-Wounding Care

- As with almost all advances in pre-hospital medicine, we must look to the military...



Battlefield Medicine prior to 1990s

- Combat corpsman and medics taught to manage battlefield injuries using the civilian standard for trauma care
- Advanced Trauma Life Support
 - Designed to train the non-trauma physician how to manage trauma victims in a hospital setting
 - Based on 'Golden Hour' with emphasis on rapid evacuation to care
- Best practice? Research was being done as well...



Wound Data and Munitions Effectiveness Team (WDMET) study

- Post-Vietnam era study of all combat deaths to identify aspects of weapon lethality
 - Sub-analysis revealed interesting findings
 - First study to show unique characteristics of battlefield field trauma management
 - Multiple subsequent studies have substantiated



Wound Data and Munitions Effectiveness Team (WDMET) study

- Greatest opportunity for life saving intervention is early on....
 - 90% of deaths occurred prior to definitive care
 - 42% immediately
 - 26% within 5 minutes
 - 16% within 5 and 30 minutes
 - 8-10% within 30 minutes and 2 hours
 - Remainder survived between 2 and 6 hours during prolonged extrication to care
- Only 10% of combat deaths occurred after medical care initiated



Wound Data and Munitions Effectiveness Team (WDMET) study

- Summary Results
 - “The greatest benefit will be achieved through a configuration that puts the caregiver at the patient’s side within a few seconds to minutes of wounding.”
 - “Far forward placement of medical assets is lifesaving.”

Anatomical Distribution of Penetrating Wounds (%) in Ground Combat

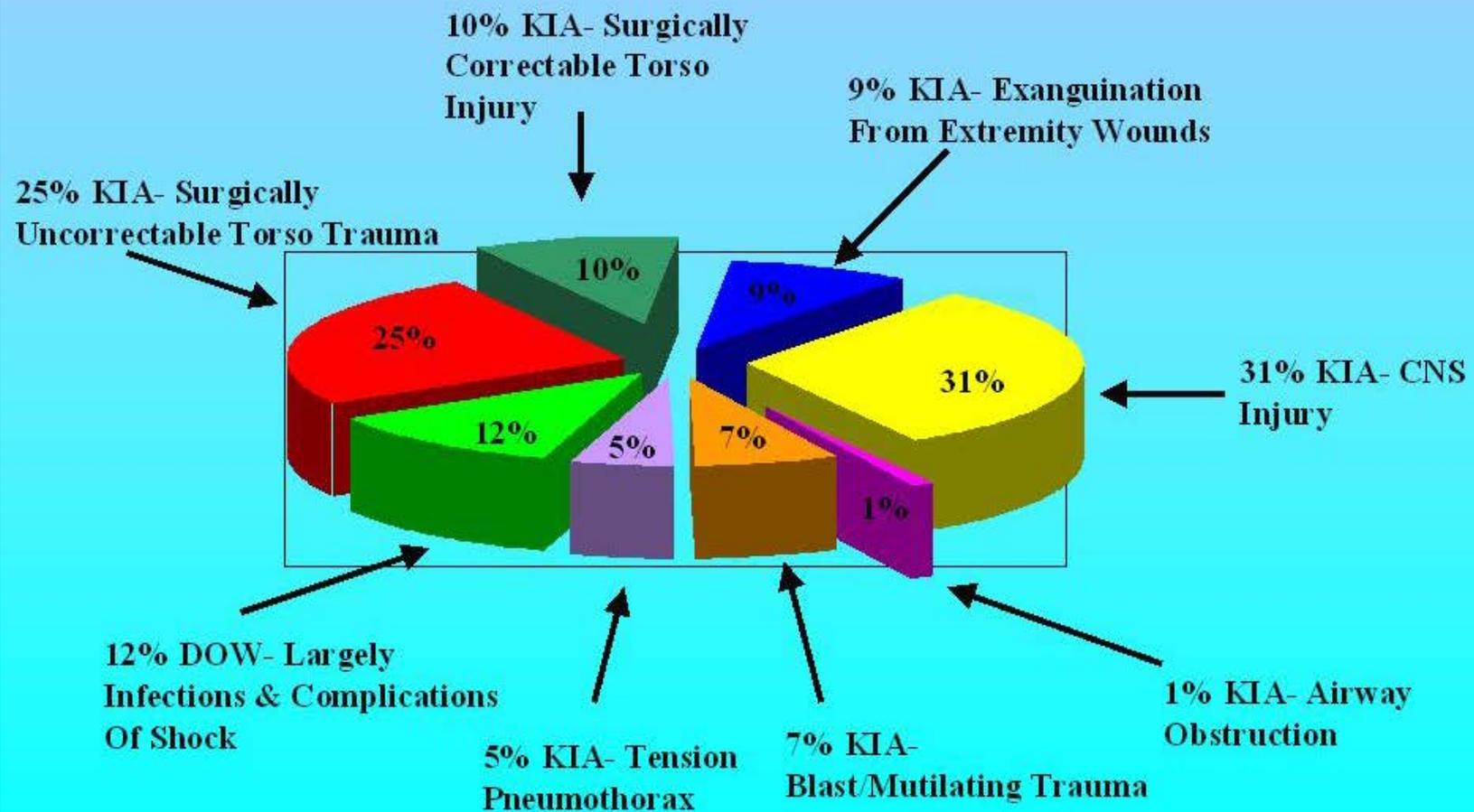
| Conflict | Head and Neck | Thorax | Abdomen | Limbs | Other |
|-------------------|---------------|------------|------------|-------------|------------|
| World War I | 17 | 4 | 2 | 70 | 7 |
| World War II | 4 | 8 | 4 | 75 | 9 |
| Korean War | 17 | 7 | 7 | 67 | 2 |
| Vietnam War | 14 | 7 | 5 | 74 | — |
| Northern Ireland | 20 | 15 | 15 | 50 | — |
| Falkland Islands | 16 | 15 | 10 | 59 | — |
| Gulf War (UK) ** | 6 | 12 | 11 | 71 | (32)* |
| Gulf War (US) | 11 | 8 | 7 | 56 | 18+ |
| Afghanistan (US) | 16 | 12 | 11 | 61 | — |
| Chechnya (Russia) | 24 | 9 | 4 | 63 | — |
| Somalia | 20 | 8 | 5 | 65 | 2 |
| Average | 15 | 9.5 | 7.4 | 64.6 | 3.5 |

- Summary: Penetrating wounds to the limbs occur in more than 1 out of every 2 combat wounds

Causes of death in conventional land warfare

- Landmark study by R.F. Bellamy
 - Military Medicine 1984
- Examined military autopsy data from multiple conflicts
- Lists cause of death described at autopsy
 - Does not describe wound pattern or non-lethal injuries

Causes of death in conventional land warfare



Causes of death in conventional land warfare

- Summary:
 - 15% of fatalities in combat from **readily treatable** causes:
 - 9% Exsanguination from peripheral hemorrhage
 - 5% Open/Tension pneumothorax
 - 1% Airway obstruction

9% KIA

Bleeding to Death From Extremity Wounds



5-10% KIA

Open and Tension Pneumothorax



1% KIA Airway Obstruction



Improving Survival in Combat



- Rapid application of simple appropriate stabilizing treatment at or near the site of wounding

PLUS

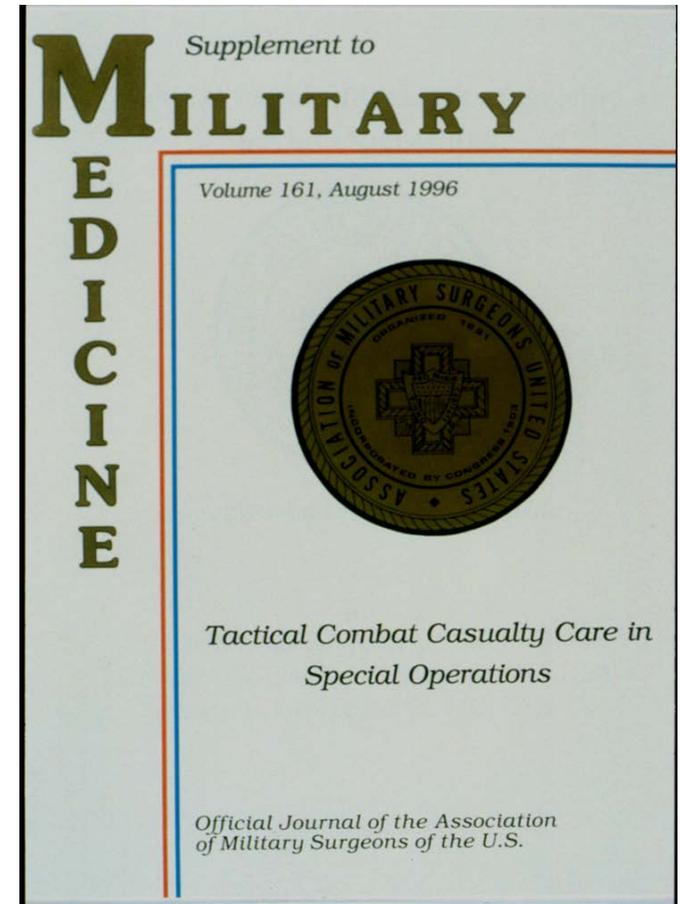
- Expedient evacuation to closest appropriate medical facility

EQUALS

- Maximal survival rate for those injured

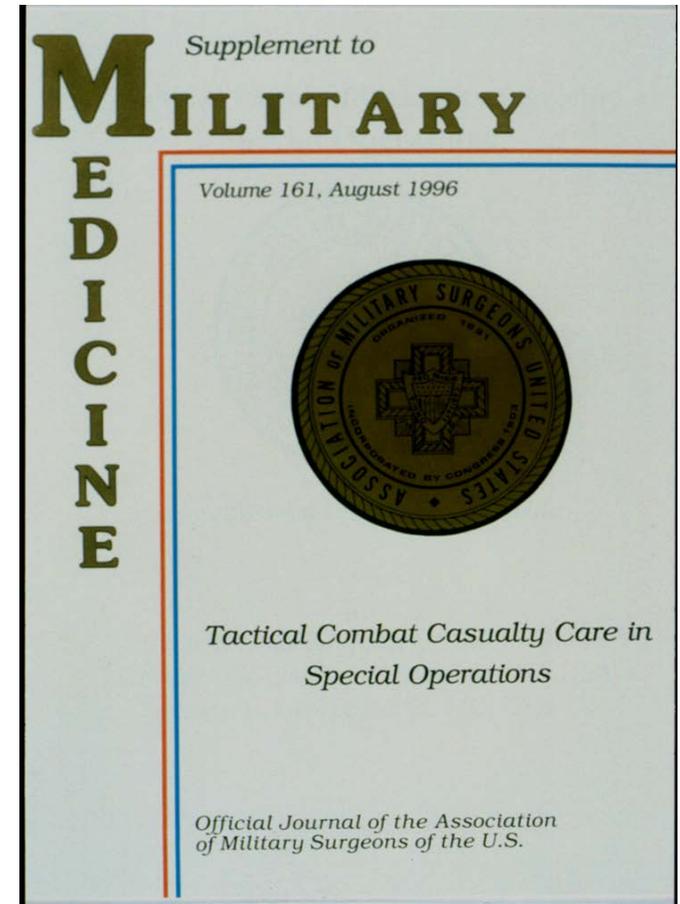
The Military Paradigm Shifts....

- Navy Special Operations community conducted an extensive funded review of the data on combat death and the principles of combat trauma care
- Followed several military special operation actions where the loss of life was high & medical care impacted tactical operations



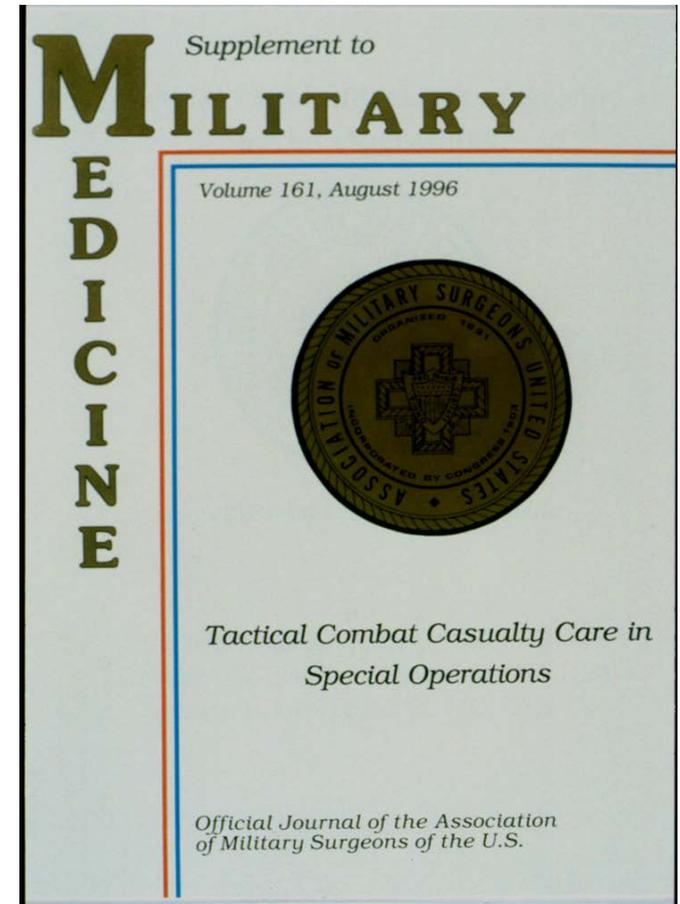
The Military Paradigm Shifts....

- Identified shortcomings of applying ATLS for combat care
- ATLS lacked of provisions for the specific combat environment
 - Hostile action and continued threats
 - Environmental factors
 - Casualty transportation problems and long delays to definitive care
 - Need to balance the management of casualties within the conduct of an ongoing combat mission



Tactical Combat Casualty Care

- Result was set of medical guidelines for use on the battlefield
 - Published by Butler et al in 1996 Supplement to Military Medicine
- Adopted quickly throughout the Special Operations Community
 - Now widely adopted throughout all combat troops



Tactical Combat Casualty Care



- Prioritization and application of medical care to address the preventable causes of death while accounting for specific limitations and conditions surrounding combat:
 - High threat environments and on-going tactical operations
 - Limited medical equipment and resources
 - Limited medical personnel

Is TCCC an effective care strategy?

Comparison of Statistics for Battle Casualties, 1941 – 2005

Holcomb et al J Trauma 2006

The U.S. casualty survival rate in the GWOT is the best
in our nation's history

| | World War II | Vietnam | OIF/OEF |
|----------------------------|--------------|---------|---------|
| %Casualty Fatality Rate | 19.1% | 15.8% | 9.4% |

The power of TCCC

- Evidence based and best practice based
 - A decade of data with continued evidence to support guidelines
- Well known and well supported throughout the military
- Now is being brought back to Civilian Fire/EMS by returning veterans

TCCC: A New Civilian Paradigm??

- Reality: Current standard Fire/EMS operational medical response is inadequate for atypical emergencies
- TCCC seemed initially to be the answer....
- BUT, it doesn't translate exactly to civilian operations.

Applying Military Medical Lessons Learned to Civilian High Threat Prehospital Care



ROUND PEG,
SQUARE HOLE

It still doesn't work...

Where TCCC potentially fails...

- Guidelines of TCCC is largely based off of evidence gleaned from the overall young and healthy military combat population
- Written for the military combatant treating the combat wounded military population in the combat environment
- Fails to account for the differences in civilian settings and resources

Civilian Differences

- Scope of practice and liability
- Patient population to include geriatrics and pediatrics
- Availability of transport assets and transport distance to definitive care
- Differences in barriers to evacuation and care
- Baseline health of the population
- Wounding patterns without ballistic armor
- Chronic medication use in the injured
- Special populations

Plus... language matters.

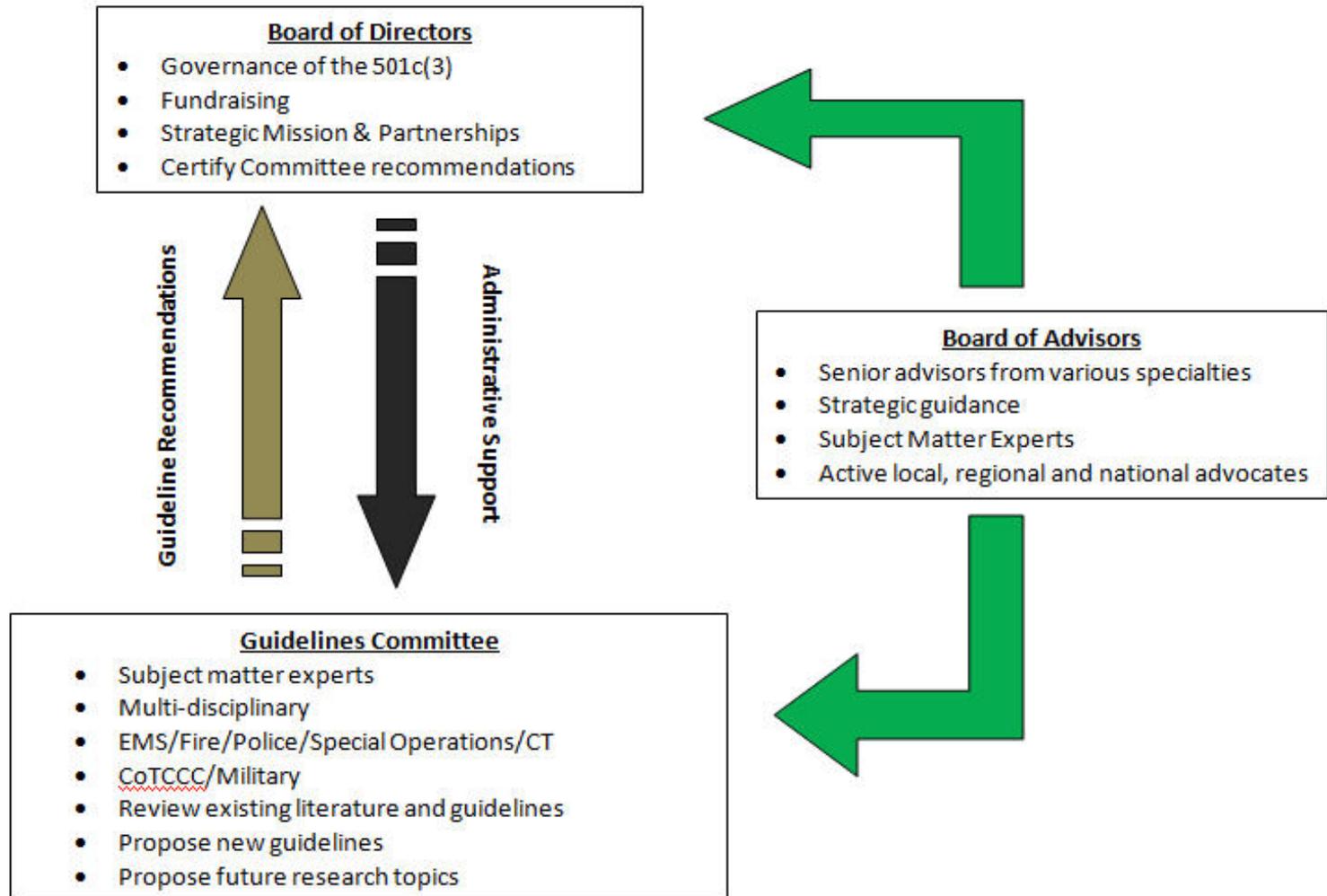
- Civilian medical operations???
 - “Care under Fire”
 - “The best medicine on the battlefield is fire superiority”
 - “Return fire and take cover”
 - “Direct or expect casualty to remain engaged as a combatant if appropriate”



Civilian Transition Initiative

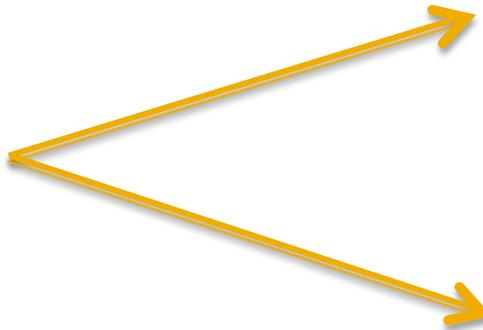
- 2005: Process began with TCCC Transition Initiative
- 2008: GW and ACFD coined the term Tactical EMERGENCY Casualty Care as a new paradigm for ALL Civilian Prehospital High Threat Medicine
- 2011: Established 501 3c Committee and held conference of Subject Matter Experts

Committee for Tactical Emergency Casualty Care (C-TECC)



Tactical Emergency Casualty Care (TECC)

- Civilian threat-based medical care guidelines
 - New framework based on military lessons learned but adapted to domestic trauma epidemiology and civilian operational constraints



TECC: The new paradigm

- TECC Goals:
 - To establish a medical care framework that balances the threat, civilian scope of practice, differences in civilian population, medical equipment limits, and variable resources for **ALL** atypical emergencies and mass casualty
 - To provide for aggressive forward deployment of stabilizing medical interventions

TECC: The new paradigm

- TECC Goals:
 - To provide principles for point of wounding management of trauma in HIGH THREAT AND MASS CASUALTY ENVIRONMENTS
 - To provide care guidelines that account for on-going threat and operations to minimize provider risk while maximizing pt benefit

Language DOES matter...

- If TECC is not SWAT medicine, why is it called “Tactical” Emergency Casualty Care?
- **Answer:**
 - On the fire ground, an interior attack on a single family is called....
 - In technical rescue, deciding how to shore then how to access and extricate an entrapped pt is called...
 - In EMS, deciding how to get a morbidly obese pt down from the 5th floor without an elevator is called...

Tactical, not Law Enforcement

- In TECC, “Tactical” means operational, not Law Enforcement
 - Tactics answer the question, “how will we achieve our objective”
- Operational response involves multiple tactical decisions that will be affected by and have an effect on medical care decisions

What TECC is...

- Civilian driven, civilian appropriate
- Representative of multi-agencies and specialties
- Vetted, evolving *principles* of care and operational recommendations
- Venue for future operational medical research

What TECC is NOT...

- Law Enforcement Tactical Medicine specific
- Only for LE Tactical Medics
- A comprehensive tactical medicine program
- **Rigid** care protocols

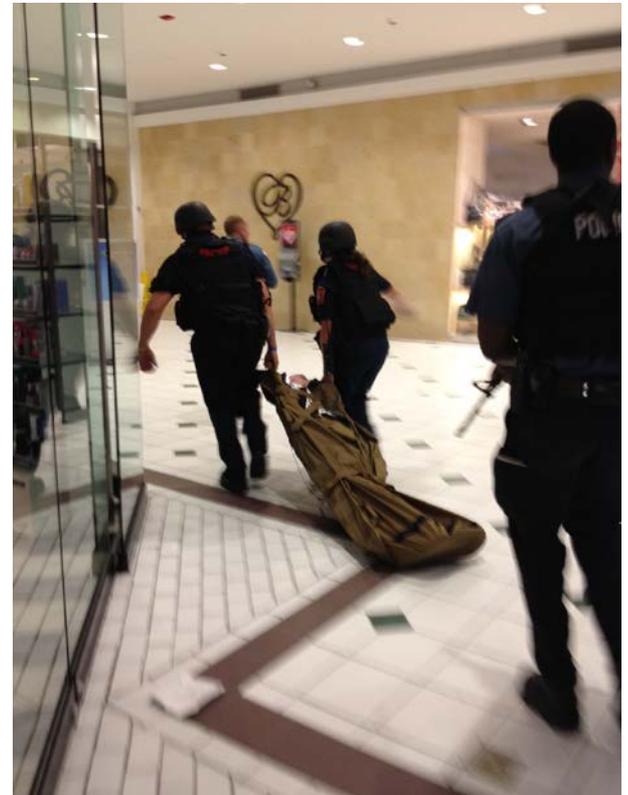
Only for medical personnel??

- ANY first responder can initiate TECC care
 - Guidelines can be implemented at any level
 - Patrol officers and non-medical first responders should initiate care as the tactical situation allows



Tactical Emergency Casualty Care

- Applications: Active Shooter Response



Tactical Emergency Casualty Care

- Applications: Fire/EMS Response to Explosives



Tactical Emergency Casualty Care

- Applications: Patrol Officer Down



Tactical Emergency Casualty Care

- Applications: SWAT/Tactical Medic



Tactical Emergency Casualty Care

- Applications: Technical Rescue Medic



Tactical Emergency Casualty Care

- Applications: Wilderness Medical Response



Tactical Emergency Casualty Care

- Applications: Mass Casualty Response



TECC Guidelines

TECC is Situation-Driven

- Operational medical guidelines applied in 3 distinct phases defined by the relationship between the provider and the threat
- Phases of Care
 - Direct Threat Care (DT)
 - Indirect Threat Care (IDT)
 - Evacuation Care (Evac)

Direct Threat Care





Direct Threat Care

- Medical actions when the external, ongoing threat to life is as or more dangerous than the injury sustained
 - Risk of further injuries to the casualty and the rescuer is extremely high
- Very minimal “medical” intervention is generally warranted
 - Emphasis on evacuation and operational mitigation of threat

Direct Threat Care

- Generally not included in the average first responders repertoire
 - Typically, either the event is over prior to arrival
 - Risk of prolonged operations & additional casualties in this zone is high without proper PPE and tactics
- Medical operations in DT should focus on limited personnel and immediate life rescue
 - LE officers pulling victims out of line of fire
 - Pulling injured victims away from bus or train after IED explosion

Direct Threat Care

- Direct Threat or Indirect threat?
 - Unknown secondary device, unknown additional threats





Guidelines for Direct Threat Care

- Initiate actions to address the immediate life threat and work towards getting to/making a safe environment
 - Contact teams, shoring, fire suppression, isolation, initiate bomb neutralization



Guidelines for Direct Threat Care

- ***Stop life threatening external hemorrhage*** if operationally feasible:
 - Apply the tourniquet over top of the clothing as proximal (high on the limb) as possible and tighten until bleeding stops and distal pulse is no longer palpable
 - Consider moving to safety prior to application of the TQ if on-going threat is too high
- Decision to apply tourniquet versus evacuation to safety based on provider determination of severity of bleeding and relative risk



Guidelines for Direct Threat Care

- Apply **direct pressure** to the wound **if no tourniquet available** or application is not tactically feasible
- Airway management is best deferred until Indirect Threat Care phase
- Evacuate the casualty to cover
 - If unable, consider quickly **placing casualty in position to protect airway**

Hemorrhage Control

- Early control of severe hemorrhage is critical
 - Only LIFE THREATENING bleeds
- Tourniquet placed for
 - Total or partial amputations
 - High risk of rebleeding
 - Wounds **WITH** heavy arterial or massive venous bleeding

Hemorrhage Control

- Place tourniquet high up on limb proximal to bleeding site over top of clothes
- Tighten until bleeding stops
- Don't put over knee, elbow, or open fracture



Tourniquets

- Function by applying using a mechanical mechanism to apply compressive pressure to limb to occlude all distal arterial and venous flow
 - Have 2 inch strap to reduce potential neurovascular damage
- Designed to be applied one handed for self application

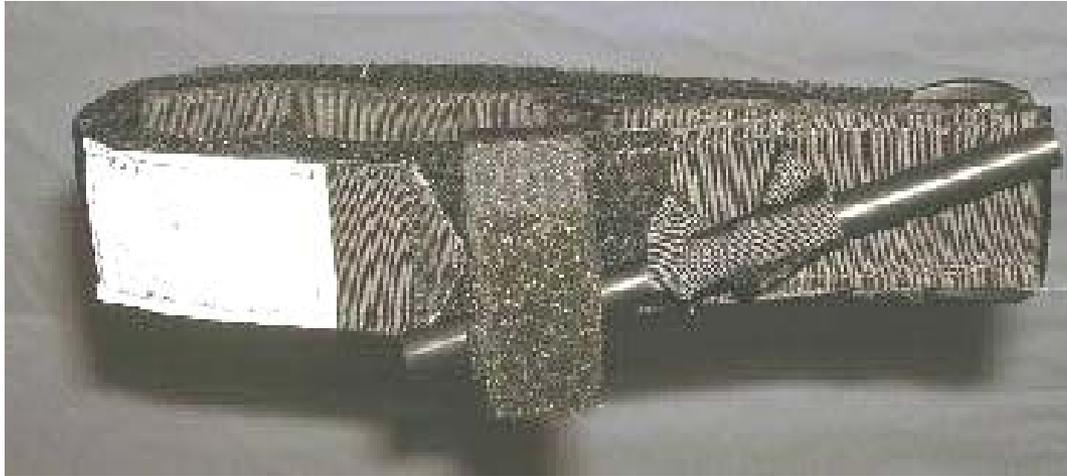
The Truth about Tourniquets

- Fast and easy to apply
 - Approximately 30 seconds to stop bleeding completely
- Subsequent bleeding control in other phases of care is aimed at downgrading
- Survival is better if applied **prior to onset of shock**
- Safety profile
 - Related to time of application
 - Multiple studies show safety if off <2 hours
 - Some reviews show 1.5-3% **transient** nerve palsy

Military Emergency Tourniquet



Combat Application Tourniquet



Special Operations Forces - Tourniquet



Military Application Tourniquet



Ranger Ratchet Tourniquet



Kravat and Windless



Indirect Threat Care (ITC)



Indirect Threat Care (ITC)

- Medical actions taken when risk to provider and patient exists but is not direct and immediate
- Emphasis on focused assessment and management of the immediate life threats

Indirect Threat Care (ITC)

- Indirect threat care is performed
 - At the point of injury
 - If no longer under effective enemy fire
 - If threat eliminated and scene declared clear but not secure
 - At a casualty collection point
 - Pre-designated area that has cover/security where patients can be initially stabilized
- Example:
 - Areas of building primarily cleared by contact teams after an active shooter



Goals for Indirect Threat Care

- Rapidly address major PREVENTABLE causes of death while maintaining operational goals
- Stabilize the casualty as required as close to the point of wounding to permit safe extraction to dedicated treatment sector or medical evacuation assets
- ***DO NOT DELAY*** casualty extraction/evacuation for non life-saving interventions

Indirect Threat Care

- Emphasis on continued threat awareness
 - Be wary of secondary devices
 - Would put you back into DT
 - Directed evacuation of those able to self evacuate
 - Triage in areas of high risk
 - Needed?? Ignore the walking and the dead, the rest are RED
 - Triage emphasized once patient in area of lower risk

Guidelines for Indirect Threat Care

- The overall approach to care during ITC phase can be accomplished in a systematic manner as is taught by the standard EMT trauma survey
 - HOWEVER there is a different emphasis on care necessitated by threat environment
- MARCH-E vs X-ABCDE vs SCAB-E

Guidelines for Indirect Threat Care

- Major Care Interventions
 - **Major Bleeding:** Tourniquets, Hemostatics, Wound packing
 - **Airway:** Adjuncts, positioning, Cricothyrotomy
 - **Respiration:** Chest seals, needle decompression
 - **Circulation:** Fluid resuscitation?/ Shock
 - **Head/Hypothermia:** Mental status, TBI, C-spine
 - **Everything Else:** Full evaluation “Head to toe, treat as you go.”

Do the Right Thing at the Right Time

- Assessment and procedures must be followed in the correct order during the Indirect Threat Care Phase

Why do we use the Acronym : MARCHE???

- Death from arterial bleeding: 2-4 minutes
- Death from airway compromise: 4-6 minutes
- Death from tension pneumothorax: 15-20+ minutes
- "Golden Hour" for Shock: 60 minutes

It is pointless to treat a casualty for a developing tension pneumo while he is dying from uncontrolled bleeding

Guidelines for Indirect Threat Care

MARCH-E

- **Major bleeding**
- Airway
- Respirations and breathing
- Circulation
- Head and Hypothermia
- Everything else

Guidelines for Indirect Threat Care: Major Bleeding

- Critical focus on stopping life-threatening bleeding
 - Most likely injury as well as most common cause of death
- Several different treatment options
 - **Tourniquet**
 - **Mechanical pressure dressing** with wound pack
 - **Chemical hemostatic agents** with pressure dressing

Guidelines for Indirect Threat Care: Major Bleeding

- Pressure Dressings
 - Quick, easy to apply
 - Use mechanical advantage and elastic bandage for direct sustained pressure over wound
 - Must use with packing for deep wounds
 - Incorporates large absorbent dressing



Effective only with PACK and Pressure Dressing



CURLEX

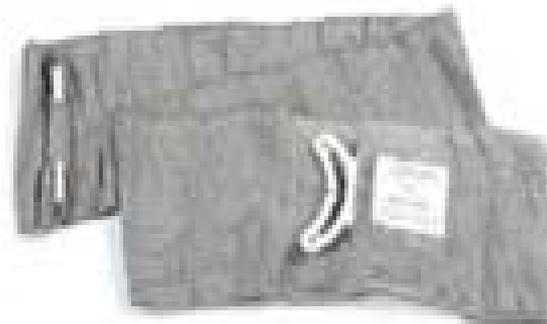
6-ply sterile
crinkle cotton
folded fluff
bandage



Placement of a “material
wad” directly into a
wound cavity, directly
activates the clotting
mechanism.



Emergency Military Bandage



Cinch Tight



H-Type Bandage



Olaes Modular Bandage



OLAES MODULAR BANDAGE
FOR THE TREATMENT OF SORES AND WOUNDS

Ace Wrap and Gauze



Guidelines for Indirect Threat Care: Major Bleeding

- Some wounds not amenable to tourniquets or pressure dressings
- Control of massive hemorrhage is challenging at best!!



3rd Generation Hemostatic Agents

- Chemical impregnated gauze that incorporate chemicals designed to initiate and accelerate the fibrin clotting process
 - Seal damages to arteries and veins
- Must be properly applied and used in conjunction with direct pressure and pressure bandages

3rd Generation Hemostatic Agents

- Older powder versions falling out of favor
 - Reports of systemic emboli from granules
- New form is impregnated gauze that combines deep wound pack and hemostatic agent
- Plain gauze is second line
 - Recent study showed good hemostatic properties

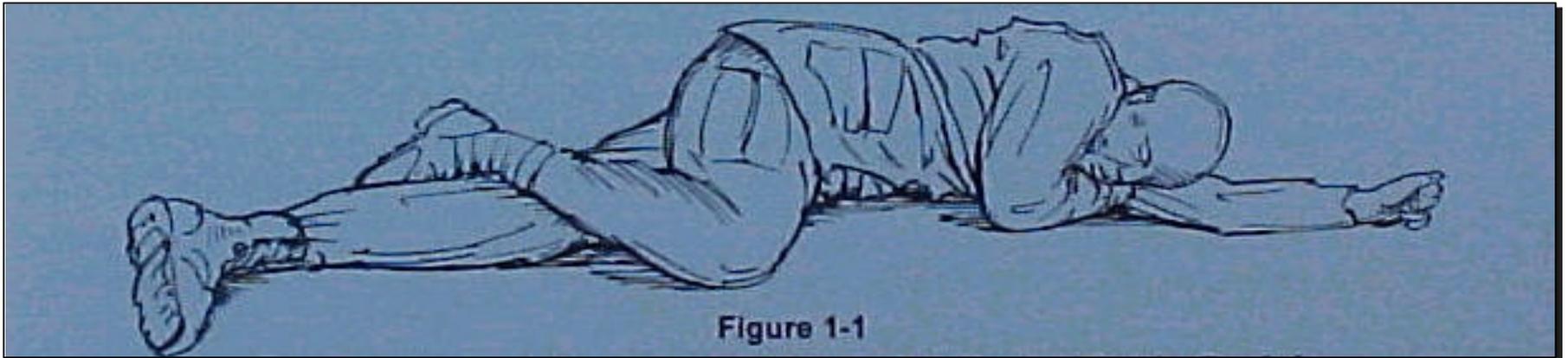
Guidelines for Indirect Threat Care

MARCH-E

- Massive hemorrhage
- **Airway**
- Respirations and breathing
- Circulation
- Head and Hypothermia
- Everything else

Guidelines for Indirect Threat Care: Airway

- Emphasis on basic airway skills
 - Nasal trumpet placed on all patients with altered mental status
 - Patients placed in recovery position or position of comfort while waiting evacuation



Guidelines for Indirect Threat Care: Airway

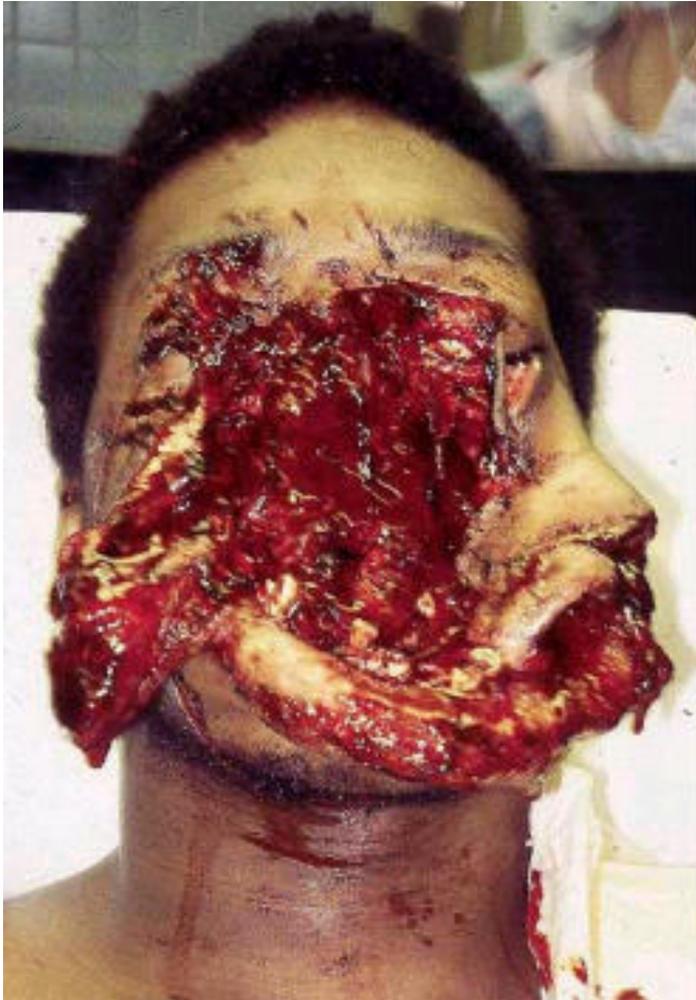
- Why NP airway??
 - Effective regardless of gag reflex
 - Relatively stable once placed
 - Transiently stimulating
- What about basilar skull fracture?
 - Not proven in literature
 - Emphasize proper placement technique



Guidelines for Indirect Threat Care: Airway

- Aggressive airway control in the CCP
 - De-emphasize standard endotracheal intubation
 - Time and equipment sensitive
 - Other options
 - Blind insertion supraglottic airways
 - ALS provider cricothyrotomy

Guidelines for Indirect Threat Care: Airway

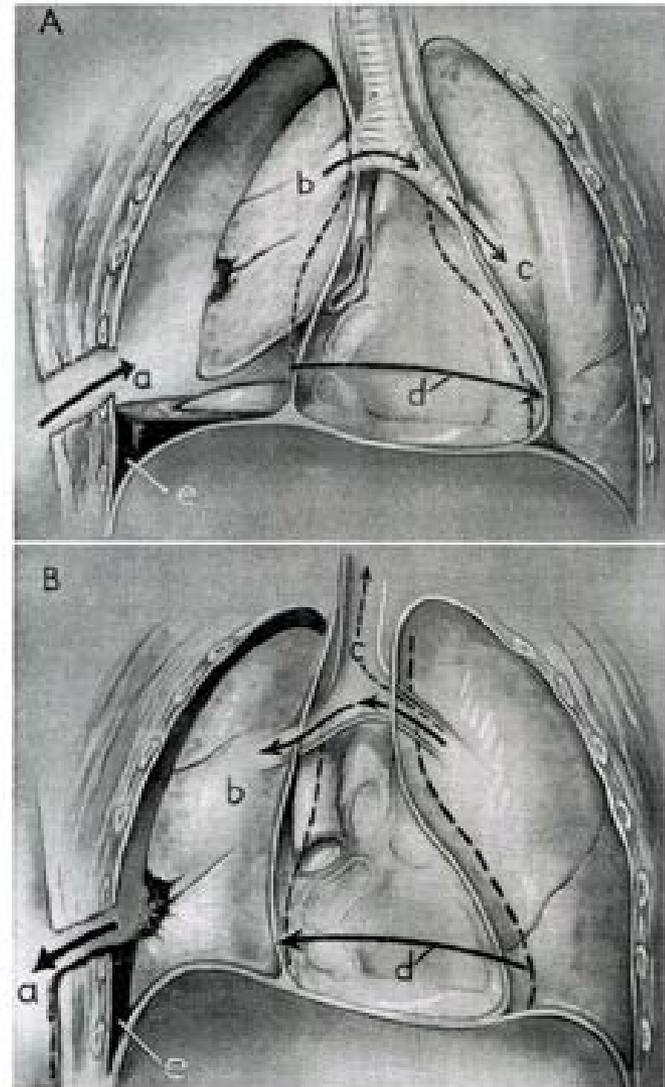


Indirect Threat Care: MARCH-E

- Massive hemorrhage
- Airway
- **Respirations and breathing**
- Circulation
- Head and Hypothermia
- Everything else

Guidelines for Indirect Threat Care: Respirations

- Focus care for penetrating chest wounds by application of occlusive dressing to restore integrity of chest wall and improve respiratory mechanics

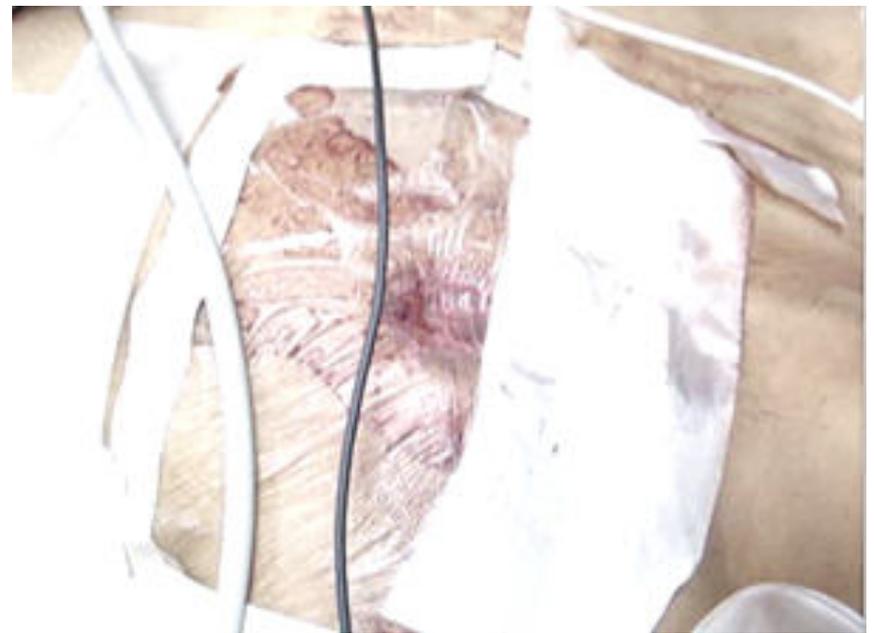


Guidelines for Indirect Threat Care: Respirations

- Occlusive chest seal quickly fixes this problem
 - Keeps air from moving into the chest cavity
 - After several breaths, the lung will be re-expanded and functional.



Guidelines for Indirect Threat Care: Respirations



LEOKA: 70% of LEO who died within 1 hour of wounding had significant chest trauma

Do 3 sided or 1- way valves help?

Just Make sure they stick!!!



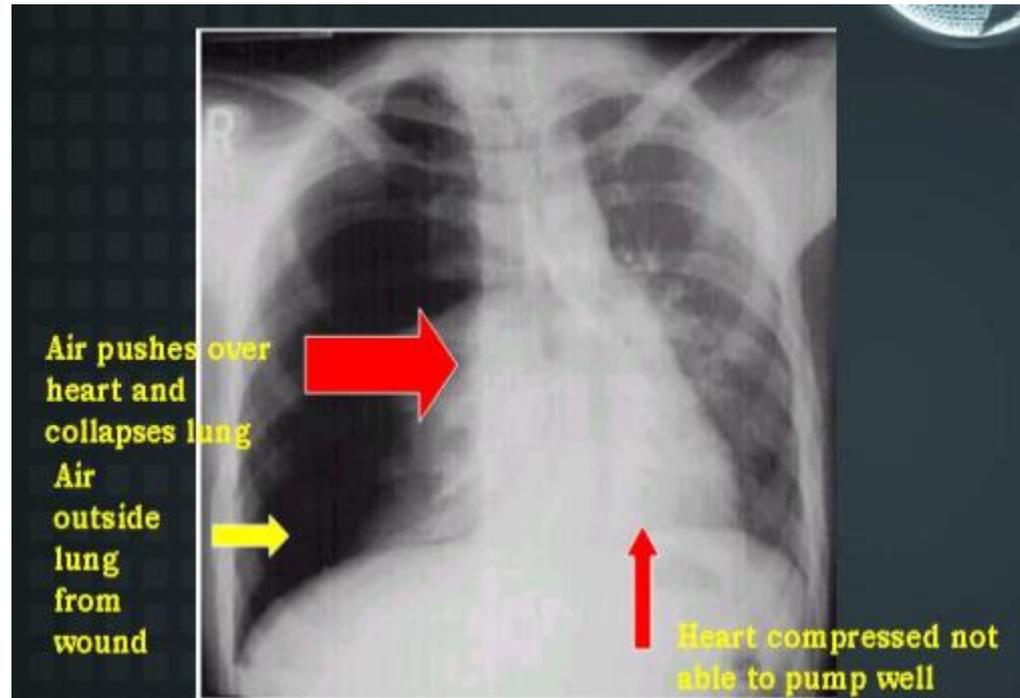
Guidelines for Indirect Threat Care: Respirations

- Proactive needle decompression for any patient with thoracic injury and respiratory distress
 - Difficult to monitor patient effectively
 - Raises likelihood of developing undetected tension pneumothorax
- Any patient with thoracic injury and respiratory distress needs ALS provider to decompress chest

Tension Pneumothorax



**Self-sealing
penetrating wound
to chest with lung
damage**



Tension Pneumothorax

- Needle Decompression recommendations
 - Research in military population shows need for 14ga 3.25 inch needle to reach pleural space
 - Abstract on civilian population chest wall thickness pending from GW Trauma Center
 - No need for flutter valve due to airflow resistance through catheter
 - To leave the catheter or to not the leave the catheter???

Indirect Threat Care: MARCH-E

- Massive hemorrhage
- Airway
- Respirations and Breathing
- **Circulation**
- Head and Hypothermia
- Everything else

Guidelines for Indirect Threat Care: Circulation

Intravenous (IV) access:

- Not all casualties need IVs!!
 - IV fluids NOT required for minor injuries
 - IV fluids and supplies are limited – save them for the casualties that really need them
 - IVs take time and distract from other care required
- Single 18ga catheter (IV/IO) is all that is needed
 - Easy to start and provides good flow rates

Guidelines for Indirect Threat Care: Circulation

- Goals of Fluid Resuscitation
 - Improved state of consciousness (no TBI)
 - Palpable radial pulse (roughly sys 80mmHg)
 - Avoiding over resuscitation of torso wounds
 - Can make internal hemorrhage worse (“pop the clot”)
- Hespan vs NS vs LR

Guidelines for Indirect Threat Care: Circulation

- Normotensive/hypotensive resuscitation
 - In uncontrolled torso hemorrhage
- Early blood products
 - 1:1 ratio
- Tranexamic Acid
- No Cardiopulmonary Resuscitation
 - Bilateral needle decompression

Indirect Threat Care: MARCH-E

- Massive hemorrhage
- Airway
- Respirations and Breathing
- Circulation
- **Head and Hypothermia**
- Everything else

Guidelines for Indirect Threat Care: Head and Hypothermia

- TBI Resuscitation
 - Resuscitate to maintain a palpable radial pulse
 - Hypotension greatly increases TBI mortality
 - Must give adequate IV fluids to maintain blood flow to brain

Guidelines for Indirect Threat Care: Head and Hypothermia

- Even small decrease in body temp can interfere with clotting and increase risk of death
 - Massive increase in mortality (100% if under 89.6F)
- Casualties in shock cannot generate body heat effectively
- Hypothermia is easier to prevent than to treat

Guidelines for Indirect Threat Care: Head and Hypothermia

- Best 'burrito' wrap
 - Vapor barrier
 - Insulating layer
 - Reflective heat shield
- Commercial options
 - HPMK
 - Blizzard Blanket
 - APLS



Indirect Threat Care: MARCH-E

- Massive hemorrhage
- Airway
- Respirations and Breathing
- Circulation
- Head and Hypothermia
- **Everything else**

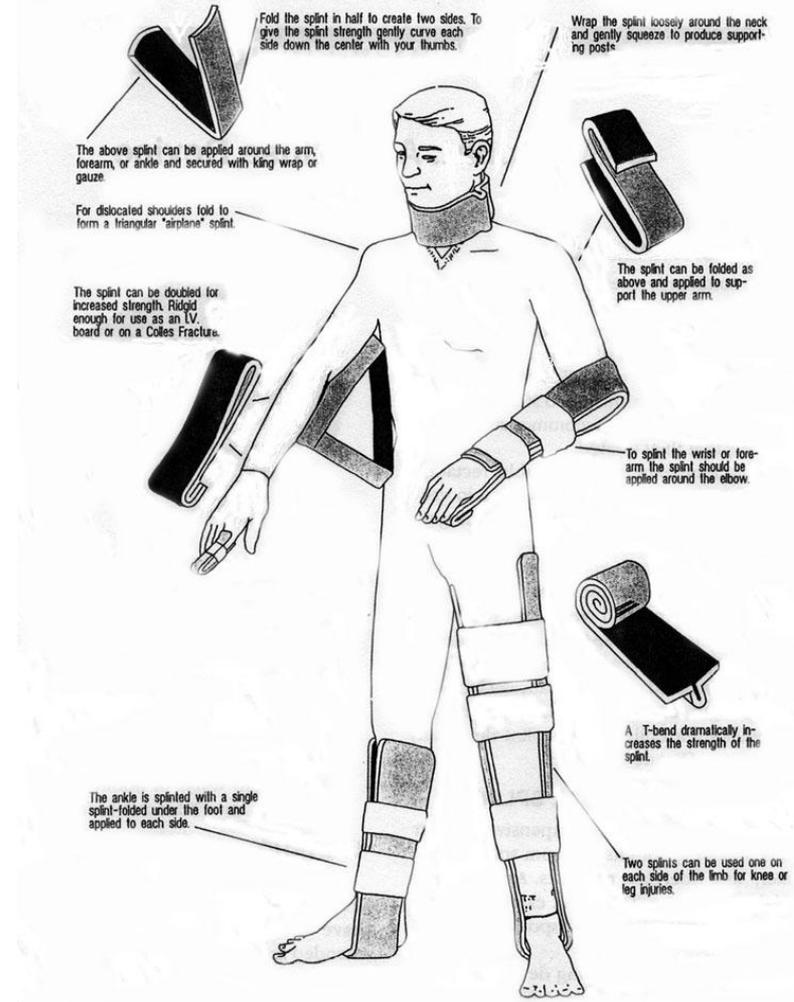
Guidelines for Indirect Threat Care: Everything Else

- Eye Injuries after blast:
 - Up to 10% will have significant eye injuries
 - May have minimal discomfort initially



Guidelines for Indirect Threat Care: Everything Else

- SAM splints
- Air splints
- Box splints
- Field expedient
 - Shirt sleeves/safety pin
 - Boards
 - Tree limbs



Guidelines for Indirect Threat Care: Everything Else

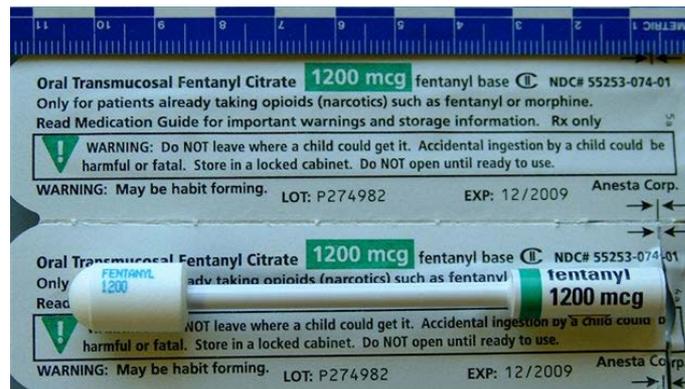
Provide *analgesia as necessary*:

- Mild-to-Moderate pain
 - Consider oral non-narcotic oral medications such as Tylenol or Mobic
 - Avoid NSAIDs – interfere with platelets and clotting
 - New IV form of Tylenol available

Guidelines for Indirect Threat Care: Everything Else

Provide *analgesia as necessary*:

- Severe pain and/or unable to continue mission:
 - Consider use of narcotic medications (hydrocodone, oxycodone, transmucosal fentanyl citrate, etc.) and/or ketamine (at analgesic doses) for moderate to severe pain



Guidelines for Indirect Threat Care: Everything Else

Antibiotics:

- Consider initiating antibiotic administration for casualties with open wounds and penetrating eye injury when evacuation to definitive care is significantly delayed or infeasible.
- This is generally determined in the mission planning phase and requires medical oversight.

Guidelines for Indirect Threat Care: Everything Else

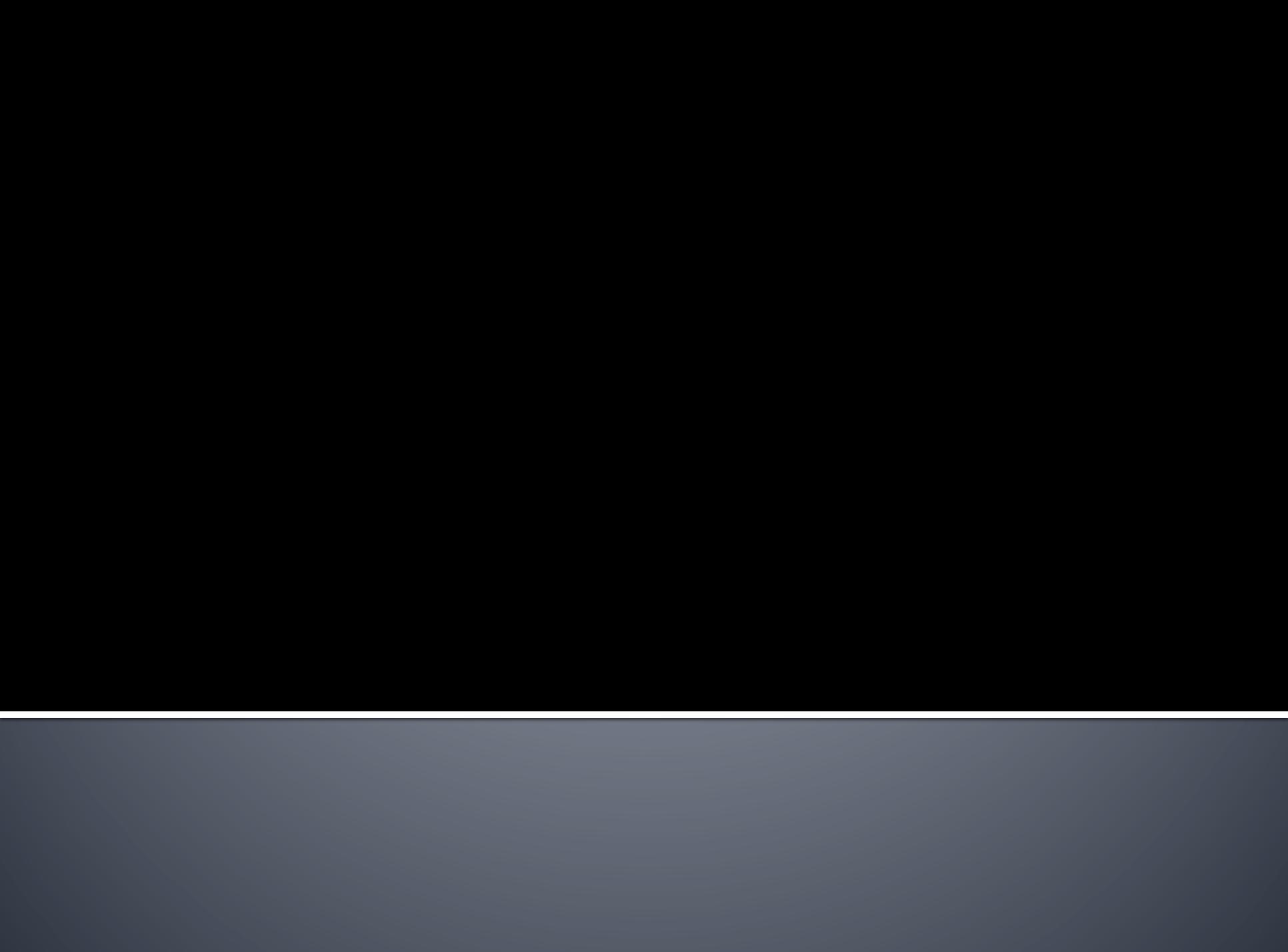
Burns:

- Patients with signs of smoke inhalation plus:
 - Significant symptoms of carbon monoxide toxicity should be treated with high flow oxygen if feasible
 - Significant symptoms of cyanide toxicity should be considered candidates for cyanide antidote treatment



Guidelines for Indirect Threat Care: Everything Else

- CPR not indicated
 - Virtually no survivability of field arrest from penetrating trauma
 - CPR performers prolongs rescuer time in a dangerous environment
 - Care to survivable patients gets delayed and casualty stays dead
 - Needle decompression prior to cessation



Guidelines for EVACUATION Care

- Care provided when there is no external threat
 - Is dynamic and NOT geographic
- More consistent with conventional pre-hospital care WITH an emphasis on those field conditions that increase mortality
- Guidelines recommendations may be continued on through continuum of trauma care

Guidelines for EVACUATION Care

- Implemented when:
 - Evacuation is delayed
 - Multiple patients waiting evacuation
 - Prolonged evacuation
 - Atypical evacuation personnel or platform





Guidelines for EVACUATION Care

- Guidelines are largely the same in EVAC as for Indirect Threat Care
 - Some differences that reflect the additional medical equipment and personnel that may be present
 - Emphasis on mitigation of conditions with known morbidity/mortality effect

Guidelines for EVACUATION Care

- Reassess all interventions applied in previous phases of care
- Utilize additional resources to maximize advanced care
 - The Evacuation Care phase allows for additional medical personnel and equipment to be used
- If multiple wounded, perform primary triage according to local protocols
 - Triage for both priority of evac AND destination

Guidelines for EVACUATION Care

- Utilize additional resources to maximize care and address preventable mortality
 - RSI / intubation/ chest tubes
 - Advanced monitoring
 - Advanced hemostasis
 - Blood products and damage control resuscitation
 - Immobilization
 - Continued hypothermia management
 - Advanced pain control options



Guidelines for EVACUATION Care

- Prevent hypothermia
- Emphasize expeditious evacuation
 - Casualties with significant injuries will need to be evacuated as soon as feasible
- Keep efficient record of medical interventions
- Emphasize communication, especially between tactical and non tactical EMS teams.

Conclusions: TECC

Tactical Emergency Casualty Care

- The goal of TECC is to identify and treat those casualties with ***preventable*** causes of death and keep them alive long enough to reach definitive care
 - If they don't arrive alive, there is nothing that the trauma surgeons can do for them

Tactical Emergency Casualty Care

- Evidence and best practice based Prehospital care Principles and Guidelines for use by all levels of providers
- Is a Starting point and an on-going process
 - Implementation will vary across disciplines and jurisdictions
- Value Added for daily trauma management

Questions???

“The fate of the injured often lies in the hands of the one who provides the first care to the casualty”

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