Tactical Combat Casualty Care for Medical Personnel
August 2017

(Based on TCCC-MP Guidelines 170131)

TCCC Scenarios

Tactical Casualty Scenarios

- If the basic TCCC combat trauma management plan doesn't work for the specific tactical situation, then for combat medics, corpsmen, and PJs – **it doesn't work.**
- *There are no rigid guidelines for combat tactics* – THINK ON YOUR FEET.
- Scenario-based planning is critical for success in TCCC
- Examples to follow:

SEAL Casualty - Afghanistan

- August 2002
- Somewhere in Afghanistan
- SEAL element on direct action mission
- Story of the casualty as described by the first responder – NOT a corpsman

SEAL Casualty - Afghanistan

“There were four people in my team, two had been shot. Myself and the other uninjured teammate low crawled to the downed men. The man I came to was lying on his back, conscious, with his left leg pinned awkwardly beneath him. He was alert and oriented to person, place, time, and event. At that point I radioed C2 (mission control) to notify them of the downed man.”

SEAL Casualty - Afghanistan

"Upon closer inspection, his knee was as big as a basketball and his femur had broken. The patient was in extreme pain and did not allow me to do a sweep of his injured leg. He would literally shove me or grab me whenever I touched his leg or wounds. I needed to find the entrance and exit wound and stop any possible arterial bleeding."

SEAL Casualty - Afghanistan

"But there was zero illumination and he was lying in a wet irrigation ditch. So I couldn't see blood and I couldn't feel for blood."

SEAL Casualty - Afghanistan

"We were also in danger because our position was in an open field (where the firefight had been) and I had to provide security for him and myself. So, I couldn't afford to turn on any kind of light to examine his wounds. I told him to point to where he felt the pain. He had to sort through his pains."

SEAL Casualty - Afghanistan

"He had extreme pain in his knee and where his femur had been shattered as well as a hematoma at the site of the entrance wound (interior and upper left thigh). Finally, he pointed to his exit wound (anterior and upper left thigh). Again, I had no way of telling how much blood he had lost. But I did know that he was nonambulatory."

SEAL Casualty - Afghanistan

"So I called C2 again. I gave him the disposition of the patient as well as a request for casevac, a Corpsman, and additional personnel to secure my position and assist in moving the patient to the helicopter. I thought about moving the two of us to some concealment 25 meters away, but we were both really low in a shallow irrigation ditch. I felt safer there than trying to drag or carry a screaming man to concealment."

SEAL Casualty - Afghanistan

"Between providing security and spending a lot of time on the radio I didn't get to treat the patient as much as I wanted to. I had given him a Kerlix bandage to hold against his exit wound. When he frantically told me that he was feeling a lot of blood, I went back to trying to treat him. I couldn't elevate his leg. To move it would mean he'd scream in pain, which wasn't tactical."

SEAL Casualty - Afghanistan

"There was just no way he would allow me to apply a pressure dressing to the exit wound even if I could locate it and pack it with Kerlix. So, I decided to put a tourniquet on him."

SEAL Casualty - Afghanistan

“His wounds were just low enough on his leg to get the tourniquet an inch or so above the site. I had a cravat and a wooden dowel with 550 cord (parachute cord) attached to it to use as a tourniquet. I told him to expect a lot of pain as I would be tightening the cravat down.“

SEAL Casualty - Afghanistan

"At this point he feared for his life so he agreed. Once I got it tightened I had trouble securing it. The 550 cord was hard to get underneath the tightened cravat."

SEAL Casualty - Afghanistan

"After over 5 minutes, the Corpsman arrived along with a CASEVAC bird and a security force. Moving the patient was very hard. Four of us struggled to move him and his gear 25 meters to the bird. The patient was over 200 pounds alone and we were moving over very uneven terrain."

SEAL Casualty - Afghanistan

"We wanted to do a three-man carry with two men under his arms and one under his legs. But again, his leg was flopping around at the thigh and couldn't be used to lift him."

SEAL Casualty - Afghanistan

“The bird, (a Task Force 160 MH-60) had a 50-cal sniper rifle strapped down, which made it hard for us to get him in. It took us minutes to get him 25 meters into the bird. The Corpsman went with my patient as well as the other downed man in my team and I went back to the op.”

Scenario Discussions – Suggested Format

- Break up into groups of six
- Present the background for the scenario on the screen.
- The Instructor will lead the group's discussion through to the end of the scenario.
- Instructor should have a printout of the speaker notes to lead the session.
- 10 minutes per scenario
- Stop after 10 minutes and present next scenario on screen

Urban Warfare Scenario

Real-World Scenario

- High-threat urban environment
- 16-man Ranger team
- 70-foot fast rope insertion for building assault
- One man misses rope and falls
- Unconscious on the ground
- Bleeding from mouth and ears
- Unit taking sporadic fire from all directions from hostile crowds

The Battle of Mogadishu

- Somalia – Oct 1993
- US casualties 18 dead, 73 wounded
- Estimated Somali casualties 350 dead, 500 wounded
- Battle 15 hours in length

Mogadishu Complicating Factors

- Helo CASEVAC not possible because of crowds, narrow streets and RPGs
- Vehicle CASEVAC not possible initially because of ambushes, roadblocks, and RPGs
- Gunfire support problems
  - Somali crowds included non-combatants
  - Somalis able to take cover in buildings
  - RPG threat to helo fire-support gunships

Care Under Fire

- Return fire?
- Move patient to cover right away or wait for long board?
- How should he be moved?
- Intubation?
- IV fluids?
- Urgency for evacuation?

Mogadishu Scenario 2
Helo Hit by RPG Round

Mogadishu Scenario 2
Helo Hit by RPG Round

- Hostile and well-armed (AK-47s, RPGs) crowds in an urban environment.
- Building assault to capture members of a hostile clan.
- Blackhawk helicopter trying to cover helo crash site.
- Flying at an altitude of 300 feet.

Mogadishu Scenario 2
Helo Hit by RPG Round

- Left door gunner with 6-barrel M-134 minigun (4000 rpm)
- Hit in left hand by ground fire
- Another crew member takes over mini-gun
- RPG round impacts under right door gunner

Mogadishu Scenario 2
Helo Hit by RPG Round

- Windshields are all blown out
- Smoke is filling the aircraft
- Right minigun is not functioning
- Left minigun is without a gunner and is firing uncontrolled
- Pilot:
  - Transiently unconscious - now becoming alert

Mogadishu Scenario 2
Helo Hit by RPG Round

- Co-pilot
  - Unconscious - lying forward on the helo's controls
- Crew Member
  - Right leg blown off above the knee
  - Lying in puddle of his own blood
  - Pulsatile bleeding from the stump

Mogadishu Scenario 2
Helo Hit by RPG Round

- YOU are the person providing care in the helo.
- What do you do first?

Mogadishu Scenario 2
Helo Hit by RPG Round

- Who gets treated first?
  - Take care of the pilot first.
    - You want to get him back to flying the aircraft.
    - The most important thing about medical care in an aircraft is to keep the aircraft in the air.
  - Stimulate the pilot by shaking him or performing a sternal rub.

Mogadishu Scenario 2
Helo Hit by RPG Round

- Who's next?
  - The casualty with the femoral bleeder is next.
  - He needs a tourniquet.
  - He should be able to provide self-care if he's conscious.
  - The individual in Mogadishu treated himself.
    - He used an improvised tourniquet.
    - He survived.

Mogadishu Scenario 2
Helo Hit by RPG Round

- What can you do for the unconscious co-pilot?
  - First, get him off the controls.
  - Get him into a supine position.
  - Establish an airway with an NPA.
  - Check for external bleeding.
    - You see none.

Mogadishu Scenario 2
Helo Hit by RPG Round

- Next action?
  - Check the casualty with the hand injury.
  - Stop any severe bleeding.

Mogadishu Scenario 2
Helo Hit by RPG Round

- What else?
  - Radio for help.
  - Prepare for impact if a crash landing is anticipated.
  - After impact – secure weapons and ordnance.

Mogadishu Scenario 2
Helo Hit by RPG Round

End of Scenario

Military Operations in Urban Terrain

MOUT Scenario 1

- A U.S. ground element is moving on a high-value target in an urban environment.
- The first two men in a 8-man patrol are shot by an individual with an automatic weapon while moving down a hallway in a building.
- The attacker follows this burst with a grenade.

MOUT Scenario 1

- One casualty is shot in the abdomen but conscious.
- The second casualty is shot in the shoulder with severe external bleeding.
- A third person is unconscious.
- The attacker withdraws around a corner.

MOUT Scenario 1

- YOU are the person providing medical care.

- What do you do?

MOUT Scenario 1

- What are the tactical considerations here?
  - How many other hostiles in are in house?
  - Should everyone pursue the hostile(s) and leave care of the casualties for later?
  - Should the whole unit withdraw to care for casualties?
  - Should the unit set security and treat casualties there?
  - Should the unit split up and have some pursue and others treat?
    - Splitting the force is most often chosen by previous groups as the best option.
  - So, you are left with the casualties to proceed with care as per Tactical Field Care Guidelines.

MOUT Scenario 1

- Who gets treated first?
  - The casualty with the shoulder injury and massive external bleeding.
  - He's the most important to treat immediately – he could bleed to death quickly.
- What do you do for him?
  - Stop the bleeding with XStat.
    - The wound has a deep, narrow tract.
    - XStat doesn't require 3 minutes of manual pressure.
  - Bleeding is controlled
  - Casualty is alert.

MOUT Scenario 1

- Casualty with shoulder injury: what next?
- Airway Management?
  - He's conscious and breathing OK.
- Respirations?
  - He's breathing OK. O2 sat is 95%.
  - Beware of the risk for tension pneumothorax.
- IV?
  - Not yet.
    - He's not in shock at the moment.
    - You have controlled the bleeding.

MOUT Scenario 1

- Casualty with shoulder injury: what else?
- Combat Wound Medication Pack?
  - Yes.
- Pain is becoming increasingly severe.
- Should you give fentanyl?
  - Careful – he may go into shock later due to bleeding from the shoulder wound.
    - **Ketamine is a better choice here.**

MOUT Scenario 1

- Who's next?
- Unconscious Casualty
- He has no penetrating head trauma.
- What do you do first?
  - Check for massive hemorrhage
    - You find major bleeding in back of one thigh from a shrapnel wound. Treatment?
    - Apply a limb tourniquet.

MOUT Scenario 1

- Unconscious casualty: What else?
- Airway Management
  - Chin-lift/jaw thrust
  - NP airway
- Next?
  - Check pulse and respirations
    - You find a rapid, thready pulse and rapid respirations.
  - You attach a pulse oximeter
    - O2 sat is 95%

MOUT Scenario 1

- Unconscious casualty: Next?
  - Circulation
    - Pelvic binder?
      - Maybe when you have taken care of the last casualty.
      - Pelvic fx is unusual following isolated hand grenade blasts.
    - IV
    - TXA
    - Whole blood
  - Hypothermia prevention

MOUT Scenario 1

- Unconscious casualty: Next?
- Analgesia?
  - None required since he's unconscious.
- Antibiotics?
  - Yes
  - IV Ertapenem
- Have someone else check for other injuries:
  - There are none.

MOUT Scenario 1

- Conscious casualty with abdominal GSW is last. What do you do?
- Check for massive hemorrhage
  - Minimal oozing from abdominal GSW
  - No exit wound
- Airway Management?
  - He's conscious and breathing OK.
- His radial pulse is strong.

MOUT Scenario 1

- Conscious casualty with abdominal GSW: Next?
- Does he need IV access?
  - Yes – he's at significant risk for developing hemorrhagic shock.
- TXA?
  - Yes. He's at significant risk of shock due to uncontrolled hemorrhage secondary to abdominal GSW.

MOUT Scenario 1

- Conscious casualty with abdominal GSW: what else?
- Fluid resuscitation?
  - No, not at present – he's not in shock.
  - Keep the saline lock.
    - He may go into shock later.
- Analgesia?
  - He is in moderate pain.
  - No opioids. Use IV ketamine.
    - Best for a casualty at risk of shock.

MOUT Scenario 1

- Conscious casualty with abdominal GSW: what else?
- Antibiotics?
  - Yes- IV ertapenem.
- Hypothermia prevention?
  - You bet.
  - Hypothermia would increase his risk of shock.

MOUT Scenario 1

End of Scenario

MOUT Scenario 2

MOUT Scenario 2

<u>SCENARIO HISTORY</u>: While on patrol in a city in Iraq, your platoon receives effective direct small arms fire. A unit member falls to the ground, holding his right thigh. The platoon, including you, reacts to the ongoing contact by returning fire.

MOUT Scenario 2

- You can see that the casualty is bleeding heavily from his thigh wound.
- YOU are the person providing medical care for the unit.
- What do you do?

MOUT Scenario 2

- What phase are you in?
  - Care Under Fire
- What should you do for the casualty?
  - Yell at him to get under cover if he can.
  - Tell him to put a tourniquet “high and tight” on his wounded leg.
- If he can’t control the bleeding, you may have to help him.
  - If you do, consider a movement plan, suppression of fire, etc.

MOUT Scenario 2

- Should he take his Combat Wound Medication Pack meds now?
  - No. You are still in Care Under Fire.
  - Your priorities are to get to cover and return fire if possible.

MOUT Scenario 2

- Scenario continues:
- The casualty has moved behind a vehicle.
- All hostiles are eliminated or have retreated.
- The platoon establishes a secure perimeter.
- The platoon leader tells you that you have only one casualty, and that you have a few minutes to work on him before the platoon will have to move.

MOUT Scenario 2

- What phase are you in now?
  - Tactical Field Care.
- Your casualty is alert, in moderate pain, and clutching his right leg. There is blood all over his leg and hands, and a tourniquet is in place on his right thigh.
- What is your first concern?
  - Is life-threatening bleeding controlled?

MOUT Scenario 2

- What do you do to assure hemorrhage control?
  - Expose the wound.
- Blood is oozing from the wound. What next?
  - Apply another tourniquet 2-3 inches above the bleeding site and tighten it.
  - Ensure that bleeding has stopped and distal pulse has been eliminated.
  - Loosen the high-and-tight tourniquet and reassess bleeding control and distal pulse elimination.
  - Slide the tourniquet that was high-and-tight down to just proximal to the second tourniquet.
    - If you need to later, you can further tighten the second tourniquet and tighten the tourniquet you just moved to control bleeding and eliminate distal pulses.

MOUT Scenario 2

- What's next?
  - You search quickly for any other life-threatening bleeding, and find none.
- Next concern?
  - Airway management
    - He is conscious and talking – his airway is OK.

MOUT Scenario 2

- Next?
  - Breathing.
    - Breathing is rapid from pain and the situation, but not labored.
- What next?
  - Check for shock.
    - Mental status is normal. Radial pulse is strong.

MOUT Scenario 2

- Should you start a saline lock?
  - No, but you'll watch for any signs of shock.
- Does the casualty need IV fluids at this point?
  - No – he's not in shock now.
  - Conserve limited IV fluids until they are really needed.

MOUT Scenario 2

- Next?
  - Prevent hypothermia?
    - Ready Heat Blanket – not needed now.
    - Heat Reflective Shell – not needed now.
- Next?
  - Should you disarm the casualty and take his comms gear?
  - Yes. He is already distracted by the pain and you anticipate giving him ketamine or narcotics soon.

MOUT Scenario 2

- Next?
- Monitoring
  - Pulse oximetry shows O2 sat is 96%
- Analgesia?
  - OTFC

MOUT Scenario 2

- Next?
  - Inspect and dress his leg wound.
  - Reassess for hemorrhage control.
- Next?
  - Assess for other wounds.
    - You discover tenderness over his anterior lower right chest.
    - You check his body armor and find corresponding damage compatible with a bullet strike.

MOUT Scenario 2

- Scenario continues:
- Your platoon leader tells you the unit will move in 10 minutes to a CASEVAC location.
  - No enemy contact is expected.
  - CASEVAC should take about 45-60 minutes.
- Should you try to remove the tourniquet and replace it with Combat Gauze?
  - No – less than two hours tourniquet time is anticipated. Leave it on.

MOUT Scenario 2

- What else do you want to accomplish before TACEVAC?
  - Reassure the casualty
  - Document care

MOUT Scenario 2

- Scenario continues:
  - You have now moved to the CASEVAC site. The platoon establishes security.
  - You check the patient and notice that he is confused and breathing rapidly.
  - You check his thigh wound and find that the tourniquet just above the wound has become loose and the dressing is soaked with blood.

MOUT Scenario 2

- The tourniquet is loose and the wound is bleeding again. What do you do?
  - Re-tighten the tourniquet nearest the wound.
  - Tighten the proximal tourniquet, too.
  - You remove the bloody dressing to re-assess hemorrhage control:
    - Bleeding is now controlled.
    - Distal pulses are not present.
  - You re-dress the wound.

MOUT Scenario 2

- Scenario continues:
- Casualty becomes unconscious from shock. What next?
  - Establish IV/IO access if not done before.
  - Immediately administer 1 gm TXA in 100cc NS over 10 minutes.
  - Begin infusion of whole blood.

MOUT Scenario 2

- What next?
  - Nasopharyngeal airway - casualty is unconscious
  - Recovery position
  - Continue resuscitation
  - Prepare for evacuation and transport ASAP

MOUT Scenario 2

End of Scenario

MOUT Scenario 3

MOUT Scenario 3

SCENARIO HISTORY: While on patrol in the city of Mosul, an infantry platoon comes under small arms fire. The point man is hit and falls to the ground. The platoon reacts to the contact, rapidly eliminating the ambushing hostiles. There are no other casualties. The platoon leader tells you take care of the casualty while the others establish a secure perimeter.

MOUT Scenario 3

- You move to the casualty, and quickly assess for life-threatening conditions:
  - GSW
    - Entrance at right upper back
    - Exit in right armpit
  - Heavy, pulsatile bleeding from the exit wound
    - Breathing OK, though a little fast
  - No other wounds
- YOU are the person providing medical care.
- What do you do?

MOUT Scenario 3

- It has been about 4 minutes since the casualty was wounded. What is your immediate concern?
  - Life threatening hemorrhage from the wound in the armpit.
- What phase of care are you in?
  - TFC

MOUT Scenario 3

- As the first responder caring for this casualty, what do you do next?
  - Expose the wound.
  - Pack the wound with XStat.
  - Hold direct pressure for a minimum of 3 minutes.

MOUT Scenario 3

- What do you do while holding pressure?
  - Talk to the casualty
    - Checks both airway and mental status
- External bleeding appears controlled but the casualty is drowsy.

MOUT Scenario 3

- What next?
  - Apply a pressure dressing over the XStat.
  - Check for other sources of bleeding.
    - None found.
  - Check the left radial pulse.
    - It is not palpable.

MOUT Scenario 3

- What next?
  - Check breathing.
    - Slightly fast but not obviously labored.
    - Breath sounds are absent on the right.
- Should you treat for a tension pneumothorax here?
  - Yes – the casualty has a chest wound, rapid breathing, absent breath sounds, and shock.

MOUT Scenario 3

- You perform needle decompression of the right chest.
  - **At the 5th intercostal space at the anterior axillary line with the patient in supine position**
    - There is no hiss of escaping air.
    - You see no improvement.
  - You decompress **at the 2nd intercostal space at the mid-clavicular line.**
    - There is no hiss of escaping air.
    - You see no improvement.

MOUT Scenario 3

- The casualty may be in hemorrhagic shock.
- What next?
  - Start an IV.
- What do you give first?
  - TXA 1gm over 10 minutes
- What next?
  - You start the first unit of dried plasma. (Because this is the only blood component you have been trained to infuse and are authorized to carry.)

MOUT Scenario 3

- Scenario continues:
  - Ten minutes pass. Plasma is going in.
  - External bleeding is controlled by the XStat.
  - Casualty is now unconscious and does not respond to deep pain.
  - There is no reading for O2 sat displayed on the pulse ox.
  - Carotid pulse is not palpable.
  - His breathing has stopped.
  - Arrival of MEDEVAC helicopter is expected to take at least an hour.

MOUT Scenario 3

- What next?
  - You perform bilateral needle decompression of possible tension pneumothorax.
  - You do this and there is no improvement.
  - You recheck the airway to make sure it's clear.
  - A second person confirms no pulse or breathing.
- What next?
  - CPR?
    - No.

MOUT Scenario 3

- Why not perform CPR?
  - It won't help!
  - Individuals in traumatic cardiac arrest have little to no chance of surviving more than 10 minutes without surgical care.

MOUT Scenario 3

- You inform your platoon leader that the casualty has died.
  - The cause of death is probably internal hemorrhage from the GSW.
- The decision to be made now is how and when to transport your teammate's body off the battlefield.
- Document the injuries and the care rendered.

MOUT Scenario 3

End of Scenario

MOUT Scenario 4

MOUT Scenario 4

SCENARIO HISTORY: You are riding with a squad in the back of a cargo Humvee. When you stop at an intersection, a lone attacker fires an RPG at your vehicle. It is poorly aimed, and strikes the ground beside the Humvee. The vehicle sustains moderate damage and is not able to move. Everyone scrambles out of the vehicle. The last person out is complaining of chest pain and shortness of breath. You and the others are uninjured.

MOUT Scenario 4

- Security is set.
- There is no further hostile fire.
- YOU are the person providing medical care.
- What do you do?

MOUT Scenario 4

- What phase are you in?
  - Tactical Field Care
- You examine the casualty and find:
  - She is alert and talking normally, but in severe pain.
  - She has a shrapnel wound in her right lateral chest - no exit wound.
  - Entrance wound is a sucking chest wound.
  - Her right thumb is missing and the wound is oozing a little blood.
  - There is no major external bleeding.

MOUT Scenario 4

- What do you do first?
  - Cover the chest wound with a vented chest seal.
    - Apply the dressing at end-exhalation.
    - Have her breathe all the way out and put it on before she breathes in again.
- This makes the casualty more comfortable.
- Her O2 sat improves from 91% to 97%.

MOUT Scenario 4

- What next?
  - She's at risk for shock.
  - You start an IV and give 1 gm of TXA.
- Next?
  - Analgesia
  - Ketamine 50 mg IM immediately after starting the TXA infusion.
- What else?
  - You have someone else dress her thumb wound while you were giving the ketamine.

MOUT Scenario 4

- You are worried about internal bleeding from the chest wound. What are you going to do about it?
  - Monitor for changes in radial pulse strength and mental status.
- Casualty is alert and now breathing OK.
- Radial pulse is strong.
- O2 sat is 97%.

MOUT Scenario 4

- What next?
  - Look for other wounds.
    - You find none.
- What next?
  - Hypothermia prevention.

MOUT Scenario 4

- Your casualty says that her pain is still very severe. What else do you want to do for her?
  - Can you give her a fentanyl lozenge?
    - No – she's at risk for hemorrhagic shock and increasing respiratory distress.
    - She's alert with good O2 sat and breathing well.
    - She's not in shock at this point, BUT – she has a chest injury and probably has internal bleeding.
    - IV ketamine is a good next option since you have an IV and you have finished the TXA infusion.
    - Monitor oxygen saturation and breathing carefully.

MOUT Scenario 4

- What's next?
  - Antibiotics.
  - Have her take the moxifloxacin in her CWMP.
- Your casualty is stable. What steps do you take now?
  - Communicate her status to your squad leader.
  - Begin TACEVAC preparations.
  - Document care on the TCCC Casualty Card.

MOUT Scenario 4

- Scenario continues:
  - You are 8 miles from a CSH.
    - A helicopter will not be available for an hour.
    - By ground vehicle, the trip will take 35 minutes.
  - A mounted patrol is dispatched to take your casualty to the CSH.
  - It has now been about 40 minutes since the RPG attack.
  - You are in route to the CSH.

MOUT Scenario 4

- The casualty tells you she's having increasing trouble breathing. What do you do?
  - Assess her airway. It's clear.
  - Breathing is rapid and labored.
  - The vented chest seal is secure.
  - Her O2 sat has dropped to 80%.

MOUT Scenario 4

- What's the presumptive diagnosis?
  - Tension pneumothorax.
- What are you going to do about it?
  - You lift one side of the chest seal for a few seconds.
  - There is a rush of air from the wound confirming the tension pneumothorax.

MOUT Scenario 4

- The casualty's respiratory distress is relieved.
  - O2 sat goes up to 94%.
  - Good job!
  - Consider replacing the chest seal, since the vent on the first one apparently failed to do it's job.
  - Continue to monitor.
  - If distress or hypoxia recurs, burp the chest seal again.
- Continue TACEVAC preparations.

MOUT Scenario 4

End of Scenario


Questions?

Tactical Combat Casualty Care

- **Casualty scenarios on the battlefield usually entail both medical and tactical problems.**
- **Emergency actions must address both.**
- **Medical personnel should be involved in mission planning.**

Scenario-Based Planning

- **The TCCC guidelines for combat trauma scenarios are advisory rather than directive in nature.**
- **Rarely does an actual tactical situation exactly reflect the conditions described in planning scenarios.**
- **Unit medics/corpsmen/PJs will typically need to modify the medical care plan to optimize it for the real scenario.**

The 3 Objectives of TCCC

- **Treat the casualty**
- **Prevent additional casualties**
- **Complete the mission**

Tactical Combat Casualty Care for Medical Personnel
August 2017

(Based on TCCC-MP Guidelines 170131)

Direct from the Battlefield:
Tactical Combat Casualty Care
Performance Improvement Items

Sources of TCCC Opportunities to Improve:

- **Reports from Joint Trauma System (JTS) weekly Trauma Telecons – every Thursday morning**
  - **Worldwide telecon to discuss every serious casualty admitted to a Role 3 hospital from that week**
- **Published medical reports**
- **Armed Forces Medical Examiner's System**
- **Theater AARs**
- **Feedback from doctors, PAs, corpsmen, medics, and PJs**

The Forgotten Tourniquet

The Forgotten Tourniquet

- **There was an adverse outcome from a tourniquet that was left in place for approximately 8 hours.**
- **Be aggressive about putting tourniquets on in Care Under Fire for any life-threatening extremity hemorrhage <u>BUT</u>**
- **Reassess the casualty in Tactical Field Care – remove it if it is not needed unless the casualty is in shock.**
- **<u>Always</u> re-evaluate tourniquets at two hours and remove if possible.**

Tourniquet Mistakes to Avoid!

- Not using a tourniquet when you should
- Using a tourniquet for minimal bleeding
- Leaving the TQ too high--if placed "high and tight" during Care Under Fire, move to just above the wound during TFC
- Not taking it off when indicated during TFC
- Taking TQ off when the casualty is in shock or has only a short transport time to the hospital
- Not making it tight enough – the tourniquet should both stop the bleeding and eliminate the distal pulse if the distal extremity is intact

Tourniquet Mistakes to Avoid!

- Not using a second tourniquet if needed
- Waiting too long to put the tourniquet on
- Periodically loosening the tourniquet to allow blood flow to the injured extremity
- Failing to reassess to make sure the bleeding is still stopped
- Not attempting to convert a tourniquet if it has been on for two hours.

Opioid Analgesics for Casualties in Shock

NO Opioid Analgesia for Casualties in Shock

- **Narcotics** (morphine and fentanyl) are **CONTRAINDICATED** for casualties who are in shock or who are likely to go into shock; these agents may worsen their shock and increase the risk of death
- Four casualties in two successive weekly telecons were noted to have received narcotics and were in shock during transport or on admission to the MTFs
- **Use ketamine for casualties who are in shock or at risk of going into shock but are still having significant pain**

JTS Case Report 2017

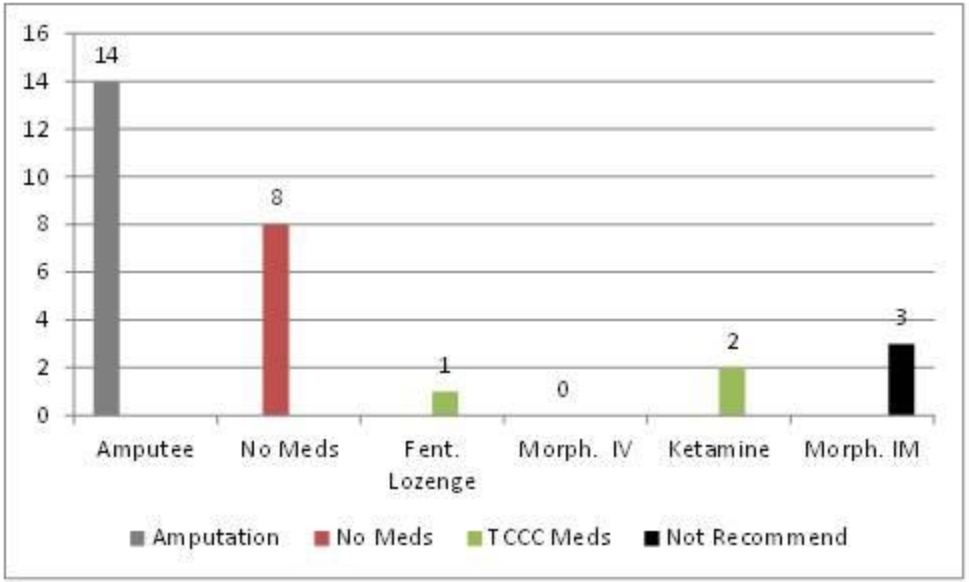
- Casualty injured in a dIED attack
- CPR in progress on arrival at forward surgical capability
- Multiple abdominal and pelvic injuries
  - Severe liver laceration (requiring packing)
  - Splenic laceration
  - Significant mesenteric bleeding
  - Left iliac vein injury
  - Pelvic fracture
  - Zone 1 REBOA placed with return of VS

JTS Case Report 2017

- **Re-operated at Role 3 hospital several times**
- **Stormy course but stabilized and was off pressor medications at time of transport**
- **Private transport to a NATO partner hospital**
- **On Precedex & ketamine at the Role 3, but changed to fentanyl and midazolam by the flight team**
- **Casualty became hypotensive and was treated with escalating dose Levophed drip**
- **Arrived at coalition partner hospital unstable**
- **Died shortly thereafter of multi-organ failure**

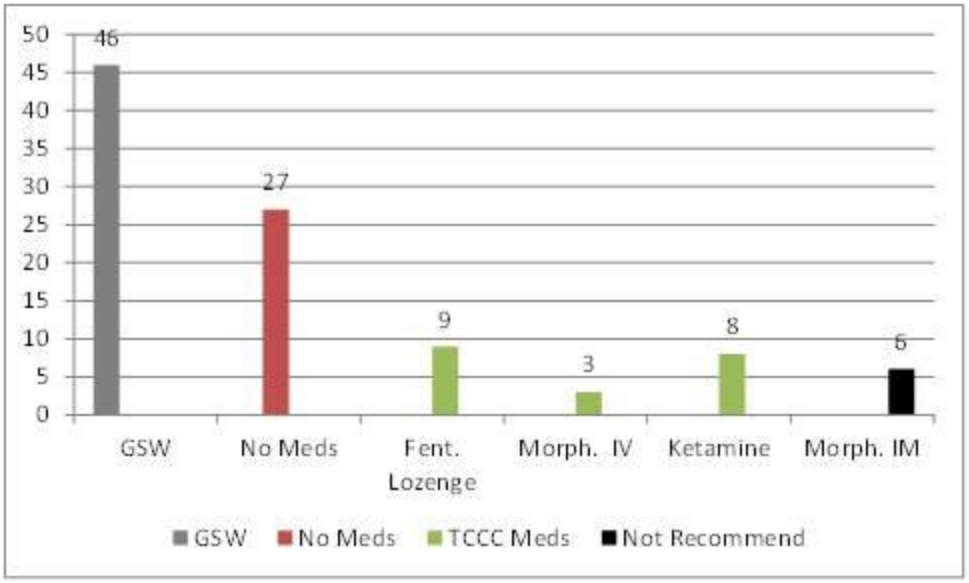
Untreated Pain on the Battlefield

Jul 2013- Feb 2014
N= 191 casualties
Prior to MEDEVAC



<u>Amputations</u>
57% no pain meds

- ***Slide courtesy of MAJ John Robinson***
- ***Data from JTS/JTTS TCCC AARs and PHTR***



<u>GSW</u>
59% no pain meds

**As of Dec 2013, 92% of line medics in USFOR-Afghanistan carry Morphine auto-injectors

Case Report

- **Male casualty with GSW to thigh**
- **Bleeding controlled by tourniquet**
- **In shock – alert but hypotensive**
- **Severe pain from tourniquet**
- **Repeated pleas to PA to remove the tourniquet**
- **PA did not want to use opioids because of the shock**
- **Perfect candidate for ketamine analgesia**
- **Ketamine not fielded at the time with this unit**
- **50 mg ketamine autoinjectors would help - but approval from the FDA is needed to use ketamine in that mode**

Opioid Analgesics Given in Combination with Benzodiazepines

Warning: Opioids and Benzos

- **Ketamine can safely be given after a fentanyl lozenge**
- **Some practitioners use benzodiazepine medications such as midazolam to avoid ketamine side effects <u>BUT</u>**
- **Midazolam may cause respiratory depression, especially when used with opioids**
- **<u>Avoid</u> giving midazolam to casualties who have previously gotten fentanyl lozenges or morphine**

Penetrating Eye Injuries

Penetrating Eye Trauma

- **Rigid eye shield for obvious or suspected eye wounds - often not being done – SHIELD AND SHIP!**
- **Not doing this may cause permanent loss of vision – use a shield for any injury in or around the eye.**
- **Eye shields are not always in IFAKs. You can use eye pro instead.**
- **IED + no eye pro + facial wounds = Suspected Eye Injury!**

Shield after injury

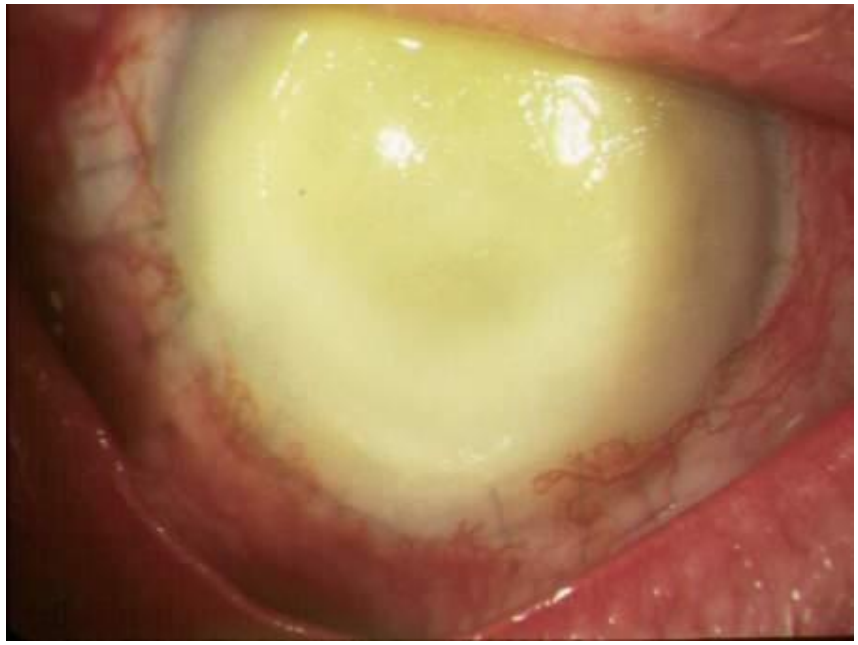
No shield after injury

Patched Open Globe

- **Shrapnel in right eye from IED**
- **Had rigid eye shield placed**
- **Reported as both pressure patched and as having a gauze pad placed under the eye shield without pressure**
- **Extruded uveal tissue (intraocular contents) noted at time of operative repair of globe**
- **Do not place gauze on injured eyes! COL Robb Mazzoli: Gauze can adhere to iris tissue and cause further extrusion when removed <u>even if no pressure is applied to eye.</u>**
- **At least two other known occurrences of patching open globe injuries**

Antibiotics after Eye Injuries

- 2010 casualty with endophthalmitis (blinding infection inside the eye)
- Reminder – shield and moxifloxacin in the field for penetrating eye injuries – use combat pill pack!
- Also –moxi, both topically and systemically, should be continued in MTFs
- Many antibiotics <u>do not penetrate well</u> into the eye



Tension Pneumothorax

The Missed Tension Pneumothorax

- One U.S. combat fatality in 2014 was found to have died with a tension pneumothorax
- NO evidence of attempted needle decompression
- Monitor anyone with torso trauma or polytrauma for respiratory distress – perform needle decompression when indicated
- ALWAYS do bilateral NDC for a casualty with torso trauma who loses vital signs on the battlefield – this may be lifesaving

Combat Gauze

External Hemorrhage – No Combat Gauze

- **Casualty with gunshot wound in the left infraclavicular area with external hemorrhage**
- **“Progressive deterioration”**
- **External hemorrhage noted to increase as casualty resuscitated in ED**
- **<u>No</u> record of Combat Gauze use**
- **All injuries noted to be extrapleural**
- **Lesson learned: see following slide**

Combat Gauze

It doesn't work if you don't use it.

Junctional Hemorrhage

Junctional Hemorrhage

- **A U.S. casualty in 2013 sustained a GSW to the inguinal area.**
- **The CASEVAC platform did not have junctional tourniquets aboard.**
- **The subsequent junctional hemorrhage was only partially controlled with Combat Gauze.**
- **Casualty went into hemorrhagic shock and had to be transfused.**

IED Blast Injury

- 3 of 5 casualties had complex blast injuries.
- All 3 had high traumatic LE amputations and reported difficulty with hemorrhage control despite tourniquet use.
- Combat Gauze was reportedly not used.
- All 3 would have been excellent candidates for a junctional tourniquet – none were fielded with this unit.
- All 3 casualties required massive transfusions upon arrival at the Role 2 MTF.

Junctional Tourniquets

Combat Ready Clamp

JETT

Sam Junctional Tourniquet

Junctional tourniquets: They don't work if your unit doesn't have them.

TCCC Training

Issues with Current TCCC Training

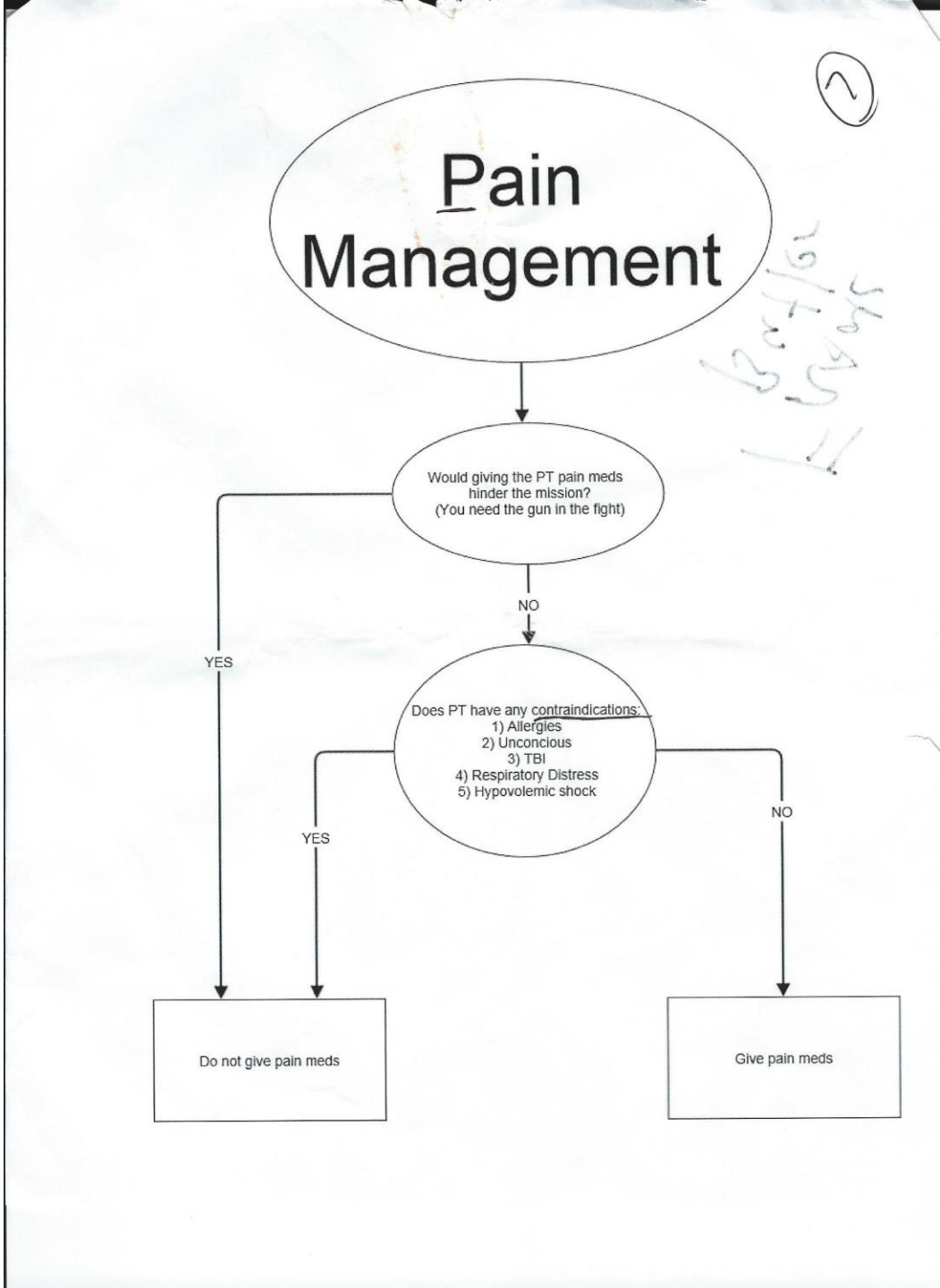
- There is significant variation among TCCC courses, both military and commercial.
- Some segments of the DoD have had no TCCC training.
- Some TCCC courses contain inappropriate training.

Problems with Non-Standard TCCC Courses

- **Incorrect messaging**
  - *Instructor drift*
    - *"Never take off a tourniquet in the field"*
- **Inappropriate training**
- **Vendor-supplied training is expensive**

Instructor Drift in a “TCCC” course, 2015

- TBI does not contrain-dicate ketamine.
- Shock does not contra-indicate ketamine.
- No one is likely to be allergic to both keta-mine and opioids.



Inappropriate Training

- “Shock labs”
- “Cognition labs”
- Insertion of intraosseous devices on course attendee volunteers
- Regional nerve blocks by non-medical personnel
- Central venous catheter placement by prehospital providers
- Arterial blood draws

NAEMT TCCC Courses:
Advantages

- JTS recommends that TCCC should be a credential-producing training program for the MHS.
- NAEMT TCCC courses and instructor courses follow the CoTCCC-developed/JTS-approved curriculum without deviation.
- NAEMT TCCC instructors undergo Quality Assurance evaluation.
- The recommended TCCC training provided through the NAEMT educational system costs much less than equivalent training purchased from for-profit TCCC vendors.

NAEMT TCCC Courses:
Advantages

- The NAEMT system issues and tracks certification for instructors and students.
  - Cards and registries
- The NAEMT system for establishing training sites is working very well for military commands using it.
- NAEMT TCCC courses do not include live tissue training with its associated expense and logistic burden.
- NAEMT TCCC courses are endorsed by the ACS-COT.
- Additional training such as trauma lanes, field exercises, and live tissue training could be added to supplement the basic TCCC curriculum as unit time and resources allow.

TCCC Training for ALL combatants:

Self and buddy aid should be part of the Warrior Culture in all combat units.

Eliminating Preventable Death on the Battlefield

- **Kotwal et al – Archives of Surgery 2011**
- **<u>All</u> Rangers and docs trained in TCCC**
- **<u>U.S. military</u> preventable deaths: <u>24%</u>**
- **<u>Ranger</u> preventable death incidence: <u>3%</u>**
- **Almost a 90% difference in preventable deaths**

TCCC in Canadian Forces
Savage et al: Can J Surg 2011

Conclusion

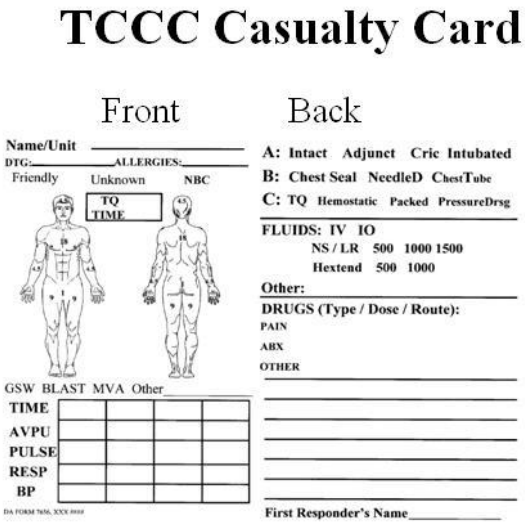
For the first time in decades, the CF has been involved in a war in which its members have participated in sustained combat operations and have suffered increasingly severe injuries. Despite this, the CF experienced the highest casualty survival rate in history. Though this success is multifactorial, the determination and resolve of CF leadership to develop and deliver comprehensive, multileveled TCCC packages to soldiers and medics is a significant reason for that and has unquestionably saved the lives of Canadian, Coalition and Afghan Security Forces. Further-

Train ALL Combatants in TCCC

- **Service medical departments are responsible for training combat medical personnel only.**
- **Line commanders must take the lead to have an effective TCCC training program for *all* combatants.**
- **The Ranger First Responder Course is the best model.**

Documentation of TCCC Care

TCCC Card – Fill It Out!


TCCC Casualty Card

Front

Name/Unit _____

DTG:_____ALLERGIES:_____

Friendly Unknown NBC

TQ TIME

GSW BLAST MVA Other_____

TIME				
AVPU				
PULSE				
RESP				
BP				

DA FORM 7656, XXX-XXXX

Back

A: Intact Adjunct Cric Intubated

B: Chest Seal NeedleD ChestTube

C: TQ Hemostatic Packed PressureDrsg

FLUIDS: IV IO

NS / LR 500 1000 1500

Hextend 500 1000

Other:

DRUGS (Type / Dose / Route):

PAIN

ABX

OTHER

First Responder's Name_____

- **You haven't finished taking care of your casualty until this is done.**
- **Mission Commanders – this is a leadership issue!**

New TCCC Card

TACTICAL COMBAT CASUALTY CARE (TCCC) CARD

BATTLE ROSTER #: _____

EVAC: ☐ Urgent ☐ Priority ☐ Routine

NAME (Last, First): _____ LAST 4: _____

GENDER: ☐ M ☐ F DATE (DD-MMM-YY): _____ TIME: _____

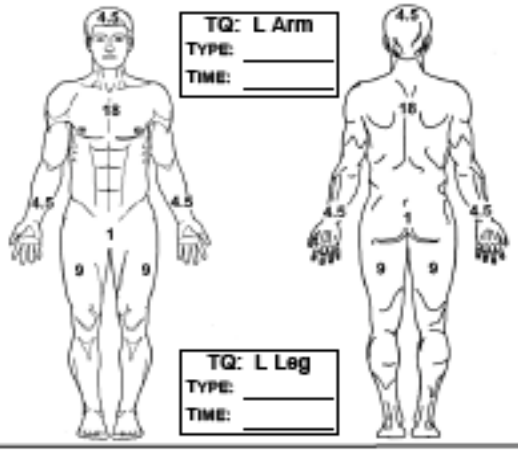
SERVICE: _____ UNIT: _____ ALLERGIES: _____

Mechanism of Injury: (X all that apply)

☐ Artillery ☐ Blunt ☐ Burn ☐ Fall ☐ Grenade ☐ GSW ☐ IED
☐ Landmine ☐ MVC ☐ RPG ☐ Other: _____

Injury: (Mark injuries with an X)

TQ: R Arm	TQ: L Arm
TYPE: _____	TYPE: _____
TIME: _____	TIME: _____



TQ: R Leg	TQ: L Leg
TYPE: _____	TYPE: _____
TIME: _____	TIME: _____

Signs & Symptoms: (Fill in the blank)

Time				
Pulse (Rate & Location)				
Blood Pressure	/	/	/	/
Respiratory Rate				
Pulse Ox % O2 Sat				
AVPU				
Pain Scale (0-10)				

DD Form 1380, NOV 2013 TCCC CARD

BATTLE ROSTER #: _____

EVAC: ☐ Urgent ☐ Priority ☐ Routine

Treatments: (X all that apply, and fill in the blank)

C: TQ- ☐ Extremity ☐ Junctional ☐ Truncal Type: _____

Dressing- ☐ Hemostatic ☐ Pressure ☐ Other _____

A: ☐ Intact ☐ NPA ☐ CRIC ☐ ET-Tube ☐ SGA _____

B: ☐ O2 ☐ Needle-D ☐ Chest-Tube ☐ Chest-Seal _____

C:

	Name	Volume	Route	Time
Fluid				
Blood Product				

MEDS:

	Name	Dose	Route	Time
Analgesic (e.g., Ketamine, Fentanyl, Morphine)				
Antibiotic (e.g., Moxifloxacin, Ertapenem)				
Other (e.g., TXA)				

OTHER: ☐ Combat-Pill-Pack ☐ Eye-Shield (☐ R ☐ L) ☐ Splint
☐ Hypothermia-Prevention Type: _____

NOTES:

FIRST RESPONDER
NAME (Last, First): _____ LAST 4: _____

DD Form 1380, NOV 2013 (Back) TCCC CARD

New TCCC AAR

MEDICAL RECORD-SUPPLEMENTAL MEDICAL DATA
For use of this form, see AR 40-66; the proponent agency is the Office of the Surgeon General

REPORT TITLE
TACTICAL COMBAT CASUALTY CARE-AFTER ACTION REPORT

JTS APROVED (Date) (20140128) -V3.0

Event: Date ____ Time ____ Country ____ AOR/Region ____

Battle Injury ☐ WIA ☐ KIA ☐ Care Under Fire ☐ Tactical Field Care ☐ Company/BAS Care | Non Battle Injury ☐ Alive ☐ Dead

Mechanism
- ☐ Aircraft Crash
- ☐ Blast – Dismounted
- ☐ Blast – Mounted
- ☐ Blast – RPG or Grenade
- ☐ Blast – Indirect Fire (Mortar/Artillery)
- ☐ Blast – Other
- ☐ Blunt
- ☐ Collapse / Crush from Structure
- ☐ Environmental ____
- ☐ Fall, Height ____ ft
- ☐ Fragmentation (shrapnel)
- ☐ Gun Shot Wound
- ☐ Motor Vehicle Crash
- ☐ Parachute Landing Fall ☐ Malfunction
- ☐ Other ____

Injuries
- ☐ Amputation
- ☐ Burn, TBSA ____ %
- ☐ Crepitus
- ☐ Deformity
- ☐ Degloving
- ☐ Fracture
- ☐ Gun Shot Wound
- ☐ Hematoma
- ☐ Laceration
- ☐ Peppering
- ☐ Puncture
- ☐ TBI (suspect)
- ☐ Other ____

Annotate Injuries

Signs — GCS: Eyes 1-4; Verbal 1-5; Motor 1-6 — Pain: 0-10

	Time										
First	____	HR	BP /	RR	pOx	AVPU	Eyes	Verbal	Motor	Pain
	____	HR	BP /	RR	pOx	AVPU	Eyes	Verbal	Motor	Pain
	____	HR	BP /	RR	pOx	AVPU	Eyes	Verbal	Motor	Pain
Last	____	HR	BP /	RR	pOx	AVPU	Eyes	Verbal	Motor	Pain

Circulation - Hemorrhage Control (Time; NM: Non-medic, M: Medic, MO: Medical Officer)
- ☐NM ☐M ☐MO ☐TQ-CAT ☐TQ-SOFTT ☐TQ-Other ____ ☐RUE ☐LUE ☐RLE ☐LLE (×4)
- ☐NM ☐M ☐MO ☐TQ-Multiple to the same extremity, Type & Exts ____
- ☐NM ☐M ☐MO ☐TQ-Junctional, Type & Region ____
- ☐NM ☐M ☐MO ☐Hemostatic Dressing, Type ____
- ☐NM ☐M ☐MO ☐Pressure Dressing, Type ____
- ☐NM ☐M ☐MO ☐Other Dressing, Type ____
- ☐NM ☐M ☐MO ☐Splint, Type ____

Airway (Time, Type)
- ☐NM ☐M ☐MO ☐NPA-Nasopharyngeal Airway
- ☐NM ☐M ☐MO ☐Cric-Cricothyroidotomy
- ☐NM ☐M ☐MO ☐ET-Endotracheal Tube
- ☐NM ☐M ☐MO ☐King LT ☐LMA ☐Other

PREPARED BY (Name, Rank & Title) | DEPARTMENT/SERVICE/CLINIC (Treating Unit) | DATE

PATIENT'S IDENTIFICATION (Name: last, first, middle; grade; date; hospital or medical facility)
Last Name ____ First Name ____ MI ____
BR# ____ Rank ____ Unit ____
SSN ____ DOB ____ Gender ☐ M ☐ F

☐ HISTORY/PHYSICAL ☒ TREATMENT ☐ DIAGNOSTIC STUDIES ☐ FLOW CHART ☐ OTHER EXAMINATION OR EVALUATION ☐ OTHER, Specify

DA FORM 4700, FEB 2003 — EDITION OF MAY 78 IS OBSOLETE. — JOINT TRAUMA SYSTEM OP 03 (MCMR-SRJ) JAN 2014

MEDICAL RECORD-SUPPLEMENTAL MEDICAL DATA
For use of this form, see AR 40-66; the proponent agency is the Office of the Surgeon General

REPORT TITLE
TACTICAL COMBAT CASUALTY CARE-AFTER ACTION REPORT *Page 2, continued*

JTS APROVED (Date) (20140128) -V3.0

Breathing (Time; NM: Non-medic, M: Medic, MO: Medical Officer) — Type & Location
- ☐NM ☐M ☐MO ☐Chest Seal(s)
- ☐NM ☐M ☐MO ☐Needle Chest Decompression ☐Right ____ ☐Left ____
- ☐NM ☐M ☐MO ☐Chest Tube ☐Right ____ ☐Left ____
- ☐NM ☐M ☐MO ☐Bag Valve Mask

Circulation - Resuscitation
- ☐NM ☐M ☐MO ☐Saline Lock
- ☐NM ☐M ☐MO ☐IO-Intraosseous Device, Type ____
- ☐NM ☐M ☐MO ☐IV Fluids, Type ____
- ☐NM ☐M ☐MO ☐IV Hextend
- ☐NM ☐M ☐MO ☐FDP-Freeze Dried Plasma
- ☐NM ☐M ☐MO ☐TXA-Tranexamic Acid

Additional Interventions
- ☐NM ☐M ☐MO ☐Eye Shield ☐Protective Eyewear ☐Right ☐Left
- ☐NM ☐M ☐MO ☐C-Collar ☐Spine Board ☐Pelvic Binder, Type
- ☐NM ☐M ☐MO ☐Hypothermia Prevention, Product ____
- ☐NM ☐M ☐MO ☐Hypothermia Prevention, Product ____

Medications
- ☐NM ☐M ☐MO Combat Wound Pill Pack
- ☐NM ☐M ☐MO Drug ____ (×8)

Evacuation ☐ Urgent ☐ Priority ☐ Routine
- ☐ Aircraft, Airframe (i.e., UH-60) ____
- ☐ Ground Vehicle Type ____
- ☐ Litter Type ____
- ☐ Manual Carry Type ____

Narrative Summary of Care

Provider Information — Last Name
- NM - Non-Medic First Responder ____
- M - Medic ____
- MO - Medical Officer ____

PREPARED BY (Signature & Title) | DEPARTMENT

PATIENT'S IDENTIFICATION (Name: last, first, middle; grade; date; hospital or medical facility)
Last Name ____ First Name ____
BR# ____ Rank ____ Unit ____
SSN ____ DOB ____ Gender ☐ M ☐ F

DA FORM 4700, FEB 2003 — EDITION OF MAY 78 IS OBSOLETE. — JOINT TRAUMA

TACTICAL COMBAT CASUALTY CARE-AFTER ACTION REPORT
Page 3, continued
IAW AR 40-66 (RAR) 22 May 2009 Paragraph 3–7. This page is a quality assurance document. Do not file in medical records.

CASUALTY'S PROTECTIVE EQUIPMENT (Check all worn)
- ☐ Helmet, Ballistic ☐ Tactical Vest (IOTV) ☐ Plate Carrier (Only)
- ☐ Neck Protector (Back) ☐ Throat Protector (Front) ☐ Groin Shield
- ☐ Deltoid Right ☐ Deltoid Left ☐ Plate Front
- ☐ Plate Back ☐ Plate Right Side ☐ Plate Left Side
- ☐ Blast Gauge ☐ Blast Sensor Helmet ☐ Blast Sensor Other
- ☐ Pelvic Undergarment ☐ Eye Protection ☐ Ear Protection

AAR Discussion — Event Date ____ ☐ Tactical situation complicated care (Explain in discussion)

Sustains	Improves

PATIENT'S IDENTIFICATION (Name: last, first, middle; grade; date; hospital or medical facility)
Last Name ____ First Name ____ MI ____
BR# ____ Rank ____ Unit ____
SSN ____ DOB ____ Gender ☐ M ☐ F
Date ____

http://usaisr.amedd.army.mil/pdfs/POI_TCCC_AAR_26Apr2013.pdf

Questions?