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|  |  | **Tactical Combat Casualty Care for All Combatants 02 June 2014**  **Introduction to TCCC** | Tactical Combat Casualty Care is the new standard of care in prehospital Battlefield Medicine. Any previous first aid training you have had may not have contained the material presented in the following lessons. Medical care in combat is significantly different than that provided on the streets of Anywhere, USA. |
|  |  | **TCCC for All Combatants**   * This version is adapted from TCCC for Medics 140602.   + Includes changes through 14-01, Fluid Resuscitation for Hemorrhagic Shock.   + This curriculum will be updated annually.   + Change packages will be distributed between annual updates.   + This course teaches medical topics to students who do not have a medical background. Accordingly, lay language has largely been used in preference to medical terminology. | Read text. |
|  |  | **Pre-Test** | Pass out pre-tests.  Collect them when done.  Do not take time to review the tests at this point. Give the **same** test later as the post-test.  Compare the pre-test grade to the post-test grade to gauge assimilation of the information. |
|  |  | **What is TCCC and Why Do I Need to Learn it?**   * **Coalition forces presently have the best casualty treatment and evacuation system in history.** * **TCCC is what will keep you alive long enough to benefit from it.** | TCCC has been remarkably successful at keeping our wounded warriors alive.  Today we are going to teach you how to do it. |
|  |  | **Comparison of Statistics for Battle Casualties, 1941-2005  *Holcomb et al J Trauma 2006***  **The U.S. casualty survival rate in Iraq and Afghanistan has been the best in U.S. history.**  Note: CFR is the Case Fatality Rate – the  percent of those wounded who die. | TCCC has been one of the big developments in the wars in Iraq and Afghanistan.  The most important measure is how well TCCC does in helping to keep our wounded warriors alive to come home to their families.  This study by former Army trauma surgeon Dr. John Holcomb documents that we are now doing that better than ever before. |
|  |  | **Why Are We Doing Better?**   * **Improved Personal Protective Equipment** * **Tactical Combat Casualty Care** * **Faster evacuation time** * **Better trained medics**   ***Holcomb et al J Trauma 2006*** | COL Holcomb and his co-authors list TCCC as one of the major reasons for that success.  Also kudos to the rest of the chain of care, from the Role 2 and Role 3 hospitals in theater, the evac crews, the staff at Landstuhl, all the way back to the staffs at Walter Reed and Bethesda. |
|  |  | **TCCC: The New Standard of Care for Managing Trauma on the Battlefield**   * **Used by Army, Navy, Air Force, Marine Corps, Coast Guard** * **Used by most coalition partner nations** * **Used by NATO** * **Used by other countries around the world** | Read text. |
|  |  | **Objectives**   * **EXPLAIN** the differences between military and civilian pre-hospital trauma care * **DESCRIBE** the key factors influencing combat casualty care * **UNDERSTAND** how TCCC developed * **DESCRIBE** the phases of care in TCCC | Read text. |
|  |  | **Importance of the First Responder**   * **Almost 90% of all combat deaths occur before the casualty reaches a Medical Treatment Facility (MTF).** * The fate of the injured often lies in the hands of the one who provides the first care to the casualty.   + Corpsman, medic, or pararescueman (PJ)   + Combat Lifesaver or ***non-medical combatant*** | Prehospital care is the most important aspect in ensuring the survival of the casualty.  If the casualty does not arrive alive at the Forward Surgical Team or the Combat Support Hospital, then the surgeon’s skill can’t help.  There may not be any combat medical personnel available when your unit takes casualties.  Initial care may have to be provided by the combatant. That’s why you need this training.  The goal of TCCC is to identify and treat those casualties with preventable causes of death, and keep them alive long enough to reach the hospital. |
|  |  | **Trauma Care Setting**  CIVILIAN TRAUMA CARE  BATTLEFIELD TRAUMA CARE | If you are injured and taken to a civilian trauma center, you will be treated by a skilled team of medical professionals using the latest technology and working in a well-lighted, climate-controlled, secure area.  What about trauma that occurs in a tactical combat setting? |
|  |  | **Tactical Trauma Care Setting –**  **Shrapnel Wound in the Hindu Kush** | This is a good example of where the combat corpsmen and medics (and other first responders like you) live and practice.  This picture was taken at about 10,000 feet altitude in the Hindu Kush mountains in Afghanistan.  The wound is a shrapnel wound of the hip.  In this setting, care is much more difficult.  Common sense tells you that the management plan will have to be different here.  TCCC helps to define how the management plan is different. |
|  |  | **Prehospital Trauma Care: Military vs. Civilian**   * **Hostile fire** * **Darkness** * **Environmental extremes** * **Different wounding epidemiology** * **Limited equipment** * **Need for tactical maneuver** * **Long delays to hospital care** * **Different first responder training and experience** | What factors do we have to think about when we plan for combat trauma care? |
|  |  | **Different Trauma Requires Different Care Strategies**   * It is intuitive that combat and civilian trauma are different, BUT… * It is difficult to devise and implement needed changes. * No one group of medical professionals has all of the necessary skills and experience. * Trauma docs in hospitals, combat medical personnel, and non-medical first responders like you all have different skill sets. ALL are needed to optimize battlefield trauma care strategies. * Tourniquets are one striking example of how battlefield trauma care has sometimes been slow to change. | TCCC principles are determined by physicians and combat medical personnel working as a team.  In the past, the failure of these two groups to communicate well slowed the implementation of critical trauma care measures.  We will look at a dramatic example of this. |
|  |  | **Tourniquets in WWII Wolff AMEDD J April 1945**  “We believe that the strap-and-buckle tourniquet in common use is ineffective in most instances under field conditions…it rarely controls bleeding no matter how tightly applied.” | This report was written by an Army doctor in World War II. Provided very clear input on tourniquets.  A tourniquet would seem to be a simple thing to fix.  Now, fast-forward 25 years. |
|  |  | **Vietnam**  Over 2500 deaths occurred in Vietnam secondary to bleeding from extremity wounds. These casualties had no other injuries. | 25 years later, we had still not learned the tourniquet lesson in Vietnam.  **2500 preventable deaths from extremity bleeding were the result.**  Surely, we would have learned the lesson after **this** experience.  Maybe not - fast-forward another 25 years. |
|  |  | **Tourniquets in U.S Military  Mid-1990s**   * **Old strap-and-buckle tourniquets were still being issued.** * **Medics and corpsmen were being trained in courses where they were taught not to use them.** | Amazingly, in the 1990’s, we were still making the same mistakes about tourniquets that we made in World War II. |
|  |  | **SOF Deaths in the GWOT  Holcomb, et al, *Annals of Surgery 2007***  **Factors That Might Have Changed Outcomes (82 Fatalities – 12 Potentially Survivable)**   * **Hemostatic dressings/direct pressure (2)** * **Tourniquets (3)** * **Faster CASEVAC or IV hemostatic agents (7)** * **Surgical airway vs. intubation (1)** * **Needle thoracostomy (1)** * **PRBCs on helos (2)** * **Battlefield antibiotics (1)** | And we paid a price for not learning the lesson about tourniquets when the GWOT started.  This paper on Special Ops deaths showed 3 out of 12 potentially preventable deaths were due to bleeding from wounds to arms and legs. These men could have been saved by good tourniquets.  Note the makeshift tourniquets used here. This casualty bled to death. |
|  |  | **Tourniquets – Beekley et al Journal of Trauma 2008**   * 31st CSH in 2004 * 165 casualties with severe extremity trauma * 67 with prehospital tourniquets; 98 without * Seven deaths * **Four of the seven deaths were potentially preventable had an adequate prehospital tourniquet been placed**. | We were still losing people to extremity bleeding in 2004.  Notice the makeshift tourniquets used here.  At about this point, the military had started a very strong effort to push tourniquets forward.  Since this study, preventable deaths from extremity hemorrhage have now been minimized due largely to issuing a new IFAK and training individuals to use the gear in it, including a tourniquet. |
|  |  | **Tactical Combat Casualty Care in Special Operations**  **Military Medicine Supplement**  **August 1996**  ***Trauma care guidelines***  ***customized for the battlefield.*** | In the mid-1990s, the Special Operations medical community began looking for some better answers for combat trauma, and Tactical Combat Casualty Care was born. |
|  |  | **TCCC**   * Originally a Special Operations research effort * Trauma management plans that take into account the unique challenges faced by combat medical personnel * Now used throughout U.S. military and by most allied countries * **TCCC has helped U.S. combat forces to achieve the highest casualty survival rate in history.** | Although TCCC started in Special Ops, it is now used by all services in the U.S. military, conventional as well as Special Ops.  It has proved dramatically successful in the Global War on Terrorism.  TCCC has been a major factor in U.S. forces having the highest casualty survival rate in our history. |
|  |  | **TCCC Approach**   * **Identify the causes of preventable death on the battlefield** * **Address them aggressively** * **Combine good medicine with good tactics** | Read text.  The setting in this photo is on the Iraqi-Syrian border. |
|  |  | **Bellamy Data** | This slide depicts the causes of death for our people who died in Vietnam. Nine percent died by bleeding to death from wounds to their arms or legs. You can help prevent such deaths with tourniquets and hemostatic dressings. One percent of those killed in action died from blocked airways. You can help prevent such deaths by positioning a casualty so that his airway remains open or by inserting a nasopharyngeal airway. 5% of those who were killed in action in Viet Nam died from tension pneumothorax. This is a condition where air gets trapped inside the chest and outside the lungs. The build up of pressure can compress the lungs and heart leading to death. Treating this will be beyond your skill level, but you can recognize it and get the casualty to a medic or corpsman as quickly as possible. |
|  |  | **Potentially Preventable Deaths (232 of 982) in OIF and OEF**   * Blood loss 85%   - 31% Compressible hemorrhage  - 69% Non-compressible hemorrhage | This is more recent data from Iraq and Afghanistan.  Hemorrhage, or bleeding, is still the major cause of potentially preventable deaths. About one third of these deaths could possibly have been prevented by treatment with tourniquets and/or hemostatic dressings.  (Note: MSOF = multi-system organ failure.) |
|  |  | **Preventable Death on the Battlefield: OEF and OIF**  **Eastridge 2012 Study:**   * **4,596 U.S. deaths** * **87% pre-hospital deaths** * **24% of pre-hospital deaths were potentially survivable**   **Holcomb, et al, 2005 – US SOF Preventable Deaths = 15%**  **Kelly, et al, 2008 – US Military Preventable Deaths = 24%**  **Eastridge, et al, 2011, 2012 – US Military Preventable Deaths = 27.6%** | We are doing better than ever, but these studies show we still have room for improvement. |
|  |  | **Point of Wounding Care**  **Causes of preventable death on the battlefield today:**   * + **Hemorrhage from extremity wounds**   + **Junctional hemorrhage (where an arm or leg joins the torso, such as in the groin area after a high traumatic amputation)**   + **Non-compressible hemorrhage (such as a gunshot wound to the abdomen)**   + **Tension pneumothorax**   + **Airway problems** | These are the injuries that we need to focus on for saving lives in combat. |
|  |  | **Junctional Hemorrhage**  These types of wounds are often caused by IEDs and may result in junctional hemorrhage. | When a limb tourniquet cannot be applied, a hemostatic dressing may help. If bleeding cannot be controlled with either of these, the casualty will need a higher level of medical care than you can provide, and he’ll need it ASAP. |
|  |  | **Extremity Hemorrhage** | (Drag the cursor over the picture to start the video.)  Here is a classic example of a preventable cause of death - arterial hemorrhage from an leg wound in a pig.  **Bleeding like this will kill you in a few minutes.**  If no one controls this type of bleeding in a casualty, that casualty is going to die very quickly. |
|  |  | **Normal Chest X-Ray** | This is a normal chest x-ray. The heart lies pretty much in the middle, and the lungs completely fill the rest of the chest cavity. |
|  |  | **Tension Pneumothorax**  **Air escapes from the injured lung – pressure builds**  **up in the chest.**  **Air pressure collapses the lung and pushes on the**  **heart.**  **The heart is compressed – it’s not able to pump well.** | This X-ray shows a tension pneumothorax, which, in combat, is usually secondary to a penetrating injury to the chest. A person with a tension pneumothorax will probably have a very hard time breathing.  Tension pneumothorax is the SECOND LEADING cause of preventable death on the battlefield after hemorrhage. This condition may be quickly fatal if not identified and treated. You can recognize the signs and symptoms of tension pneumothorax and get these casualties to a medic as quickly as possible. |
|  |  | **Airway Trauma** | Deaths from airway trauma are a small percentage of combat fatalities.  If the casualty is conscious, he will instinctively protect his own airway.  **While this patient has a significant injury to his airway, he is able to breathe on his own reasonably well if he is sitting up and leaning forward.**  **This casualty survived and did well after reconstructive surgery.**  Could you lay this casualty down on a litter on his back to transport him?  Probably a bad idea - all that blood and mucus would funnel right into his airway. |
|  |  | **Three Objectives of TCCC**   * **Treat the casualty** * **Prevent additional casualties** * **Complete the mission** | The ongoing mission does not stop just because there is a casualty.  The 3 objectives of TCCC are to provide lifesaving care to the injured combatant, to limit the risk of taking further casualties, and to enable the unit to achieve mission success. |
|  |  | **TCCC Guidelines 1996**   * + **Tourniquets**   + **Aggressive needle thoracostomy**   + **Nasopharyngeal airways**   + **Surgical airways for maxillofacial trauma**   + **Tactically appropriate fluid resuscitation**   + **Battlefield antibiotics**   + **Improved battlefield analgesia**   + **Combine good tactics and good medicine**   + **Scenario-based training**   + **Combat medic input to guidelines** | Here were the key elements of TCCC as originally published in 1996.  Once established, though, there had to be a way to keep TCCC guidelines updated. |
|  |  | **Changes in TCCC: How Are They Made?**  **The Committee on Tactical Combat Casualty Care** | The DoD has a group with a charter to keep the TCCC Guidelines updated. |
|  |  | **Committee on Tactical Combat Casualty Care**   * **Part of the Joint Trauma System** * **42 members from all services in the DoD and civilian sector** * **Trauma Surgeons, ER and Critical Care physicians, operational physicians; medical educators; combat medics, corpsmen, and PJs** * **100% deployed experience** * **Meet periodically; update TCCC as needed** | Read text. |
|  |  | **TCCC Now: Additional Interventions**   * **Hemostatic dressings** * **Intraosseous infusion devices** * **Hypotensive resuscitation** * **Fentanyl lozenges for severe pain** * **Ketamine as an analgesic option** * **Junctional hemorrhage control devices and TXA** * **Hypothermia prevention** * **Management of wounded hostile combatants** | These are more recent changes in the TCCC guidelines made by the CoTCCC. TCCC for corpsmen, medics, and PJs includes a lot of advanced medicine for trauma care on the battlefield.  Note that the updated guidelines are now published with each new edition of the military version of Prehospital Trauma Life Support textbook. This textbook is the preeminent guide book for prehospital trauma care by paramedics in the whole world.  **The recommendations made in this manual have the endorsement of the American College of Surgeons Committee on Trauma and the National Association of EMTs. In other words, they say TCCC makes sense for the battlefield.**  **TCCC is the ONLY set of combat trauma care guidelines to have been approved by these two groups.** |
|  |  | **TCCC: How Do We Know That it’s Working?** | Read text. |
|  |  | **TCCC**  **“I am writing to offer my congratulations for the recent dramatic advances in prehospital trauma care delivered by the U.S. military. Multiple recent publications have shown that Tactical Combat Casualty Care is saving lives on the battlefield.”**    ***Dr. Jeff Salomone***  ***American College of Surgeons Committee on Trauma***  ***Chairman of Prehospital Trauma Subcommittee***  ***Letter to ASD Health Affairs***  ***10 June 2008*** | This letter is from the Chairman of the Prehospital Subcommittee of the American College of Surgeons Committee on Trauma.  The same trauma experts that have established Advanced Trauma Life Suport for managing trauma in the hospital endorse TCCC for battlefield trauma care. |
|  |  | **Mabry and McManus AMEDD Center and School**  **“The new concept of Tactical Combat Casualty Care has revolutionized the management of combat casualties in the prehospital tactical setting.”**  ***Critical Care Medicine***  ***July 2008*** | In 2008, Major Bob Mabry was the Director of Academics for Combat Medic Training at the Army Medical Department Center and School. He used to be an 18D Special Forces medic himself.  LTC John McManus was the Director of Predeployment Medical Training for the Army Medical Department Center and School. |
|  |  | **USMC Casualty Scenario 2008**   * **CoTCCC gets input directly from combat medics, corpsmen, and USAF pararescuemen (PJs)** * **15 casualties - 4 tourniquets applied** * **3 lives saved - 4th casualty died from chest wound** | In every meeting of the CoTCCC, real combat casualty scenarios are presented and discussed.  Lessons learned are incorporated into TCCC curriculum. |
|  |  | **Tourniquets – Kragh et al: Two Landmark Papers**   * **Published in 2008/2009** * **Tourniquets are saving lives on the battlefield** * **31 lives saved in 6 months by tourniquets** * **Author estimates 2000 lives saved with tourniquets in this conflict up to that date (2009)** * **No arms or legs lost because of tourniquet use** | These two medical journal articles are the most important tourniquet papers ever published.  Most importantly – tourniquets should be applied ASAP when they are needed.  Survival is improved if shock is ***prevented***.  NOBODY is arguing about whether tourniquets save lives any more. |
|  |  | **What Do the Soldiers Say?**  **A recent U.S. Army Training and Doctrine Command survey of Soldiers in combat units found that TCCC is the second most valued element of their training, exceeded only by training in the use of their individual weapon.**  ***COL Karen O’Brien***  ***TRADOC Surgeon***  ***CoTCCC Meeting April 2010*** | Soldiers value TCCC training second only to weapons training. |
|  |  | **Eliminating Preventable Death on the Battlefield**   * **TCCC in the 75th Ranger Regiment** * **All Rangers and docs trained in TCCC** * **Ranger preventable death incidence: 3%** * **Overall U.S. military preventable deaths: 24%** | The Army Rangers have achieved the lowest preventable death rate ever reported in a major conflict.  They did it by training **everyone** in TCCC. |
|  |  | **ASDHA TCCC Letter 14 February 2014**  **Woodson TCCC Training Memo** | The Assistant Secretary of Defense for Health Affairs agrees that TCCC should be taught across the board to everyone who deploys. |
|  |  | **Phases of Care in TCCC: Timing Is Everything**   * Casualty scenarios in combat usually entail both a medical problem and a tactical problem. * We want the best possible outcome for both the casualty and the mission. * Good medicine can sometimes be bad tactics; bad tactics can get everyone killed or cause the mission to fail. * **Doing the RIGHT THING at the RIGHT TIME is critical** | Most battlefield casualty scenarios involve making both medical and tactical decisions very rapidly.  Remember the enemy still wants to kill you.  The combat environment does not take a “time-out” just because you have a casualty. |
|  |  | **TCCC Phases of Care**   * TCCC divides care into 3 phases based on the tactical situation. * During the gunfight, attention is focused primarily on eliminating the threat. * As the threat decreases, increasing focus is applied to providing the best possible medical care for the casualties. | Doing the RIGHT thing at the WRONG time can get you and your teammates killed. |
|  |  | **Phases of Care in TCCC**   * **Care Under Fire** * **Tactical Field Care** * **Tactical Evacuation Care** | These are the 3 phases of care in TCCC.  Next we’ll define these three phases of care.  This picture is of an FA-18 flying by Mt. Fuji. |
|  |  | **Care Under Fire**  Care Under Fire is the care rendered by the first responder at the scene of the injury while he and the casualty are still under effective hostile fire. Available medical equipment is limited to that carried by the individual or by the medic in his or her aid bag. | The critical feature of Care Under Fire is that the casualty and the first responder are still under effective hostile fire. |
|  |  | **Tactical Field Care**  Tactical Field Care is the care rendered by the first responder once he and the casualty are no longer under effective hostile fire. It also applies to situations in which an injury has occurred, but there has been no hostile fire. Available medical equipment is still limited to that carried into the field by unit personnel. Time to evacuation to a medical treatment facility may vary considerably. | The tactical situation is different in Tactical Field Care.  The first responder and the casualty are not under effective hostile fire.  This means you have some time and relative safety, to provide further medical care.  Remember – effective hostile fire could appear or resume at any time. |
|  |  | **Tactical Evacuation Care**  Tactical Evacuation Care is the care rendered once the casualty has been picked up by an aircraft, ground vehicle or boat. Additional medical personnel and equipment that may have been pre-staged should be available in this phase of casualty management. | Tactical Evacuation Care is similar to TFC in many respects.  However, the presence of extra medical personnel and equipment on the evacuation asset may enable some additional care. It is not generally expected that combatants will care for casualties during evacuation. If it does happen, you will apply the skills you learn for Care Under Fire and Tactical Field Care.  The key principle in TACEVAC is that care and monitoring MUST be continued until the casualty is transferred to a higher level of care. |
|  |  | **Summary of Key Points**   * **Prehospital trauma care in tactical settings is very different from that in civilian settings.** * **Tactical and environmental factors have a profound impact on trauma care rendered on the battlefield.** * **Good medicine can be bad tactics.** * **Up to 24% of combat deaths today are potentially preventable.** * **Good first responder care is critical.** * **TCCC will give you the tools you need!** | TCCC has resulted in significantly lower death rates in combat.  Good battlefield care is paramount in avoiding preventable deaths.  You can help. |
|  |  | **Summary of Key Points**   * **Three phases of care in TCCC**   + **Care Under Fire**   + **Tactical Field Care**   + **TACEVAC Care** | Care Under Fire is the very limited care that can be provided while the casualty and the provider are under effective enemy fire.  Tactical Field Care is performed on the battlefield, but not under effective enemy fire.  TACEVAC Care is rendered during transport off the battlefield on the way to more definitive care. |
|  |  | **Summary of Key Points**   * **TCCC – designed for combat** * **NOT designed for civilian trauma settings** * **But may have applicability in some cases, especially active shooter incidents and other mass casualty events like the Boston Marathon bombing.** | Read the text. |
|  |  | **Questions?** |  |