

TCCC Critical Decision Case Studies



August 2017



The Biggest Challenge in TCCC

- **Knowing WHEN to use the interventions taught in TCCC**
- **Based on a suggestion by COL Bob Mabry**
- **TCCC Critical Decision Case Studies will help to illustrate which interventions to perform for casualties with life-threatening conditions.**



TCCC Critical Decisions

Bleeding Case Study 1

The Setting

- **A unit is on a dismounted mission in Afghanistan.**
- **Dismounted IED attack.**
- **The unit has no junctional tourniquets.**
- **There is no effective incoming fire at the moment.**



TCCC Critical Decisions

Bleeding Case Study 1

The Casualty

- **High amputation right leg**
- **Below the knee amputation left leg**
- **Ongoing massive hemorrhage from his right leg amputation site**
- **Too proximal to be controlled by a tourniquet**



TCCC Critical Decisions

Bleeding Case Study 1

Question

What is the NEXT action you should take?

- 1. Combat Gauze applied with at least 3 minutes of direct pressure at the bleeding site**
- 2. Start an IV**
- 3. Construct a pressure dressing over the bleeding site**
- 4. Apply direct pressure over the femoral artery at the level of the inguinal ligament**



TCCC Critical Decisions

Bleeding Case Study 1

Correct Answer and Feedback

- 1. Combat Gauze applied with at least 3 minutes of direct pressure at the bleeding site**

In this casualty with uncontrolled junctional bleeding in the right upper thigh, since the unit has no junctional tourniquets and since the bleeding site is too proximal on the leg to be controlled with a limb tourniquet, the best option is direct pressure with Combat Gauze. Pressure dressings and pressure applied to so-called "pressure points" at vascular sites proximal to the bleeding have not been proven to be effective.



TCCC Critical Decisions

Bleeding Case Study 2

The Setting

- **A squad of Marines is engaged in a small arms battle with hostile forces**
- **RPG blast near one of the unit members**
- **Casualty lying on his right side**
- **There is no effective incoming fire at the moment**



TCCC Critical Decisions

Bleeding Case Study 2

The Casualty

- **The casualty is moving around and awake, but his movements are not purposeful and he is not responding to questions**
- **Face and neck wounds (not airway) are present**
- **Several teeth are missing, and there are lip and cheek lacerations**
- **There is ongoing severe bleeding from the neck wound**
- **No other major bleeding sites are immediately noted**
- **He is voicing significant pain**



TCCC Critical Decisions

Bleeding Case Study 2

Question

What is the NEXT action you should take?

- 1. Perform a cricothyroidotomy**
- 2. Start an IV**
- 3. Apply Combat Gauze with sustained direct pressure at the bleeding site on the neck**
- 4. Administer OTFC to treat the casualty's pain**



TCCC Critical Decisions

Bleeding Case Study 2

Correct Answer and Feedback

3. Apply Combat Gauze with sustained direct pressure at the bleeding site on the neck

This casualty has massive hemorrhage from a neck wound. Tourniquets are obviously not usable, so sustained direct pressure with Combat Gauze is the best hemostatic option available. Also - opioid medications such as OTFC should not be used in casualties in or at risk for shock, which this casualty definitely is.



TCCC Critical Decisions

Bleeding Case Study 3

The Setting

- **A small unit is moving across an open area**
- **It is night and there is zero visibility without night vision devices**
- **The casualty has a gunshot wound in his left leg just above the knee**
- **The unit is still taking effective incoming fire**



TCCC Critical Decisions

Bleeding Case Study 3

The Casualty

- **There is severe bleeding on the thigh on a blood sweep**
- **Visualization of the bleeding site is poor**
- **He is in extreme pain**



TCCC Critical Decisions

Bleeding Case Study 3

Question

What is the NEXT action you should take?

- 1. Apply a limb tourniquet high and tight on the left leg**
- 2. Try to guess where the bleeding site is and apply a limb tourniquet just proximal to that.**
- 3. Administer OTFC to the casualty**
- 4. Administer ketamine to the casualty**



TCCC Critical Decisions

Bleeding Case Study 3

Correct Answer and Feedback

- 1. Apply a tourniquet high and tight on the left leg**

For this casualty, with potentially life-threatening bleeding from the gunshot wound to his leg, the most important aspect of care is to control the extremity bleeding. Since the bleeding site cannot be definitively located at this point in his care, the hemorrhage must be controlled by immediately applying a limb tourniquet as proximally as possible on the extremity. Treating the casualty's pain is important, but should be done after bleeding is controlled, once the unit is in the Tactical Field Care phase of care.



TCCC Critical Decisions

Bleeding Case Study 4

The Setting

- **A US Military advisory team is assaulting a terrorist compound**
- **They take small arms fire from a roof**
- **One team member sustains a GSW just below the left clavicle**
- **The casualty is moved to cover for treatment**
- **There is no effective incoming fire at the covered location**



TCCC Critical Decisions

Bleeding Case Study 4

The Casualty

- **There is very heavy bleeding from the wound just below the left clavicle.**
- **Breathing is not labored.**
- **The wound is noted to have a deep wound track**
- **Efforts to control the bleeding with Combat Gauze are unsuccessful**



TCCC Critical Decisions

Bleeding Case Study 4

Question

What is the NEXT action you should take?

- 1. Construct a pressure dressing over the wound using standard gauze**
- 2. Start an IV**
- 3. Use a hemostat to reach in the wound and clamp the bleeding vessel**
- 4. Apply XStat into the wound tract**



TCCC Critical Decisions

Bleeding Case Study 4

Correct Answer and Feedback

4. Apply XStat into the wound tract

For uncontrolled bleeding from a wound with a deep wound track such as in this casualty, XStat is clearly the best of the listed options. Neither a limb tourniquet nor a junctional tourniquet is usable and Combat Gauze has not been effective.



TCCC Critical Decisions

Bleeding Case Study 5

The Setting

- **A helicopter is disabled by small arms fire and crashes**
- **2 of the crew are dead**
- **1 crew member has severe head trauma and is unconscious – she being treated by another medic**
- **You are treating the 4th member of the flight crew - the pilot**
- **There is no effective incoming fire at the crash site**



TCCC Critical Decisions

Bleeding Case Study 5

The Casualty

- **The pilot is alert and complains of severe left hip pain**
- **Breathing is unlabored with an O2 sat of 96%**
- **Blood sweep shows no external hemorrhage**
- **You examine his pelvic region and find a large area of bruising over his left hip**
- **There is marked tenderness to palpation in that area**



TCCC Critical Decisions

Bleeding Case Study 5

Question

What is the NEXT action you should take?

- 1. Administer OTFC 800 ug for pain**
- 2. Apply a pelvic binder for suspected pelvic fracture**
- 3. Start an IV and administer 500 mL of Hextend**
- 4. Administer the Combat Wound Medication Pack**



TCCC Critical Decisions

Bleeding Case Study 5

Correct Answer and Feedback

2. Apply a pelvic binder for suspected pelvic fracture

The diagnosis of immediate concern here is a suspected pelvic fracture, so a pelvic binder should be applied immediately. Pelvic fractures may be associated with non-compressible bleeding. This casualty has a weak radial pulse and may be going into hemorrhagic shock. He may need fluid resuscitation shortly, but the pelvic binder should be applied first. OTFC should not be used in this casualty.



TCCC Critical Decisions

Bleeding Case Study 6

The Setting

- **An Army infantry squad is on foot patrol in Iraq**
- **A dismounted IED detonates, causing multiple casualties**
- **There is no effective incoming fire at the moment**



TCCC Critical Decisions

Bleeding Case Study 6

The Casualty

- **The casualty you are treating has bilateral lower extremity amputations**
- **Both are very high**
- **There is severe bleeding from both amputation sites**
- **Limb tourniquets are judged unlikely to be successful**
- **No other life threatening injuries are noted**



TCCC Critical Decisions

Bleeding Case Study 6

Question

What is the NEXT action you should take?

- 1. Administer ketamine since this casualty is at risk of going into shock**
- 2. Start an IV and administer TXA**
- 3. Construct pressure dressing's using standard gauze for both amputation sites**
- 4. Apply direct pressure with Combat Gauze until the unit's SAM Junctional Tourniquet is ready to apply**



TCCC Critical Decisions

Bleeding Case Study 6

Correct Answer and Feedback

4. Apply direct pressure with Combat Gauze until the unit's SAM junctional tourniquet is ready to apply

The correct next action is to apply direct pressure with Combat Gauze until a junctional tourniquet is ready to apply. This action may prevent the casualty from going into shock. An IV, TXA, and ketamine are all good follow-on actions in this casualty, but the first priority is to control massive hemorrhage, which this casualty currently has.



TCCC Critical Decisions

Circulation Case Study 1

The Setting

- **A small unit is moving outside of a village**
- **There is a single shot from somewhere in the village**
- **No other hostile fire**



TCCC Critical Decisions

Circulation Case Study 1

The Casualty

- **Single gunshot wound to abdomen**
- **The casualty is alert and in moderate pain**
- **There is no life-threatening external hemorrhage**
- **There is a normal radial pulse**



TCCC Critical Decisions

Circulation Case Study 1

Casualty Dashboard

- **AVPU** **Alert**
- **Airway** **Patent**
- **Breathing** **RR 18 and unlabored**
- **Radial Pulse** **Strong**
- **O2 Saturation** **97%**



TCCC Critical Decisions

Circulation Case Study 1

Question

What is the NEXT action you should take?

- 1. Start an IV and administer TXA immediately**
- 2. Start an IV and administer a unit of freeze-dried plasma**
- 3. Administer 50 mg of ketamine IM**
- 4. Administer an 800ug fentanyl lozenge**



TCCC Critical Decisions

Circulation Case Study 1

Correct Answer and Feedback

1. Start an IV and administer TXA immediately

This casualty may have life-threatening intra-abdominal hemorrhage. The next action should be to immediately start an IV and infuse 1 gm of TXA over 10 minutes.



TCCC Critical Decisions

Circulation Case Study 2

The Setting

- **A small unit is patrolling outside of a village**
- **There is a single shot from somewhere in the village**
- **No other hostile fire**



TCCC Critical Decisions

Circulation Case Study 2

The Casualty

- **Single gunshot wound to abdomen**
- **The casualty was alert initially but is now becoming confused**
- **The radial pulse is weak**
- **You have already started an IV and administered a gram of TXA**



TCCC Critical Decisions

Circulation Case Study 2

Casualty Dashboard

- **AVPU** Alert but confused
- **Airway** Patent
- **Breathing** RR 20 and unlabored
- **Radial Pulse** Present but rapid and weak
- **O2 Saturation** 96%



TCCC Critical Decisions

Circulation Case Study 2

Question

What is the NEXT action you should take?

- 1. Administer another gram of TXA**
- 2. Infuse 500 mL of Hextend**
- 3. Administer a unit of fresh whole blood as per unit protocol**
- 4. Administer 1 gm of ertapenem to prevent infection**



TCCC Critical Decisions

Circulation Case Study 2

Correct Answer and Feedback

3. Administer a unit of fresh whole blood as per unit protocol

The casualty has gone into shock from intra-abdominal hemorrhage. The best resuscitation fluid for hemorrhagic shock is whole blood and giving a unit of that should be the next action taken.



TCCC Critical Decisions

Circulation Case Study 3

The Setting

- **An Army infantry squad is on foot patrol in Iraq**
- **A dismounted IED detonates**
- **There are multiple casualties**
- **There is no effective incoming fire at the moment**



TCCC Critical Decisions

Circulation Case Study 3

The Casualty

- **Your casualty has bilateral lower extremity amputations**
- **There was previously severe bleeding from the amputation sites**
- **Limb tourniquets were quickly applied to both legs and are effective**
- **The casualty is alert and in significant pain**
- **His radial pulse is normal**
- **The casualty also has multiple penetrating wounds of the abdomen and pelvis**



TCCC Critical Decisions

Circulation Case Study 3

Casualty Dashboard

- **AVPU** **Alert**
- **Airway** **Patent with patient dazed but breathing well**
- **Breathing** **RR 16 and unlabored**
- **Radial Pulse** **Strong**
- **O2 Saturation** **95%**



TCCC Critical Decisions

Circulation Case Study 3

Question

What is the NEXT action you should take?

- 1. Start an IV and administer 1 gm of TXA**
- 2. Start an IV and administer 500 mL of Hextend, since there are no blood products available on this operation**
- 3. Administer 50 mg of ketamine IM**
- 4. Try to convert both tourniquets to other modes of hemorrhage control**



TCCC Critical Decisions

Circulation Case Study 3

Correct Answer and Feedback

1. Start an IV and administer TXA

This casualty does need battlefield analgesia, but the most important aspect of care right now is to start an IV and administer 1 gm of TXA. He is at risk of non-compressible hemorrhage due to his penetrating abdominal and pelvic wounds. He does not require fluid resuscitation at the moment.



TCCC Critical Decisions

Airway Case Study 1

The Setting

- **An IED detonates underneath a vehicle in a mounted convoy**
- **The vehicle is turned over by the blast**
- **The casualty is unconscious**
- **She is not wearing seat belt**
- **Her helmet is dented**
- **There is no effective incoming fire at the moment**



TCCC Critical Decisions

Airway Case Study 1

The Casualty

- **Blood and bruising over the right parietal area**
- **No facial injuries noted**
- **No other injuries noted**
- **The unconscious casualty has been removed from the vehicle and is in the supine position**
- **Chin lift maneuver accomplished**



TCCC Critical Decisions

Airway Case Study 1

Question

What is the NEXT action you should take?

- 1. Cricothyroidotomy**
- 2. Place casualty in a sit-up and lean forward position**
- 3. Start an IV**
- 4. Insert a nasopharyngeal airway**



TCCC Critical Decisions

Airway Case Study 1

Correct Answer and Feedback

4. Insert a nasopharyngeal airway

This casualty may have an airway obstruction. The low pulse oximetry reading indicates a critical level of hypoxia. This casualty needs her airway opened immediately. There are no facial injuries noted, so a cricothyroidotomy should not be attempted until less invasive measures have failed. The casualty should not be placed supported in a sitting position because of the potential for spinal cord injury. Inserting a nasopharyngeal airway is the best option of the choices shown.



TCCC Critical Decisions

Airway Case Study 2

The Setting

- **A small unit is on foot patrol**
- **There is incoming fire from two hostiles**
- **The hostile threat is quickly eliminated by the unit**
- **One of your unit members sustains a gunshot wound to the lower face**
- **There is no further effective incoming fire**



TCCC Critical Decisions

Airway Case Study 2

The Casualty

- **The casualty is awake**
- **There are facial wounds to lower jaw and teeth**
- **There is blood in the mouth**
- **The casualty has noisy, rapid breathing while in the supine position**
- **He is struggling to breathe**



TCCC Critical Decisions

Airway Case Study 2

Casualty Dashboard

- **AVPU** **Alert**
- **Airway** **Facial injuries**
- **Breathing** **RR 22 - Noisy**
- **Radial Pulse** **Strong**
- **O2 Saturation** **75%**



TCCC Critical Decisions

Airway Case Study 2

Question

What is the NEXT action you should take?

- 1. Cricothyroidotomy**
- 2. Nasopharyngeal airway**
- 3. Endotracheal intubation**
- 4. Allow this conscious casualty to assume any position that best protects the airway, to include sitting up and leaning forward.**



TCCC Critical Decisions

Airway Case Study 2

Correct Answer and Feedback

4. Allow this conscious casualty to assume any position that best protects the airway, to include sitting up and leaning forward.

The diagnosis is airway obstruction due to his maxillofacial injuries. The principle is to open the airway. Since the casualty is conscious, allow him to assume any position that best protects his airway, to include sitting up and leaning forward.



TCCC Critical Decisions

Airway Case Study 3

The Setting

- **A Marine platoon is moving across an open field on foot**
- **Dismounted IED detonation**
- **There is no effective incoming fire at the moment**



TCCC Critical Decisions

Airway Case Study 3

The Casualty

- **The face and neck are peppered with shrapnel wounds**
- **The casualty is alert but noted to have labored respirations and moderate distress**
- **A small puncture wound is noted on the left side of neck with minimal bleeding**
- **But there is rapidly expanding swollen area under the skin of the neck immediately adjacent to the midline airway structures**



TCCC Critical Decisions

Airway Case Study 3

Casualty Dashboard

- **AVPU** **Alert and in distress**
- **Airway** **No blood or obstruction noted**
- **Breathing** **RR 22 - labored**
- **Radial Pulse** **Strong**
- **O2 Saturation** **65%**



TCCC Critical Decisions

Airway Case Study 3

Question

What is the NEXT action you should take?

- 1. Cricothyroidotomy using the CricKey device**
- 2. Nasopharyngeal airway**
- 3. Endotracheal intubation**
- 4. Help the casualty into the sit-up and lean-forward position**



TCCC Critical Decisions

Airway Case Study 3

Correct Answer and Feedback

1. Cricothyroidotomy using the CricKey device

The diagnosis is airway obstruction due to a rapidly expanding hematoma that has resulted from a shrapnel injury to a large blood vessel in the neck. A nasopharyngeal airway and the sit-up and lean-forward position will not help in this situation. The best next action is a cricothyroidotomy performed with local anesthesia.



TCCC Critical Decisions

Breathing Case Study 1

The Setting

- **A small unit is on patrol in a mountainous area**
- **The unit is ambushed, but hostile fire is quickly suppressed**
- **There is no effective incoming fire at the moment**



TCCC Critical Decisions

Breathing Case Study 1

The Casualty

- **Gunshot wound in right upper quadrant of the abdomen just below the plate**
- **No other wounds**
- **Casualty conscious**
- **Noted to have increasing difficulty breathing**
- **Breath sounds on the right are absent**



TCCC Critical Decisions

Breathing Case Study 1

Casualty Dashboard

- **AVPU** **Alert**
- **Airway** **Patent**
- **Breathing** **RR 24 - Noisy and labored**
- **Radial Pulse** **Strong**
- **O2 Saturation** **80%**



TCCC Critical Decisions

Breathing Case Study 1

Question

What is the NEXT action you should take?

- 1. Perform a cricothyroidotomy**
- 2. Perform a needle decompression on the right side**
- 2. Insert a chest tube**
- 4. Start an IV**



TCCC Critical Decisions

Breathing Case Study 1

Correct Answer and Feedback

2. Perform a needle decompression on the right side

The diagnosis is a suspected tension pneumothorax. Although the entry wound is in the abdomen, the bullet may have traveled into the chest and injured the right lung. The correct next action is to perform a needle decompression on the right side of the casualty's chest.



TCCC Critical Decisions

Breathing Case Study 2

The Setting

- **A small unit is patrolling in a mountainous area**
- **The unit is ambushed**
- **One unit member is hit**
- **Four hostiles are killed after an intense, 2-minute firefight**
- **There is no effective incoming fire at the moment**



TCCC Critical Decisions

Breathing Case Study 2

The Casualty

- **Gunshot wound in right upper quadrant of the abdomen just below the plate**
- **No other wounds**
- **The casualty is conscious but in pain**
- **He is noted to have increasing difficulty breathing**
- **There are absent breath sounds on the right**
- **Breath sounds are present on the left side**
- **Needle decompression is performed on the right side at the right 4th ICS at the anterior axillary line**
- **No improvement is noted**



TCCC Critical Decisions

Breathing Case Study 2

Casualty Dashboard

- **AVPU** **Alert**
- **Airway** **Patent**
- **Breathing** **RR 22 and labored**
- **Radial Pulse** **Rapid and thready**
- **O2 Saturation** **80%**



TCCC Critical Decisions

Breathing Case Study 2

Question

What is the NEXT action you should take?

- 1. Perform a cricothyroidotomy**
- 2. Administer OTFC 800 ug**
- 3. Start an IV**
- 4. Repeat needle decompression at the 2 ICS in the right mid-clavicular line**



TCCC Critical Decisions

Breathing Case Study 2

Correct Answer and Feedback

4. Repeat needle decompression at the 2 ICS in the right mid-clavicular line

The diagnosis is a suspected tension pneumothorax. Since needle decompression at the lateral site on the right side did not improve the casualty's condition, the next step should be to move to an alternate decompression site. A cricothyroidotomy will not help a casualty with a tension pneumothorax. Anyone with respiratory distress and hypoxia should not be given opioids, since this will potentially depress respirations.



TCCC Critical Decisions

Breathing Case Study 3

The Setting

- **A platoon of Marines is approaching a village to meet with village leaders**
- **One Marine steps on a pressure-plate IED and it explodes**
- **There is no effective incoming fire at the moment**



TCCC Critical Decisions

Breathing Case Study 3

The Casualty

- **Facial peppering**
- **Below the knee amputation - left leg**
- **Above the knee amputation - right leg**
- **Multiple fragment wounds to pelvis and abdomen**
- **Leg bleeding is controlled with tourniquets**
- **15 minutes later, while waiting for evacuation, he is noted to have labored breathing**
- **He becomes confused, then loses consciousness**
- **Not breathing**
- **There is no radial or carotid pulse detectable**



TCCC Critical Decisions

Breathing Case Study 3

Question

What is the NEXT action you should take?

- 1. Perform CPR**
- 2. Perform needle decompression on both sides of the chest**
- 3. Declare the casualty deceased and discontinue care**
- 4. Start an IV**



TCCC Critical Decisions

Breathing Case Study 3

Correct Answer and Feedback

2. Perform needle decompression on both sides of the chest

This casualty has lost vital signs. This could be due to non-compressible hemorrhage, but it may also be due to bilateral tension pneumothoraces. Casualties with chest or abdominal trauma or polytrauma who suffer a traumatic cardiac arrest should have needle decompression performed on both sides of the chest. If the arrest was caused by a tension pneumothorax, this maneuver may result in a return of vital signs.



TCCC Critical Decisions

Breathing Case Study 4

The Setting

- **A vehicle-borne IED explodes near US troops**
- **Your casualty was near the explosion**
- **She was briefly unconscious.**
- **Her tympanic membranes are ruptured –
difficulty hearing**
- **You are now caring for her on a TACEVAC flight
to the Role II hospital.**



TCCC Critical Decisions

Breathing Case Study 4

The Casualty

- **Your casualty is alert**
- **There is no external hemorrhage**
- **There is no obvious trauma to the chest or abdomen.**
- **Some shrapnel peppering on face and extremities**
- **But she is having labored respirations.**
- **You are unable to hear breath sounds because of helicopter noise**



TCCC Critical Decisions

Breathing Case Study 4

Casualty Dashboard

- **AVPU** **Alert**
- **Airway** **Patent**
- **Breathing** **RR 22 – Mildly labored**
- **Blood pressure** **140/85**
- **O2 Saturation** **70%**



TCCC Critical Decisions

Breathing Case Study 4

Question

What is the NEXT action you should take?

- 1. Needle decompression of both sides of the chest**
- 2. Start an IV and administer TXA**
- 3. Insert a supraglottic airway**
- 4. Start supplemental oxygen**



TCCC Critical Decisions

Breathing Case Study 4

Correct Answer and Feedback

4. Start supplemental oxygen

This casualty is likely suffering from blast-induced pulmonary contusions. A tension pneumothorax is possible, but unlikely because there is no penetrating trauma and there was no evidence of blunt trauma on exam. Additionally, the casualty is NOT in shock - her blood pressure is 140/85. The blast wave from the explosion can injure the lung and interfere with oxygenation. Providing supplemental oxygen will help reverse the hypoxia induced by the blast-induced pulmonary contusions.



TCCC Critical Decisions

TBI Case Study 1

The Setting

- **A small unit is operating in a mountainous region**
- **The casualty was a passenger in a vehicle that was attacked with an IED**
- **The vehicle was turned over by the blast**
- **Casualty was unrestrained in his seat**
- **Unconscious after the IED detonation**
- **Lying on roof of vehicle**
- **Helmet is dented**
- **Casualty was removed from the vehicle with attention to possible spinal injuries**



TCCC Critical Decisions

TBI Case Study 1

The Casualty

- **Casualty is now lying supine on a litter during helicopter TACEVAC**
- **C-Collar in place**
- **Still unconscious**
- **There is an open left-sided skull fracture**
- **No other injuries are noted**
- **Breathing is not labored**
- **A supraglottic airway is in place**



TCCC Critical Decisions

TBI Case Study 1

Casualty Dashboard

- | | |
|------------------|-------------------|
| • AVPU | Unconscious |
| • Airway | Patent |
| • Breathing | RR 12 - unlabored |
| • Blood pressure | 135/85 |
| • O2 Saturation | 85% |



TCCC Critical Decisions

TBI Case Study 1

Question

What is the NEXT action you should take?

- 1. Start an IV and give a unit of red blood cells**
- 2. Perform a bilateral needle decompression of the chest**
- 3. Perform a surgical airway**
- 4. Start high-flow supplemental oxygen via reservoir mask to get oxygen saturation to 90% or higher**



TCCC Critical Decisions

TBI Case Study 1

Correct Answer and Feedback

4. Start high-flow supplemental oxygen via reservoir mask to get oxygen saturation to 90% or higher

Hypoxia (oxygen saturations below 90%) in casualties with moderate/severe TBI is associated with worsening of outcomes. This casualty should receive supplemental oxygen to improve his oxygenation status and reduce the likelihood of secondary brain injury.



TCCC Critical Decisions

TBI Case Study 2

The Setting

- **The casualty was a passenger in a vehicle that was attacked with an IED**
- **The vehicle was turned over in the explosion**
- **Casualty was unrestrained in his seat**
- **Unconscious for several minutes after the IED detonation**
- **Lying on roof of vehicle**
- **Helmet was dented**
- **She was removed from the vehicle with attention to possible spinal injuries**
- **Pupils were equal and reactive at the point of injury**
- **You are now caring for her on a TACEVAC flight to the Role II hospital.**



TCCC Critical Decisions

TBI Case Study 2

The Casualty

- **Casualty is now lying supine on a litter during helicopter TACEVAC**
- **She was initially alert and followed commands**
- **Pupils were equal and reactive at the start of the flight**
- **There is a left-sided scalp laceration**
- **No other injuries are noted**
- **Breathing is not labored**
- **The casualty suddenly becomes confused and then loses consciousness**
- **One pupil is dilated and unresponsive**



TCCC Critical Decisions

TBI Case Study 2

Question

What is the NEXT action you should take?

- 1. Administer 250 mL of 3% hypertonic saline**
- 2. Perform an emergency cricothyroidotomy**
- 3. Elevate the foot of the casualty's litter**
- 4. Immediately begin therapeutic hypothermia by removing the casualty's HPMK**



TCCC Critical Decisions

TBI Case Study 2

Correct Answer and Feedback

1) Administer 250 mL of 3% hypertonic saline

The decreasing state of consciousness and the dilated pupil are signs of an impending cerebral herniation. The casualty should receive 250 mL of hypertonic saline and have the head of his litter elevated 30 degrees. His oxygen saturation is good, so there is no need to perform an emergency surgical airway. Therapeutic hypothermia should not be undertaken during TACEVAC.



TCCC Critical Decisions

Additional Case Study 1

The Setting

- **You are on a hostage rescue mission**
- **An 8-man team is looking for 3 hostages in a building**
- **The team suddenly comes under heavy fire**
- **The assaulter next to you is shot in the head**
- **The hostages have not yet been located**
- **The hostiles are moving and returning fire**
- **The tactical situation is dynamic**



TCCC Critical Decisions

Additional Case Study 1

The Casualty

- **The casualty is lying on the floor with a massive head wound.**
- **Shots are still being exchanged with the hostile forces.**



TCCC Critical Decisions

Additional Case Study 1

Question

What is the NEXT action you should take?

- 1. Stop the assault and examine the casualty for other wounds**
- 2. Stop the assault and start an IV**
- 3. Stop the assault and begin CPR as needed**
- 4. Continue the assault until the threat is eliminated and the hostages have been secured.**



TCCC Critical Decisions

Additional Case Study 1

Correct Answer and Feedback

4. Continue the assault until the threat is eliminated and the hostages have been secured.

In the context of a hostage rescue operation, the hostages are in grave danger until the threat has been eliminated. The correct action here is to continue the mission until the hostages have been located and their safety has been assured.



TCCC Critical Decisions

Additional Case Study 2

The Setting

- **A small unit is approaching a compound to search for weapons and drugs**
- **They suddenly come under fire**
- **Fire is suppressed but several unit members are injured**
- **There is no effective incoming fire at present**



TCCC Critical Decisions

Additional Case Study 2

The Casualty

- **Gunshot wound to the left chest just above his plate**
- **The casualty is conscious and in severe pain**
- **His radial pulse is weak**
- **His breathing is deep and rapid**
- **Oxygen saturation was 85% prior to needle decompression**
- **After needle decompression, the casualty's breathing becomes slower and less labored**
- **His oxygen saturation improves to 92%**
- **An IV has been started, TXA has been given, and Hextend is running**
- **The severe pain persists and he repeatedly asks for pain medicine**



TCCC Critical Decisions

Additional Case Study 2

Casualty Dashboard

- **AVPU** Alert
- **Airway** Patent
- **Breathing** RR 20
- **Radial Pulse** Weak
- **O2 Saturation** 92% at present



TCCC Critical Decisions

Additional Case Study 2

Question

What is the NEXT action you should take?

- 1. Administer OTFC 800 ug**
- 2. Administer 5 mg of IV morphine**
- 3. Administer 20 mg of IV ketamine**
- 4. Administer 10 mg of IM morphine**



TCCC Critical Decisions

Additional Case Study 2

Correct Answer and Feedback

3. Administer 20 mg of ketamine IV

The casualty has both pulmonary compromise and the potential for hemorrhagic shock. Opioids may worsen both conditions. The best choice for analgesia here is ketamine, which does not lower blood pressure or suppress respirations.



TCCC Critical Decisions

Additional Case Study 3

The Setting

- **An Army convoy has taken multiple casualties in an ambush**
- **There is no effective incoming fire at the moment**
- **One casualty has a gunshot wound to the knee**



TCCC Critical Decisions

Additional Case Study 3

The Casualty

- **Gunshot wound to the right knee**
- **There was moderate bleeding that was quickly controlled with a tourniquet**
- **No other wounds**
- **Casualty in severe pain**
- **Asking loudly for pain medications**
- **There are multiple other casualties remaining to be treated**



TCCC Critical Decisions

Additional Case Study 3

Casualty Dashboard

- AVPU** **Alert**
- Airway** **Patent**
- Breathing** **RR 18 and unlabored**
- Radial Pulse** **Strong**
- O2 Saturation** **98%**



TCCC Critical Decisions

Additional Case Study 3

Question

What is the NEXT action you should take?

- 1. Administer IM morphine 8 mg**
- 2. Administer OTFC 800 ug**
- 3. Give the casualty meloxicam and acetaminophen from the Combat Wound Medication Pack**
- 4. Withhold pain meds because of the risk of shock**



TCCC Critical Decisions

Additional Case Study 3

Correct Answer and Feedback

2. Administer OTFC 800 ug

This casualty needs analgesia. OTFC is as effective as IV morphine and its onset of action is very rapid. IM morphine is slower acting and a less desirable choice. Meloxicam and acetaminophen are less potent than OTFC. There is no need to withhold opioid analgesia from this casualty since he is not in shock and his bleeding is controlled with a tourniquet – he should get an 800 ug OTFC lozenge.



TCCC Critical Decisions

Additional Case Study 4

The Setting

- **A small unit sustains multiple casualties from an engagement with hostile forces**
- **There is no effective incoming fire at the moment**



TCCC Critical Decisions

Additional Case Study 4

The Casualty

- **Your casualty has a gunshot wound to the right knee**
- **Heavy bleeding from the wound was controlled quickly with a tourniquet**
- **There are no other injuries**
- **The casualty has a strong radial pulse**
- **Casualty given 800 ug of OTFC for pain and the antibiotic ertapenem**
- **5 minutes later - the casualty suddenly has labored breathing and is confused**
- **Re-exam confirms no chest or abdominal wounds**
- **Breath sounds reveal bilateral wheezing**



TCCC Critical Decisions

Additional Case Study 4

Casualty Dashboard

- **AVPU** **Alert but confused**
- **Airway** **Raspy breathing**
- **Breathing** **RR 26 - Noisy and rapid**
- **Radial Pulse** **Rapid and weak**
- **O2 Saturation** **82%**



TCCC Critical Decisions

Additional Case Study 4

Question

What is the NEXT action you should take?

- 1. Perform a bilateral needle chest decompression**
- 2. Administer 0.5 mg epinephrine by autoinjector**
- 3. Insert a supraglottic airway**
- 4. Start an IV**



TCCC Critical Decisions

Additional Case Study 4

Correct Answer and Feedback

2. Administer 0.5 mg epinephrine by autoinjector

Anaphylactic reactions to ertapenem are rare but they do occur. The presence of labored breathing and a weak pulse shortly after administering this medication require that this diagnosis be considered and appropriate treatment rendered. There is no chest trauma and other obvious cause for these severe signs in this casualty.



TCCC Critical Decisions

Additional Case Study 5

The Setting

- **A hand grenade detonates in a building**
- **One unit member has moderate pain and vision loss in his right eye after the explosion**
- **He was not wearing eye protection**
- **There is no effective incoming fire at the moment**



TCCC Critical Decisions

Additional Case Study 5

The Casualty

- **The casualty is alert but in significant pain from his eye injury**
- **There is mild pain from several scattered fragment injuries on his extremities and abdomen but no significant external bleeding is identified**
- **His right eye is red and tearing**
- **The cornea appears to be injured**
- **His right upper eyelid is lacerated**
- **On vision testing, he is unable to count fingers with that eye but can see hand motion**



TCCC Critical Decisions

Additional Case Study 5

Casualty Dashboard

- AVPU Alert**
- Airway Patent**
- Breathing RR 18 and unlabored**
- Radial Pulse Strong**
- O2 Saturation 98%**



TCCC Critical Decisions

Additional Case Study 5

Question

What is the NEXT action you should take?

- 1. Cover the eye with a rigid eye shield**
- 2. Perform a detailed eye exam with the aid of a tactical flashlight**
- 3. Apply a pressure patch to the injured eye**
- 4. Apply pressure patches to both eyes to minimize eye movement**



TCCC Critical Decisions

Additional Case Study 5

Correct Answer and Feedback

1. Cover the eye with a rigid eye shield

The injured eye should be immediately covered with a rigid eye shield to protect it from further injury or from accidental pressure being applied that might cause the ocular contents to extrude from the corneal laceration. **DO NOT** attempt to manipulate the eye to perform a more thorough exam. **DO NOT** apply a pressure patch to the injured eye.



TCCC Critical Decisions

Additional Case Study 6

The Setting

- **A small unit sustains multiple casualties from a small arms engagement**
- **Your casualty has a gunshot wound to the right knee**
- **There are no other injuries**



TCCC Critical Decisions

Additional Case Study 6

The Casualty

- **You are now on board a helicopter in the TACEVAC phase of care**
- **Severe pain during Tactical Field Care was treated with IM morphine x 3**
- **Bleeding from the wound was controlled quickly with a tourniquet**
- **The casualty continues to complain of pain**
- **You give the casualty 5 more mg of IV morphine x 2 at 10 minute intervals in an attempt to relieve his pain**
- **The casualty experiences relief of his pain**
- **But soon appears sleepy and confused**



TCCC Critical Decisions

Additional Case Study 6

Casualty Dashboard

- **AVPU** **Awake but drowsy**
- **Airway** **Patent**
- **Breathing** **RR 8**
- **Blood Pressure** **95/70**
- **O2 Saturation** **79%**



TCCC Critical Decisions

Additional Case Study 6

Question

What is the NEXT action you should take?

- 1. Administer a unit of packed red blood cells**
- 2. Stop using IV morphine and switch to 50 mg of ketamine as your next option**
- 3. Administer 0.4 mg of naloxone IV**
- 4. Administer 1 gm of TXA**



TCCC Critical Decisions

Additional Case Study 6

Correct Answer and Feedback

3) Administer 0.4 mg of naloxone IV

This scenario depicts a casualty suffering from an opioid overdose. IM morphine acts slowly, and the lack of pain relief may cause the combat medical provider to administer multiple doses of morphine, as in this scenario. When the morphine begins to take effect 30-45 minutes later, the multiple doses may act on concert with the IV morphine to produce an overdose. The next action should be to administer IV naloxone.



TCCC Critical Decisions

Additional Case Study 7

The Setting

- **A mission team is clearing a building**
- **One person is moving near the edge of the roof of a two-story building**
- **The person is hit by small arms fire in his body armor plates**
- **He stumbles backwards and falls from the roof**
- **There is no effective incoming fire at present**
- **Hostile fire is intensifying from nearby buildings**
- **Rounds are landing near you and your casualty**



TCCC Critical Decisions

Additional Case Study 7

The Casualty

- **The casualty is unconscious when you get to him**
- **Hostile fire is intensifying from nearby buildings**
- **There are rounds landing near you and your casualty**
- **There is no obvious external bleeding**



TCCC Critical Decisions

Additional Case Study 7

Question

What is the NEXT action you should take?

- 1. Intubate the casualty to secure his airway**
- 2. Await the arrival of a commercial litter before attempting to move the casualty to cover**
- 3. Start an IV**
- 4. Immediately move the casualty to the nearest cover by supporting his head and dragging him along the long axis of his body.**



TCCC Critical Decisions

Additional Case Study 7

Correct Answer and Feedback

4. Immediately move the casualty to the nearest cover by supporting his head and dragging him along the long axis of his body.

This casualty has a potential spinal cord injury that must be considered as well as likely TBI. He may also have noncompressible hemorrhage and multiple musculoskeletal injuries from his fall. But the first consideration at the moment is to move him to cover so that he (and you) will not be injured further by hostile fire.



Questions?