

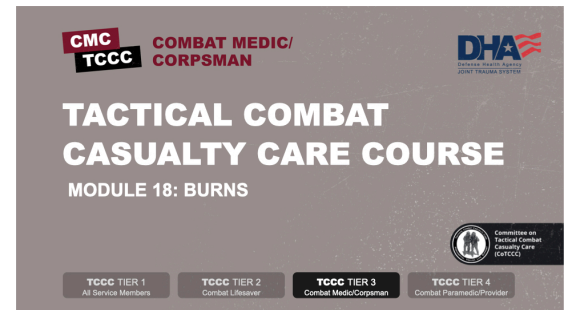
# SPEAKER NOTES

## MODULE 18 – BURNS

These comprehensive speaker notes provide a script for the trainer to use during the delivery of this TCCC-CLS Didactic Presentation. The notes also include key points that should be emphasized throughout the presentation.

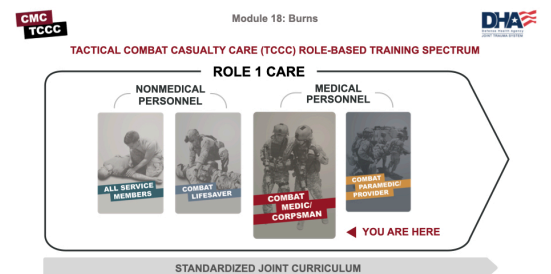
### SLIDE 1 – TITLE SLIDE

This module discusses the management of burns in the Tactical Field Care (TFC) setting, highlighting your role as a Combat Medic.



### SLIDE 2 – ROLE 1 CARE

Recognizing that Tactical Combat Casualty Care (TCCC) is the standard of care in battlefield prehospital medicine, DoDI 1322.24, Medical Readiness Training, implemented standardized combat casualty care training for all Service members. Training focuses on lifesaving skills and is tailored to the level of care that an individual might be expected to perform. If you have not been trained in TCCC, then your previous medical training may not have contained the material presented in the following lessons.



### SLIDE 3 – LEARNING OBJECTIVES

There are six cognitive and two performance enabling learning objectives covered in this module.

You will learn how to identify scene safety issues and actions required of a trauma casualty with burns before evaluation and care of the casualty, types and severity of burns, and how to estimate the percentage of the body surface involved in the burn.

You will also be able to identify progressive strategies and limitations for burn management in Tactical Field Care (TFC) as well as how to identify the indications, contraindications, and administration methods of Lactated Ringer's.

The performance objectives involve learning how to apply a dry dressing, demonstrating techniques to prevent heat loss (hypothermia), and initiating burn fluid resuscitation when indicated.

Module 18: Burns

**1 x TERMINAL LEARNING OBJECTIVES**

**21** Given a combat or noncombat scenario, perform assessment and initial treatment of burns during Tactical Field Care in accordance with CoTCCC Guidelines.

- 21.1 Identify the specific scene safety issues and actions required of a trauma casualty with burns before evaluation and care of the casualty.
- 21.2 Identify types and severity of burns in accordance with the conventional burn classification.
- 21.3 Identify how to estimate the body surface area burned using the Rule of Nines.
- 21.4 Identify the evidence supporting the indications, progressive strategies, and limitations for burn management in TFC.
- 21.5 Demonstrate the application of a dry dressing to a burn casualty in accordance with CoTCCC Guidelines.
- 21.6 Demonstrate techniques used to prevent heat loss in a severe burn casualty in accordance with CoTCCC Guidelines.
- 21.7 Describe burn fluid resuscitation in Tactical Field Care.
- 21.8 Identify the indications, contraindications, and administration methods of Lactated Ringer's in Tactical Field Care.

**08 x ENABLING LEARNING OBJECTIVES**

# = Terminal Learning Objectives ● = Cognitive ELOs ⊗ = Performance ELOs

# SPEAKER NOTES

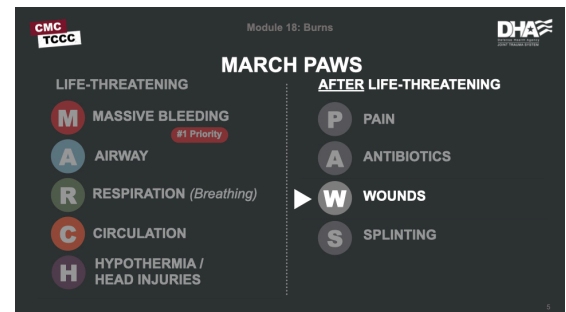
## SLIDE 4 – THREE PHASES OF TCCC

Remember, you are now in the Tactical Field Care phase of care, so the focus has shifted from immediate life-threatening hemorrhage control while still under enemy fire in the Care Under Fire phase, to the reassessment of all previous interventions, followed by the prevention and treatment of other injuries and complications such as burns.



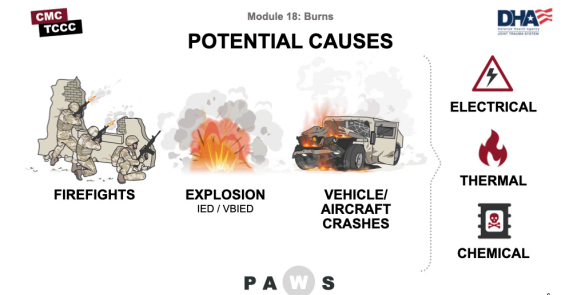
## SLIDE 5 – MARCH PAWS

Burns are part of the “W” in the MARCH PAWS sequence, which stands for wounds.



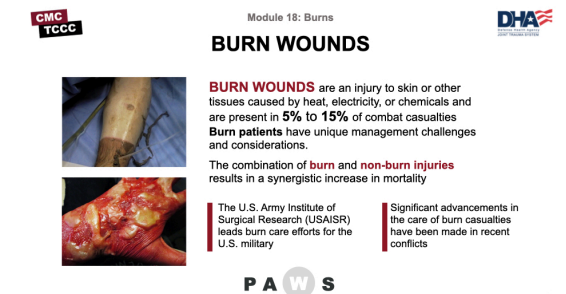
## SLIDE 6 – POTENTIAL CAUSES

Burns can happen during firefighting, explosions, or vehicle or aircraft crashes. The source of the burn can be from exposure to electrical, thermal, or chemical events. Each of these different sources have specific management principles both for you and the casualty's safety and proper casualty treatment.



## SLIDE 7 – BURN WOUNDS

Burn wounds are present in 5% to 15% of combat casualties. Although significant advancements in the care of burn casualties have been made in recent conflicts, burn patients still have unique management challenges and consideration. In fact, the combination of burn and non-burn injuries results in a synergistic increase in mortality. This can often be the result of inhalation injury, or burn shock superimposed on hemorrhagic shock, making management and treatment decisions critically important. Loss of the epidermal barrier causes a loss of moisture and fluids, loss of heat, lack of protection from infection, and initiation of an inflammatory process. The U.S. Army Institute of Surgical Research (USAISR) leads burn care efforts for the U.S. military. They perform cutting edge research to identify methods and techniques to improve outcomes in military burn casualties.



# SPEAKER NOTES

## SLIDE 8 – FOLLOW MARCH PAWS


A burned casualty is a trauma casualty first. Although the burn wounds can be distracting, you must address all other life-threatening injuries using the MARCH PAWS sequence first. Remember, all trauma treatments can be performed on or through burned skin.

Module 18: Burns

**FOLLOW MARCH PAWS**

- Address **ALL OTHER** life-threatening injuries using the MARCH PAWS sequence
- All trauma treatments can be performed on or through burned skin
- Burn wounds may be distracting, but are unlikely to lead to immediate death

**REMEMBER:** A burned trauma casualty is a trauma casualty first!



Depending on the source of the burn special consideration must be taken when providing care

**P A W S**


## SLIDE 9 – IN CASE OF ELECTRICAL INJURY

In an electrical injury, the first thing to do is to secure the power, if possible.

Otherwise, remove the casualty from the electrical source using a nonconductive object, such as a wooden stick. Then, move the casualty to a safe place. Low-voltage injuries such as wall outlets may cause arrhythmias in addition to burns. High-voltage injuries such as high-tension wires may cause deep tissue injury and can result in an explosion which can lead to other blunt trauma injuries.

Module 18: Burns

**IN CASE OF ELECTRICAL INJURY**



- Secure the power, if possible
- Otherwise, **remove** the casualty from the electrical source using a nonconductive object, such as a wooden stick
- Move the casualty to a safe place


**P A W S**

## SLIDE 10 – IN CASE OF THERMAL INJURY

Thermal injury is the most common burn injury and involves direct damage to the skin and underlying structures by heat or flame. Since the temperature of the heat source and the time of contact with the skin determine the depth of the burn, the first step is to **stop the source of the burning**. This may entail smothering the flames or removing the casualty from the heat source, but always remember to protect yourself from getting burned while doing this.

Module 18: Burns

**IN CASE OF THERMAL INJURY**



- STOP** the sources of the burning
- Assess and manage** the burn, cut the clothing from around the burned area and gently lift it away
- If clothing is stuck to the burn, ensure you cut around the clothing and leave it in place
- Be sure to avoid grabbing or further damaging burned areas

**P A W S**

Then, to assess and manage the burn, cut the clothing from around the burned area, and gently lift it away. If the clothing is stuck to the burn, cut around the edges of the clothing that has adhered to the skin and leave it in place. Do not pull it off the burn. Be sure to avoid grabbing or further damaging burned areas by manipulating them during casualty movements.

# SPEAKER NOTES

## SLIDE 11 – IN CASE OF CHEMICAL INJURY

Chemical burns can be caused by many different types of chemicals present in vehicles, machinery, and even some weapons.

An example of a chemical is white phosphorus. It can be found in tank, mortar, and artillery rounds. White phosphorus ignites spontaneously when in contact with air, producing a yellow flame and white smoke in the wound bed.

To prevent continued burning, submerge the affected area in water, if possible.

If submersion is not possible, the dressing must be wet, which can be done by applying a wet barrier, such as water-soaked gauze, clothing, or mud, and covering with an occlusive dressing. Submersing the affected area removes the oxygen supply that causes the burning. Advise all first responders of the presence of a chemical burn. This presents an increased risk to all providers and must be clearly communicated.

Module 18: Burns  
**IN CASE OF CHEMICAL INJURY**

Advise all first responders of the presence of a chemical burn

**EXAMPLE**  
**WHITE PHOSPHORUS**  
**SOURCE**  
Commonly found in tank rounds, mortar rounds, artillery rounds can cause burns

**TREATMENTS**  
Submerge the burned area in water  
Apply wet barrier (water-soaked gauze, clothing, mud, etc.) with an occlusive dressing

Patients with chemical burns should be decontaminated IAW Unit SOP

P A W S

## SLIDE 12 – SEVERITY OF BURN

Burns range in severity. Here are visuals to help identify the severity of the burn, based on its depth.



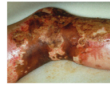
Superficial, or first-degree burns, will appear reddened like a sunburn, which is painful and erythematous without blistering or open wounds.

Partial thickness, or second-degree burns, will also appear reddened but may also have blisters.

Full thickness, or third-degree burns, will be dry, stiff, leathery, and variable in color.

Subdermal Burns or fourth degree burns extend through the subcutaneous tissue into fascia, muscle, and even bone.

Module 18: Burns  
**SEVERITY OF BURN**  
BURNS ARE CLASSIFIED BY THE DEPTH OF THE WOUND

			
<b>SUPERFICIAL</b> <b>1<sup>ST</sup> DEGREE BURNS</b> These burns are painful and erythematous without blistering or open wounds. An example of a superficial burn is sunburn.	<b>PARTIAL THICKNESS</b> <b>2<sup>ND</sup> DEGREE BURNS</b> Bright red to mottled in appearance and wet to the touch. Blisters are commonly seen in superficial partial-thickness burns.	<b>FULL THICKNESS</b> <b>3<sup>RD</sup> DEGREE BURNS</b> May appear charred or whitish in color, dry, leathery, and insensate. Thrombosed blood vessels may be visible.	<b>SUBDERMAL BURN</b> <b>4<sup>TH</sup> DEGREE BURNS</b> Subdermal burns extend through subcutaneous tissue into fascia, muscle, and even bone.

P A W S

# SPEAKER NOTES

## SLIDE 13 – RULE OF NINES

On the DD Form 1380 the percentage of coverage on the casualty's body will need to be documented. The Rule of Nines will help with the estimation. The graphic here shows the approximation for each area of the body:

**Eleven areas** each have 9% body surface area (head, upper extremities, front and backs of lower extremities, and front and back of the torso having two 9% areas each). General guidelines are that the size of the palm of the hand represents approximately 1% of the burned area.

When estimating, it is easiest to round up to the nearest 10. If half of the front or rear area is burned, the area would be half of the area value.

**For example**, if half of the front upper/lower extremity is burned, it would be half of 9%, or 4.5%. If half of the front torso is burned, say either the upper or lower part of the front torso, then it would be half of 18%, or 9%. Remember, the higher the percentage burned, the higher the chance for hypothermia.

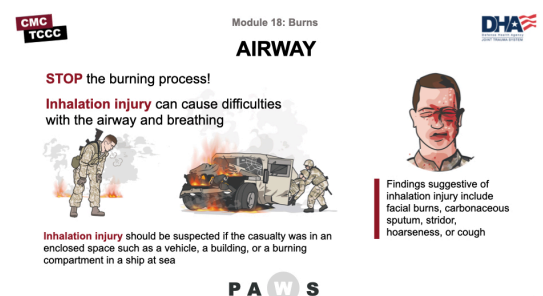
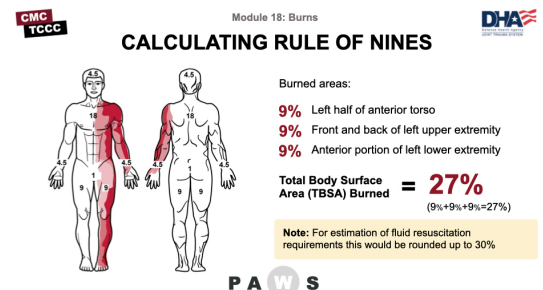
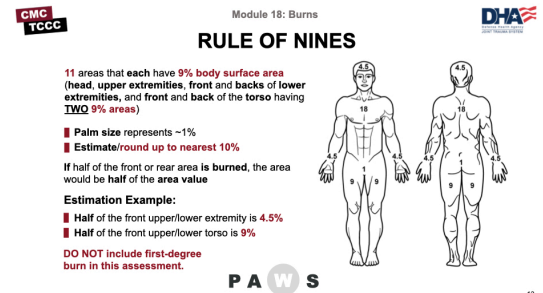
## SLIDE 14 – CALCULATING RULE OF NINES

In this example, the areas burned are the left side of the anterior torso, which is 9%, the entire left upper extremity, front and back, which is 9%, and the front of the left lower extremity, which is also 9%. This adds up to a total body surface area burned of 27%. If you are going to use this for estimation of fluid resuscitation, you would round this up to 30%.

## SLIDE 15 – AIRWAY

Inhalation injury can cause difficulties with the airway and breathing. Inhalation injury should be suspected if the casualty was in an enclosed space such as a vehicle, a building, or a burning compartment in a ship at sea. Clinical exam findings suggestive of inhalation injury include facial burns, carbonaceous sputum, stridor, hoarseness, or cough. In these patients, special attention must be paid to the airway.

Facial burns, especially those that occur in closed spaces, may be associated with inhalation injury. Aggressively monitor airway status and oxygen saturation in such patients and consider early surgical airway for respiratory distress or oxygen desaturation.





# SPEAKER NOTES

## SLIDE 16 – AIRWAY (CONT.)

Inhalation injury can quickly compromise the airway due to edema and you must be ready for early intervention and possibly the need for an advanced airway. They may require a surgical airway to bypass the edema of the upper airway and oropharynx. These casualties should be monitored closely for potential airway issues. Do not place an NPA or extra-glottic in a casualty with signs of inhalation injury, as a surgical airway should be performed for signs of airway compromise in a burn casualty.

## SLIDE 17 – BURN CARE

All TCCC procedures can be performed on or through burned skin in a burn casualty. Remove all watches and jewelry from the burned area so they don't cause constriction when swelling occurs. Cover the burned area with a dry, sterile dressing, if possible. For extensive burns (>20%), consider placing the casualty in the Heat-Reflective Shell or Blizzard Survival Blanket from the Hypothermia Prevention Kit in order to both cover the burned areas and prevent hypothermia.

## SLIDE 18 – BURN CARE AND HYPOTHERMIA PREVENTION

TAKE EARLY and aggressive steps to prevent further body heat loss

Always be mindful of burns along with massive bleeding. **Ensure bleeding is controlled first.**

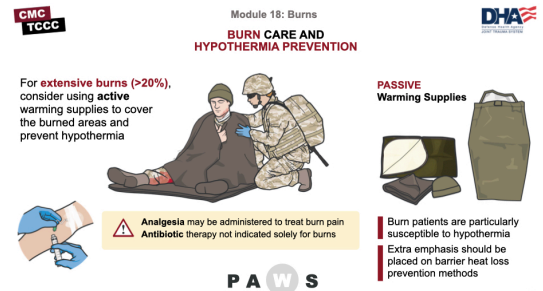
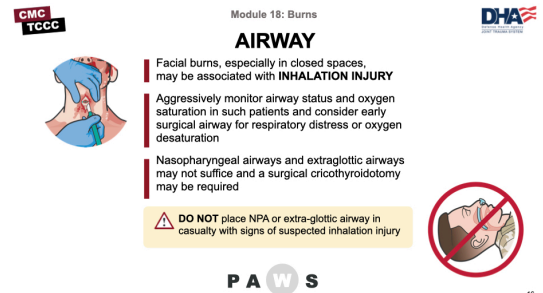
Burn patients are particularly susceptible to hypothermia. Extra emphasis should be placed on barrier heat loss prevention methods. Keep casualties off the ground and onto an insulated surface as soon as possible.

For **extensive burns**, those with **>20%** of the area burned, consider placing the casualty in the vapor barrier shell to cover the burned areas and prevent hypothermia.

Regardless of ambient temperature in the environment, actively prevent/manage hypothermia for burn patients using these methods.

Be mindful of warm weather and cool weather interventions. The addition of blood loss can cause the body's temperature to drop even when it is hot outside. Never cover a tourniquet; keep it visible so medical personnel can easily see it.

Analgesia may be administered to treat burn pain. Antibiotic therapy is not indicated solely for burns but should be given to prevent infection in penetrating wounds.



# SPEAKER NOTES

## SLIDE 19 – BURN FLUID RESUSCITATION

Fluid resuscitation for burn casualties is guided by the USAISR Rule of Ten. For burns > 20% TBSA, initiate fluid resuscitation as soon as IV/IO access is established. REMEMBER: If hemorrhagic shock is also present, resuscitation for hemorrhagic shock takes precedence over resuscitation for burn shock.

Use Lactated Ringer's, normal saline, or Hextend®. If Hextend is used, no more than 1000 ml should be given, followed by Lactated Ringer's or normal saline as needed.

The initial IV/IO fluid rate is the %TBSA x 10 ml/hr for adults weighing 40-80 kg. For every 10 kg above 80 kg, increase the initial rate by 100 ml/hr.

Consider using oral fluids for burns up to 30% TBSA if the casualty is conscious and able to swallow.

## SLIDE 20 – SKILL STATION: BURN TREATMENT (SKILL)

At this time, we will break into skill stations to practice the following skills:


- Burn dressing

## SLIDE 21 – SUMMARY

In this module, we discussed burn care. We identified the treatment priorities in trauma and burn casualties, and the special airway considerations in burn casualties with inhalation injuries. We addressed the causes of burns and how to know the types of burns by severity and how to estimate the body surface area affected by a burn. We also demonstrated estimating burn size with the Rule of Nines and how to calculate fluid resuscitation requirements with the USAISR Rule of Ten. In addition, we demonstrated the application of a burn dressing and techniques to prevent heat loss in a burn trauma casualty.

Module 18: Burns

**BURN FLUID RESUSCITATION**



Fluid resuscitation for burn casualties is guided by the USAISR Rule of Ten

For burns > 20% TBSA, initiate fluid resuscitation as soon as IV/IO access is established

REMEMBER: If hemorrhagic shock is also present, resuscitation for hemorrhagic shock takes precedence over resuscitation for burn shock

Use Lactated Ringer's, normal saline, or Hextend® (If Hextend is used, no more than 1000 ml should be given, followed by Lactated Ringer's or normal saline as needed)

Initial IV/IO fluid rate is %TBSA x 10 ml/hr for adults 40-80 kg

For every 10 kg ABOVE 80 kg, increase initial rate by 100 ml/hr

Consider using oral fluids for burns up to 30% TBSA if casualty is conscious and able to swallow

P A W S

Module 18: Burns

**SKILL STATION**

Burn Treatment (Skill)

✓ Burn Dressing

Module 18: Burns

**SUMMARY**

- Treatment priorities in trauma and burn casualties
- Airway considerations in burn casualties
- Potential causes of burns
- Types of burns (Electrical, Thermal, and Chemical)
- Severity of burn injuries according to depth
- Estimating burn size with the Rule of Nines
- Fluid Resuscitation with the USAISR Rule of Ten
- Prevention of hypothermia in burn casualties

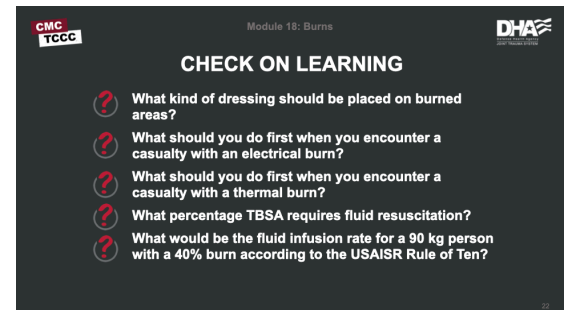
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# SPEAKER NOTES

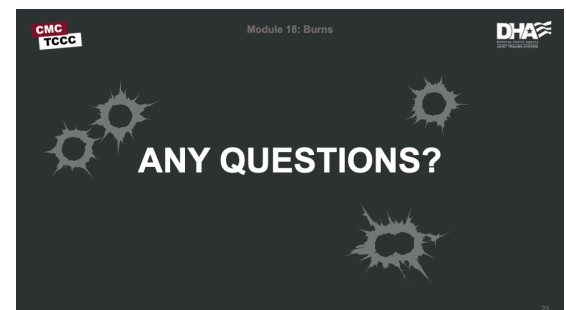
## SLIDE 22 – CHECK ON LEARNING

Ask questions of the learners referring to key concepts from the module.

1. Question: What kind of dressing should be placed on burned areas?
  - Answer: A dry sterile dressing
2. Question: What should you do first when you encounter a casualty with an electrical burn?
  - Answer: Secure the power, if possible; otherwise, remove the casualty from the electrical source using a nonconductive object, such as a wooden stick.
3. Question: What should you do first when you encounter a casualty with a thermal burn?
  - Answer: Stop the source of the burn
4. Question: What percentage TBSA requires fluid resuscitation?
  - Answer: For burns > 20% TBSA, initiate fluid resuscitation as soon as IV/IO access is established.
5. Question: What would be the fluid infusion rate for a 90 kg person with a 40% burn according to the USAISR Rule of Ten?
  - Answer: 500ml/hr
  - The initial IV/IO fluid rate is the %TBSA x 10 ml/hr for adults weighing 40-80 kg. For every 10 kg above 80 kg, increase the initial rate by 100 ml/hr.
  - $40\% \times 10 \text{ ml/hr} = 400\text{ml/hr}$
  - $400\text{ml/hr} + 100\text{ml/hr} = 500\text{ml/hr}$



## SLIDE 23 – ANY QUESTIONS?



## SLIDE 24 – REFERENCES

