

# Pre-hospital Burns

## Adapted for Prolonged Field Care

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**Paris Special Operation Forces  
Combat Medical Care Conference**

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# Declaration of interests:

- Medical Officer RAMC 1976-2013
- Colonel TA BATLS 2006-2013
- Consultant in Anesthesia & Pain Medicine, Regional Burn Centre, Manchester UK 2003 -2020
- Founding Member Pre-hospital Faculty RCSEd, Edinburgh & College of Remote & Offshore Medicine, Malta
- Chair Pre-hospital SIG British Burns Association



# The Challenge?

“..requires flexibility, common sense and an appreciation of imposed limitations..”

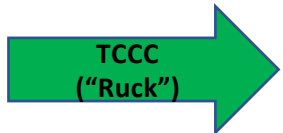
“..based on available material, personnel, operating room time and patient condition..”

“Forget how you do things back home”

Barillo DJ & Brisam M (2012)



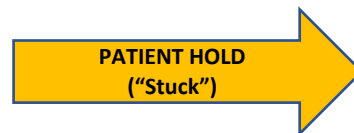
**RUCK:**  
what you carry



**TRUCK:**  
additional kit carried in SUV



**HOUSE:**  
gear stored in remote clinic



**PLANE:**  
move casualties on aeromedical platforms



# Proportion of burns in conflict:

CONFLICT	%
Vietnam 1965-1973	4.6
Israeli Six Day War	4.6
Yom Kippur War 1982	10.1
Falklands War 1982	14.0
Lebanon War 1982	8.6
Panama Police Station 1989	2.3
Operation Desert Shield/Storm 1990-1991	7.9
Operation Iraq & Enduring Freedom 2003-2005	1.8-10.5

Tactical Situation  
Physical Environment  
Resources  
Training  
Communication  
Casualty Count

10 Essential PFC Capabilities										
	1. Monitoring	2. Resuscitate	3. Ventilate and oxygenate	4. Control the Airway	5. Sedation and Analgesia	6. Physical Exam and Diagnostics	7. Nursing and Hygeine	8. Surgical Interventions	9. Telemedical Consult	10. Package and Prepare for flight
Minimum	BP Cuff, Stethoscope, Pulse Ox, Foley	Fresh Whole Blood Kit	Bag-Valve-Mask with PEEP Valve	Awake Ketamine Cric	Opiate Analgesics titrated through IV	Physical Exam without advanced	clean, warm, dry, padded, catheterized	Chest tube, cric	Make comms, present patient and key vitals	Be familiar with stressors of flight
Better	Capnometry	2-3 cases of LR for Burn Resus	O2 Concentrator	Long duration sedation	Sedation with Ketamine/option of midazolam	Ultrasound and point of care labs	Elevate head of real beddebride, washout NG/OG	Fasciotomy debridement, amputation	Add labs and ultrasound video	Trained in critical care transport
Best	Vital Signs Monitor	PRBS, FFP, Type specific donors	Portable Ventilator	Proficient in Rapid Sequence Intubation	Educated and practiced imulti drug sedation	Experienced and trained in above	Experienced in all nursing care concerns	Trained and experienced in above	Real time video conference	Experienced in critical care transport
Ruck	Pulse Ox, Head Lamp	1 FWB Kit per man, 2 250cc bag NS	BVM with PEEP Valve	Cric Kit, LMA/SGA, lidocaine and ketamine IM	Fentanyl TML, Perc PO, Ketamine IM/ IV	Urinalysis test strips, fluorescein strips	Compct Foley kit, Sterile kerlix, litter padding	Cric, 10gNeedle D Scalpel	Cell Phone and call sheet	Have checklist available
Truck	BP Cuff, Stethoscope, capnometry, small monitor	Casre LR, Additional FWB Kits, 3% Saline	SAVent or SAVE 2	RSI, LMA/SGA, Cric kit ketamine bag IV	Ketamine IV with midazolam	Blood tubes to drop off labs on the way	Padded litter, NG,	Sterile Chest Tube Kit with drapes	Cell phone and call sheet, sat phone, radio	Checklist plus flight evac kit
House	Add defibrillation	2 additional cases LR, Case NS, Additional 3% Saline	Impact Vent and O2 bottle	All from above Add Benzo if not available for truck	Same as above	Blood tubes to run labs to local clinic	Real mattress with head elevated, nursing care kit sleeping bg	Sterile Surgical Kit with Drapes, Gowns and scrub soap	Secure comms, email	Extensive evac kit
Plane	Take all of above	All of above	Impact vent on O2	All above calculate for flight and double	All above calculate for flight and double		Padded Litter, Sleeping Bag	10g needle D Chest tube kit Cric kit	Through aircraft	From Above

*If you can't bring the patient back, you have to push capability forward*  
Col Keenan, PFC Working Group (2012)



# Aim:

- To provide a clean granulating burn wound, with splintage to prevent contracture; in an active, well nourished patient in a PFC environment
- With all the duties of a multidisciplinary burn team provided by one SF medic
- Reducing TBSAB% and doing interventions that reduce morbidity and mortality and the post-burn PTSD

# MARCH & Ten clinical pearls:

1. The first few hours
2. Airway mitigation techniques
3. Pragmatic fluid resuscitation
4. Alternative analgesic approaches
5. Escharotomy
6. Fasciotomy
7. Managing burn wounds
8. Physiotherapy interventions & positioning
9. Feeding
10. Palliation



## Structure of EMSB

LOOK DO	A	B	C	D	E	FLUIDS ANALGESIA TESTS TUBES	A.M.P.L.E. History Head to Toe Examination Tetanus Documentation and Transfer Support
	IRRAWAY	REATHING	IRACULATIONS	ISABILITIES	EXPLOSURE		
	C spine	O <sub>2</sub>	Haemorrhage control I.V.	AVPU & Pupils	Environmental Control		
	Primary Survey					First Aid	Secondary Survey

# Mechanism of injury

- Flame is coagulopathic
- Acid is coagulopathic
- Alkali is liquefactive
- Friction is superficial trauma but can be extensive as in a degloving injury
- Electrical injury can cause limb or life threatening + compartmental syndrome and rhabdomyoglobinuria
- Confined spaces risk of inhalational injury and systemic poisoning

# Types of burns

- Heat: flame, flash, scalds, contact
- Friction (ejection)
- Chemical: acid, alkali (cement), phosphorous
- Electrical: flash or conductive
- Radiation: civilian (sun exposure) industrial & military
- Cold: frostbite

# 1. The first few hours:

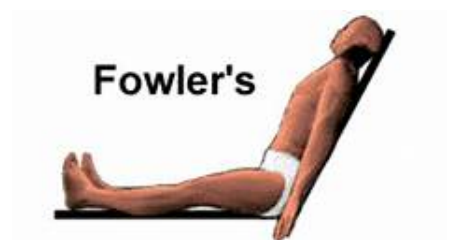
Good early resuscitation reduces the zone of stasis and reduces the %TBSAB and depth of burn  
**Jackson's Zones (1953)**

- Burn is distracting injury
- Trauma and burn may co-exist
- History & mechanism of injury (AMPLE)
- Consider need for PPE
- Photograph scene for telemedicine
- **Shout** for help
- **Assess** scene
- **Free** from danger
- **Evaluate**: MARCH
- Stop the burning process and cool the burn but not the victim
- **M**: *On the floor plus 4 more*: Chest, Abdomen, Pelvis and Long bones
- **Shock in major burns before 12 hours look for another source of M**



## 2. Airway mitigation

- Inhalational injury ? CO/CN toxicity, upper airway obstruction > pneumonia
- Oxygen supplementation
- Upper airway compromise or > 40% TBAB > early intubation (oedema formation ceases between 18-30 h)
- Consider nebulised epinephrine (1 mg in 10 ml) before advanced airway techniques
- Fowler position ( Bali bombings – Prof Fiona Wood) Negated intubation



# Respiration

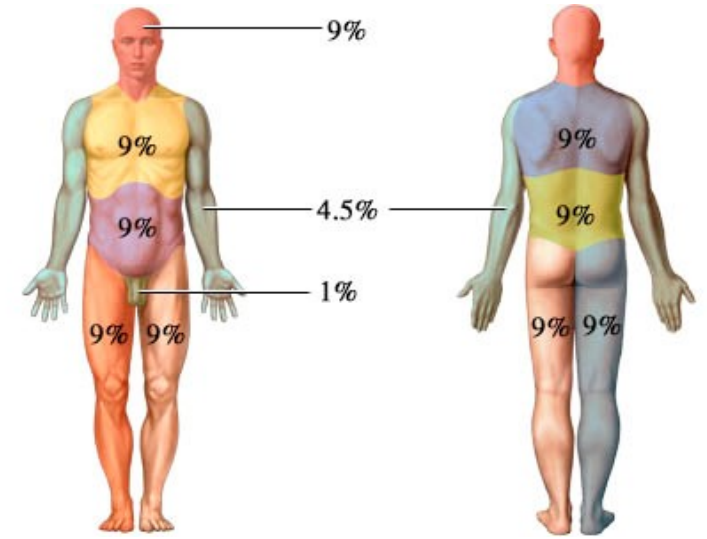
- Is there adequate bilateral gas movement?
- Ensure ventilation is not restricted by circumferential chest burn
- Seal, needle and drain

# Circulation

- Adequate radial pulse? Systolic  $>90$
- Fluid resuscitation: oral route if possible
- $\text{CRT} < 2\text{s}$
- Urinary bladder catheterization: monitor urine output  $0.5 - 1\text{ml/kg/h}$
- Escharotomy needed?

# Assessment of TBAB% + Depth

- Size: Palm with fingers = 1 %, Rules of 9, Serial halving
- Is overestimated in prehospital setting ( blisters)
- Depth



# Burn Size and Fluid Routes of Administration

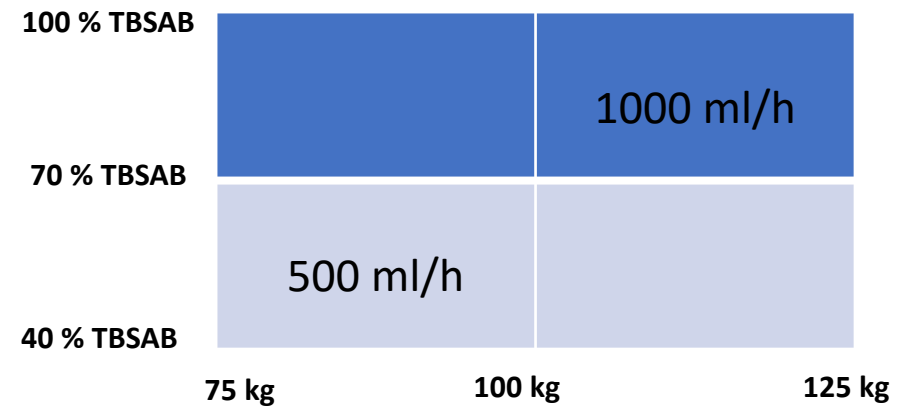
- Consider oral/enteral fluids – “coached” drinking for 10 - 40% TBAB
- Rectal infusion up to 500 ml/h

1. WHO ORS: 1L potable water + 6 level tsp sugar + 0.5 level tsp salt
2. Mix 1L water + 8 tsp sugar + 0.5 tsp salt + 0.5 tsp baking soda



### 3. Pragmatic Fluid resuscitation

- Parkland, Brooke or Consensus Formula ( Use lower figure)
- The Burns Fluid Grid: A pre-hospital guide to fluid resuscitation in burns.  
de Mello WF & Greenwood NPA. JRAMC (2010)



- “Big man, big burn, big bag; small man, small burn, small bag”

+

Boluses of 250 ml to maintain radial pulse

# Head

- LOC: hypovolemia, head injury, systemic poisoning etc
- Use of supplemental oxygen in carboxyhaemoglobin poisoning
- Cyanide toxicity : Hydroxycobalamin (Cyanokit™) and sodium thiosulfate and sodium nitrite (Nithiodote™) iv

# 4.1 Alternative analgesic techniques

- Battlefield analgesia (2006) Hodgetts T, de Mello WF et al. Surgeon Generals Office, HMSO, UK
- Efficacy of topical morphine on burns EMJ (2007) de Mello WF
- The use of topical morphine on burn wounds 20 mg in 10-20 ml sterile water
- The early detection and management of neuropathic pain following combat injury. JRAMC (2009) Mercer J, de Mello WF et al
- Early introduction of pregabalin 75 mg BD orally or amitriptyline 10 mg orally at 1900
- Battlefield analgesia 2009 – 10 years on. JRAMC (2010) de Mello WF & Hemmings V

**painDETECT** PAIN QUESTIONNAIRE

Date: ..... Patient: Last name: ..... First name: .....

How would you assess your pain now, at this moment?  
0 1 2 3 4 5 6 7 8 9 10  
none max.

How strong was the strongest pain during the past 4 weeks?  
0 1 2 3 4 5 6 7 8 9 10  
none max.

How strong was the pain during the past 4 weeks on average?  
0 1 2 3 4 5 6 7 8 9 10  
none max.

Mark the picture that best describes the course of your pain:

Persistent pain with slight fluctuations ☐

Persistent pain with pain attacks ☐

Pain attacks without pain between them ☐

Pain attacks with pain between them ☐

Does your pain radiate to other regions of your body? yes ☐ no ☐  
If yes, please draw the direction in which the pain radiates.

Do you suffer from a burning sensation (e.g., stinging nettles) in the marked areas?  
never ☐ hardly noticed ☐ slightly ☐ moderately ☐ strongly ☐ very strongly ☐

Do you have a tingling or prickling sensation in the area of your pain (like crawling ants or electrical tingling)?  
never ☐ hardly noticed ☐ slightly ☐ moderately ☐ strongly ☐ very strongly ☐

Is light touching (clothing, a blanket) in this area painful?  
never ☐ hardly noticed ☐ slightly ☐ moderately ☐ strongly ☐ very strongly ☐

Do you have sudden pain attacks in the area of your pain, like electric shocks?  
never ☐ hardly noticed ☐ slightly ☐ moderately ☐ strongly ☐ very strongly ☐

Is cold or heat (bath water) in this area occasionally painful?  
never ☐ hardly noticed ☐ slightly ☐ moderately ☐ strongly ☐ very strongly ☐

Do you suffer from a sensation of numbness in the areas that you marked?  
never ☐ hardly noticed ☐ slightly ☐ moderately ☐ strongly ☐ very strongly ☐

Does slight pressure in this area, e.g., with a finger, trigger pain?  
never ☐ hardly noticed ☐ slightly ☐ moderately ☐ strongly ☐ very strongly ☐

(To be filled out by the physician)

never ☐ hardly noticed ☐ slightly ☐ moderately ☐ strongly ☐ very strongly ☐

x 0 = 0 x 1 = x 2 = x 3 = x 4 = x 5 =

Total score out of 35

R. Freynhagen, R. Baron, U. Gockel, T.R. Tölle, CurrMed Res Opin Vol 22, 2006, 1911-1920 ©Pflizer Pharma GmbH 2006 06-00547 December 2010

**painDETECT** SCORING OF PAIN QUESTIONNAIRE

Date: ..... Patient: Last name: ..... First name: .....

Please transfer the total score from the pain questionnaire:

Total score

Please add up the following numbers, depending on the marked pain behaviour pattern and the pain radiation. Then total up the final score:

Persistent pain with slight fluctuations 0

Persistent pain with pain attacks -1 if marked, or

Pain attacks without pain between them +1 if marked, or

Pain attacks with pain between them +1 if marked

Radiating pain? +2 if yes

Final score

Screening Result

Final score

negative unclear positive

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38

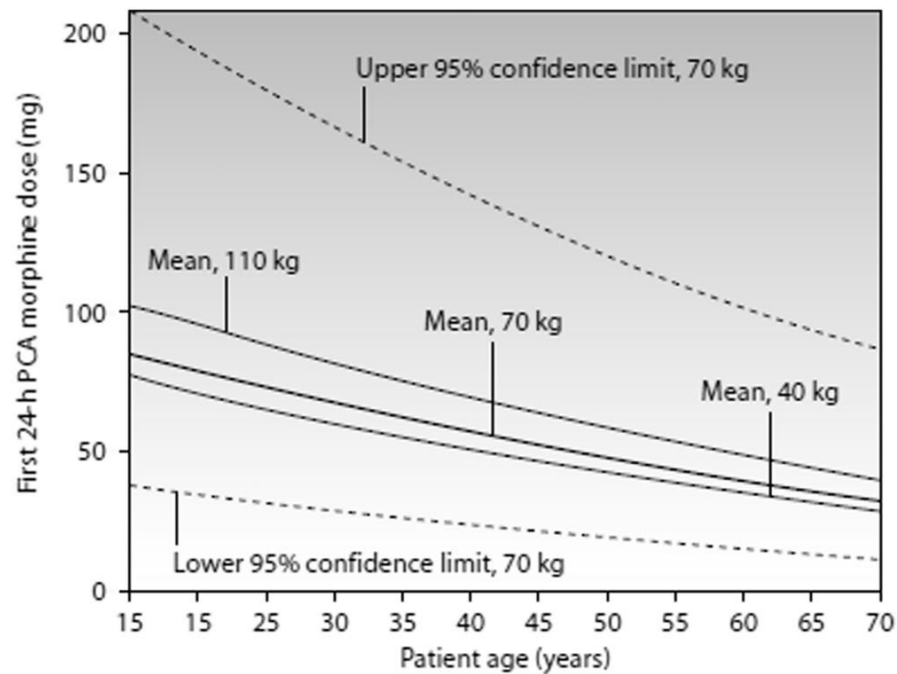
A neuropathic pain component is unlikely (< 15%)

Result is ambiguous, however a neuropathic pain component can be present

A neuropathic pain component is likely (> 90%)

This sheet does not replace medical diagnostics.  
It is used for screening the presence of a neuropathic pain component.

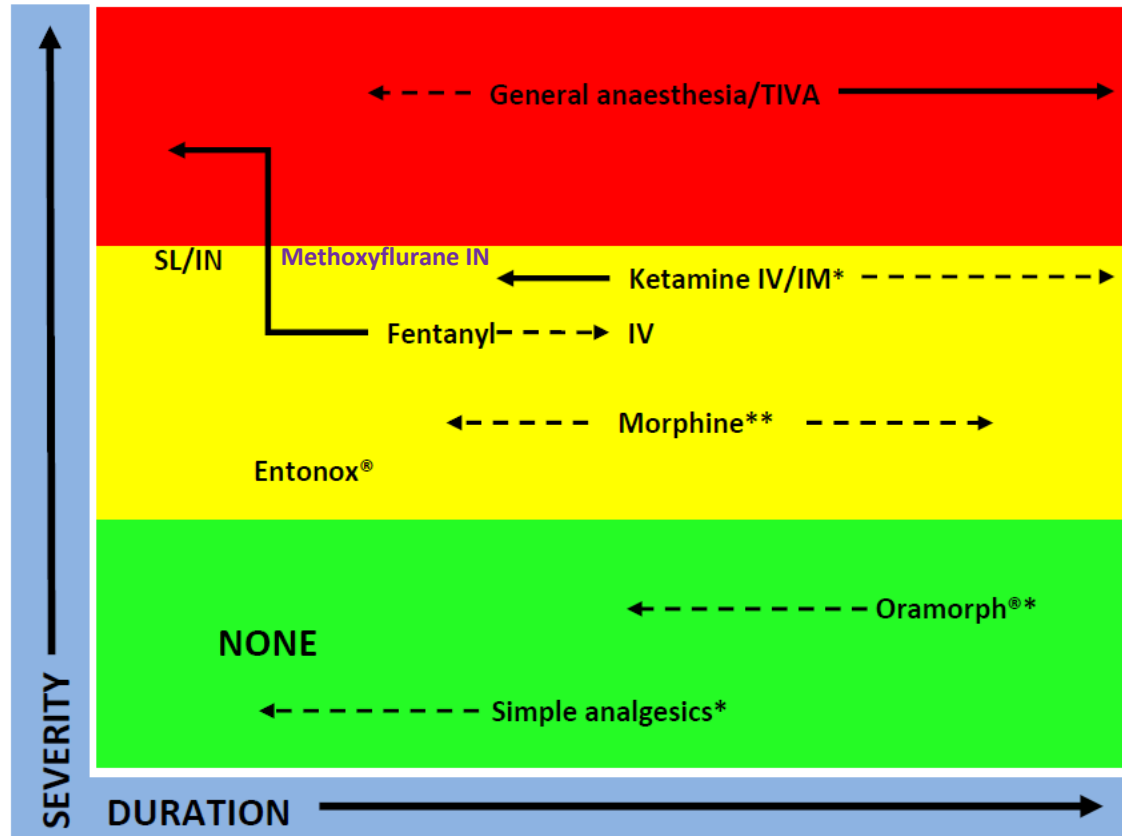
R. Freynhagen, R. Baron, U. Gockel, T.R. Tölle, CurrMed Res Opin Vol 22, 2006, 1911-1920 ©Pflizer Pharma GmbH 2006



- Morphine requirements in first 24 hours after major trauma =  $100 - \text{Age in years}$  (MaCintyre P & Jarvis DA Anaesthesia 1996)
- Morphine use after combat injury in Iraq and post-traumatic stress disorder  
Holbrook TL et al NEJM 2010; 362:110-7 + letter) NEJM (2010) , Schofield J, de Mello WF et al
- Sublingual fentanyl for post burn therapy (poster) IBSI (2012) Rajan J & de Mello WF
- Fentanyl is cardio-stable in comparison with morphine
- Ketamine is versatile for analgesia and anaesthesia

# 4.2 Procedural pain matrix:

Young & de Mello (2011)



Use Penthrane™ (methoxyflurane) for procedural pain

**Procedural sedation in burns - A quick reference guide**  
Miss Frances Young, Dr WF de Mello  
July 2011

**UHSM**  
Your Hospital

**ESTABLISH SUITABILITY**

- Current physical and burn status
- Weight/BMI
- Current medication
- Medical conditions
- Psychological status
- Any potential airway or breathing problem
- > ASA 3
- Establish duration and severity of pain for procedure
- Establish target level of sedation
- Contraindications
- Side effects
- Patient/carer preference
- Staff training
- Proposed sedation technique
- Alternatives to sedation
- Associated risk and benefit

**PREPARATION**

**FASTING**

- Confirm and record time of last food and fluid intake
- Fasting not needed minimal sedation, sedation with Entonox® or moderate sedation with maintained verbal contact
- Apply the 2-4-6 fasting rule for deep and moderate sedation where verbal contact not maintained
- In an emergency for patient who is not fasted base decision to proceed on urgency and target depth of sedation (NB, if the patient is already intubated then enteral feeding need not be stopped)

**PSYCHOLOGICAL PREPARATION**

- Offer information on procedure and what the patient and the carer will do, sensations associated with the procedure and how to cope with the procedure
- Ensure information is appropriate to the cognitive state and check they have understood
- Offer relatives/carers the opportunity to be present during procedure if appropriate and offer advice about their role during it

**CHOOSING SEDATION TECHNIQUE**

SEVERITY ↑

DURATION →

General anaesthesia/TIVA

SL/IN

Methoxyflurane IN

Fentanyl - - - -> IV

Ketamine IV/IM\*

Morphine\*\*

Entonox®

NONE

Oramorph®\*

Simple analgesics\*

\*With or without benzodiazepines \*\* With or without clonidine

**IF LANKS score > 12 then add in gabapentin**

**DURING AND POST-SEDATION**

Continuously monitor, interpret and respond to changes in all of the following

For moderate and deep sedation	For deep sedation only
<ul style="list-style-type: none"> <li>Depth of sedation</li> <li>Respiration</li> <li>Oxygen saturation</li> <li>Heart rate</li> <li>Pain</li> <li>Coping</li> <li>Clonus</li> </ul>	<ul style="list-style-type: none"> <li>Three-lead ECG</li> <li>End tidal CO2</li> <li>Blood pressure - monitor every 5 minutes</li> </ul>

Ensure data from continuous monitoring clearly documented in records

Post procedure continue monitoring until the patient

- Has a patent airway
- Shows protective airway and reflexes
- Is haemodynamically stable
- Is easily roused

If any untoward incident occurs during procedure ensure that future interventions are modified appropriately

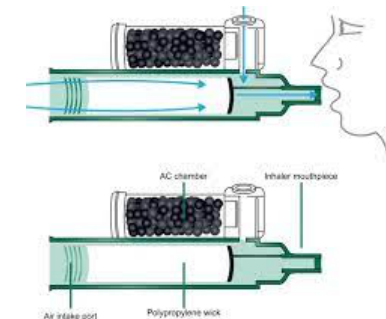
**PERSONNEL AND TRAINING**

Healthcare professionals delivering sedation should have the following experience/skills

	Minimal sedation (Entonox®)	Moderate sedation	Deep sedation
All members	Basic	Basic	Basic
At least one member		Intermediate	Advanced

Each healthcare professional and their team delivering sedation should update their knowledge and skills through programmes designed for continuing professional development

We would like to thank Mr K Dunn (FRCS) and the nursing staff in the Burns Centre at UHSM for their assistance with the development of this guidance.





# Environment



- Personal safety
- Cool the burn only - cold wet towel 20 min up to 3 h postburn
- Large burn patients are poikilothermic
- Commercial polyethylene clingfilm in longitudinal strips as initial dressing
- Consider contamination by exotic organisms - necrotizing mucormycosis (Walsh TJ et al 2019)

## 5. Escharotomy:

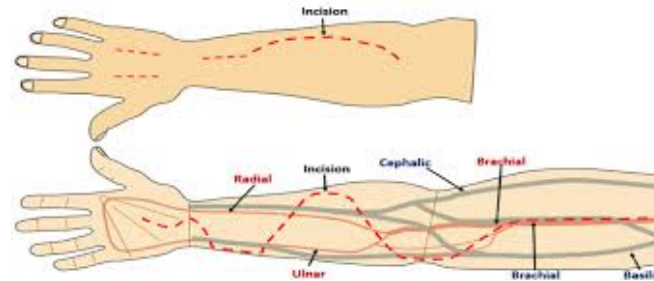
- For circumferential burns of chest, abdomen or long limbs
- Cut skin only along red dotted lines: Will open up under internal pressure
- Cut from beyond burnt area at either end

Management of escharotomy bleeding
Avoid cutting blood vessels
Pack wound with alginate dressing
Epinephrine 1/1000 soaks : 1 mg in 1000 ml N Saline
Haemostatic bandages
Pressure dressings
Elevate affected limb
Tranexamic acid 1-2 Gms IV

# 6. Limb saving Fasciotomy

- Causes: High voltage electrical injury, crush or forearm fractures

- Upper Limb:



- Lower limb:



# 7.1 Initial wound cleaning

Handwashing

PPE

Clean working surface

- Use baby wipes initially to clean burn wound
- Followed by octenidine dihydrochloride + ethylhexylglycerine (Octenilin™) or 0.5% Silver Nitrate ( $\text{AgNO}_3$ )

- Re-assess TBAB% and depth





schülke +  
octenilin®

Wound irrigation solution  
Lösung zur Reinigung  
des Wundes

wounds<sub>UK</sub>

octenilin® range **made easy**

**Introduction**

Most wound cleaning investigations, yet the majority are not infected. The potential for bacteria to produce harmful effects is influenced by the ability of the patient's immune system to control the bacteria as well as the number and type of bacteria present. Barriers are also known to play a role in wound management, including regular cleaning and debridement, to wounds at risk of infection and to maintain the clinical efficacy of occlusive (occlusive) range, shields).

*Authors: Brian M. McGrath A, Denise F.*

**UNDERSTANDING TOPICAL WOUND MANAGEMENT**

Wound infection can delay healing and lead to serious medical complications. Combined with debridement, regular wound cleaning is a critical first step in preventing infection in wounds and has become a basic principle in modern wound management, where it forms part of the process of wound bed preparation (Schultz et al., 2004). These actions help address the barriers to healing by removing any bacteria and debris from the wound surface, such as exudate and devitalized tissue, loose debris (including macrophages) and any dressing material residues. This can promote an optimal environment for healing and facilitate wound assessment by optimizing visualization of the wound bed.

**The role of wound irrigation solutions**

Wounds are cleaned using a variety of methods and solutions. Although tap water has not been found to increase the risk of infection (Fernandez et al., 2010), consideration should be given to the use of sterile solutions (eg sterile saline) and to specially-designed wound irrigation solutions, which have the potential to improve outcomes through their additional actions.

Most wound irrigation solutions contain surfactants that reduce the surface tension of the medium in which they are dissolved, thereby increasing the ability of the solution to spread over the wound surface and penetrate wound crevices, filling dead spaces and debriding from the solution. Such solutions may also help to debride and remove bacteria from the wound (Hibbs and Jackson, 2007).

Current evidence suggests that the use of sterile solutions of polyurethane polymers developed on the surface of wounds and may contribute to debridement. The polyurethane acts as a thick, deep barrier, making it very difficult for bacterial agents to penetrate it. This highlights the importance of topical approaches – treatments should aim to disrupt the biofilm through regular and repeated debridement and vigorous wound cleaning (Phillips et al., 2010).

The addition of a preservative agent enhances the shelf life of these solutions and supports the prevention of bacterial contamination of the wound.

**The role of wound gels**

Wound hydrogels have a high water content (usually between 30-95%) and can donate moisture to the wound surface. This provides a moist wound environment that supports analysis by lowering necrotic or sloughy tissue. As hydrogels are hygienic, they essentially enhance the diffusion of patient-derived proteolytic, enzymatic and growth factors into the wound. In addition, the osmotic properties of hydrogels reduce the possibility of desiccation adhering to the wound surface and minimize the risk of pain and trauma at dressing changes (Dowsett and Newton, 2004). In burn wounds hydrogels also have a cooling effect (Hird, 2007).

**WHAT IS OCTENILIN® WOUND IRRIGATION SOLUTION?**

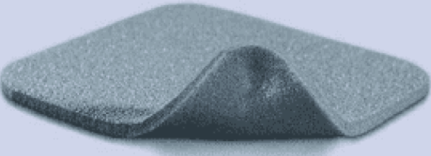







Octenilin® wound irrigation solution is a colorless, alcohol-free solution intended for cleaning and moistening chronic, acute wounds and burns. The solution can also be used to loosen elevated dressing at dressing changes.

**Figure 1: The low surface tension of octenilin® compared to other wound irrigation solutions demonstrates its ability to spread over the wound surface**



## 7.2 Burns dressings

- Aim to keep wound moist, clean and reduce environmental contamination
  - Simplest is dry gauze dressings and clean linen
  - Choice and schedule (daily or if soiled) will depend on the mission
  - Adding topical antibiotic is not a substitute for dead tissue; so debride with forceps and scissors
  - Regular inspection of wound
  - Treat with antibiotic topically if local or intravenously if spreading or systemic
  - Reclean wound and dress with Acticoat™ 3 or 7 day version
- 
- Dressings have 3 components:
    1. Contact Layer
    2. Absorbent layer
    3. Holding layer

	Option 1	Option 2
<b>Contact</b>	 <p>Silver impregnated (Mepilex Ag™ )</p>	 <p>Jelonet</p> <p>+</p>  <p>Silver Impregnated (Acticoat™ 3 or 7)</p>
<b>Absorbent</b>	 <p>Drymax™</p>	<p>Gamgee (heavy duty cotton)</p> 
<b>Holding layer</b>	 <p>Mefix™</p>	 <p>Velband</p> <p>+</p>  <p>Crepe bandage</p>

## 7.3 Topiceuticals

- Lidocaine (20 ml 1%) + Morphine (20-40 mg)



- Metronidazole -perineum



- Honey



- Plantain peel and Papaya as natural enzymatic debridement





## 8. Physiotherapy intervention and positioning

- Chest care and putting major joints through passive and active range of movements



- Splintage

- **Neck:** avoid use of pillow – keep in extension
- **Fingers:** individually wrap with gelonet, gauze and bandage
- **Whole hand:** Plastic bag with 0.05% chlorohexidene sachet then tape round wrist
- **Forearm & Hand fracture or complex injury:** splint palm, hand & forearm : do not wrap hands in a fist but keep thumb web open with dressings
- **Arms and legs:** keep extended
- **Feet:** in 'boot position'





# 9. Feeding

BMR Formula (Harris-Benedict)	
	<b>MEN</b> $BMR = 66.47 + (6.24 \times \text{weight in lbs}) + (12.7 \times \text{height in inches}) - (6.755 \times \text{age})$
	<b>WOMEN</b> $BMR = 655.1 + (4.35 \times \text{weight in lbs}) + (4.7 \times \text{height in inches}) - (4.7 \times \text{age})$

- Hypercatabolic state
- **Harris-Benedict Equation**
- **Calories required= Basal Energy Expenditure (BEE) x Stress Factor (SF) x Activity Factor (AF)**

$BEE = 66 + (14 \times \text{weight kg}) + (5 \times \text{height in cm}) - (6.8 \times \text{age in years})$

SF = 2.1 in major burns or 1.3 if minor procedures

AF = 1.2 if on bed rest or 1.3 if mobilising

- Use early oral route nutrition if possible if >15% TBSAB or NGT
- Stress ulceration use PPI cover: omeprazole 20 mg OD
- Gut-brain axis: importance of faecal microbiome > use natural probiotics (Yoghurt, Kefir, Sauerkraut etc)

# 10. Palliation

- The top 3 complaints by military survivors:
  1. Lack of communication
  2. Failure to relieve pain
  3. Failure to quench thirst
- Modified Baux Score = Age + TBSAB % + 17 (if inhalation) Sturdevant et al (2001)
- > 160 non survivable
- > 109 50% risk of death Roberts G et al 2012
- Be aware of the emotional impact on patient, team, family and friends

## In Summary: Immediate Tasks at Point of Injury

- Don't let the burn distract from life/limb/sight threatening injuries
- Decontaminate ( irrigate or dust off )
- Follow MARCH sequence
- Administer fluids orally if possible
- Cool the burn but keep patient warm
- Cover with Clingfilm longitudinally
- Rapid assessment size of burn: palm + fingers = 1% TBSAB
- Check site of burn does not compromise ventilation, urine output (secondary abdominal compartmental syndrome) limb or visual loss
- Wash and apply dressings

# Thank you for your attention!

Paris Special Operation Forces  
Combat Medical Care Conference  
October 20-21, 2022  
Paris, France



[w.demello@corom.edu.mt](mailto:w.demello@corom.edu.mt)

Thanks to Mr Ken Dunn BSc FRCS (Clinical Director) and the MDT at the Burn Centre, Manchester, UK