Queensland
Trauma Education

BURNS TRAUMA

Facial burns management

Immersive scenario

Facilitator resource kit

CSDS
Clinical Skills Development Service

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Queensland Trauma Education

The resources developed for Queensland Trauma Education are designed for use in any Queensland Health facility that cares for patients who have been injured as a result of trauma. Each resource can be modified by the facilitator and scaled to the learners needs as well as the environment in which the education is being delivered, from tertiary to rural and remote facilities.

Developed by
Dr Frances Williamson, Staff Specialist Emergency Physician – Metro North Health
Kimberly Ballinger, Simulation Educator – Clinical Skills Development Service

Reviewed by
Angelka Opie, Nurse Educator – CSDS, MNHHS

Education Working Group, Statewide Trauma Clinical Network - Clinical Excellence Queensland

Queensland Trauma Education
Burns Trauma – Facial burns management: Immersive scenario – Facilitator resource kit
Version 2.0

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About this training resource kit

This resource kit provides healthcare workers with knowledge and skills to effectively manage a patient with thermal facial burns.

National Safety and Quality Health Service (NSQHS) Standards

Target audience

Emergency department medical and nursing clinicians.

Duration

60 minutes (setup, scenario, debrief).

Group size

4-6 participants (or team composition applicable to local area).

Learning objectives

By the end of this session the participant will be able to:

- perform a structured assessment of a patient presenting with thermal burns
- understand the clinical features and risks associated with airway and inhalational injury secondary to thermal burns
- demonstrate the decision-making to effectively initiate management of a patient with thermal facial burns and associated inhalational injury.

Facilitation guide

1. Facilitator to provide participant resource kit to the participants.
2. Facilitator to discuss the pre-simulation briefing and deliver the immersive scenario on thermal facial burns.
3. Utilise the supporting documents to maximise the learning throughout immersive scenario.
4. Utilise the debriefing guide to evaluate participant performance and provide feedback.

Supporting resources (in Printable Resources)

The following supporting documents are provided for this case discussion:

1. Radiology: CXR: Pre-intubation

2. Radiology: CXR: Post-intubation and OGT insertion
3. Pathology: Venous Blood Gas (pre-intubation)
4. ANZBA Referral Criteria
5. VIC Burns Rule of Nine
6. ANZBA: Initial Management of Severe Burns

Simulation event

This section contains the following:

1. Pre-simulation briefing poster
2. Immersive scenario
3. Resource requirements
4. Handover card
5. Scenario progression
    a. State 1: Initial assessment
    b. State 2: Ongoing management / secondary survey
    c. State 3: Further deterioration / intubation
6. Debriefing guide

Immersive scenario

Type	Immersive scenario
Target audience	Emergency department medical and nursing clinicians
Overview	Martin is a 57-year-old male, BIBA suffering thermal burns whilst trapped in an enclosed space during a house fire. He is at risk of airway and inhalational burns injury and deteriorates soon after arrival to ED. Prompt recognition of airway risk and decision-making is required to effectively manage the patient.
Learning objectives	By the end of this session the participant will be able to: • perform a structured assessment of a patient presenting with thermal burns • understand the clinical features and risks associated with airway and inhalational injury secondary to thermal burns • demonstrate the decision-making to effectively initiate management of a patient with thermal facial burns and associated inhalational injury.
Duration	45 minutes, including debrief.

Resource requirements

Physical resources

Room setup	Resus bay in emergency
Simulator/s	Simman 3G, Simman ALS, ALS Advanced

Simulator set up	• All clothing was removed pre-hospital, patient covered with a sheet.
	• Moulage: normal patient
	  ○ Facial burns - singed facial hairs, soot around nose and mouth.
	  ○ Truncal - burn moulage to anterior chest and abdomen.
	  ○ Limb burns - anterior surfaces of upper limbs (non-circumferential)
	• High flow O2 applied (15L NRB mask)

Clinical equipment	• Intubation medication and equipment • Intubation checklist • Rule of Nine burns size assessment tool • ANZBA Initial Management of Severe Burns infographic
Access	1 x IVC setup in R ACF
Other	ED chart and relevant paperwork (optional)

Human resources

Faculty	2 facilitators (doctor/nurse with debriefing experience) to take on roles of scenario commander and primary debrief
Simulation coordinators	1 simulation coordinator for manikin set up and control
Confederates	Ambulance officer (if available)
Other	1 nurse and 1 doctor in room to receive handover

Handover card

Handover from ambulance officer

This is Martin, he is a 57-year-old man.

He was involved in a house fire tonight. He was pulled from the building by the Fire Service and was reportedly unconscious initially. We do not think he was thrown or sustained a blast injury but was trapped in the building for at least 15 minutes prior to the Fire Service getting him out. This was approximately 1.5 hours ago.

On our arrival he was awake and talking, with mild stridor and finding it hard to breathe, his respiratory rate was 28. We applied oxygen via a NRB and his saturations are now 96%. We did not check his saturations prior to applying oxygen. Other vitals ok - HR 120, BP 100/80mmHg, afebrile. As you can see, he has sustained burns to his face, anterior chest/abdomen and both upper limbs, these are not circumferential.

Martin is otherwise well. He is a smoker, and we think that is how the fire started. He has no regular medications, and no allergies.

We were worried about him so came straight here. He had limited cooling performed en route to hospital and has not had 20 minutes in a shower yet.

He has received 100microg IV fentanyl. He has an 18G cannula in his R ACF.

Scenario progression

<table>
<tr><th colspan="4">STATE 1: INITIAL ASSESSMENT</th></tr>
<tr><th colspan="2">Vital signs</th><th>Script</th><th>Details</th><th>Expected actions</th></tr>
<tr><td>ECG</td><td>ST</td><td rowspan="9">Martin
“I am in pain” *moaning*.
Obvious distress, sitting forward.</td><td rowspan="9">Manikin: bilateral lung sounds – crackles (quiet)

Primary survey results
A: Speaking in short sentences, soot around nares, singed facial hair, unable to phonate ‘E’, hoarse voice
B: crepitations to both lung fields
C: well perfused
D: anxious and alert, no neurological deficits
E: PT burns to face, anterior chest/abdomen and upper limbs</td><td rowspan="9">Commence primary survey
❑ Recognise airway involvement
○ Upper: facial burns, soot in nares and inability to phonate
○ Lower: crepitations and hypoxia
❑ Recognise need for large bore IV access

Decision making
❑ Call for help early given respiratory compromise
❑ Recognise risk to airway and discuss management options with team</td></tr>
<tr><td>HR</td><td>120</td></tr>
<tr><td>SpO₂</td><td>96%
15L
NRB</td></tr>
<tr><td>BP/ART</td><td>110/80</td></tr>
<tr><td>RR</td><td>28</td></tr>
<tr><td>Temp</td><td>37.4</td></tr>
<tr><td>BGL</td><td>5</td></tr>
<tr><td>GCS</td><td>15</td></tr>
<tr><td></td><td></td></tr>
</table>

<table>
<tr><th colspan="4">STATE 2: ONGOING MANAGEMENT / SECONDARY SURVEY</th></tr>
<tr><th colspan="2">Vital signs</th><th>Script</th><th>Details</th><th>Expected actions</th></tr>
<tr><td>ECG</td><td>ST</td><td rowspan="9">Martin
“It’s….. so….. painful….”
One word responses.
Breathlessness, stridor</td><td rowspan="9">Manikin: bilateral lung sounds – stridor

Secondary survey results
Head: No signs of TBI/traumatic injuries
Abdo: soft, non-tender, burn area non-circumferential.
Long bones: NAD
Back: no areas of burn
Eyes: nil fluorescein uptake

Results
CXR: bilateral patchy infiltrates
VBG: respiratory acidosis, hypoxic</td><td rowspan="9">Secondary survey
❑ Estimate burn size (TBSA) = use of attached Rule of Nines chart (moulage to approx. 20%)

Investigations
❑ Arrange CXR, VBG and other bloods (other bloods can be taken but results will not be available)

Management
❑ Continue high flow O2 therapy
❑ Provide further analgesia

Decision making
❑ Liaise with team regarding plan for management</td></tr>
<tr><td>HR</td><td>120</td></tr>
<tr><td>SpO_2</td><td>94% 15L NRB</td></tr>
<tr><td>BP/ART</td><td>110/80</td></tr>
<tr><td>RR</td><td>32</td></tr>
<tr><td>Temp</td><td>37.4</td></tr>
<tr><td>BGL</td><td>5</td></tr>
<tr><td>GCS</td><td>14 (eyes closed)</td></tr>
<tr><td colspan="2">Other: stridor present but minimal</td></tr>
</table>

STATE 3: FURTHER DETERIORATION / INTUBATION				
Vital signs		**Script**	**Details**	**Expected actions**
ECG	ST	**Martin** Able to interact but breathlessness worsening. Ongoing complaints of pain.	***Further deterioration if failure to initiate intubation (SpO2 decrease to 88%, HR increase to 130, BP decrease to 95 systolic).*** **Results** CXR: post intubation	**Assessment** ❑ Recognition of potential inhalational injury ○ Progressive worsening of saturations **Decision making** ❑ Discuss need to progress to intubation ❑ Discuss plan for intubation (role allocation, plan A & B) ❑ Ensure adequate personnel resources available for intubation ❑ Escalate care if junior participants and require help with patient management **Management** ❑ Can trial NIV with nil improvement. ❑ Plan for and progress to successful intubation (airway is secured with plan A) ❑ Discuss burns referral/RSQ notification. ❑ Commence fluid resuscitation based on Parklands formula.
HR	120			
SpO_2	90% 15L NRB			
BP/ART	110/80			
RR	32			
Temp	37.4			
BGL	5			
GCS	13 (eyes closed, opening to pain)			

Debriefing guide

Scenario objectives

- Perform a structured assessment of a patient presenting with thermal burns.
- Understand the clinical features and risks associated with airway and inhalational injury with thermal facial burns.
- Demonstrate the decision-making to effectively initiate management of a patient with thermal burns and associated inhalational injury.

Example questions

Exploring diagnosis

- How do you differentiate between upper airway and an inhalational burn injury?
- What history is important when considering the risk for inhalational burns?
- What other clinical assessment features would make you worried about blast injury/chemical exposure (cyanide or other toxins)?
- What options for burns size estimation can you use?
- Does the presence of inhalational burn change the TBSA%?
- How do you differentiate between superficial, partial thickness and full thickness burn depth?

Discussing management

- What other resources are available for a high-risk intubation scenario in your centre?
- How do you prioritise the airway management with burn first aid (cooling)?
- In which patients does fluid resuscitation need to be mitigated against inhalational injury?

Discussing teamwork / crisis resource management

- How do you allocate roles for the intubation in your facility?
  → Who can you call to help (local vs RSQ resources)?
- Where should this patient be managed?
- How do you contact/make referrals to the burns service?

Key moments

- Early recognition of significant burn with airway and inhalational involvement.
- Use of structured assessment tool for the estimation of burn size.
- Appropriate fluid resuscitation calculations and ongoing management.
- Referral pathways and burns resources.

Acronyms and abbreviations

Term	Definition
TBSA	total body surface area
PT	partial thickness
FT	full thickness
ANZBA	Australia and New Zealand Burns Association
NRB	Non-rebreather
ACF	Antecubital fossa
TBI	Traumatic brain injury
NAD	Nil abnormalities detected
CXR	Chest xray
VBG	Venous blood gas
RSQ	Retrieval services Queensland

References

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Visit csds.qld.edu.au/qte
Email CSDS-Admin@health.qld.gov.au
Phone +61 7 3646 6500

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