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| **Case Title**  | Full Thickness Burns: Adult  |
| **Scenario Name** | Chemical fire |

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| **Learning Objectives**  |
| **Knowledge:**1. Initial management of a serious burns patient, including recognition of airway compromise due to inhalation injury
 |
| **Skills:**1. Accurate calculation of total burn surface area (TBSA) using Lund-Browder chart
2. Accurate calculation of fluid resuscitation
 |
| **Attitude/Behaviours:**1. Demonstrate Team skills
2. Demonstrate Situational awareness
3. Demonstrate Graded Assertiveness
 |
| **Scenario Environment** |
| **Location** | Trauma room |
| **Monitors** | Standard ER monitor |
| **Props/Equipment** | IV/IO supplies Burn packs/sterile gauze Portable ventilator/tubingIntubation equipment Normal saline Bair HuggerBags of Lactated Ringers Burns resources/documentation Ranger warmerBurn packs of sterile gauze Wet flannels |
| **Make-up/Moulage** | Burns: (school glue, red washable markers, charcoal)Burned clothing |
| **Potential Distractors** | None |

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| **Case Introduction:** |
| 38 year old male, working in home garage (door closed), sustained serious burns when a nearby container of flammable liquid caught alight. He tried to put out the fire using a Class A fire extinguisher which caused a massive fireball. Initial appearance: singed nose hairs and soot around his mouth/lips; patient is grimacing and yelling in pain with a hoarse voice; patient is pale with pink mucous membranes. Patient has sustained burns to face, neck, chest, abdomen, arms, hands and thighs.  |

| **Patient Parameters** | **Effective Management** | **Notes** |
| --- | --- | --- |
| **Phase 1: Title of Phase****Condition:** Unstable**.** Moaning, audible stridor**Initial Assessment*** Heart Rhythm: ST
* HR: 128
* BP: 132/90
* RR: 28
* SP02: 92%
* T: 36.1
* Glucose: 7.3
* CNS: AVPU ; eyes partially open; grimacing; moaning in pain; no clear words audible.
* Chest: lungs clear all fields, occasional cough of carbonaceous sputum
* CVS: Unable to palpate peripheral pulses (Doppler only); strong carotid/femoral pulses
* GI: No bowel sounds
* GU: No urine output at this stage, normal
* Integ:

- Full thickness burns to face, chest, lower arms, upper abdomen; - Deep, partial-thickness burns to neck, upper arms and lower abdomen* Weight: 82 kg
* Height: 5’10 (177.8 cm)
 | 1. **Take a focused history** (see Notes column)
2. **Medical Management**
* Assess airway
* Apply oxygen via NRB
* Prepare for intubation → intubate → ventilate using portable ventilator
* Cool and decontaminate (cold, wet blankets, sterile water, remove clothing/jewelry)
* IV/IO access x 2
* Fluid bolus: LR 1L: use fluid warmer
* Calculate TBSA based on Lund-Browder chart (30%)
* Calculate min & max fluid resuscitation requirements
* Give appropriate analgesia/sedation
* Check neurovascular compromise of burned limbs
* Assess other injuries
* Prevent hypothermia

**Consequences of ineffective management*** Increased tachycardia with delayed fluid resuscitation
* Hypotension with delayed fluid resuscitation
* Respiratory failure: airway obstruction due to laryngeoedema; decreased SpO2; increased EtCO2
* Difficulty using BVM due to airway obstruction
* Hypothermia
 | 1. **Focused history**
* (see above)

**PMHx*** Inguinal hernia repair 2 years ago

**Meds*** None

**Allergies*** Penicillin
 |
| **Phase 2: Intubation**Condition: Airway stable. Patient hypothermic and hypotensive after sedation.Physical Examination* Heart Rhythm: ST
* HR: 118
* BP: 86/62 (58)
* RR: 22
* SP02: 98%
* T: 35.3; patient shivering
* Glucose: 8.1
* CNS: Sedated
* Chest: lungs clear all fields, suctioning carbonaceous sputum via ETT
* CVS: Weak central pulses;
* GI: Absent bowel sounds
* GU: 20ml since admission
* Integ: as above
 | 1. **Patient Reassessment** (see Notes column)
2. **Medical Management**
* Maintain ventilated patient
* Give 1L LR
* Recalculated fluid requirement
* Consider Norepinephrine infusion
* Wound dressings: wet saline or sterile water soaked gauze, wrapped in seran wrap or blue pads.
* Bair hugger
* Ranger warmer

**Consequences of ineffective management*** Hypotension
* Hypothermia
 | 1. **Patient Reassessment**

**Airway*** Patient with ETT

**Breathing** * Adequate if placed on ventilator

**Circulation*** BP improves with fluid bolus, may remain soft if using fentanyl or propofol for sedation.
 |

**Insert more lines if more phases required.**

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| **Expected Patient Management** | **Debriefing Points** |
| 1. **Student**
2. **Junior Resident**
3. **Senior Resident**
 | * **Airway management of burns patient → risk factors, delay of signs and symptoms, difficult airway**
* **Calculating TBSA**
* **Fluid calculations**
* **LR vs NS**
* **Maintaining normothermia**
* **Treatment of wounds**
 |

**References:**

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**X-RAYS – Click** [here](https://extranet.interiorhealth.ca/IHUBCFaculty/Diagnostics/Forms/AllItems.aspx?RootFolder=%25252FIHUBCFaculty%25252FDiagnostics%25252FX%25252Drays&View=%25257bFD97E2FE-FD01-433F-B9CB-D75A4195924E%25257d)



**LABS – click** [here](https://extranet.interiorhealth.ca/IHUBCFaculty/Diagnostics/Forms/AllItems.aspx?RootFolder=%25252FIHUBCFaculty%25252FDiagnostics%25252FLabs&View=%25257bFD97E2FE-FD01-433F-B9CB-D75A4195924E%25257d) **OR fill out below**

LABORATORY \*LIVE\* Lab Summary Report

|  |  |  |  |
| --- | --- | --- | --- |
| **Test** | **DATE/TIME here** | **Flag** (H or L) | **Reference** |
| **CBC** |
| WBC | 11.9 |  | 3.5 – 10.8 10^9/L |
| RBC | 6.3 |  | 4.3 – 5.7 10^12/L |
| Hgb | 170 |  | 130 – 170 g/L |
| HCT | 0.53 |  | 0.37 – 0.47 L/L |
| Platelets |  |  | 150 – 400 10^9/L |
| **Chemistry** |
| Na | 137 |  | 137 – 145 mmol/L |
| K | 3.7 |  | 3.5 – 5.0 mmol/L |
| Cl | 103 |  | 98 – 107 mmol/L |
| HCO3 | 25 |  | 22-26 mmol/L |
| Urea |  |  | 2.5 – 6.1 mmol/L |
| Creat |  |  | 62 – 106 umol/L |
| GFR Est |  |  | > 60 ml/min |
| Glucose - Random | 9.3 |  | 3.0 – 11.0 mmol/L |
| Lactate | 4.6 |  | 0.9 – 1.8 mmol/L |
| CK |  |  | 5 – 130 U/L |
| Troponin |  |  | <0.03 mcg/L |
| **Coags** |  |  |  |
| INR | 0.9 |  | 0.9 – 1.2 |
| PTT | 18 |  | 28 – 38 s |
| **ABGs** |
| **Arterial** |
| pH | 7.30 |  | 7.35- 7.45 |
| pCO2 | 51 |  | 35 – 45 mmHg |
| PO2 | 64 |  | 80-100 mmHg |
| BE | -2.0 |  | -2.0 to +2.0 mmol/L |
| HCO3 | 25 |  | 22 – 26 mmol/L |
| O2 Sat | 97 |  | 95 – 100% |
| Carboxyhemoglobin | 4.8 |  | < 3.0 |

**EKGs – click** [here](https://extranet.interiorhealth.ca/IHUBCFaculty/Diagnostics/Forms/AllItems.aspx?RootFolder=%25252FIHUBCFaculty%25252FDiagnostics%25252FECGs&View=%25257bFD97E2FE-FD01-433F-B9CB-D75A4195924E%25257d) **or paste**

