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| Queen's logo |

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 **Queen’s University Simulation Scenario Template** |
| **Course:** | SR Resus Rounds |
| **Case Title:** | Organophosphates |
| **Brief Case Description** |
| **52 year old man attempts suicide by ingesting 4 x 250mL bottles of Malathion 50% insecticide. Malathion is an organophosphate insecticide that can be purchased at local gardening centres.** **The patient demonstrates a cholinergic toxidrome and requires LARGE doses of atropine for reversal. 2PAM is also antidotal.** |
| **Searchable Keywords:** |
| 1. **Organophoosphate**
2. **Toxicology**
3. **Cholinergic toxidrome**
 |
| **Target Audience:** | FRCP SR Residents |
| **Number of Participants:** | 5 |
| **CanMeds Roles :** | [x]  | Medical Expert | [x]  | Manager | [ ]  | Scholar |
|  | [ ]  | Communicator | [x]  | Collaborator | [ ]  | Professional |
|  | [ ]  | Health Advocate |  |  |  |  |
| **Objectives:** |  |
| * **Knowledge**
 | * Understand the pahotphysiology of organophosphate poisonings
* Recognize that the dose of atropine required to treat these patients usually exceeds hospital resources
 |
| * **Skills**
 | * Atropine delivery with doubling doses
 |
| * **Behaviour**
 | * Recognize the need for decontamination on scene
* Staff protection
 |

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| **Stem:** *Detailed description of exercise* |
| **52 y/o male attempts suicide approximately 30 minutes before presentation by consuming 4x250mL of 50% Malathion insecticide (2x LD50 dose). He presents with a cholinergic toxidrome (Salivation, vomiting, bronchorrhea, bradycardia, altered mental status).****The majority of the resuscitation centers on giving large doses of atropine in doubling doses to control bronchorrhea, and the early administration of 2PAM to prevent the conformational change of the AChe enzyme.****The patient remains hypoxic with significant bronchorrhea until 50mg of atropine are given. The patient’s heart rate improves after 10 mg but should not be the end point of resuscitation.****Transcutaneous pacing doesn’t work (no capture)** |
| **Roles:** | 1. RN Confederate
2. Worried wife
 |
| **Script (for each role):** | Worried wife:I found him in the garage with 4 of these bottles empty (hand the bottle of Malathion to the residents). He told me they were for the mosquitos. I believed him. I shouldn’t have. He’s been so sad lately but I didn’t think he’d try to kill himself again. It’s been 3 years since he had any trouble with suicidal thoughts.He doesn’t have any medical history. He’s healthy. He’s not on any medications. He doesn’t even drink. He’s not diabetic |
| **Scenario Tips:*** *Tips to future instructors to keep the scenario flowing.*
* *Anticipated difficulties*
 |  |

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| **Scenario Details:** |
| **Demographics:*** Name:
* Age:
* Sex:
* BMI
 | Larry McTavish52Male |
| **Chief Complaint:** | Altered level of consciousness after suicide attempt |
| **Past Medical History:** | None |
| **Medications:** | None |
| **Allergies:** | None |
| **Lab data:** (provided if requested) | *Normal, except acute respiratory acidosis and profound hypoxia* |
| **Imaging:** (provided if requested) | *Pre-Intubation CXR: CHF/Pulmonary Edema**Post Intubation CXT: Good ETT position, ongoing edema* |
| **ECG:** (provided if requested) | *Sinus bradycardia* |

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| **Initial Physical Examination Findings: (Normal if left blank)** |
| **Vital signs:** |
| Temperature | **37.2** |
| HR | **39** |
| BP | **82/40** |
| RR | **28** |
| O2 saturation | **78% RA 🡪88% NRB** |
| Finger stick glucose | **14.8** |
| Weight (kg) | **84** |
| **Cardiovascular:** |
| Heart rate/rhythm | **Sinus bradycardia @39** |
| Heart sounds | **Normal** |
| JVP | **Normal** |
| Peripheral pulses | **Normal** |
| Evidence of cyanosis? | **Yes** |
| Diaphoresis | **Yes- Profound** |
| Other |  |
| **Respiratory:** |
| Respiratory rate/pattern | **Tachypnea @ 28** |
| Accessory muscle use? | **Yes** |
| Lung sounds | **Diffuse coarse inspiratory crackles** |
| Evidence of fatigue? | **Yes** |
| Other |  |
| **Abdominal:** |
| Visible signs of pathology? | **Normal** |
| Bowel sounds | **Normal** |
| Peritoneal signs? | **Normal** |
| Tenderness? | **Normal** |
| Hepatosplenomegaly? | **Normal** |
| Signs of ascites? | **Normal** |
| Other | **Vomiting (Stomach contents, and non-bloody diarrhea)** |
| **Neurological:** |
| Level of consciousness & Behaviour | **Aletered LOC (confused, combative)** |
| Muscle tone | **Generalized decreased muscle tone** |
| Motor | **Normal** |
| Sensory | **Normal** |
| Reflexes | **Normal** |
| Other |  |
| **Head/Ears/Eyes/Nose/Throat/Skin:** |
| Visible abnormalities | **Small pupils****frothing from mouth** |

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| **Flow Table:** |
| **Time or Stage:** | Arrival | Pre intubation | Post intubation | 10 mg Atropine | 50 mg Atropine |  |  |
| **Heart rhythm:** | Sinus Brady | Sinus Brady | Sinus Brady | NSR | NSR |  |  |
| **Heart rate:** | 30 | 30 | 40 | 60 | 70 |  |  |
| **Heart Sounds:** | Normal | Normal | Normal | Normal | Normal |  |  |
| **Blood pressure:** | 82/40 | 78/38 | 80/40 | 84/50 | 90/60 |  |  |
| **Respiratory rate:** | 28 | 28 | Vent | Vent | Vent |  |  |
| **Respiratory Pattern:** | Tachypnea | Tachypnea | Vemt | Vent | Vent |  |  |
| **O2 saturation:** | 78%RA | 88%NRB | 88%Vent | 88% Vent | 93%Vent |  |  |
| **Temperature:** | 37.2c | 37.2c | 37.2c | 37.2c | 37.2c |  |  |
| **Glucose** | 14.8 | 14.8 | 14.8 | 14.8 | 14.8 |  |  |
| **Eyes:** | open | closed | closed | closed | Closed |  |  |
| **Pupils:** | 2mm | 2 | 2 | 2 | 4 |  |  |
| **Specific simulator dialogue:** | Crackles | Crackles | Crackles | Crackles | No Crackles |  |  |
| **Other:** | Bronchorrhea |  |  |  |  |  |  |

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| **Flow Diagram:** |
| Insert specific scenario flow diagram showing pathways for anticipated actions. Each section of the diagram should correspond to a column on the Flow Table above.example |

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| **Simulator Requirements:** |  |
| **Environment:**  | [x]  | ER |
|  | [ ]  | Hospital Ward |
|  | [ ]  | ICU |
|  | [ ]  | Other |
| **Required simulator capabilities:** | [x]  | Adult |
|  | [ ]  | Child |
|  | [x]  | Ability to talk |
|  | [x]  | Ability to open and close eyes |
|  | [x]  | Ability to change pupil size |
|  | [x]  | Output of basic cardiorespiratory rhythms |
|  | [x]  | Ability to change vital signs |
|  | [ ]  | Ability to perform CPR |
|  | [x]  | Ability to deliver energy via LifePack |
|  | [x]  | Ability to gain IV access |
|  | [ ]  | Ability to gain IO access |
|  | [ ]  | Ability to get 12 and 15 lead EKG’s |
|  | [x]  | Ability to deliver drugs |
|  | [x]  | Ability to ventilate |
|  | [x]  | Ability to intubate |
|  | [ ]  | Ability to catheterize |
|  | [ ]  | Ability to needle decompress |
|  | [ ]  | Ability to insert chest tube |
|  | [ ]  | Ability to seize |
|  | [x]  | Ability to simulate cyanosis |
|  | [ ]  | Other: |
| **Task trainers required:** | [ ]  | IV access trainer |
|  | [ ]  | IO access trainer |
|  | [ ]  | Lumbar puncture trainer |
|  | [ ]  | Central line access trainer (IJ, femoral, subclavian) |
|  | [ ]  | Chest tube trainer |
|  | [ ]  | Cricothyrotomy trainer |
|  | [ ]  | Pericardiocentesis trainer |
|  | [ ]  | Thoracotomy trainer |
|  | [ ]  | Other: |
| **Communications Equipment:** | [ ]  | One way wireless (confederate) |
|  | [ ]  | Two way wireless (confederate) |
|  | [ ]  | Overhead Speakers |
|  | [ ]  | Telephone |
|  | [ ]  | Pager |
|  | [ ]  | Other: |

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| **Moulage:** |

*Describe any scenario-specific moulage on the diagram below:*

Small pupils

Vomit

Diaphoresis (Sweat

Diarrhea



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| **Mannequin Clothing** |
| [x]  | Hospital gown |
| [ ]  | Formal work attire |
| [ ]  | Casual attire |
| [ ]  | Athletic clothing |
| [ ]  | Other:  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Equipment Required:** |  |  | Quantity Required | Sizes Required*(if applicable)* |
| **Diagnostic/Monitoring:** | [x]  | Portable monitor | 1 |  |
| [x]  | Thermometer | 1 |  |
| [x]  | NIBP | 1 |  |
| [x]  | Defibrillator | 1 |  |
| [x]  | EKG | 1 |  |
| [x]  | CXR | 1 |  |
| [x]  | O2 saturation probe | 1 |  |
| **Airway:** | [x]  | Bag valve mask | 1 |  |
| [ ]  | Peak flow meter |  |  |
| [x]  | Nasal cannula | 1 |  |
| [ ]  | Nebulizer |  |  |
| [x]  | Non-rebreather mask | 1 |  |
| [x]  | Mechanical ventilator | 1 |  |
| [x]  | Oropharyngeal airway | 1 |  |
| [x]  | Nasopharyngeal airway | 1 |  |
| [ ]  | Non-invasive positive pressure ventilation |  |  |
| [x]  | Laryngoscope | 2 | Mac 3 & 4 |
| [x]  | Endotracheal tube | 3 | 7, 7.5, 8 |
| [x]  | Syringe | 1 | 10cc |
| [x]  | Stylet | 1 |  |
| [x]  | End tidal CO2 detector (colorimetric) | 1 |  |
| [ ]  | End tidal CO2 detector (capnographic) |  |  |
| [x]  | Bougie | 1 |  |
| [ ]  | Glidescope |  |  |
| **Vascular access:** | [x]  | Peripheral IV | 2 | 18 Ga |
| [ ]  | Arterial line |  |  |
| [ ]  | Central line |  |  |
| [ ]  | PICC line |  |  |
| [ ]  | Swan Ganz catheter |  |  |
| [ ]  | Dialysis catheter |  |  |
| **Resuscitation:** | [x]  | Crash cart | 1 |  |
| [ ]  | Trauma cart |  |  |
| [x]  | Difficult airway cart | 1 |  |
| [ ]  | Cricothyrotomy tray |  |  |
| [ ]  | Chest tube tray |  |  |
| [ ]  | Pericardiocentesis tray |  |  |
| [ ]  | Chest tube tray |  |  |
| [ ]  | Urinary catheter tray |  |  |
| **Other:** | [ ]  |  |  |  |
| **Fluids and Drugs** |  |  | Volume, Concentration or Dose Required | Number of Units Required |
| **IV Fluids:** | [x]  | NS | 1000 cc | 2 |
| [ ]  | 0.45% NS |  |  |
| [ ]  | 3% NS |  |  |
| [ ]  | 2/3 1/3 NS |  |  |
| [ ]  | D5W |  |  |
| [ ]  | D5 ½ NS |  |  |
| [ ]  | Ringer’s lactate |  |  |
| [ ]  | Pentaspan |  |  |
| [ ]  | Other: |  |  |
| **Blood products:** | [ ]  | 25% albumin |  |  |
| [ ]  | 5% albumin |  |  |
| [ ]  | pRBC’s |  |  |
| [ ]  | Platelets |  |  |
| [ ]  | Fresh Frozen Plasma |  |  |
| [ ]  | Cryoprecipitate |  |  |
| [ ]  | Factor VIII concentrate |  |  |
| [ ]  | Factor IX concentrate |  |  |
| [ ]  | Other: |  |  |
| **Pre-filled drugs:** | [ ]  | D50W |  |  |
| [x]  | Epinephrine | 1 mg/10mL Amps | 5 |
| [ ]  | Bicarbonate |  |  |
| [ ]  | Calcium chloride |  |  |
| [ ]  | Lidocaine |  |  |
| [x]  | Atropine | 1 mg/10 mL Amps | 20 (I have them) |
| [ ]  | Adenosine |  |  |
| [ ]  | Other: |  |  |
| **Other drugs:** | [ ]  | Fentanyl |  |  |
| [ ]  | Midazolam |  |  |
| [x]  | Propofol | 10 mg/Ml | 20 mL |
| [x]  | Etomidate | 20 mg vial | 1 |
| [x]  | Ketamine | 50 mg/mL  | 1 bottle |
| [x]  | Succinylcholine | 10 mg/mL | 1 bottle |
| [x]  | Roccuronium |  | 1 bottle |
| [ ]  | Glucagon |  |  |
| [ ]  | Digoxin |  |  |
| [ ]  | Lasix |  |  |
| [ ]  | Nitrogylcerin |  |  |
| [ ]  | Labetelol |  |  |
| [ ]  | Other: |  |  |

|  |  |
| --- | --- |
| **Audiovisual Needs:** |  |
| **Imaging:** | *(link to x-rays, CT scans, ultrasounds, MRI’s)* |
| **Bloodwork:** | *(link to bloodwork here)* |
| **EKG’s:** | *(link to EKG’s here)* |
| **Short didactic presentation:** | *(link to short presentation here – max 5 minutes)* |
| **Handouts:** | *(link to handouts here)* |
| **Simulator exercise file:** | *(link to simulator exercise file here)* |
| **References:** |  |
| **Required reading:** | *(link to required reading here)* |

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| **Debriefing points:** |  |
| * **Knowledge**
 | * Understand the pahotphysiology of organophosphate poisonings
* Recognize that the dose of atropine required to treat these patients usually exceeds hospital resources (1000 mg, KGH has 90 mg)
 |
| * **Skills**
 | * Atropine delivery with doubling doses
 |
| * **Behaviour**
 | * Recognize the need for decontamination on scene
* Staff protection
 |

|  |  |
| --- | --- |
| **Assessment:** |  |
| * **Knowledge**
	+ Objective 1
	+ Objective 2
	+ Objective 3
 | 111 | 222 | 333 | 444 | 555 |
| * **Psychomotor**
	+ Objective 1
	+ Objective 2
	+ Objective 3
 | 111 | 222 | 333 | 444 | 555 |
| * **Behaviour**
	+ Objective 1
	+ Objective 2
	+ Objective 3
 | 111 | 222 | 333 | 444 | 555 |
| **Global performance:** | 1 | 2 | 3 | 4 | 5 |
| * **Critical action:**
 |  |
| * **Critical errors:**
 |  |
| * **Participants’ evaluation:**
 | *Link to evaluation for the session to be filled out by the participants* |

**LABS**

**WBC 14.5**

**Hb 156**

**Plt 506**

**Na 145**

**K 3.1**

**Cl 102**

**CO2 20**

**BUN 13**

**Cr 108**

**ABG**

**pH 7.12**

**pO2 52**

**pCO2 68**

**HCO3 22**

**CK 205**

**TnI <0.010**

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****

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