

# ILLNESS SIMULATION 1

## Simulation focus - Overdose and Aspiration (OP & NP airway/BMV - skill)

### Expected outcomes

**Team Leader** - to perform initial ABCDE assessment, direct team and lead care – taking over skills as and when appropriate. Identify loss of airway and probable aspiration, supporting airway and breathing. Identifies and treats likely opiate toxicity, hypoglycaemia and hypothermia. Realises need for ongoing naloxone infusion.

**Team/More experienced candidate** - Manages further vomiting, aspiration and respiratory deterioration appropriately – escalating and requesting RSI.

### Assessment

This simulation allows for practise and assessment of OPA, NPA & BMV (infant and child).

### History

#### Emergency staff:

Joe is a 15-year-old boy who has been found unconscious in the park by a member of the public and brought in by ambulance. The crew report finding empty vodka bottles on scene and unknown tablets. They applied high flow oxygen, obtained IV access and have given a 10ml/kg fluid bolus.

#### Ward staff:

The HCA has found Joe (a 15-year-old boy with mental health problems) unconscious in his cubicle on the ward after he has had some visitors from school. They have applied high flow oxygen. They also noticed an empty vodka bottles and some unknown tablets on the floor in one of the toilets.

### Immediately apparent

Please ensure the prompt card with global overview is placed on the manikin for the start of the sim.

*As you approach the child you notice he looks pale, slightly cyanosed and you can hear a slow gurgling sound. 15L/min of O<sub>2</sub> is being administered via a NRBM.*

### Clinical course (to be given as the simulation progresses)

Assess	Features	Action	Key treatment points
A	Audible gurgling/snoring (RR 4). Evidence of vomiting around mouth	Assess, perform suction and airway manoeuvres (at which point snoring stops). Insert OPA (tolerated)	<b>Suction</b> <b>Airway opening manoeuvres</b> <b>OPA insertion.</b> Ask for help
B	<b>RR 4</b> with deep breaths and irregular. Equal air entry, coarse crackles/secretions throughout additional noises. <b>SpO<sub>2</sub> 83%</b> (poor trace) despite 15l O <sub>2</sub>	Assess including auscultation and SpO <sub>2</sub> . Commences BMV after ascertaining inadequate ventilation and recognises likely aspiration. Two helpers arrive	<b>BMV ventilation</b> With high flow oxygen SpO <sub>2</sub> and colour improve once with ventilation
C	<b>HR 116, CRT 3-4, BP 90/51</b> Remains pale and cool.	Assess and recognise shock.	<b>Further fluid bolus 10ml/kg</b> 2 <sup>nd</sup> IV access <b>Blood glucose,</b> blood ketones and VBG

D	Grimaces and withdraws to pain <b>GCS 6</b> (E1V1M4) <b>BM 1.9</b> Pupils pinpoint and unable to gauge reactivity.  <b>glycemia 34 mg/dl</b>	Recognise lowered level of consciousness and escalate concern. Gives glucose and naloxone bolus. If naloxone given – response prompts re-assessment at this stage.	<b>3ml/kg 10% glucose bolus</b> <b>Administer bolus IV naloxone (400mcg)</b> Request further assistance from anaesthetics/PICU
<b>NB</b>	<ul style="list-style-type: none"> <li>Once naloxone given, the patient begins to rouse; this should prompt re-assessment from A.</li> </ul>		

### Reassessment – option 1– for LESS experienced candidates

After administration of naloxone – coughing and OPA is no longer tolerated.

Assess	Features	Action	Key treatment points
A	Ongoing snoring, however not tolerating OPA previously inserted. Partial obstruction	Assess Cannot insert OPA but may opt for NPA	NPA insertion
B	<b>RR 12</b> , fighting any attempts at bag mask ventilation. <b>SpO<sub>2</sub> 95%</b>	Assess including auscultation and SpO <sub>2</sub>	Switch from BMV to high flow O <sub>2</sub> via non-rebreath mask
C	<b>HR 86, CRT 2, BP 106/63</b>	Assess	
D	Responds to pain only, <b>BM 5.3</b> (assuming IV glucose given), pupils 2/2 sluggish. <b>GCS 9</b> (E2V3M4) <b>glycemia 95 mg/dl</b>	Assess	Request senior/PICU assistance Further dose of naloxone or naloxone infusion. Discuss need for RSI.
E	Cold, no signs trauma. <b>Temp 32.7</b>	Recognises hypothermia and commences some form of warming	Warms patient (bair hugger/blankets /environment/warmed fluids)

<b>NB</b>	<ul style="list-style-type: none"> <li>This scenario is one in which there is mixed ETOH and opiate intoxication with hypothermia and hypoglycaemia. Some basic airway and ventilatory support will need to be given along with glucose and naloxone. There will be a partial response to this initially with requirement for further naloxone on re-assessment.</li> <li>The optional scenario, see below, is more representative of a mixed OD/severe alcohol intoxication and so will not respond to further naloxone. Further vomiting and aspiration will occur necessitating urgent escalation to anaesthetics and RSI.</li> </ul>
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### Reassessment – option 2 – for MORE experienced candidates

After administration of naloxone – gagging and OPA is no longer tolerated. Patient begins to vomit whilst still lying flat.

Assess	Features	Action	Key treatment points
A	Vomit obstructing airway and patient failing to clear.	Assess, suction and patient laid flat/head down. OPA insertion will elicit gag reflex – tolerates NPA.	Suction and clearance of vomitus Escalation NPA insertion
B	<b>Desaturation to 70s</b> <b>RR 6</b> Copious secretions (vomit) audible.	Assess including auscultation and SpO <sub>2</sub>	Ongoing BMV after airway clearance. SpO <sub>2</sub> stabilises in mid 80s. Recognise need for RSI for respiratory support

			Escalate to anaesthetic/PICU
C	<b>HR 86, CRT 2, BP 106/63</b>	Assess	
D	Responds to pain only, <b>BM 5.3</b> (assuming glucose given), pupils 3/3 sluggish. <b>GCS 6</b> (E1V1M4) <b>glycémie 95 mg/dl</b>	Assess	May administer further dose of naloxone or naloxone infusion – this will have minimal effect. Recognises need for RSI to protect airway.
E	Cold, no signs trauma. <b>Temp 32.7</b>	Recognises hypothermia and commences some form of warming	Warms patient (Bair hugger/blankets/environment/warmed fluids)

## Debrief

Using the learning conversation, discuss the technical and non-technical elements of the simulation.

## Assessment

This station makes up part of the continuous assessment process, therefore candidates need to know whether they are meeting the standard.

At the end give the opportunity for candidates to ask questions, answer these and then summarise the key points.

### Illness 1 - Global overview (to be placed on SIM manikin)

The child looks pale and slightly cyanosed.  
You can hear a slow gurgling sound.  
15L/min of O<sub>2</sub> is being administered via a NRBM.

### Illness 1 - Results Information:

#### Venous Blood Gas

pH	7.18
PO <sub>2</sub>	5.4
pCO <sub>2</sub>	6.8
HCO <sub>3</sub> <sup>-</sup>	19
BE	-6
Na	129
K	5.2
Ca (ionised)	1.1
Lactate	3.5

BM 1.9  
Ketones 4     **glycemie 34 mg/dl**

## Faculty helper Information – Illness 1

When candidate requests information regarding observations please give the following in “real-time” (e.g., wait for blood pressure to cycle, saturation trace to be achieved). If key treatment points are not undertaken, consider a “prompt” that would be visible in a child.

Assess	Observation	Example prompt
A	Audible gurgling/snoring ( <b>RR 4</b> ). Evidence of vomiting around mouth	“What’s that sound?” “Can I get you anything”
B	<b>RR 4</b> with deep breaths and irregular. Equal air entry, coarse crackles/secretions throughout additional noises. <b>SpO<sub>2</sub> 83%</b> (poor trace) despite 15l O <sub>2</sub>	“I’m struggling to get these sats to come up” “That breathing doesn’t look right”
C	<b>HR 116, CRT 3-4, BP 90/51</b> Remains pale and cool.	“He looks a bit dry”
D	Grimaces and withdraws to pain <b>GCS 6</b> (E1V1M4) <b>BM 1.9</b> <b>glycemia 34 mg/dl</b> Pupils pinpoint and unable to gauge reactivity.	“Do you want a BM?” “Why are his pupils so small?” “Is there anything else we should give?”
Patient begins to rouse and spits out OPA once naloxone given prompting re-assessment.		

## Reassessment – option 1 – Illness 1

Assess	Observation	Example prompt
A	Ongoing snoring, however not tolerating OPA previously inserted. Partial obstruction	“Is there anything else you can try?”
B	<b>RR 12</b> , fighting any attempts at bag mask ventilation. <b>SpO<sub>2</sub> 95%</b>	“He’s not syncing up with you very well is he?” “I think he’s trying to breathe”
C	<b>HR 86, CRT 2, BP 106/63</b>	“He looks a bit better now”
D	Responds to pain only, <b>BM 5.3</b> (assuming IV glucose given), pupils 2/2 sluggish. <b>GCS 9</b> (E2V3M4) <b>glycemia 95 mg/dl</b>	“Do you want me to call a senior?” “Are there any more drugs I can get you?”
E	Cold, no signs trauma. <b>Temp 32.7</b>	“He feels freezing”

## Reassessment – option 2 – Illness 1

Assess	Observation	Example prompt
A	Vomit obstructing airway and patient failing to clear.	“How are you going to clear that?”
B	<b>Desaturation to 70s, RR 6</b> Copious secretions (vomitus) audible.	“He’s still very chesty?” “Do you want anyone else?”
C	<b>HR 86, CRT 2, BP 106/63</b>	
D	Responds to pain only, <b>BM 5.3</b> (assuming glucose given), pupils 3/3 sluggish. <b>GCS 6</b> (E1V1M4) <b>glycemia 95 mg/dl</b>	“Do you want me to call a senior?” “It doesn’t look like the naloxone’s working very well”
E	Cold, no signs trauma. <b>Temp 32.7</b>	“He feels freezing”

## Algorithms/Treatment plans:

### Opiate toxicity

## 6.8 Approach to the child poisoned with opiates

These children have usually accidentally ingested oral opioids such as methadone, oxycodone or oramorph. The sedative effect of the drug may reduce the conscious level sufficiently to put the airway at risk and cause hypoventilation.

### Emergency treatment of opiate poisoning

#### *Reassess ABCDE*

Following stabilisation of the airway, breathing and circulation, the specific antidote is naloxone, with rapid titration to reverse potential life-threatening effects, starting with an initial bolus dose of **10** micrograms/kg IV in children under 12 years. If there is no response, repeat the dose at intervals of 1 minute to the maximum dose of 2 mg, then review the diagnosis. In children over 12 years, the initial dose is 400 micrograms, then 800 micrograms for up to two doses at 1 minute intervals, then one dose of 2 mg if there is still no response. Naloxone has a short half-life, relapse often occurring after 20 minutes. Further boluses, or an infusion of 5–20 micrograms/kg/min, may be required. For older children, intranasal is an alternative route for delivery (1 spray = 1.8 mg).

Adverse events such as ventricular arrhythmias, acute pulmonary oedema, asystole or seizures have incidentally been described, due to the sudden rise in catecholamine (pro-arrhythmogenic) or central neurogenetic responses to narcotic reversal. Assess ABCDE and prepare for resuscitative measures prior to naloxone administration.