# PACU Hypoxia

## Demographics

**Patient Name:** Fred Hampton

**Simulation Developer:** Devin Sydor

**Date of Development:** June 19, 2013

**Target Learning Groups:**

|  |  |  |  |
| --- | --- | --- | --- |
| X | Junior anesthesia residents |  | Medical students |
| X | Senior anesthesia residents |  | Nursing students |
|  | Anesthesiology staff | X | Nursing staff (PACU) |
|  | Emergency Medicine |  | Family Medicine |
|  | Critical Care | X | Anesthesia Assistants |

**Learning Objectives:**

* By the end of this scenario the team will be able to:
1. Describe the basic team structure including the team leader and followers
2. Describe and put into practice important team communication techniques, including: closed-loop communication, SBAR handovers, direct and explicit communication
3. Discuss and put into practice important task management strategies, including, role and task assignments, task monitoring, and task support and adaptability

**References:**

## Preparation

**Location and Additional Information:**

* This scenario details a postoperative patient in PACU with respiratory depression after a left frontal craniotomy for aneurysm clipping. The etiology is increased ICP from pneumocephalus because of a clotted drain.
* The patient is a previously healthy 60 yo male farmer who was found down by his wife 24 hours ago. He was ambulanced to hospital where he had regained consciousness, only complaining of a severe H/A. A CT head revealed a L-sided subarachnoid haemorrhage and a large left anterior communicating aneurysm. Going into the surgery he was alert and oriented with a normal neurological exam. He arrived 30 minutes ago in PACU post-clipping, which was uneventful (hemodyanmically stable, 100cc blood loss).
* PACU nurse #1 (actor) was the receiving nurse who got the following information:
	+ Vitals: HR 85, BP 140/85, RR 12 regular, Sat 98% on 8 L/min mask O2, T 36.9oC, UOP 300cc in bag
	+ Neuro status: pt drowsy and awakes with minimal stimulation, moves all 4 limbs to command, complains of pain in head, given fentanyl 50 mcg IV 10 minutes ago
	+ Additional information from anesthesiologist: midazolam 1mg given at beginning, remi infusion throughout, fentanyl 100mcg IV given before emergence; no NMB reversal given as >1hr procedure; 35g mannitol given; 1g phenytoin given
* PACU nurse #1 going on break and handing over to PACU nurse #2 and #3.

**Monitors:**

|  |  |  |  |
| --- | --- | --- | --- |
| X | ECG | X | Arterial line (Right radial) |
| X | Non-invasive BP cuff |  | CVP |
| X | Pulse oximeter |  | PA catheter |
|  | Capnograph | 2 | Number of peripheral IV’s (#18) – one can be capped |
|  | Temperature |  |  |
|  | BIS |  |  |

**Other Equipment:**

|  |  |  |  |
| --- | --- | --- | --- |
|  | Anesthesia machine |  | MH cart |
|  | Infusion pump | X | Moulage (Head wrap centered over L side; head drain with minimal amount of red blood) |
|  | Nerve stimulator | X | Foley catheter |
|  | Blood warmer | X  | Oxygen source and nasal prongs |
|  | Defibrillator with cardiac arrest cart | X | BVM with adult mask, O2 tank |
|  | Difficult intubation cart | X  | Airway equipment (#9 and 10 oral a/w; laryngoscope with MAC3 blade; #7.0, 7.5 standard ETT; ETT stylet; NOTE : we do have an emergency airway tackle box in PACU that we may be able to get |
| X | Drugs (propofol, succinylcholine, remifentanil, phenylephrine, ephedrine, IV GTN, labetolol, hydralazine, propofol infusion bottle and tubing and Alaris pump) and variety of syringes (3cc, 5cc, 10cc, 20cc); NOTE : white labels would be enough for syringes | X | Wall suction |

**Support Files :**

* Anesthesia record
* PACU record

**Actors :**

* PACU nurse #1 (initial contact for PACU nurses and will come to help)

**Time Duration :**

* Setup : 5 minutes
* Simulation: 10-15 minutes
* Debrief: 10 minutes

## Information for Student:

* none

## Additional Information for Instructor:

## Discussion and Teaching Points:

* team training discussion points
* management of increased ICP
* transferring an unstable patient

## Simulator Programming Notes

|  |  |  |  |
| --- | --- | --- | --- |
| **State** | **Trigger** | Events | **Instructions for Operator** |
| 1. Initial state in PACU (2 min)
 |  | * Handover from PACU nurse #1 (actor) to PACU nurse #2 and #3
 | * Hold steady at initial state (State 1): pt lying flat and drowsy but responds to stimuli with eye opening; moves all 4 limbs spontaneously; verbal response when repeated questioning; pupils 3mm equal and reactive to light
* Vitals: HR 85, BP 140/85, RR 12 regular, Sat 96% on 2 L/min nasal prongs O2, T 36.9oC, UOP 300cc in bag
 |
| 1. Respiratory depression (~2 min)
 | 1 minute after handover | * Nurse will hopefully notice desat and attempt to rouse patient
* When no improvement nurse will hopefully call anesthesia +/- AA +/- another nurse (call board room)
* Sats will increase to 94% if nurses give jaw thrust or apply more oxygen
* No response to naloxone
 | * State 2: Sats drop to 90% over 20 seconds, HR drops to 60, BP 180/95, RR 8 and irregular, pupils: left 6mm and nonreactive, right 3mm with slow reactivity; moans only to painful stimulation; actor to state arms in extended posture with stimuli
* If mask O2 applied sats will increase to 94%
 |
| 1. Anesthesia resident arrival (~3 min)
 | Phone call and in person handover | * Handover from PACU nurse #2 or #3 to anesthesia resident
* Resident may request staff presence but staff will have started the next case
* May ask for surgeon presence; call can be made but surgeon in next case and not immediately available; surgeon requests CT-head
* Resident will hopefully do a quick AMPLE history and physical exam and generate differential diagnosis
 | * State 3: Patient becomes more unresponsive over next 2 minutes and vitals decline: stats 88% on np oxygen (94% if on mask), HR 55, BP 190/99, RR 5 irregular, pupils unchanged, no response to stimulation
 |
| 1. Management (~ 3-5 min)
 |  | * Resident will hopefully call for further help (ie. AA) for airway and respiratory management; this can be recommended by PACU nurse #1 (actor) who has returned
* Sats improve with effective bag mask ventilation
* Airway will hopefully be secured with RSI and drugs.
* Institution of management of increased ICP should be made with resident directing nursing and AA for drugs, preparation for CT-head (transport oxygen and BVM; call CT, drug infusions, etc.)
 | * State 4a: If drugs given patient quiet with no movement; vitals: HR 70, BP 170/88, RR 0, sats 100%
* State 4b: If no drugs given then patient fighting (movement of arms and head by actor), vitals: HR110, BP 220/110, RR 10, sats 88%, increase resistence to ventilation
 |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |