

CAN'T INTUBATE CAN'T OXYGENATE (CICO)

Management of the Critically Obstructed Airway

Session 7 – Integrated practice scenarios

Format: Simulations

Aims: Integrates all lessons (technical and human factors) and recommendations including:

- Rehearsal of '3' and '3' stages of rescue
 - '3' supra-glottic rescue lifeline
 - decision to transition to infra-glottic rescue and infraglottic rescue
 - '3' primary paths of infraglottic rescue
- Application of the algorithms
- Practice with the equipment including the 'CICO Kit'
- Rehearsal of a coordinated team approach: team roles, record keepers and time prompts, good communication with appropriate assertiveness

Description:

In this session participants will manage four mini-scenarios in groups of three. Each group stays at the same workstation with one facilitator. The facilitator (1) introduces the session (assumes groups may be in different break out rooms and (2) runs four scenarios, internally managing change over time between scenarios.

Duration: 90 minutes - Intro (5); Scenarios (4 x 20); Wrap-up (5)

Documents and resources: See equipment list simulations; lap-tops with videos and PowerPoint slides for review; laminates of algorithms.

Equipment List – See list

Set-up

- Each table has one set equipment and all tables are identical (i.e. will perform same activities)
- Use either full manikins or airway-trainer-torsos depending on what is available for the supraglottic rescue component
- Use neck models (situated nearby) for the infraglottic airway rescue component
- Use SimMan™ software on a laptop to create the falling SaO2 tone to create urgency
- Aim to have an assistant at each workstation to operate the software (if possible)
- You will need to brief your assistant on how you want the saturations to play out for your scenario

Venue: Breakout rooms

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Guide to introducing the session

The introduction comprises (1) a statement of the workstation aims (2) a briefing and (3) a short familiarisation before the scenarios commence.

(1) Aims – see above

(2) Briefing

- We will do four short scenarios to rehearse '3' and '3' stages of supraglottic and infraglottic rescue and transition.
- Each scenario will require you to manage a difficult airway involving some degree of airway obstruction. These will vary in respect to the stages of airway rescue that will be appropriate for resolution – i.e., supraglottic only or supraglottic transitioning to infraglottic. Each scenario will require a justification of the choice to desist or proceed with transition to infraglottic rescue and, in the event of the latter, the stage of the CICO algorithm used.
- You should pre-allocate roles and prepare for the scenario in advance using the preparedness checklist and change roles before each scenario.
- Each scenario will commence with the facilitator (me) setting the scene. I will provide patient vital signs and info to enable you to make a judgment about next steps.
- We acknowledge that the manikin lacks important life like features that are important in assessing airway obstruction. The facilitator will try to provide cues and will not trick you. The faculty nurse (if present) will be acting as a nurse and his / her comments will need to be considered as in real life, rather than interpreted as a cue from big brother.
- Remember, this is a really low fidelity scenario so please ask anaesthetist to talk about the things you look for from the end of the bed etc the things that make you the airway expert for example: Patient's state of agitation, posture, paradoxical resps, accessory muscles etc.
- The scenario may have challenges built in for the purposes of rehearsing topics addressed earlier in the workshop, including possibly the need to consider criteria for CICO; negotiate and be assertive and work under time pressure. The facilitator may play a role in the scenario to enable these situations to be practiced.

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Guide to running scenarios

Scenario 1/4

Overview

Intended outcomes - Not a CICO (Supraglottic rescue resolves situation) i.e. "1-2-1" stage

Structural elements for discussion

- Following the obstructed airway algorithm with stabilisation before declaring CICO
- What criteria to declare CICO
- Responding to pressure to perform CICO when not indicated

Set-up

- Patient (Resus Annie™) in Recovery with O2 mask around neck, trolley slightly head up, but flat on his back.
- Simulator Settings: Simman RR 8 , HR 95-120 BP 150/90 - 165/95 over 2 mins Sa O2 90

Briefing

Briefing from facilitator

- Recovery ward. A 35 year old man BMI 35 had a tonsillectomy for obstructive sleep apnoea, Handed over to recover nurse by confederate(facilitator) increasingly drowsy, laboured breathing and snoring.
- O/E you find him unrousable, RR 8, snoring and SAO2 85%. O2 mask has fallen off although the nurse is at liberty to replace this before she calls for other team members. BP 160/95 HR 110

Patient background info on the anaesthetic sheet

- OSA no CPAP machine , day time drowsiness denied but partner says snores a lot and wakes himself up; IDDM, hypertensive and high cholesterol. Preop notes show he had Insulin this am Actrapid 4 units with a half piece of dry toast; Normal Insulin last night 24 units long acting BSL preop 4.5
- Intra-op: 200 fentanyl , 10 mg morphine; roc; ETT Grade 2 +BURP

Start Scenario

Confederate hand-over to recovery nurse *"Thanks for helping this guy really isn't great but I've got to go to the bathroom really urgently sorry to leave him to you to sort out there's others around to help you out"*

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Progress:

- Sa O₂ 90 –falls to 84 over 20 secs unless O₂ mask put on, drops to 88% if Hudson mask put on
- Initial intervention will reveal him to be difficult to oxygenate with bag and mask with SaO₂ remaining < 90%.
- 2 handed bag and mask ventilation will be difficult although some chest rise esp if coordinated with his resp attempt i.e., Sat O₂ never really improves greatly but not terrible 84-88
- At this stage if suggestion of CICO hasn't come from group, the facilitator could pause and ask is this a CICO? Try to get the nurses to prompt the anaesthetists to refer to the Transition section of the algorithm and use graded assertiveness. Then ask what equipment should we be getting ready but don't over prompt by suggesting LMA unless it is not coming from the group. An LMA will succeed in achieving an airway. Narcan will result in reawakening, but depending on dose and progress of scenario you could make laryngospasm return and possibly deteriorate again.
- SaO₂ will rise slowly when Nasopharyngeal airway x 2 inserted or LMA
- BSL will be 1.9 and he will respond somewhat to glucose although will remain drowsy.

Discussion

1. Tell us about this case? What happened and why did we manage it the way we did?
2. Why was this not a CICO? What criteria were present/not present?
3. What could the scenario have evolved differently to convert it a CICO?

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Scenario 2/4

Overview

Intended outcomes: Aim is to push them into CICO algorithm (i.e. 1 2 3 stage) and then run with whichever method they choose (i.e. 1, 1-2 or 1-3). Needle will work in this situation, but scalpel bougie / scalpel finger bougie Ok.

Structural elements for discussion

- Referral to the preparedness for CICO checklist
- Team-based decisions – opportunities to plan with surgeons, ICU, ED, anaesthetists + nurses
- Team preparation – event leader, proceduralist, airway assistant, set-up people x 2, timekeeper, scribe

Set-up

- Patient (Resus Annie) in recovery with O2 mask around neck, trolley slightly head up, but flat on his back.
- HR 60 reg, BP 160/110, RR 16, SpO2 96% 6 l Hudson mask

Briefing

Briefing by facilitator

Recovery. 70 year old patient after carotidendarterectomy GA awaiting transfer to ICU. Surgeon now standing beside bed 300ml in Redivac, neck is distended a little and possibly ongoing. Surgeon somewhat concerned about neck swelling. Keen to explore early preferably in OT under controlled conditions of GA.

Patient background info from anaesthetic sheet

- 70 years ex-smoker gave up 2 weeks ago, hypertensive and high cholesterol on medication, has stable angina, last ECHO showed no valve lesions and reasonable ejection fraction
- Previous R Fempop Bypass
- Anaesthetic sheet show 150 MCG fentanyl, 120 Propofol , Vecuronium 7mg,
- Grade 3 larynx by registrar
- Clonidine 75 mcg intra op
- Morphine 3 mg in OT 2 lots of 2mg in recovery

Pre scenario Discussion

1. What are you looking for on examination?(no respiratory distress, normal voice, trachea difficult to feel but not obviously deviated, minimal use of accessory muscles, able to lie reasonably flat if you try it but surgeon wants him sitting)
2. How are you going to put him to sleep?

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Start Scenario

Induce anaesthesia (pretend and talk through quickly)

Progress:

- Patient will desaturate after induction by what-ever method
- Loss of pharyngeal muscle tone even without relaxants
- Early NP airways will slow but not prevent desaturation
- LMA difficult to get a good seal because of swelling but may slightly improve Sats but only to high 80s
- Aim is to push them into CICO algorithm. Will succeed with needle but OK for any method they choose.

Final Discussion

- Refer to CICO checklist – what level of preparedness have group members achieved? Re they familiar with equipment in their units; would nurses know what equipment to use etc.
- Team preparation – event leader, primary proceduralist, airway assistant, set-up people x 2, timekeeper, scribe.

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Scenario 3/4

Overview

Intended outcomes: CICO need to perform all '3' and '3' stages of rescue

Structural elements for discussion

- Two potential proceduralists – anaesthetists + surgical registrar
- Dilemma about optimal location – controlled conditions of OT or elsewhere

Set-up

- Patient (resus Annie) in OT with O2 mask around neck, trolley slightly head up, but flat on his back. 6 l Hudson mask
- No monitoring until team place it. Then initial vitals will be: RR 24 HR 130-160 BP 150/90 - 170/100 Sa O2 with O2 99%

Briefing

Briefing from facilitator

- Patient admitted for drainage of abscess after dental extractions several days ago; preop CT scan ordered and but brought back from X-ray without scan as they are unhappy without anaesthetic assistance
- Induction bay of OT. Surgeon (registrar) has brought him into induction bay as he thinks we need to proceed quickly
- Large man in obvious distress (Megacode with ice packs wrapped around head and neck). Sitting up on trolley from faculty voice is hoarse, drooling, barely coping with saliva. Able to lie down for short periods if given a sucker self-suctioning mouth
- Has IV in situ has had antibiotics (if asked no response to Neb AD)

Patient background info from anaesthetic sheet – NA (no old notes)

Start Scenario

Let team get monitoring on BP SaO2, team time out, preop checks, etc.

Progress: Supraglottic rescue attempts

- Deteriorates: develops soft inspiratory stridor, becoming sweaty
- Cough and Speak, Spasms so SaO2 falling to 90%
- Further fall in Sao2 will depend on management
- Impossible to get view with laryngoscopy can't get laryngoscope into mouth properly
- May get a little improvement if attempts LMA but not good seal CPAP helps a bit
- Able to assist with bag/ mask +/- nasopharyngeal airway + CPAP will hold at 83%

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Progress: Transition:

- SaO₂ 83% sweaty, HR rising, BP going up, seesaw resps mainly using accessory muscles despite supraglottic rescue

Progress: Infraglottic rescue attempts

- Progress through 3 steps to scalpel finger bougie
- If surgeon does it fails (Surgical route needle unsuccessful landmarks not palpable)

Discussion Points

- Team-based decisions – how would you decide who the proceduralist and what method?
- How do you decide if you have time to perform this in OT under controlled conditions?

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Scenario 4/4

Overview

Intended outcomes: CICO need to perform all '3' and '3' stages of rescue plus ALS for hypoxic cardiac arrest

Structural elements/learning objectives

- ED – early admission demise
- Disagreement with colleague about transfer of patient to OT
- Cardiac arrest

Set-up

- Scenario takes place in the ED
- Simulator: stridor, saturations of 80%, RR 25, HR 130, BP 190/110

Briefing

Briefing from facilitator

- Patient presents with breathing difficulty. Patient provides a history (with difficulty) of previous airway cancer treated 2 years ago with surgery and radiotherapy. He has recently been diagnosed with a recurrence of this airway tumour and is booked to have a microlaryngoscopy next week. He has smoking related airways disease and is on regular bronchodilator treatment.
- OE: he appears to have evidence of existing COAD with chest hyperexpansion and use of accessory muscles of respiration. In addition he has stridor, saturations of 80%, RR 25, can't phonate easily and evidence of a previous radical neck dissection and possible mandibulectomy and tethering suggestive of radiotherapy. Mouth opening is limited to two cm.
- **Patient background info from old notes:** Medical records not available.

Start Scenario

Progress: Early treatment

- Treatment by the team may include: Nebulised adrenaline, Heliox and dexamethasone
- There will be a mild but inadequate response to this with SaO₂ rising to 86%

Progress: Decision-making/assertiveness

- The facilitator advises the team that the surgeon wants to perform a tracheostomy under LA in the OT but the team leader is not confident the patient can be transferred safely to theatre. He/she needs to negotiate this as a mock telephone call with the surgeon. Objective is to rehearse Assertiveness

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Initial Discussion

1. What is your plan? Are you going in a lift with this patient? What is the best location to secure the airway and what would be the preferred anaesthesia?

Scenario Part 2

Irrespective of the final decision, the patient deteriorates and becomes unconscious

Progress: Supraglottic rescue attempts fail

Progress: Transition: Meets criteria for CICO

Progress: Infraglottic rescue attempts

- Progress through 3 steps to scalpel finger bougie. The needle cannula will work temporarily before kinking (faculty may need to pause and kink cannula with audience aware of this) prompting a modification in response (scalpel bougie or scalpel finger).
- Meanwhile heart rate rapidly slows to 30bpm and femoral pulses become thready. SaO2 stops reading suggesting imminent hypoxic cardiac arrest requiring cardiac compressions and ALS for bradycardia/asystole while the airway is secured. This will be successful (faculty need to be ready to prompt if team are slow)
- If ED/surgeon does procedure it fails (Surgical route needle unsuccessful landmarks not palpable)

Discussion Points

- Team-based decisions – how would you decide who the proceduralist and what method?
- How do you decide if you have time to perform this in OT under controlled conditions?