ACMx Airway Scenario: (Mr Hans Zimmer)

ACMx Airway Scenario (17th November 2023)

Title: "Can you be at hand, to bail me out?"

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Learning Objectives:

After participating in this scenario, participants will:

- Recognise the potentially difficult airway and allocate the most skilled personnel appropriately.
- Identify if an appropriate airway plan has been formulated for a potentially difficult airway scenario, and if not, then make plans
- Recognise the impediment a hard collar poses to difficult airway management, and therefore remove this prior +/- use of Manual-Inline Neck Stabilisation (MILNS) in a potentially unstable neck
- Utilise and optimise attempts at all 3 lifelines of the Vortex model
- Demonstrate priming for CICO
- Recognise and declare when the situation has progressed to the Can't Intubate/Can't Oxygenate (CICO) scenario
- Perform FONA according to the pathway in the CICO algorithm
- Develop teamwork skills in the management of a CICO scenarios

Background:

The scenario is set in ED in the afternoon. A 60 yo obese man has fallen off the stage at a classical matinee music concert he was conducting, hitting his head on the way down. He has moderate neck pain for which a hard collar was put on. His GCS is now starting to drop. He has had a CXR which is normal. He is in need of a CT head and neck, but will need intubation first, and the ED reg is requesting anaesthetics backup if needed when intubating. ED reg is about to induce and intubate with drugs and direct and video laryngoscopes ready, but has little experience.

Participant Allocations:

Participants will as much as possible be allocated to roles that fall within their normal scope of practice.

Roles

- Confederates – ED Reg Mike (or Mandy) (initially makes a call to a mobile phone which is on speaker mode and with the 1st responders; subsequently is in ED with the patient)
- 1st responders (receive the phone call from ED reg) – 2 x Anaesthetic doctors and 1x Anaesthetic nurse.
- 2nd responders – Anaesthetic incharge, other anaesthetic doctors +/- nurses

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Available Facilitators and Roles in Simulation/Debrief (NB All roles can be swapped)

Sim 1

- Mark Ng = Lead debriefer
- Raph Pyo = 2nd debriefer/ED reg (Mike)

Sim 2

- Amro Zahran = Lead debriefer
- Sophie Dash = 2nd debriefer/ED reg (Mandy)

Equipment required

- Mannikin that has an airway that can insert guedel, LMA, ETT into
    - dressed in patient gown
    - lying on back
    - anterior neck has protective fibreglass shield over it. Overlying this is a fake trachea that is taped down slightly off the midline and caudal end is tucked in under the mannikin's chest wall skin if possible. Overlying this are 2 hotdog bread rolls and then a fake skin over the whole lot.
    - Hard collar applied to the "obese" neck
    - Pt has an 18g iv R arm with CSL hanging
    - Air viva attached to ball/flow meter at 10L O_2/min attached to oxygen cylinder
    - Monitoring Display :
        - ECG
        - Oxygen saturation
        - NIBP
        - Capnography (if requested) – need to attach in-line capnography line
- Monitoring display:
    - I will use an ipad and my phone connected through the SimMon app. I've recommended Amro do the same as we had issues with the iSimulate device last time.
- On a trolley in preparation for intubation by ED reg
    - 5ml Syringe labelled Midazolam 5mg/5ml (with 5ml saline inside)
    - 3ml syringe labelled fentanyl 100mcg/2ml (with 2ml saline inside)
    - 5ml syringe labelled suxamethonium 100mg/2ml (with 2ml saline inside)
    - 20ml syringe labelled metaraminol 0.5mg/ml (with 20ml saline inside)
    - Size 8 cuffed ETT, with 10ml syringe attached
    - Spare size 7 cuffed ETT
    - Laryngoscope 3 & 4 MAC blade
    - Malleable Stylet (not loaded into ETT)
    - FROVA Bougie
    - OPAs size 3-5
    - HFNO (Optiflow) prongs – if participants want to use, they can apply the prongs to the pt, and we just tell them to assume its attached to the HFNO machine.
- Readily available in room on another trolley (that participants can ask for):

    - Other drugs (perhaps on a tray or in a box) - propofol, suxamethonium, rocuronium, atracurium, ephedrine, alfentanil, fentanyl. If its easier can just have already drawn-up labelled syringes rather than the ampoules.
    - Range of syringes and drawing up needles to draw up the drugs required
    - Marker pen +/- stickers for drugs
    - NPAs size 6-8
    - LMAs size 3-5
    - Yankeur Suction
    - Glidescope Stylet
    - Glidescope
    - Syringe driver (to run ppf once asleep)
    - Art line bag/setup/ABG syringe
    - Range of iv cannulaes
    - Spare O2 cylinder with 15l/min ball flowmeter (if possible – if not, we'll just use the same O2 source for the Leroy device as well as for BMV)
- Difficult Airway trolley including CICO kit. Main items include (in bottom drawer):
    - CICO kit x 1, spare BD insyte cannulae
    - Manujet
- Cognitive aids:
    - Vortex Priming Status tool, EH CICO algorithm, Vortex Optimisation Strategies (need 1 of each for both simulations, in colour and A3)
- Flexible intubating bronchoscope (Ambu ascope) - not planned to be used. Therefore can have 1 outside available between the 2 sims. If one sim calls for it they can get it but then the pt deteriorates before it can be used; if thee other sim calls for it, it just won't be available)
- Cardiac Arrest trolley – not planned to be used, so happy to have 1 available outside the room between the 2 sims.

Scenario introduction:

Phone call to first responders (Anaesthetic doctors x 2 and anaesthetic nurse) on speaker phone:

"Oh hi, this is Mike (or Mandy) one of the ED registrars. The incharge anaesthetist asked me to give you a call as he said your list was cancelled and you and your registrar were free. I'm in ED with a 60yo man in Resus bay 4, who needs intubation for deteriorating GCS and then transferring to CT for a head and neck scan, and wondering if you can come down and give me a hand.

So his name is Hans Zimmer, previously well except for obesity – I'm guessing about 100kg. He was conducting a midday concert today, and fell off the stage and hit his head on the way down. Primary and secondary surveys were largely normal except for the neck. He was complaining of neck pain and tenderness posteriorly - so we put on a hard collar. C-spine X-rays were normal but we're still concerned. CXR was normal. He initially had a GCS of 14, and but now this has dropped to 10 and he's becoming obtunded so I'm hoping to intubate him quickly and get him to the CT scanner.

If you can bring down an anaesthetic nurse that'd be great also as I'm on my own due to the multitrauma that's just come in – its pretty crazy down here and pretty much all of our staff have been pulled in to help with that.

Are you able to come now?"

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[First responders enter the room (ED resus bay 4)]

[Confederate ED registrar is at head of the patient (pt is still wearing a hard collar which conceals an obese neck underneath) with an Air viva on 10L/min of O_2 not well applied, Pt's SpO2 is 94%. As the Anaesthetic doctors and anaesthetic nurse enter, he looks up happily and says:]

"Oh great, thanks for coming guys. My name's Mike (or Mandy), and I'm the ED reg who called you. This is Mr Zimmer the 60yo man, who had the fall and needs intubation and transfer to CT for a head and neck scan. I heard there were quite a few theatres upstairs with cancelled lists, so the incharge anaesthetist said if we need further help, he can supply – as basically we're super short here in ED with the multi trauma case going on.

Anyway Mr Zimmer is obese, I'm guessing 100kg, with BMI ~40, but otherwise well. No medications normally and no allergies. He's fasted. I've got an 18g jelco in his arm. His GCS has deteriorated a bit more since I spoke with you, and so I'm keen to get this tube into him. I'm happy to do airway if you guys do drugs, and your nurse helps me. I was just thinking of giving midaz, fentanyl, and suxamethonium and I've got a size 8 ETT with Mac blade 4, and glidescope available as well. If I run into trouble, I'm happy for you to bail me out.

Are you happy if we get started?

<u>Progress of scenario</u>

Initial patient state:

- Sats 94% with air viva loosely applied to face at 10L/min
- BP 150/90
- HR 100
- RR 8, pt taking shallow breaths, some groans

ED reg does not appear to know what he's doing – not preoxygenating properly, hasn't assessed airway, no plan B, hasn't removed the hard collar (or if anaesthetics team removes the collar, the ED reg will try to hyperextend the neck), drugs not appropriate for someone with head injury (no ppf drawn up), no plan for keeping pt asleep post intubation. If asked he will admit that he has only done 1 intubation before (minimal experience). When suggestions come up/plan revised by anaesthetic team he will nod with "oh yeah, good idea" as though he has never thought about this before (indicating his minimal experience). If asked about airway assessment, he will state "I couldn't really assess with his hard collar on". If asked about fasting status of the pt, he will state that "pt had breakfast at 8am, and it's now 3pm so he's been adequately fasted" (However if question further then injury occurred at 12noon and he had a large McDonald's breakkie).

If the anaesthetic team allow the ED reg to intubate the pt, he will run into trouble straight away, even unable to BMV but won't let on, and will be a bit reluctant to handover (I think I'm almost there, I think I'm okay…when clearly he is not)

Otherwise the preferred approach would be that the anaesthetic team would recognise the mismatch in skill set of the ED reg for this situation and therefore start off as the main airway providers after assessing the airway.

Anaesthetic team can call for backup from anaesthetist incharge who will come down with others (they should call for help with MILNS). If they try to call ED staff – no-one comes; If they press emergency buzzer, then anaesthetic staff come.

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Anaesthetic team may want to do cricoid pressure, but should release this if there are issues with the lifelines.

If at any point the airway team start to plan for an AFOI, the pt will deteriorate further with loud snoring/obstructed airway, or clenched mouth, and the team will have to crash-induce (we don't want them to do an AFOI).

If preoxygenate the pt well, SpO2 will increase to 100% preinduction. Once the pt is induced, BMV is not great but getting some air into the pt – SpO2 drops to 94%.

At an appropriate time (when there are enough staff that he/she is not needed), the ED reg will exit the situation, abruptly stating "oh dear, I'm having a migraine with aura. I really need to leave. I think you've got enough hands"

Progress:

Intubation:

- Gd 4 DL
- VL – can't see large tongue and pharynx crowding the view completely

BMV:

- When try again, the team really struggles with difficult/impossible BMV and SpO2 drop

LMA

- Difficult or unable to ventilate through it

As to how impossible it is to BMV and LMA ventilate depends on how quickly you want to progress the scenario. When you want to progress, just make it impossible to now ventilate with falling SpO2.

Not planning to allow the pt to go into cardiac arrest requiring CPR.

Would like to see:

- Airway assessment
- Assessment of ED reg capability and appropriateness for having "the first go"
- Removal of hard collar and consideration of MILNS and staffing for this
- Priming for CICO
- Use of Cognitive aids (Priming, EH CICO algorithm +/- Vortex optimisation strategies)
- Declaration of CICO
- Cannula cricothyroidotomy (which will fail), and then progression onto Scalpel/finger/cannula or Scalpel/finger/bougie (ie scalpel/finger and then when find airway structures perform scalpel/bougie from there) technique.

Discussion points

- Who should be on the airway first up? Is it appropriate to allow the obviously inexperienced ED reg first go in a difficult airway? Is anaesthetic team happy to just be "the backup" for the airway here.

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- Staffing required for MILNS
- Priming/transitioning to CICO
- Declaration of the CICO situation
- CICO algorithm – what to do in an obese neck with no palpable anatomy
- Team leadership, teamwork, roles etc