



Inspire

VORTEX APPROACH TRAINING PROGRAM
module 3

3.3 Transition Workshop
(Interactive Workshop)

45 mins

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OVERVIEW

PROGRAM Name:

Inspire: Vortex Approach Training Program
Module 3: Transition to CICO Rescue

SESSION TITLE:

Vortex Transition workshop

Format

Interactive workshop utilising low-fidelity case-based 3 phase “mini-scenario”

AIM

To introduce use of the Vortex Approach to facilitate a structured, team-based approach to transition between upper airway lifelines and CICO Rescue

Duration

45 minutes

Type of learners

Medical/nursing/paramedical/technician/surgical staff whose clinical responsibilities include advanced airway management.

Number of Participants

4 - 8 (at least 3 airway operators)

Number of staff

1 Instructor

Summary of components

1. Introduction (5 mins)
2. Pause & discuss mini-scenario (35 mins)
3. Summary (5 mins)

Learning objectives

By the end of the session participants should be able to:

- Classify optimisation strategies for each of the upper airway lifelines according to the 5 categories of the Vortex tool.



- Demonstrate use of the Vortex tool to facilitate a team-based approach to prompting optimisation of upper airway lifelines (Note: technical aspects of optimisation techniques should not be covered during this session)
- Demonstrate the process of priming for CICO Rescue using the CICO Status tool.
- Define the trigger for declaring a CICO situation and initiating CICO Rescue
- Define the Green Zone and describe how it is recognised clinically
- Demonstrate use of the ‘critical language’ of the Vortex Approach

Evaluation technique

Feedback form at end of session (educators to generate this tailored to meet local needs)

Anticipated challenges

- Encouraging participants to feel comfortable with new terminology and communication dynamics within a short session.
- Avoiding temptation to teach technical aspects of optimisation strategies (these are addressed in the “Best Effort” videos or separate workshops)

Preparatory Material

Instructors:

- Vortex Approach e-book
- Completion of Module 1 & 2 content

Participants: Completion of Module 1 & 2 content (participants should already be familiar with basic concepts of the Vortex approach from on-line preparatory material).

SET

Equipment

- Manikin: Basic airway trainer or Resusci-Anne is adequate.
- Trolley or Table
- Setup: Hudson mask applied with oxygen at 6L/min. **No other props or monitoring are required or desirable** (Mini-scenarios are not intended to be realistic. **Use of monitoring slows progression of the drills and distracts from the learning objectives**).

The following suggested list of airway equipment should be tailored to reflect the usual spectrum of equipment available in the participants’ clinical environment & their scope of practice. It is desirable that equipment be presented as it would be in the clinical environment, ideally in the format of the Vortex Emergency Airway Cart.

Sizes listed reflect those required for training for adult practice. For paediatric training the usual spectrum of appropriate sized equipment should be provided.

- Ventilation device: Anaesthetic machine, Mapleson circuit or BVM device.
- Gas source: cylinder or wall oxygen if not using self-inflating bag
- Facemasks: small/med/large adult masks and different mask types if available.
- LMAs: 1st and 2nd generation SGA’s, in sizes 3/4/5



- ETT's: standard 6.0-8.5 ETT, Fastrach ETT Size 7.0, Glidescope ETT Size 7.0 (parker tip)
- Laryngoscopes:
 - Direct Laryngoscopes (DL): Mac 3/4, Miller, McCoy, Kessel, Short handle,
 - Videolaryngoscopes (VL): standard geometry (SG) & hyperangulated (HA) blades.
- Adjuncts: Oropharyngeal airways (size 3-5), nasopharyngeal airways (size 6.0-8.0), bougies, stylet
- CICO Rescue Kit
- Suction device and tubing (actual suction pressure not necessarily required)
- Syringes 10ml, 20ml
- Laminated teaching materials on wall (downloadable from VortexApproach.org):
 - Vortex Tool
 - CICO Status Tool
 - Laminated Green Zone Decision Tool
 - Lateral 3D image of Vortex showing 'tiers' of Green Zone
- Laminated "Best Effort" foundation tool: for FMV, SGA & ETT (<http://vortexapproach.org/lifelines/#besteffort>)
- Laminated Vortex Optimisation Training Matrix foundation tool
- Laminated laryngoscopy images or iPad with laryngoscopy images
- iPad with Vortex Training App

FOUNDATION (5 MINS)

Welcome

Introduction of instructors/participants: names & backgrounds/roles

Explain aim of session

- Practice using the Vortex Approach to facilitate a structured, team-based approach to transition between upper airway lifelines and CICO Rescue
- Emphasis is on process of prompting optimisations & priming rather than technical aspects of how to perform airway interventions.
- Important to *consider* all available optimisations but whether they should be *implemented* is a context dependent decision.

ESTABLISH RELEVANCE

- Management of the challenging airway can be a time critical emergency requiring an efficient coordinated team-based response to ensure CICO is avoided wherever possible and CICO Rescue initiated without delay where this is not the case.
- Structured approach to optimisations allows:
 - Maximises opportunities to efficiently enter Green Zone.
 - Facilitates recognition of completed best effort, providing permission to move on to alternatives.

establish groundrules



- Interactive session – encourage participants to speak up
- Intention is to practice a new format for team interaction in a low stress setting. As such, mini-scenario will be ‘low key’ and not necessarily evolve in real time so as to maintain this emphasis.
- Participants should feel comfortable to pause & discuss at any times. Likewise instructors may interrupt case to discuss points of interest – this does not imply the participants have done anything wrong.
- Mini scenario is based around a single evolving clinical case in 3 phases
- Each phase will focus on optimisation of one lifeline (FMV, SGA or ETT). In real life clinicians may rightly undertake optimisation of several lifelines in parallel but during this simulated case participants will be encouraged to exhaust optimisations on a single lifeline before moving on. This is not what the Vortex Approach advocates but is simply a teaching technique to facilitate recognition of all available optimisations for a given lifeline and their classification under the 5 categories of the Vortex Approach.
- Appropriateness of a given optimisation is context dependent. Intention is not that all optimisations for each lifeline are *attempted* but they are *considered*.
- At each stage discussion will be had on the following:
 - Optimisation of upper airway lifelines
 - Recognition of the Green Zone and the opportunities it affords
 - Priming for CICO Rescue
 - Use of critical language: Xth attempt at..., best effort, CICO Status, CICO Rescue, In the Vortex, Green Zone, etc

- Monitoring will not be used. Vital signs (SpO2, ETCO2) and other feedback (chest rise/fall, patient colour) will be provided verbally by instructor.
- Laryngoscopy grade will be communicated using photos. Participants should respond to laryngoscopic grade depicted rather than actual view on manikin.
- Explain layout of Vortex Emergency Airway Cart (where this is being used) and its relationship to the prompts of the Vortex tool.
- Explain role and operation of Vortex Training App. Stress the app is not intended to be used during the management of a real airway crisis but is simply a teaching tool to assist in associating specific interventions for each lifeline with the 5 optimisation prompts of the Vortex.
- Sharps Safety: tell participants not to actually perform CICO Rescue on the manikin/airway trainer. They should open the CICO Rescue Kit and prime for CICO Rescue according to the level of the CICO Status but should leave scalpels/cannulae sheathed for this session to avoid accidental injury to participants/manikin.
- Assign & explain roles (participants should rotate between different roles in each phase)
 1. Vortex coordinator (this role may be assigned to any clinician): will use Vortex app and offer prompts as required. Best approach is to initially allow airway operator to proceed as they usually would and keep track of optimisations which have/haven’t been implemented. Coordinator should intervene and offer prompts:
 - To declare “Xth attempt at...” each lifeline as it is initiated.
 - If a request for suggestions is made by the airway operator.
 - If the airway operator is struggling: uncertain or repeating interventions.
 - If following two attempts at a lifeline, potentially important optimisations appear to have been omitted.
 - To declare when a best effort at any lifeline is achieved.
 2. Airway operator: will perform airway interventions. In response to optimisation prompts they should respond with one of the following:
 - “Done”: they have already performed the intervention.
 - “Yes”: they wish to perform the intervention.



- “Defer”: the optimisation is potentially useful for this lifeline but the airway operator does not wish to implement it yet – but wishes to be reminded again to implement it before declaring a ‘BEST EFFORT’ at this lifeline (e.g. administration of neuromuscular blockers).
 - “Unsuitable”: the intervention is not considered useful for this lifeline.
3. Airway assistant: will provide equipment and assist with airway interventions. May also offer optimisation prompts as appropriate, particularly if Vortex Emergency Airway Cart is being used.
 4. Help: will perform any tasks requested by Vortex coordinator/Airway operator. May also offer optimisation prompts as appropriate.
 5. Observers (remaining participants): should not actively participate during scenario but should be encouraged to contribute to discussion during pauses.

establish entry level

Establish whether any participants have previously used Vortex Approach in a team setting?

BODY (35 MINS)

Stem

The following generic stem will be suitable for the majority of in-hospital clinicians with backgrounds in anaesthesia, intensive care and emergency medicine but can be altered as required according to the learner group. For prehospital providers the stem should simply be that of a collapsed, unresponsive patient (blood sugar will be normal if checked). Where varying from the stem given below the overriding principle should be to create a simple scenario in which the patient is clearly apnoeic but does not have other distracting physiology/pathology so that a focus on airway management can be maintained. In particular clear cues should be provided to indicate the presence of an adequate cardiac output and avoid progression to ACLS.

You are sedating a 65yr old, otherwise well, fasted patient for synchronised cardioversion of rapid atrial fibrillation.

Patient has received 2mg midazolam and 50mg propofol and following DCR has returned to sinus rhythm with normal blood pressure. The patient is now apparently oversedated: unresponsive to sternal rub and making no respiratory effort. SpO2 is 98%, No ETCO2 trace. Other vitals unremarkable. Demonstrate how you would approach this situation.

Conduct of mini-scenario

Participants may approach lifelines in any sequence but should be encouraged to complete all optimisations for a given lifeline (within 3 attempts) before moving on to the next. ***If a participant attempts to move on to a different lifeline, acknowledge that clinically this would be completely appropriate but explain that as a teaching exercise we are going to take the artificial approach of exhausting all optimisations for a given lifeline before moving on.*** Strategies for optimisation of the remaining lifelines will be explored in the other phases of mini-scenario.

The following information should NOT be volunteered to participant at outset but will form the basis for feedback given to them as the scenario progresses.

- Patient does not show signs of waking at any stage.



- Interrupt participants to *insist* on use of appropriate critical language (this is important to overcome self-consciousness about new terminology and facilitate use of these terms during more immersive module 4 scenarios).
- Airway patency/ventilation for a given lifeline will only be restored when all interventions listed in table below have been implemented Note that interventions undertaken during previous phases may be assumed to have been implemented in subsequent phases.
- Required optimisation interventions may be altered as appropriate to suit equipment & scope of practice of different clinician groups.

	FACE MASK	Supraglottic airway	Endotracheal tube
Clinical information	<p>Significant leak around face mask. NO chest rise or ETCO2 trace</p> <p>Bag tight (if using collapsible bag) – suggesting issue is primarily obstruction rather than poor seal (This info not available if using self inflating bag).</p>	<p>SGA does not seem to be passing properly INitially. Significant leak around SGA cuff with ventilation attempts. No chest rise or ETCO2 trace</p>	<p>VL should not be available on 1st two attempts to encourage optimisation of DL view.</p> <p>DL/sgVL: Grade 4 Larynx regardless of any interventions until fully relaxed (SHOW IMAGE)</p>
MANIPULATIONS 	<p>Head & Neck</p> <ul style="list-style-type: none"> ▪ Sniffing Position (Flexion) <p>Device</p> <ul style="list-style-type: none"> ▪ Thumb grip 	<p>Head & Neck</p> <ul style="list-style-type: none"> ▪ Sniffing Position (Flexion) ▪ Jaw thrust <p>DEVICE</p> <ul style="list-style-type: none"> ▪ Twist on insertion 	<p>HEAD & NECK</p> <ul style="list-style-type: none"> ▪ flexion <p>Larynx</p> <ul style="list-style-type: none"> ▪ ELM: improves paralysed DL view from 3B to 3A (Show image). Blind intubation unsuccessful. NO IMACT ON HAVL view. <p>DEVICE</p> <ul style="list-style-type: none"> ▪ ETT Will 'hang up' at cords unless rotated during insertion
Adjuncts 	<ul style="list-style-type: none"> ▪ OPA ▪ NPA 	<p>Laryngoscope or gauze assisted tongue protrusion</p>	<p>BoUGIE: will only be able to be passed to larynx once Grade 2B view obtained with HAVL & Paralysis</p>



Size/type 		Change Size or type of SGA	SGVL: same view as DL. HAVL: GRADE 3B prior to paralysis. Grade 2B view Once paralysed (SHOW IMAGE). Straight blade (or other)DL:same view as Mac DL.
SUCTION 	Small amt secretions		
MUSCLE TONE 	Induction bolus of Propofol or muscle relaxant	Propofol Bolus or muscle relaxant	intubating dose of muscle relaxant: DL: Grade 3B View (3A in combination with ELM) HAVL: grade 2B view

KEY DEBRIEF POINTS for all phases:

Once all required optimisations for Lifeline have been implemented, Inform participants that chest rise/fall & ETCO2 (with waveform description as outlined for each phase) have been restored & pause scenario for debrief.

OPTIMISATION:

- Recap optimisation strategies implemented under each of the 5 categories for that lifeline. Has a best effort been achieved? IF not, note the interventions (typically PROPOFOL/muscle relaxation) required for completion.
- Highlight any overlooked interventions (make note that these omissions occur even in this relatively non-stressful situation) & reinforce need for structured team-based approach to avoid this in time critical situation of true airway emergency.
- Recap number of attempts made at lifeline. If muscle relaxation not yet administered, a 3rd attempt at that lifeline should be reserved for this ('GAMECHANGER' should not need to be invoked during this session).
- 'BEST EFFORT' at any lifeline not possible without paralysis (Unless this is beyond scope of practice for clinician)
- Emphasise artificiality of exhaustive optimisation of single lifeline in drills and encourage alternating between different lifelines between attempts in clinical practice such that optimisation of multiple lifelines is occurring in parallel.

Priming:

- What is appropriate CICO STATUS at this stage?
- Has this been declared? What was done in response?

Green Zone:



- Is the patient Currently in the Green Zone? How was this determined? (Is there “CONFIRMED, ADEQUATE alveolar Oxygen delivery”?)
- What are the opportunities of the Green Zone? (oxygenation, resources, strategy)
- Is this a high/low tier of Green Zone?
- Is Green Zone Tenuous/stable ?

CRITICAL LANGUAGE: Highlight use of relevant critical language to make key declarations (should have been insisted on during scenario):

- “Xth attempt at...”
- “Yes”, “Unsuitable”, “Defer” or “Done” in response to optimisation prompts.
- “IN the Vortex” vs “in the Green Zone”
- “CICO status to...”
- “completed best effort at...”
- use of term “cico rescue” (Rather than other terms: FONA, surgical airway, ‘cric’, etc)

AT end of debrief, rotate all participants into new roles. Tell airway operator:

- that the same scenario is now continuing and they have implemented all the same optimisations as the participant in the preceding phase(s) (recap whether propofol &/or muscle relaxant have YET been administered)
- that (Unlike the end of the preceding phase) none of these optimisations Have allowed alveolar oxygen delivery
- Recap the current cico status & Whether this will need to be escalated given previous lifeline is now unsuccessful.
- Recap patient physiological status: The patient remains apnoeic, there is no ETCO₂ TraCE with attempted ventilation & SpO₂ is as per phase specific info.
- Ask airway operator to demonstrate how they would approach this situation.



Phase specific points:

Phase 1

- SpO2 remains at 98% throughout, flat line on ETCO2 trace until all required optimisations implemented.
- Encourage administration of propofol bolus prior to completion of phase 1.
- CICO Status need not necessarily escalate (unless muscle relaxant administered thereby completing a best effort).
- Once alveolar oxygen delivery is restored ETCO2 trace is nice square wave (ETCO2 40) with good chest movement. SpO2 remains at 98%. (Stable, high tier Green Zone)

Phase 2

- At resumption of scenario, immediately after informing participant that there is now NO chest movement or ETCO2 - but SpO2 remains 98% - ask whether this patient is now in the Green Zone. Discuss why not (no confirmed alveolar O2 delivery) & encourage them to declare that they are “stuck in the Vortex” to the team.
- CICO status should escalate to READY following first attempt at phase 2 lifeline (based on consecutive unsuccessful attempts at 2 lifelines).
- As phase 2 progresses, SpO2 will slowly decline from 98% to 85%.
- Once alveolar oxygen delivery restored ETCO2 trace is small (ETCO2 25) triangular peaks (representing partially obstructed airway). SpO2 rises from 85% but plateaus at a maximum of 91%. (Tenuous, low tier Green Zone).

Phase 3

- SpO2 begins at 85% (patient is cyanosed) and declines towards 70%, flat line on ETCO2 trace until all required optimisations implemented.
- CICO Status should escalate to SET after 1st unsuccessful attempt at current lifeline (based on consecutive unsuccessful attempts at 2 lifelines +/- 2 completed best efforts) if not already at this level.
- If muscle relaxant is only administered during phase 3, this should be accompanied by a return to a final attempt at phase 1 & 2 lifelines to complete “best effort” in the presence of paralysis.
- Once alveolar O2 delivery is restored ETCO2 is nice square wave (ETCO2 40) with good chest movement. SpO2 rises from 70% to 100%.

CLOSE (5 MINS)

Reinforce the following concepts:

Optimisation

- Reinforce the importance of implementing as many optimisation strategies as possible prior to inducing the patient when undertaking planned airway management.



- Reinforce the role of the Vortex optimisation prompts in facilitating efficient entry into the Green Zone via each of the upper airway lifelines (where this is possible) as well as provide an endpoint to optimisations and permission to move on to alternative strategies (when it is not possible).
- Reinforce that a completed best effort at any of the three lifelines should not be declared until attempted in the presence of paralysis (except for clinician groups in whom administration of muscle relaxants is outside their scope of practice). As such if entry into the Green Zone has not been achieved by other methods, a commitment must be made to actively moving forward to establish adequate alveolar oxygen delivery by administering anaesthesia/muscle relaxation. These optimisations should not be withheld in the hope that the patient might wake.
- Remind the participants that even if there are optimisation strategies remaining, a maximum of 3 attempts at each lifeline must be imposed (except in the limited situation of a 'Gamechanger')
- Emphasise that concept of a 'best effort' is context dependent. In addition to the fact that not all optimisations will be of value in all contexts, a completed best effort does not necessarily require having the maximum number of attempts. The aim should be to achieve a 'best effort' in the minimum possible number of attempts, without overlooking potentially useful interventions. Even where all *potentially* useful optimisations have not yet been implemented, the presence of critically low/precipitously falling SpO₂ & low likelihood of success of further attempts may mean that a lifeline should be abandoned and a best effort declared after fewer than three attempts.

GREEN ZONE

- Highlight the definition of the Green Zone (confirmed adequate alveolar oxygen delivery) and that it does not require normal SpO₂/ETCO₂ trace – nor does a normal SpO₂ following preoxygenation indicate entry into the Green Zone.
- Highlight the opportunities of the Green Zone: oxygenation, resources, strategy.

Priming

Emphasise the role of the CICO status tool to facilitate priming for CICO Rescue in real-time as an airway emergency evolves.

Critical language

Highlight the importance of critical language to effective team performance during management of an airway emergency. In particular reinforce the following key declarations to facilitate situational awareness and trigger crucial actions:

- "Stuck in the Vortex" or "In the Green Zone"
- "Xth attempt at...(lifeline)"
- "Completed Best Effort at...(lifeline)"
- "CICO status to...(level)"
- "CICO Rescue"

