**Critical Care Airway Nurse Network (CCANN) course - *Local***

*A guide to delivering the course within your department*

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Dear Colleague,

Thank you for choosing to run the CCANN course. This guide aims to provide clinicians with the information required to run the course within your trust.

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**Introduction to the CCANN course**

**Background:**

Staff working across Critical Care and Emergency Medicine will no doubt recognize the considerable risk associated with Critical Care intubation (CCI). As a team, we often intervene at a time when patients are particularly unstable making an already complex process even more challenging.

CCI is more than an airway procedure and is perhaps best viewed as a high acuity resuscitation event. A large number of time critical interventions are often required, all conducted simultaneously and by different staff members. As such, a successful outcome is favoured by a skilled and well prepared team, who together may be referred to as the ‘Critical Care airway team.’

**The Course:**

Despite the clear importance of nursing staff during CCI, historically staff have rarely undergone formal training in this area. The CCANN course aims to address this by providing nurses with confidence, skills and knowledge to help staff provide assistance during the CCI process.

The local CCANN coursetakes the critical elements of the full day program and condenses them into a single 2.5 hour session. This enables busy departments to deliver airway training more flexibly. The local program incorporates a combination of lectures and simulation exercises. Each course can accommodate up to 10 candidates and requires 2 to 3 faculty.

In line with UK practice, the CCANN program assumes nursing staff will work within an airway team led by an appropriately trained senior Doctor (SpR or Consultant) in a relevant medical specialty.

**Candidate allocation:**

Nursing staff attending the course should work within clinical environments where assisting within a critical care airway team forms an expected component of their daily duties. Typically, this includes staff across Critical Care and Emergency Medicine. Candidates are usually band 5 or 6 nurses, though ANP/ACPs are also very welcome to attend depending on local requirements.

**Faculty:**

The faculty for each course should ideally be led by an appropriately trained senior doctor (SpR or consultant). Other clinicians suitable to work as faculty include; junior doctors, ODPs and senior nursing staff and advanced practitioners with appropriate training and experience.

**Course Outline**

The following outlines the standard format for the course. The program in total will take just under 2.5 hours:

**Lecture 1:**

*Critical Care Intubation (CCI) – the process explained… (30 minutes)*

**Lecture 2:**

*Drugs used during Critical Care Intubation… (20 minutes)*

**Lecture 3:**

*Potential complications during Critical Care Intubation… (20 minutes)*

**Simulation 1:** …*(20 minutes)*

**Simulation 2:** …*(20 minutes)*

**Simulation 3:** … *(20 minutes)*

**Lecture 4:** *Summary and Close … (10 minutes)*

**Session Guide**

The following section provides a summary of each individual session:

**Lecture 1** – *Critical Care Intubation (CCI) – the process explained*

This provides an insight into all aspects of CCI from the origins of the traditional ‘Rapid Sequence Induction’ through to the various modifications we now commonly use to meet the needs of the critically unwell patient. Detailed information is also provided on airway equipment preparation, patient monitoring, cricoid pressure, endotracheal intubation and pre-optimisation strategies.

**Lecture 2 –** *Drugs used during Critical Care Intubation*

This lecture provides an overview of the drugs commonly used during CCI. This includes those used for induction of anaesthesia, cardiovascular support and post intubation sedation. The aim is to keep this as practically orientated as possible with an emphasis on drug preparation and safe delivery.

**Lecture 3:** *Potential complications during Critical Care Intubation*

Whilst CCI usually proceeds relatively smoothly, when complications occur they do so rapidly and are often immediately life threatening. This lecture provides a systematic approach to the potential complications of CCI subcategorized into ‘Airway, Breating and Circulation’ related problems. For each complication we aim to provide an approach to both detection and management emphasizing the importance of team work and collaboration. This lecture also introduces the Difficult Airway Society guideline for the management of tracheal intubation in critically ill adults.

**Simulation Sessions:**

The simulation sessions directly follow the lectures. Four individual scenarios are included in total, with allocated time for 3 per course. Two of the scenarios are critical care based, with the remaining two taking place in the ED resus room. The scenarios used for a given course can be adjusted depending upon the nurses background.

Simulation 1: Respiratory failure + sepsis

Simulation 2: Out of hospital cardiac arrest

Simulation 3: Severe pancreatitis

Simulation 4: Severe head injury

A faculty member should introduce each simulation session to the whole group using the powerpoint slides provided. Candidates then split into two sub-groups (4 or 5 in each) to undertake the simulation scenario. One faculty member should be allocated to each sub-group.

Once each simulation session is complete, the candidates should reconvene (as one group) for the scenario debrief. The process is then repeated for the second and third simulation scenarios.

The following provides guidance for faculty in relation to each simulation scenario:

In addition to the specific points below, throughout the simulation scenarios candidates should be encouraged to always consider whether additional help is required, and considering where this might come from. For example:

- If the airway looks difficult, should the team call an anaesthetist before commencing? (if not already present)

- If the patient is incredibly unwell, do we need to ensure the Intensive Care consultant is either present or en route to attend I addition to the SpR

- Do the nursing staff need more support? Is a senior nurse present? Would the presence of an ODP be beneficial?

**Simulation 1:**

**Case introduction**:

50 year old male, currently Day 1 of critical care stay. Admitted with community – acquired pneumonia causing respiratory failure. Working plan for trial of CPAP but would be for early intubation if required. An arterial line, 2 cannulas and a naso-gastric tube are all in situ. Patient has raised BMI (weight 120KG) but is otherwise fit and well. Patient deteriorates significantly over 30 minute period: increasingly hypoxic, agitated + haemodynamically unstable. Nursing staff call SpR who is currently off unit assessing a ward patient. SpR agrees – likely to need intubation/ventilation, will be able to attend in around 10 minutes. Has asked nursing staff to starting preparing equipment / drugs and consider what pre-optimisation they think the patient might need.

**Group Discussion:** (Questions to candidates, as they appear on the slides)

What are the challenges with this case?

- Critically unwell patient

- Raised BMI + respiratory failure (will desaturate rapidly following induction)

- Tachycardia and hypotension (likely due to sepsis)

- Agitated

What equipment would you prepare?

- Full complement of airway equipment

- Consider video laryngoscope

- Nasal oxygen

- Several pillows to allow sat up / ramped position

What strategies would you consider for pre-optimisation?

- Volume resuscitation

- Vasopressor infusion (consider metaraminol as we only have peripheral access)

- Ideally a central line (but probably not achievable before induction due to agitation + extent of respiratory failure)

- Aspirate naso-gastric tube

- Pre-oxygenation with CPAP + nasal oxygen

- Nursing staff may also reasonably check patient has had blood cultures and appropriate antibiotics

**Role Allocation:**

Nurse 1: airway equipment

Nurse 2: cricoid pressure

Nurse 3: responsible for checklist

Nurse 4: runner

Nurse 5: critique scenario and feedback during debrief

A faculty member will act as the senior doctor, will undertake intubation + lead team.

**Simulation:**

- Suggest using ketamine for induction given CVS instability

- Gentle mask ventilation required before intubation

- BP drops to 70 following induction drugs, requiring metaraminol boluses

- Patient is a Grade 2 intubation requiring a bougie

**Debrief:**

- As outlined on final slide

**Simulation 2:**

**Case introduction:**

A previously well 60 year old male has just arrived in the resus room following an out of hospital VF arrest. The patient is currently tolerating an IGELR  with a regular breathing pattern and an appropriate blood pressure. CCI is required due to persisting low GCS to allow airway an neuro-protection within the ICU. On assessment, the patient has a receding jaw combined with limited neck movement raising the possibility of a difficult intubation.

**Group Discussion:** (Questions to candidates, as they appear on the slides)

What are the challenges with this case?

- Likely challenging/difficult intubation -> call Anaesthetist (if not already present).

- Recent cardiac arrest -> possibility of further arrhythmias.

- Possible aspiration

- Multiple facets to post arrest care:

(Such as: Targeted temperature management, neuro-protection, identify/investigate for cause, arrange critical care bed – not specifically mentioned during lectures and beyond scope of CCANN to discuss in detail).

What equipment would you prepare?

- Full complement of airway equipment

- Video laryngoscope (suggest should be ‘Plan A’ in this case)

- Have Difficult Airway Trolley immediately present

What strategies would you consider for pre-optimisation?

- Leave defib pads attached throughout induction

- Consider nasal oxygen: may take longer than average to achieve intubation

**Role Allocation:**

Nursing staff should switch roles for each scenario.

A faculty member will act as senior doctor, will undertake intubation + lead team.

**Simulation:**

- Patient requires video-laryngoscope (for the purposes of simulation, can simply state that VL is in use.

- First look: vomit ++ requiring suction. Use bougie -> tube in stomach – identified and removed -> go back to IGEL + bag patient.

- Second look: Succesful intubation using bougie.

- Patient remains otherwise stable throughout.

**Debrief:**

- As outlined on final slide

**Simulation 3:**

**Case introduction:**

35 year old male presenting with severe pancreatitis and AKI on a background of alcohol excess. Sudden deterioration shortly after admission to critical care with rapidly worsening oxygenation and hypotension. Respiratory failure may be secondary to ARDS. Both arterial line and central line are in situ. Patient is very obtunded.

**Group Discussion:** (Questions to candidates, as they appear on the slides)

What are the challenges with this case?

- Critically unwell

- Hypoxic and hypotensive

- Very distended abdomen: will effect breathing + high risk of regurgitation

What equipment would you prepare?

- Full complement of airway equipment

- Consider video – laryngoscope

- Nursing staff might mention Naso-gastric tube to aspirate stomach. Could potentially insert before induction if enough staff present.

What strategies would you consider for pre-optimisation?

- Significant volume resuscitation

- Commence noradrenaline prior to induction

- Nasal oxygen in addition to waters circuit

- Try guidel airway (already needing jaw thrust)

**Role Allocation:**

Nursing staff should switch roles for each scenario

Faculty member will act as senior doctor, will undertake intubation + lead team.

**Simulation:**

- BP now adequate with noradrenaline

- Induction using ketamine

- Gentle mask ventilation + nasal oxygen

- Grade 3 intubation requiring bougie

- Initially all well: spo2 95% + capnography trace

- Patient then desaturates: ETT inserted too far -> right main bronchus

- Reduced air entry over left lung: tube withdraw a couple of cms -> patient improves and stabilizes.

**Debrief:**

- As outlined on final slide

**Simulation 4:**

**Case introduction:**

20 year old male, trauma pre – alert from ambulance crew, assaulted in city centre. Just arrived in resus bay: GCS 3 with blown left pupil. No other injuries identified on primary survey. Hypertensive 160/110 + tolerating a guidel airway. Currently has one cannula in situ.

**Group Discussion:** (Questions to candidates, as they appear on the slides)

What are the challenges with this case?

- Significant head injury + need for neuro-protective measures

- Tolerating guidel airway

- Critically unwell

What equipment would you prepare?

- Full complement of airway equipment

- Consider video – laryngoscope

- Arterial line once asleep

- Consider Mannitol / Hypertonic Saline

(not specifically mentioned during lectures)

What strategies would you consider for pre-optimisation?

- Probably little to be done for this case

- Consider giving hyperosmolar therapy prior to/during induction

- Ensure use of quick acting opiate during induction to attenuate response to laryngoscopy

- Will need full neuro-protective measures following induction (beyond the scope of CCANN to discuss in detail)

**Role Allocation:**

Nursing staff should switch roles for each scenario.

Faculty member will act as senior doctor, will undertake intubation + lead team.

**Simulation:**

- Proceeds smoothly

- Some airway soiling requiring suction

- Grade 1 intubation

**Debrief:**

- As outlined on final slide

**Complete Equipment List**

This section provides a complete equipment list required for each section of the course. Of note:

- An Ambu bag (or similar device) is used to simulate a Mapelson C breathing circuit (Water’s circuit).

- A HME combined with connection tubing is used to simulate capnography.

- A standard hudson facemask may be used to simulate CPAP / NIV or high flow oxygen depending on the clinical scenario. Alternatively, some centres may wish to use the actual devices depending on availability.

- To enable the simulation exercises, **two sets** of the following equipment are required:

Airway Equipment:

- Ambu bag

- Manikin

- Endotracheal Tubes (COETT) sizes 7 and 8

- Suction – Yankauer suction tip

- Supraglottic airway device

- Oropharyngeal airways ‘Guidels’ - green and orange

- Bougie

- Tube tie

- Macintosh Laryngoscope (check working bulb) ideally both size 3 and 4.

- Oxygen facemask x 1

- Capnography (as above) x 1

**Summary:**

Once again, thank you for choosing to deliver the CCANN course. I really hope the program benefits your nursing staff and reinforces the interdisciplinary team working which is so crucial to the success of CCI.

Best wishes,

Andy Stewart

***Disclaimer:***

*The CCANN course aims to provide nursing staff with a basic level of training in relation to the process of critical care intubation. The course content should not be used in place of the protocols and guidelines used by individual institutions. The author does not accept any responsibility for any damage arising from actions resulting from information contained within any of the CCANN documents. The opinions expressed by the author relating to specific techniques should not be seen as an endorsement and should not replace local protocols. The ultimate responsibility for ensuring patient safety during any airway procedure lies with the senior Doctor. The decision as to whether or not an individual staff member is competent to work within airway team should also be at the discretion of the supervising physician.*

