Welcome to the 2020 online GAMC.

// Welcome to the GAMC 2020 Displaying.2020(Posters);
Join the Twitter Discussion #GAMC2020
SPONSORS OF THE GAMC 2020 POSTERS

Each poster shown for 90s
Scan QR Code to get the posters on your device

Also Available at: bit.ly/39hQe5v
INTRODUCTION

Throat packs commonly used during oro-maxillo-facial surgeries to prevent ingestion or aspiration of blood & debris. A missing throat pack or a throat pack inadvertently left behind after surgery can lead to catastrophic complications like total airway obstruction and have serious medico legal repercussions. Various guidelines suggest that the use of throat pack is a mutual decision between operating surgeons & anaesthetists. But there is no universal agreement on team responsible for its insertion & removal. We undertook a survey to assess the current practices & incidence of complications due to use of oropharyngeal throat pack.

METHODOLOGY

Descriptive cross-sectional study undertaken in the form of a survey from June 2018 to August 2019. A semi-structured set of 21 questions prepared and validated by a panel of five anaesthesiologists who had more than 10 years of experience. Developed by using Google forms and circulated via electronic media. Snowball sampling technique. A total of 700 anaesthesiologists were contacted.

RESULTS

243 responses were analyzed. The prevalence of its insertion in oral surgeries was 75.3% (183). 42.8% (104) had an institutional policy in place for throat pack insertion. The anaesthesia team was mostly responsible for insertion (53.5%) and removal of throat pack (73.6%). Documenting in the case sheet and leaving a part of the throat pack outside were the common methods used to ascertain throat pack removal after surgery. 38.2% (93) encountered complications due to retention of throat pack, majority (97.8%, 91) being post operative airway obstruction that led to an introduction of institutional guideline in 28.3% (%65) of our study participants.

Problems encountered during throat pack insertion

<table>
<thead>
<tr>
<th>Problem</th>
<th>Number of participants</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tonsillar pillar injury</td>
<td>49</td>
<td>13.7</td>
</tr>
<tr>
<td>Uvular injury</td>
<td>66</td>
<td>18.4</td>
</tr>
<tr>
<td>Tongue/fundamental ridge injury</td>
<td>32</td>
<td>8.7</td>
</tr>
<tr>
<td>Dental damage</td>
<td>15</td>
<td>4.1</td>
</tr>
<tr>
<td>Nose</td>
<td>20</td>
<td>5.6</td>
</tr>
</tbody>
</table>

Methods used to ascertain throat pack removal

<table>
<thead>
<tr>
<th>Method</th>
<th>Number of participants</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visual mark/label on anesthesia machine</td>
<td>29</td>
<td>11.9</td>
</tr>
<tr>
<td>Leave a part of the throat pack outside</td>
<td>154</td>
<td>63.4</td>
</tr>
<tr>
<td>Document in case sheet during insertion</td>
<td>154</td>
<td>63.4</td>
</tr>
<tr>
<td>Label/mark on patient</td>
<td>105</td>
<td>43.2</td>
</tr>
<tr>
<td>Document in WHO checklist</td>
<td>38</td>
<td>15.6</td>
</tr>
<tr>
<td>Put a label on airway device</td>
<td>17</td>
<td>6.9</td>
</tr>
<tr>
<td>Remember from memory</td>
<td>5</td>
<td>2.05</td>
</tr>
</tbody>
</table>

Throat pack insertion is common in oral surgeries. In spite of lack of institutional guideline in majority of the cases, anaesthetists took the responsibility of insertion and removal of throat pack most of the times. A ribbon gauze is used as a pharyngeal pack rather than lose gauze pieces which prevents the retention as well as the complication of a ‘lost gauze piece’. Prevention of a retained throat pack: proper verbal communication between all teams in OT, documentation in case record sheet, inclusion in swab count, labelling on the patient and machine. Gauze piece should preferably have a radio-opaque marker to enable its easy identification in case of retention. Complications of retained throat pack seen: total airway obstruction seen during extubation, & swallowed throat pack may cause intestinal obstruction. A check laryngoscopy with a DL or VL should be done before extubation wherever feasible in cases where a throat pack is used. Limitations: Our survey is not an actual measure of adverse effects faced by the participants.

CONCLUSION

There is still a lack of consensus regarding throat pack insertion and removal in most institutions. Protocized approach with proper communication and strict documentation are the key to prevent such untoward incidents.

References:
Management of a life-threatening difficult airway with combined use of videolaryngoscope and fiberoptic bronchoscopy in awake patient when front of neck access is not an option

Muhammad Furgan Khan¹, Faisal Shamim¹*, Muhammad Umer Slote¹, Bushra Salim¹, Syed Akbar Abbas²
Department of Anaesthesiology¹, Department of Surgery² Aga Khan University Hospital, Karachi

Introduction
- Oral cancers operated upon along neck dissection and free flap followed by chemotherapy, can present with massive face and neck swelling
- Largely due to secondary lymphedema arises as a result of damage to the local lymphatic system during tumor resection
- Swelling can progress to the point where it creates serious functional problems such as airway obstruction

Case history
- A young male presented to our hospital with hypoxia, stridor and respiratory distress
- Several features of Difficult Airway: Reduced mouth opening, fixed neck flexion extension, Mallampati grade IV, tumor regrowth and neck circumference 55 cm. Sitting and not willing to lie down a slightest degree. Awake FONA not possible.

Discussion
- Due to failed nasendoscopy in ER, we opted awake videolaryngoscopy as first choice, can visualize swollen arytenoids on initial attempt but no vocal cords and glottic opening can be seen
- We tried to pass bougie with VL but could not succeed due to acute angle and it slips down towards esophagus
- We combined VL with fiberoptic, have succeeded in creating an oropharyngeal space, thus improving visual field of the airway and simultaneously maneuvering fiberoptic bronchoscope into the glottic opening.

The simultaneous use of videolaryngoscope and fibersonde is an important step in the management of difficult airways and can improve the rate of successful intubation
Evaluation between fiberoptic bronchoscope and C-MAC D blade Videolaryngoscope for nasotracheal intubation in patients with oropharyngeal carcinoma under general anaesthesia: a prospective randomized study

Abhishek Kumar, Nishkarsh Gupta, Vinod Kumar, Rakesh Garg, Sachidanand Jee Bharti, Sushma Bhatnagar, Seema Mishra

Department of Onco-anesthesia and Palliative Medicine, All India institute of Medical Sciences, New Delhi, India

Introduction

- Nasotracheal intubation (NTI) in oropharyngeal carcinoma patients is a challenging exercise due to distorted anatomy, mucosal congestion, and increased risk of bleeding.
- Flexible fiberoptic (FFB) has been considered as the gold standard for difficult airway management but its usefulness is limited by the long learning curve and limited availability.
- C-MAC videolaryngoscopes (VL) have been used in various difficult airways scenarios but there is limited literature comparing its efficacy with FFB for NTI in oropharyngeal cancer patients.
- We hypothesized that CMAC D blade can be a better alternative to FFB for NTI under GA in these patient.

Methodology

- In this prospective trial, 100 patients posted for oropharyngeal cancer surgery were randomized to receive NTI under GA with either VL or FFB (n=50) in a tertiary cancer center.
- Patients with anticipated difficult BMV, ASA PS more than II, emergent surgeries and with EL-Ganzouri Risk Index >7 were excluded.
- The nostrils were examined for patency and the more patent nostril was prepared for NTI.
- After propofol based IV induction, a premeasured length of flexible ET tube(7a of the nose to the tragus of the ipsilateral ear) was inserted in the more patent nostril.
- Time to intubation (primary objective), was calculated from the insertion of FFB in the nostril or CMAC D blade in the oral cavity till the appearance of square wave capnograph.
- Time to glottis view, best POGO scoring and changes in hemodynamic parameters were also recorded.

Results

<table>
<thead>
<tr>
<th>Variable</th>
<th>Group VL</th>
<th>Group F</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Best glottis view (percentage)</td>
<td>81+/-6.45</td>
<td>85.60 +/-5.12</td>
<td>0.060</td>
</tr>
<tr>
<td>Mean +/- SD</td>
<td>80 (80-80)</td>
<td>90 (80-100)</td>
<td></td>
</tr>
<tr>
<td>Median (IQR)</td>
<td>8 (6-9)</td>
<td>22 (14.0-24.5)</td>
<td>0.000</td>
</tr>
<tr>
<td>Total intubation time (seconds)</td>
<td>Median (IQR)</td>
<td>38 (26-43)</td>
<td>60 (52-65)</td>
</tr>
</tbody>
</table>

- The preoperative EGRI and demographics were comparable in the two groups. The median (IQR) time for glottis visualization (8 ± [6-9]) vs 22 [14.0-24.5]) and intubation (38 [26-43]) vs 60 seconds, ([52-65], p=0.00) were significantly less in the C-MAC VL group. The median NIDS (5 (4-6) vs 3 (2-4), p=0.00) was also higher in Group VL. Intraoperative and postoperative complications were similar in both the groups.

Discussion

- A previous study compared FFB with C-MAC D blade for awake NTI, reported TTI was significantly shorter with VL.3
- This can be attributed to the design of D-blade VL which has an inbuilt pronounced curvature with an increase in angulation to 400.
- In our study, even though the VL group had a higher NIDS scoring and NRS score, TTI and time to glottis view were significantly less in with C MAC VL, advocating its superiority as the choice of airway device for NTI in oropharyngeal carcinoma patients.
- Haemodynamic parameters were comparable in the two groups. The duration of TTI in FFB group longer whereas the VL may have produced an increased pressure on application resulting in a similar symptomatic surge.
- In conclusion, when compared to FFB, C-MAC D blade VL can be a safer alternative device for NTI in anticipated difficult airways of oropharyngeal cancer patients.

References

A review of rates and causes of re-intubation in COVID-19 patients: a retrospective observational single centre study

G Nair, B Vowles, J Jeyarajah, I Ahmad, D Onwochei
1 Consultant Anaesthetist, 2 Specialist Registrar
Guy’s and St Thomas’ NHS Foundation Trust, London, UK

Introduction:
- Majority of patients admitted to critical care with COVID-19 require advanced respiratory support
- Mortality in this group is around 50%.¹
- Failed extubation is associated with increased mortality
- Number of factors influence the likelihood of successful reintubation.
- We present a series of patients requiring reintubation and assess factors contributing to failure.

Methods:
- Retrospective observational cohort study of patients requiring reintubation during their stay on the critical care unit
- Data extracted from electronic critical care and hospital patient records in patients with confirmed COVID-19 pneumonitis who had >1 intubation during their hospital admission.
- Any intubation performed after the first intubation was defined as a reintubation event.

Results:
- Patients fulfilling study inclusion criteria: 18 / 319
- Median age of the patients: 51 [43-57] years.
- Male/female: 14/4
- Number of days intubated prior to initial extubation: 7.5 [4-12] days
- Median time to reintubation: 10 [4-32] hours.
- Lowest SpO₂ prior to reintubation: 89% (5.46%).
- Number of ventilated days after reintubation: 3 [3-4] days.
- 2 (11%) of the patients received a tracheostomy
- 16 (89%) patients who needed reintubation were discharged home.
- No correlation noted between the levels of various biochemical markers and the need for reintubation.

Conclusions:
- The overall reported survival of reintubated patients in our study was 89%.
- Whilst not definitive, our results show that re-intubation was not a poor prognostic indicator for outcome in COVID-19 patients.
- None of the biochemical markers were predictive of need for reintubation.
- The main limitations of our study was the small patient numbers and lack of comparator group.

References:
The Learning Curve for Vertical Incision eFONA in Obesity - A Bench Top Study
Naeem Ashraf, Olawale Ajetunmobi, Moustafa Ibrahim, Conan McCaul
Rotunda Hospital, Dublin.

Introduction

Vertical incision is the current recommended strategy for eFONA when a clinician is not confident of CTM location which is common in obesity. We wished to determine the minimum number of training eFONA attempts required to perform the procedure using the standard threshold of 40 seconds or less and a physiology-based threshold of 120 seconds based on the expected haemoglobin desaturation in obesity.¹

Method

In a bench top study 10 anaesthetists performed eFONA on an obese neck model with 3 cm tissue depth 10 times each. A scalpel bougie tube technique was used as per DAS guidelines. The primary outcome was a plateau of success time defined by no significant reductions in eFONA time in three consecutive attempts by 3 × 2 chi-square analysis. Secondary outcomes included ectopic placement of ETT, clinician confidence in CTM localization, incision size and tissue injury.² Correlations were also performed.

Results

Success in less than 40 seconds was infrequent and occurred in 17% of attempts with no improvement over time. Success in less than 120 seconds plateaued at attempt 5 and did not change thereafter. There were 8 direct tracheal entries and no false passages. Clinician confidence did not improve with repetition and did not correlate with time or incision length. Mean incision size was 7.0 +/- 0.3 cm and only 27% were greater than 8 cm. The cricoid cartilage was damaged in 17% and the thyroid cartilage in 2% of attempts. There was a weak negative correlation between clinical confidence in CTM localization and incision length (r= -0.26, P = 0.005) and a strong correlation between the number of attempts and time required (r=0.6, P < 0.05).

A 40 second time frame for eFONA using the scalpel bougie tube technique is infeasible. A minimum number of 5 repetitions is required for the 120 second threshold in this model. Multiple attempts increase time requirements significantly and are indicative that the first attempt is of primary importance in eFONA.

References

A novel technique of total control introducer™ (TCI) aided nasal intubation in an anticipated difficult airway of oropharyngeal cancer

Abhishek Kumar, Nishkarsh Gupta, Vinod Kumar, Tanvi Bhargava
All India Institute of Medical Sciences, New Delhi, India
Dr RML Hospital and PGIIMER, New Delhi, India

Introduction
- Nasotracheal intubation (NTI) can be challenging due to unwanted incidences of nasal bleeding and soft tissue injuries.
- The bleeding can make the glottis visualization more difficult, increase the total intubation time and increases the risk of aspiration and desaturation.
- The conventional technique is passing the endotracheal tube through the nares and guiding the tip through the glottis blindly or under vision.
- The NTI can be facilitated by the use of videolaryngoscopes, Magill’s forceps and cuff inflation1,2.
- We are describing first case of the successful NTI by total control introducer™ in an anticipated difficult airway of carcinoma buccal mucosa posted for elective surgery.

Case Description
- A 41-year-old male patient, a case of carcinoma buccal mucosa, weighing 90 kilograms (Body mass index-30.8 Kg m-2) was planned for composite resection and reconstruction surgery.
- Airway examinations revealed interincisors distance of approximately 3 cm, MMPG III, in inability to prognath mandible, the neck circumference of 44 cm and restricted neck extension.
- In the operating room, after preoxygenation and IV induction with propofol, bag and mask ventilation was confirmed with two-hand technique and IV cisatracurium given.
- CMAC® videolaryngoscope- blade was inserted in the oral cavity 3 min later to get a glottic view (POGO 60).
- Total control introducer™ (TCI),70 cm (15 French) was inserted through the right nostril and advanced until the tip was visualized.
- The VL was manipulated to achieve the best glottis view. The articulating distal tip of the TCI was directed towards the glottis using the detachable handle attached to the shaft.
- After ensuring green colour of the shaft at the level of glottis (adequate length) its handle was detached from the shaft and a cuffed flexometallic endotracheal tube 8.0 mm ID was railroaded over it under vision.
- The correct placement was confirmed by square wave capnogram and chest auscultation.

Conclusion
- Total control introducer™ (TCI) is a new airway adjunct with a flexible shaft, articulating tip and an intuitive depth control system which can be used in difficult airway situations to improve the successful nasal intubations.

References
Diagnostic Accuracy of Virtual Laryngoscopy in Preoperative Detection of Patients with Difficult Airways Undergoing Cervical Spine Surgery

Bruiks M.*, 5th year medical student, Riga Stradins University, Riga, Latvia
Kazune S., Consultant Anesthetist, Hospital of Traumatology and Orthopaedics, Riga, Latvia
Apine I., Consultant Radiologist, Children's Clinical University Hospital, Riga, Latvia

Background
• Preoperative airway examination tests lack accuracy, and 75%–93% of all difficult intubations are unanticipated
• The patient’s pre-existing diagnostic CT images can be reconstructed into 3D virtual laryngoscopy (VL) images
• VL is non-invasive, provides visual representation of the patient’s airway

Objective:
The aim of the study was to investigate VL as preoperative airway assessment tool in patients with cervical spine pathology

Methods:
• Ten patients undergoing cervical spine surgery under general anaesthesia were included
• Preoperative airway examination was performed using El-Ganzouri index
• Photograph of the glottic view during direct laryngoscopy taken
• Cormack-Lehane score used to compare VL reconstruction with image obtained during visualization of glottis
• Agreement of Cormack and Lehane grade of glottic view and VL was evaluated using Bland-Altman plot. Agreement in prediction of difficult intubation using El-Ganzouri index and VL was evaluated with Cohen’s kappa

Results:

![Figure 1 Modified Cormack-Lehane classification of the glottic view. All images acquired during the study](image)

![Figure 2 Bland-Altman plot of agreement between Cormack-Lehane grade between VL and intraoperative view](image)

![Figure 3 Difference in Cormack-Lehane grade between VL and intraoperative view](image)

![Table 1 Accuracy of prediction of difficult intubation by El-Ganzouri index and VL](image)

<table>
<thead>
<tr>
<th>Quantity</th>
<th>El-Ganzouri index</th>
<th>Virtual Laryngoscopy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Correct diagnosis probability</td>
<td>70%</td>
<td>80%</td>
</tr>
<tr>
<td>Sensitivity</td>
<td>0.75</td>
<td>0.50</td>
</tr>
<tr>
<td>Specificity</td>
<td>0.67</td>
<td>1.00</td>
</tr>
<tr>
<td>Accuracy of positive test</td>
<td>0.6</td>
<td>1.00</td>
</tr>
<tr>
<td>Accuracy of negative test</td>
<td>0.8</td>
<td>0.75</td>
</tr>
<tr>
<td>Cohen’s kappa</td>
<td>0.40</td>
<td>0.55</td>
</tr>
</tbody>
</table>

Conclusion:
VL as sole predictor of difficult intubation in patients with cervical spine disease has a moderate strength of agreement with intraoperative view of the larynx. VL is very specific in predicting difficult airway in patients with cervical spine disease but has less sensitivity than El-Ganzouri index.
Comparison of King vision VL channelled blade & Tuoren VL non-channelled blade for intubation in a simulated COVID scenario by novices: a prospective randomized mannequin study

Anju Gupta, Anjan Trikha, Arashad Ayub, Sulagna Bhattacharji, Ajisha Arivandan, Kellika Prasad
Venkata Ganesh, Dr Kapil Dev Soni, Dr Richa Aggarwal
Anesthesiology, Pain Medicine and Critical Care, All India Institute of Medical Sciences, Delhi

Introduction

COVID-19 has a wide spectrum of clinical severity, ranging from asymptomatic to critically ill.
These patients often need intubation but because of the urgency of situation the intubation may be done by non-anesthesiologists.
Most consensus recommendations recommend full PPE and use of VL for initial intubation attempts in COVID scenario.
But the most appropriate VL for intubation in COVID situation by novices is not ascertained.
We hypothesized that King Vision channelled VL (KVL) will be better than non-channelled Tuoren VL (TVL) for intubation by novices in a simulated COVID scenario.

Materials and Methods

A prospective randomized trial was done in 25 non-anesthesiologists who performed 50 intubations.
All the participants were taught about the intubation procedure with both devices (KVL and TVL) on a Laerdal Airway Management Trainer (Laerdal, Stavanger, Norway).
All of them practiced intubations for at least 10 times with each device in simulated COVID intubation scenario (donned in standard PPE (goggles, head gear, double gloves, and gown) and the mannequin covered with a transparent plastic sheet).
Thereafter, participants used one of the two VL as the initial device for intubation as per the randomization followed by other device.

Results

The time to glottic view, total intubation time, ease of intubation procedure, need for manuvers, dental clicks and intubation failure was recorded.
Statistical analysis was done using SPSS version 20.

Discussion

Endotracheal intubation (ETI) performed by non-experienced providers in emergent settings outside the operating room carries a much higher risk of severe life-threatening complications especially in COVID 19 patients where precautions to reducing aerosol exposure are in place.
The intubation is cumbersome in COVID setting especially for a novice.
The KVL channelled blade was found to better than TVL non-channelled blade in our study.
A KVL has a channel to direct ET into trachea that improved the success rate and time to tracheal intubation.
It averted the need of an intubating aid like stylet that may be difficult to use with COVID precautions and may increase the risk of aerosol generation during its removal.

Conclusion

KVL channelled blade performs better than TVL non-channelled blade for intubation in COVID simulated scenario by non-anesthesiologists donned in PPE.

References

Lessons Learnt from Intraoperative Anaphylaxis to Sugammadex – A Case Report

Dr Edward Scott, Dr Sam Funnell
University Hospital Lewisham, London, UK

Introduction
The most recent National Audit Project (NAP6) provided in-depth information relating to perioperative anaphylaxis in the UK. The most common causative agents were found to be antibiotics and muscle relaxants and the most frequent presenting feature was hypotension. Only one case of anaphylaxis to sugammadex was reported in NAP6, however other studies suggest that the incidence may be as high as antibiotics and muscle relaxants.

Case History
We report a case of intraoperative anaphylaxis in a 31-year-old male, confirmed with allergy testing. This ASA 1 patient presented on the CEPOD list of a South London DGH for oesophagoscopy and retrieval of impacted foreign body. Induction of anaesthesia was uneventful, as was the very short procedure. Due to ongoing deep neuromuscular blockade, he was given a single dose of 2mg/kg sugammadex. Following administration, profound hypotension proved refractory to adrenaline boluses. Central venous access and an adrenaline infusion were required to maintain normotension. He developed a progressive metabolic acidosis which required renal replacement therapy and a NAC infusion, remaining intubated on ICU overnight.

Over the following 12 hours his clinical condition improved and he was extubated the following day. He was discharged 36 hours post operatively. Mast cell tryptase levels were sent at 1.5, 4 and 24 hours post exposure to the likely causative agent (sugammadex) which gave results of 22, 19 and 8 micrograms/L respectively. Skin prick testing at local allergy clinic subsequently showed a positive result to sugammadex with negative results to all other medications used perioperatively.

Discussion
Sugammadex is a relatively new drug and as such, use in the UK is limited by it’s cost. Japan is one country in which the drug is used more commonly, with studies performed there quoting variable rates of anaphylaxis ranging from 1:2,500 to 1:34,0002,3. This may suggest a more anaphylactogenic profile than the most common causative agent found in NAP6 – teicoplanin (1:6,250). As the cost of sugammadex decreases and its’ use likely becomes more commonplace, we may see the number of adverse reactions increase in the UK.

The incidence of anaphylaxis to sugammadex remains unclear - possibly due to it’s use not being very widespread. However, some studies suggest that the potential for hypersensitivity is as high as other agents traditionally regarded as being high risk. It is therefore of utmost importance that when using sugammadex we must be conscientious of this and monitor patients closely for signs of anaphylaxis.

References:

Conflict of interest or funding to declare: none
Utilising virtual teaching methods during the COVID-19 pandemic: advantages and disadvantages

Emma Collins* (emma.collins22@nhs.net), Aminah Ahmad, Hannah May, Elizabeth Egbase, Kathryn Price, Catherine Mathews

Introduction
At Lewisham and Greenwich NHS Trust (LGT), novel virtual teaching methods such as webinars were used to replace traditional medical teaching during the COVID-19 pandemic. Here we discuss the pros and cons of webinar-based teaching.

Methods
We organised webinars on COVID-19 relevant topics. These were viewed via Zoom and included medical topics and case-based discussions. Medical webinars were recorded and uploaded to YouTube with unlisted links sent out for later viewing.

Results
20 webinars were organised centrally with 597 attendees total. The best attended one was on respiratory physiology and ventilation with 67 attendees. 9 webinars were uploaded to YouTube with a total of 353 views at the time of writing.

Advantages
- Attendees can watch from home
- Easily recorded for later viewing
- Open to all: facilitates cross-specialty teaching
- Can have large number of attendees, no room bookings
- No need for social distancing

<table>
<thead>
<tr>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Difficult to teach practical skills</td>
</tr>
<tr>
<td>Technical difficulties</td>
</tr>
<tr>
<td>Attendance verification difficult if attendee webcams off</td>
</tr>
<tr>
<td>Confidentiality concerns with recognisable case details for CBDS</td>
</tr>
<tr>
<td>Security concerns- ‘zoom hijacking’</td>
</tr>
</tbody>
</table>

Conclusion
We received great feedback for all webinars. Here we present some of the advantages and disadvantages we encountered.

Although virtual teaching is useful for teaching theory, the main disadvantage of note for airway and anaesthetics skills is inability to obtain hands-on practice.

We feel virtual teaching provides flexibility, as it can be watched from anywhere at any time.

Disclaimer
All authors were involved in preparing this. We declare no funding, sponsorship or conflicts of interest. Relevant approval was obtained.
Novice anaesthetists airway skills: a survey in the SETSA region

E Scott, D Harshan, K Chandradeva
Princess Royal University Hospital, Kings College Hospital NHS Foundation Trust

Aims: To study the airway skills that novice anaesthetists develop during their first four months of training.

Target: Novice level anaesthetists who commenced their anaesthesia training in August 2017 in the South East Thames Society of Anaesthetists (SETSA) region.

Methods:
- Online, electronic questionnaire created using Google Forms.
- Trainees asked specific questions relating to formal airway training and practical airway experience gained during their 4-month novice period.
- Anonymity of trainee and institution maintained.
- A link to the online questionnaire was distributed to eligible trainees via the SETSA representative of each hospital by email.

Results
- The link was left open to accept responses between the dates 04/02/18 and 04/03/18.

- 13 responses were received.
- All 13 respondents had formal airway lectures and a difficult intubation simulation.
- 12 respondents had attended an airway workshop.
- Airway workshop skills taught:
  - Face-mask ventilation, SGA device insertion and front of neck emergency access (100%)
  - Direct laryngoscopy tracheal intubation and bougie assisted tracheal intubation (91.7%)
  - Video laryngoscopy (75%);
  - Fibreoptic intubation (50%).
- The number of practical airway skills performed:
  - SGA devices inserted ranged from 50 to 181 (median = 110)
  - Tracheal intubations ranged from 45 to 122 (median = 71) (Fig.1)
  - Bougie assisted intubations range 4 - 22 (median = 10)
  - Video laryngoscopy assisted intubations range 0 - 10 (median = 4)
  - Fibreoptic intubations range 0 - 5 (median = 0)
  - Satisfaction with airway training was graded on a scale of 1-10 with a median score of 9/10 (Fig.2)

Conclusions
- The majority of novice anaesthetists were satisfied with their airway training and therefore the anaesthetic departments within the SETSA region can be commended for their achievement.
- It may be recommended that bougie assisted intubations and video laryngoscopy intubations are performed more frequently during the novice period as these two techniques are included in the unanticipated difficult intubation guidelines.
- All trainees had performed a simulation of difficult intubation.
- Airway training for novice anaesthetists varies in both number of practical airway procedures they are exposed to and to what is taught in airway workshops.
‘Bath Tea Trolley’ training to increase use of High Flow Nasal Oxygen in anaesthetic practice

J E Dalton, S Nava, N Harris, O Allan, C Cameron, F E Kelly
Department of Anaesthesia and Intensive Care Medicine, Royal United Hospitals Bath NHS Foundation Trust, Bath, UK

Background
The peri-intubation use of High Flow Nasal Oxygen (HFNO) was limited in our theatre suites due to two postulated reasons:
1. lack of staff confidence when setting up and using HFNO
2. limited knowledge of the indications for HFNO despite previous training.

We therefore designed and delivered a ‘Tea Trolley’ multidisciplinary training programme for our anaesthetists and anaesthetic assistants to address these issues and encourage use where indicated.

Results
• 49 staff received training (33 anaesthetists, 16 anaesthetic assistants)
• 100% of participants completed feedback forms.
• Use of HFNO consumables increased immediately after training but declined with the COVID19 pandemic, due to:
  • concerns about aerosol generation by HFN
  • reduced elective ENT lists, with only low comorbid elective cases
  • preference for regional anaesthesia

HFNO use per month

Conclusions
• A mobile training programme for staff increased confidence in the practical use of HFNO and refreshed indications for its use
• This translated into a demonstrable change in clinical practice, albeit only until the start of the COVID19 pandemic
• We plan to repeat this training following the cautious restarting of HFNO use in isolated/COVID19 negative patients

Feedback
49 Trained
33 Anaesthetists
16 Anaesthetic Assistants

95% ↑ of ≥ 1 point for confidence with the set up/use of HFNO
92% very/quite confident in the use of HFNO after training
80% training would change their practice
97% training would improve their ability to safely manage patients with an anticipated difficult airway
98% training would improve their ability to manage patients with a high BMI

References
2. O’Farrell G, McDonald M, Kelly FE. Anaesth 2014; 70:104
Post-operative airway management in head & neck cancer patients: A retrospective cohort study of 1000 patients in a tertiary care centre

**Raghav Gupta, Nishkarsh Gupta, Vinod Kumar, Rakesh Garg, Sachidanand Jee Bharati, Seema Mishra, Sushma Bhatnagar**

**Onco-Anesthesiology and Palliative Medicine, Dr. B.R.A. IRCH, All India Institute of Medical Sciences, Delhi**

---

## Introduction

- Exstubation after head and neck cancer surgery is often challenging.
- Elective tracheostomy has been suggested to reduce airway related morbidity especially after head and neck cancer surgery involving reconstruction.²
- But tracheostomy increases morbidity and mortality and may increase the length of hospital stay.
- The purpose of this study is to retrospectively analyze the post-operative airway management choices in patient undergoing head and neck cancer surgery and to compare them with existing tracheostomy scoring system and preoperative difficulty intubation score.

## Materials and Methods

- Medical records of patients undergoing surgery for head & neck cancer (tongue, alveolobucal mucosa, floor of mouth and retromolar tumours) over a period of four years from January 2014 to December 2017 at tertiary care cancer centre were reviewed.
- Demographics (Gender, Age and Weight) and post-operative airway management practices were analysed.
- Tracheostomy scoring system by Cameron ² was calculated using the available data. Then the resulting score obtained was compared with the extubation strategy used.
- We also correlated the difficulty in intubation calculated by El-Ganzouri risk index (EGR1) score ³ with the extubation strategy.
- Data was analysed using SPSS 20 software.

## Results

- Data of Total 1050 patients was screened; fifty patients were excluded because of incomplete data.
- Majority (91.9%) of the patients were shifted to the ICU and extubated the next day, only 28 (2.8%) patients could be extubated on the table and another 53 (5.3%) underwent tracheostomy before shifting to recovery.
- Out of 53 cases which underwent tracheostomy, only eight cases had Cameron Tracheostomy scoring system >5, thus it showed poor positive predictive value of 0.01 with sensitivity and specificity of 0.15 and 0.29.
- Out of 202 patients with EGR1 score >7 only 12 eventually required tracheostomy.

## Discussion

- Optimal post operative airway management in head and neck cancer patients is precarious.
- Traditional thinking is that more major the procedure, the more a tracheostomy is indicated.
- Majority patients with Cameron tracheostomy score >5 did not require tracheostomy. Schmutz et al also reported that only 14 (6%) out of 234 patients of major oral cancer surgery required tracheostomy.
- Majority of patients with EGR1 score (difficult airway index) >7 also did not require tracheostomy.
- Predicting the necessity of elective tracheostomy post head and neck cancer surgery using preoperative difficulty of intubation EGR1 score or Cameron tracheostomy score was not accurate.

## Conclusion

- A delayed extubation strategy was effective in reducing the incidence of tracheostomy in our patients.
- We need to develop scores that are more accurate (High specificity and positive predictive value) in predicting a likely possibility of a tracheostomy following head & neck cancer surgery.

## References

Observational Study
Location: University Teaching Hospital
Outcome: Oxygen Flow via standard nasal prongs through commonly available Rotameters.
Flow measurement: Fluke Biomedical VT Mobile Gas Analyser.
Flowmeters assessed:
(Device 1 and 2) Datex Ohmeda
(Device 3) Amve
(Device 4) Diamond
(Device 5) GE Aespire S/5 Anaesthesia machine supplemental O2 port

Sequence:
Flow was measured from zero to maximum flow at intervals of one full rotation of the control dial.

Apnoeic co-oxygenation with standard nasal cannula and oxygen flow meters at higher than calibrated flows, a technical feasibility study

Introduction
The use of commercial high flow nasal cannula to prevent hypoxia during intubation has rapidly expanded since the advent of THRIVE (1). Some limitations to the use of HFNC for this purpose include relatively high unit cost ($25-$50), low availability in certain emergency settings and cannula bulk.

Our research question was twofold:
1. Can a wall oxygen rotameter/anaesthesia machine port provide higher than calibrated flow via standard "low flow" nasal prongs at rates useful for apnoeic co-oxygenation.
2. Would resulting gas flow be reasonably titratable so that the operator may be able to administer a specific desired flow.

If feasible, benefits of using standard nasal cannula and flow meters for apnoeic/co-oxygenation could include low cost, widespread availability and small cannula profile to reduce obstruction to a face mask.

Methods
Observational Study
Location: University Teaching Hospital
Outcome: Oxygen Flow via standard nasal prongs through commonly available Rotameters.
Flow measurement: Fluke Biomedical VT Mobile Gas Analyser.
Flowmeters assessed:
(Device 1 and 2) Datex Ohmeda
(Device 3) Amve
(Device 4) Diamond
(Device 5) GE Aespire S/5 Anaesthesia machine supplemental O2 port

Results
We documented a total of 307 readings from over 11 clinical areas.
Data are shown in Figure 1 and Table 1,2.

Significant differences were observed between devices 3,4 and 5 with no differences observed between devices 1 and 2 (P<0.05).

The lowest maximum mean flow was seen in device 3.

Table 1

<table>
<thead>
<tr>
<th>Rotation</th>
<th>Device 1</th>
<th>Device 2</th>
<th>Device 3</th>
<th>Device 4</th>
<th>Device 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>13</td>
<td>3.5</td>
<td>3.5</td>
<td>3.5</td>
<td>3.5</td>
<td>3.5</td>
</tr>
<tr>
<td>31</td>
<td>3.5</td>
<td>3.5</td>
<td>3.5</td>
<td>3.5</td>
<td>3.5</td>
</tr>
<tr>
<td>40</td>
<td>3.5</td>
<td>3.5</td>
<td>3.5</td>
<td>3.5</td>
<td>3.5</td>
</tr>
<tr>
<td>50</td>
<td>4.5</td>
<td>4.5</td>
<td>4.5</td>
<td>4.5</td>
<td>4.5</td>
</tr>
<tr>
<td>64</td>
<td>5.5</td>
<td>5.5</td>
<td>5.5</td>
<td>5.5</td>
<td>5.5</td>
</tr>
</tbody>
</table>

Table 2

<table>
<thead>
<tr>
<th>Flow (L/min)</th>
<th>Device 1</th>
<th>Device 2</th>
<th>Device 3</th>
<th>Device 4</th>
<th>Device 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>27</td>
<td>0.517</td>
<td>No</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>192.5</td>
<td>4.518</td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>313.5</td>
<td>7.359</td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>513.5</td>
<td>14.502</td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>821.5</td>
<td>5.842</td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1211.5</td>
<td>9.949</td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Figure 1

Flow by Rotations

Figure 2

Rotation/Device

Conclusion
All devices achieved flows comparable to those that can be used for apnoeic co-oxygenation.
Greater variation in flow rates were observed at higher flows.

The device which showed the most linear and predictable data distribution was the GE Aespire S/5 anaesthesia machine auxiliary oxygen port (Device 5). This may present the most practical option for apnoeic co-oxygenation using standard nasal cannula.

Each 360° turn of the dial equates to approximately 10L of additional oxygen flow. To open the dial fully will lead to a mean flow of 74L/min which equates well to flow rates used in THRIVE.

Apnoeic co-oxygenation with standard nasal cannula may present a low cost alternative to commercial HFNC in low resource areas or emergency settings.

As described in the British Thoracic Society guidelines for use of supplemental oxygen, use of non humidified high flow oxygen should be limited to short periods (2) and should only reasonably be used in unconscious patients.

References
AWAKE TRACHEAL INTUBATION IN A PATIENT WITH COVID-19
A. Langdon, S. Wade

Awake tracheal intubation (ATI) was performed on a COVID-19 patient with impending airway obstruction. This was, to our knowledge, the first reported case of ATI in a patient with COVID-19.

This case has also been published in Anaesthesia Reports by the same authors.

Case History
• 54M with large squamous cell carcinoma at base of tongue presented in respiratory distress with impending airway obstruction
• PMHx: Hepatitis C, IV drug use, cigarette smoker.
• Stratified as COVID-19 suspected given respiratory symptoms and prevalence of COVID at the time. Swabs later came back positive.

PPE
Full PPE worn as recommended by Public Health England for aerosol-generating procedures (AGPs)\(^1\)

Modifications to standard ATI
Minimization of AGPs
• Preoxygenation. 5L/min via Hudson mask with cut out section to avoid high flow oxygen.
• Conscious sedation. High dose remifentanil to suppress cough reflex.
• Topicalization. Co-phenylcaine and 10% lignocaine via mucosal atomiser device, avoiding cough inducing trans-tracheal topicalization.
• Closed circuit ventilation. Positive pressure ventilation only initiated after circuit closed.

References
Introduction

- Guidelines for intubation and airway management in COVID patients suggest the use of video-laryngoscope (VL) as the first device to aid intubation (1).
- The use of personal protective equipment and ‘intubation or aerosol box’ to reduce the risk of exposure is recommended.
- The best VL to facilitate intubation in COVID setting especially by novices is not ascertained.
- We compared intubation characteristics by two VL’s (McGrath-VL blade 4 and C-MAC blade 4) for intubation in a COVID simulated mannequin by novices.

Materials and Methods

- Study Design – Prospective randomized manikin-based crossover study.
- Inclusion criteria – medical professionals (non anaesthetist) with no previous experience of intubation with video laryngoscopes.
- Exclusion criteria – 1) previous experience of intubating in similar setting (i.e. within intubation box with video laryngoscope) 2) Refusal of consent to participate.
- Sample size – 30 (based on results of a previous manikin study with alpha 0.05 and power 80%)
- Equipment – Figure 1.
- Experimental design – 5 practice sessions with each scope with and without wearing PPE, 24 hour gap between practice and final session.
- Final timed session – randomized into 2 groups of 15 each, Group 1 – initial attempt with McGrath, Group 2 - initial attempt with C-MAC, followed by crossover to other VL in both groups.

Results

- Primary outcome – time to intubation. (defined as time from passing the scope into the mouth till first visible lung inflation.
- The mean (S.D.) time to intubation was similar with both McGrath-VL and C-MAC VL [31.33(14.72) s vs 26.27(8.5) s, p* = (p=0.063)].

<table>
<thead>
<tr>
<th>Parameter</th>
<th>McGrath</th>
<th>C-MAC</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time to intubation (seconds) mean (S.D.)</td>
<td>31.33(14.72)</td>
<td>26.27(8.5)</td>
<td>0.063</td>
</tr>
<tr>
<td>PODC store (mean S.D.)</td>
<td>60.33(14.73)</td>
<td>61.33(16.24)</td>
<td></td>
</tr>
<tr>
<td>VL GRADE - n (%)</td>
<td>1</td>
<td>2</td>
<td>18 (60%)</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
<td>0</td>
<td>5 (16.7%)</td>
</tr>
<tr>
<td>2a</td>
<td>2b</td>
<td>17(96.7%)</td>
<td>7 (23.3%)</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>2 (6.7%)</td>
<td>0</td>
</tr>
<tr>
<td>Overall difficulty score (t)</td>
<td>4 (13.33%)</td>
<td>1 (3.33%)</td>
<td></td>
</tr>
<tr>
<td>Performance measures (%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Failure rate (%)</td>
<td>1</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Multiple attempts</td>
<td>0.1 (3.33)</td>
<td>0.2 (6.7%)</td>
<td></td>
</tr>
<tr>
<td>Percentage success (Mean S.D.)</td>
<td>0.6 (1.29)</td>
<td>0.13 (0.95)</td>
<td></td>
</tr>
</tbody>
</table>


FIGURE -1

Discussion

- Choosing the right VL is of utmost importance in the current pandemic.
- Ideal VL for use in COVID patients – easy to use, quick intubation with minimal complications and easy to clean and disinfect.
- Search for ideal VL – recent study by Salto (2) with 8 experienced anaesthetists - minimum time with Airwayscope s-100 (19 sec) and McGrath scope (20 sec).
- This RCT – compared two commonly used VL’s, used by novices with minimal complications, thus can be easily implemented for both experienced as well as non experienced users.

Conclusion

- The time to intubation was similar with both VL’s but majority of novices preferred C-MAC probably due to a bigger screen that helped them to have a better view of glottis in the COVID simulated mannequin.
- However, McGrath is more portable and may be preferred when one needs to intubate in peripheral areas.

References

COVID-19 emergency response kit for out of theatre intubations

Dr Daniel Henderson, Dr Anna Forbes, Dr Andrew McKechnie. Queen Elizabeth Hospital, Woolwich

### Introduction

During the 1st wave of COVID, multiple out-of-theatre (OOT) intubations were occurring each shift, often at the same time. Over 100 OOT intubations were documented at Queen Elizabeth Hospital over a two-month period. Managing airway emergencies in an OOT environment is often challenging, with increased frequency of adverse events. In particular, the lack of immediately available specialist equipment when intubating ward-based critically unwell patients. To streamline the preparation process, Emergency Response (ER) trolleys including PPE, monitor, ventilator, airway equipment including DAS-aligned difficult airway equipment, and COVID intubation checklists were created. Pre-drawn RSI drugs were also stored in a nearby fridge.

### Methods

ER trolleys and checklists were created with reference to RCoA/FICM guidance. These were used throughout the COVID period. An anonymised survey was conducted to assess the perceived usefulness of the ER trolleys in ensuring all necessary equipment was available, and to gather any suggested improvements. This was sent to all stakeholders involved in ER trolley use – anaesthetic nurses, trainees and consultants. The survey consisted of yes/no and scaled responses. It also included a free-text box for further suggestions and comments. Scaled responses were analysed using mean and range. Survey responses were collected over a two period.

#### Results

The survey received 26 responses (5 nurses, 7 consultants, 4 specialty doctors and 10 trainees). Regarding the ER trolley, 77% found it sped up the process from receiving an emergency bleep to intubation; **100%** found the ER trolley more useful than standard critical care transfer bags used within the trust. Importantly, we identified that **92%** of respondents using the checklist stated it helped to identify forgotten points (e.g. having suctioning equipment within reach and tube clamps).

**Eighty percent** found that the use of a specific COVID-emergency checklist helped to decrease mental load during the intubation. Confidence in the ability to source equipment for OOT intubations, and deal with a difficult airway in a timely manner, was scored a mean of **3.1** (0 – 6) out of 10 before ER trolley implementation and improved to an average score of **8.8** (6 – 10) thereafter.

From free comments, safely minimising time from entering room to securing the airway, thus limiting time exposed to potential aerosols, was the most valued use of the ER trolley and checklists. Many commented on ‘usefulness of formally assigning roles’ and ‘having confidence that you were fully prepared’ before going into the room.

### Conclusion

During the COVID 1st wave, multiple critically hypoxic patients required intubation outside of theatre. Having pre-assembled ER trolleys, including DAS-aligned specialist equipment, led to increased confidence in operators, perceived increased efficiency in response time and reduced mental load at a time of high-pressure.

---

### References

A prospective, observational, cohort study of tracheal intubation in patients with COVID-19

Imran Ahmad, FRCA; Jeyanjali Jeyarajah, FRCA; Ganeshkrishna Nair, FRCA, EDRA; Sophie Rabbourne, MBBS; Benjamin Vowles, FRCA; Danny J. N. Wong, FRCA; Kariem El-Boghdady, FRCA, EDRA
Department of Anaesthesia, Guy’s and St Thomas’ NHS Foundation Trust, Great Maze Pond, London SE1 9RT. Email: drimranahmad1@gmail.com

Introduction

- To date more than 12.9 million cases of COVID-19 and 570,000 deaths have been reported worldwide
- A reported 51% mortality rate in patients admitted to critical care
- We formed a dedicated Mobile Endotracheal Rapid Intubation Team (MERIT) to ensure that a highly skilled team would be deployed to manage the airways of this cohort of patients

Aim: to report both patient outcomes and MERIT activity over a seven-week period at a Central London tertiary centre.

Methods

- Prospective, observational, cohort study
- Inclusion criteria:
  - first episode of tracheal intubation for:
    - respiratory failure due to suspected or confirmed COVID-19
    - imminent airway obstruction
    - airway protection
  - age ≥ 18
  - complete data available

Our Model

- 23 anesthesiologists & 40 anesthetic assistants
- All team members undertook in-situ simulation training:
  - donning and doffing of PPE
  - tracheal intubation drills
  - emergency front-of-neck airway (eFONA) skills
- Focus on: Communication; Ergonomics; Checklists; team debriefings
- COVID-19 tracheal intubation checklist and action card

Results

- Data analysed from 150 patients
- Videoendolaryngoscope used in 137 (91.3%) cases
- 1st attempt success in 132 (88%) cases
- Outcomes at 30 days:
  - 46 (30.1%) Died
  - 50 (33.3%) remained in hospital
  - 54 (36%) discharged home

Complications of Primary Tracheal Intubations

- Hypotension
- Desaturation
- Death
- Dental damage
- Bronchial intubation

Conclusions

- An early tracheal intubation strategy performed by specialist teams, is associated with favourable patient outcomes
- We instituted a tracheal intubation protocol and simulation training programme prior to establishing the MERIT service
- First pass success rate and video laryngoscopy utilisation was similar to that reported by Yao et al., yet our outcomes were superior
- Limitations: 1) uncontrolled single-centre study; 2) no comparative data; 3) conservative patient numbers

References

2. Intensive Care National Audit and Research Unit. COVID-19 Report. Available from URL:
SURVEY OF AIRWAY MANAGEMENT IN
CORONAVIRUS COVID-19

R.C. Konig1, M.P. Sharma2, S. Charters3, B.T. Batuwitage1
1 Department of Anaesthesia, Liverpool University Hospitals NHS Foundation Trust
2 Department of Anaesthesia, Manchester Royal Infirmary, Manchester University NHS
3 Department of Anaesthesia, Warrington and Halton Hospitals NHS Foundation Trusts

Intro
The North West had the 2nd highest number of cases outside London by the end of March 2020*

Aims
Survey of anaesthetists in our region to look at airway management during Covid

Methods
Electronic survey sent to all anaesthetic departments of acute hospitals in the North West

Results
175 responses, 66% Consultants
90% anaesthetists
8% problems with availability of PPE
66% used a Videolaryngoscope
51% McGrath
34% GlideScope

95% used an intubation checklist
18% used a ‘shieding device’
39% had problems with non technical skills,
mainly communication
83% respondents reported no problems with
airway management

Conclusions
Senior anaesthetists involved in majority of intubations
Videolaryngoscopes mainly used - McGrath popular (widely available/portable/easy decontamination)
DL still common, technique still preferred by many or could be due to disposability/availability of VL/training with VL

Limitations
As this survey was sent out electronically it was difficult to ascertain the response rate, if low this can lead to reporting bias

*ICNARC report for North West May 2020
Dr Stephen Ramage, Dr Arun Tohani, Dr Kanika Dua.
St George’s Hospital NHS Foundation Trust. Tooting, London.

Introduction:
Nasal intubations are frequently performed in maxillofacial elective and emergency lists. These can be complicated by epistaxis and higher incidence of sore throat especially if Magill’s forces are used. The use of VideoLaryngoscopy has an increasing role but tube manipulation can be a challenge. We carried out a survey to assess the department practice of techniques, tubes and rescue plans used for nasal intubations.

Method:
A simple 9-question survey was designed using the publicly available tool ‘Survey Monkey’ and disseminated amongst our consultant and trainee colleagues. The focus of questions was:
- Current technique for nasal intubation in the unanticipated and anticipated difficult airway
- Preferred type of endotracheal tube (ETT) for asleep and awake Fibreoptic intubation (FOI)
- Perceived advantages and benefits of VideoLaryngoscopy (VL) over other techniques
- Rescue measures when encountering difficulty passing the ETT through the cords.

Results:
While Direct Laryngoscopy (DL) remains the first choice for nasal intubations in unanticipated difficult airway, the first choice for nasal intubations in anticipated difficult laryngoscopy but easy mask ventilation was an asleep Fibreoptic or naso-tracheal tube followed by VL chosen by 30% responders. The reason cited was because of difficulties encountered in manipulation of tube with VL and the well-known problem of “good view did not guarantee a successful intubation” and the main advantages of VL were thought to be better view of the cords, less trauma, better for training and decreased intubation times.
The rescue measures in cases of inability to intubate when using VL for nasal intubations were: tube manipulation followed by use of Magill’s, some responders used patients neck manipulation and cuff inflation or change in size of tube.
Preformed Nasal tubes were the most commonly used tubes followed by reinforced tubes. Some responders preferred the Intubating Laryngeal Mask (ILMA) tube.

Conclusion:
There is a wide variation in practice in use of techniques, types of tubes and rescue techniques in Nasal Intubations in our hospital. While those commonly performing these techniques are confident in use of VL effectively, the use is not widespread. Further training in rescue measures for troubleshooting the perceived difficulty in manipulation of tubes when using VL and different options of tubes available could lead to better confidence in its use and possibly fewer patient complications like nasal and pharyngeal trauma.
Results
The availability of capnography outside theatre areas is shown in the bar diagram. Most areas receiving sedated and ventilated patients have robust access to the capnography equipment.

We received responses to our survey from 50 recovery nurses and ODPs across the Trust:
- Around 60% of the responders always have access to capnography and always use it for monitoring patients in recovery.
- Almost all responders said that they had not received refresher training in capnography last year and would benefit from a teaching session.

Discussion & Conclusion
- Only 50% of locations outside theatre areas comply with standards for availability of capnography.
- The locations (50%) which do not meet standards do not care for patients with airway device in situ (e.g. Delivery Unit, ICU, Cardiac Theatre Recovery) or receive ventilated patients who come with full monitoring including capnography if capnography equipment is needed, it can be mobilised from pre-agreed locations. The clinicians working in these areas are in agreement with this arrangement.
- Most recovery staff reported that they will benefit from a teaching session on capnography. A small percentage reported they will not benefit/not sure as they do not routinely look after patients with airway device in situ.

Future Directions
- Continue teaching sessions in capnography (to be conducted during the Trust’s Audit and Clinical Effectiveness Days)
- Encourage e-learning
- Re-audit.

References
Tracheostomies are well known to be challenging to manage out of hours. This is especially true in isolated locations with the added challenge of COVID precautions. We would like to draw attention to an incident that occurred in such circumstances which had the potential to cause significant patient harm.

Case History
An elderly gentleman was admitted to the burns intensive care unit at Morriston hospital with significant burns. As part of his weaning process a TRACOE® twist size 8 was inserted. The tracheostomy was 5 days old when it was noted that the white plastic collar was broken and therefore the tracheostomy was not secured and the tracheostomy was held in place only by the cuff.

After discussion it was decided given the patient's clinical picture and the isolated location to try and seek an alternative method and delay a potential difficult tracheostomy change. A size 0 soft silk suture was inserted through clear plastic flange and around the tracheostomy collar (see figure 2) which was able to hold it safely in place overnight. A new tracheostomy was successfully exchanged the following day and the broken tracheostomy sent to medical equipment for review and a Datex completed. Of note, the same equipment failing occurred in the new tracheostomy with the same batch number as the first and this was escalated appropriately.

Discussion
This is an obvious equipment failure of which we could not find any similar incidences in the literature. However, there is clear evidence that exchanging a new tracheostomy can be a difficult and a potential cause of patient harm. This novel way to overcome an unusual and previously undocumented equipment failure allowed a period of stability overnight to facilitate a planned and safe exchange in a controlled environment.

References

Disclaimer
The authors declare that they have sources of funding, sponsorship or conflicts of interest. Consent from the patient’s next of kin was obtained.
Two cases of angioedema were simultaneously present in an intensive care unit.

**Case 1:** An 88 year old man presents with facial swelling & inability to breathe

PMH: Hypertension, COPD. Nil known drug / food allergies.

DH: Amlodipine, atorvastatin, bendroflumethiazide, ramipril.

**On the scene**


Some neurological recovery described on arrival to ED. Further history: Recent similar episodes appeared to resolve with antihistamine.

**Investigations**

- pH 7.18, pO<sub>2</sub> 47.8, pCO<sub>2</sub> 6.1, HCO<sub>3</sub> 17.2, BE neg 11.2, lactate 6.6
- Inflammatory markers, Hb, Plt, clotting NAD. Urea 10.9, Creat 182
- Tryptase level: normal; C1 esterase inhibitor: normal; Functional C1 inhibitor: high, normal
- CT head: nil acute. Chest XR: enlarged heart, left-sided pleural effusion/collapse (not new), calcified aorta.
- MRI head: new small R cerebellar infarct. Subacute infarct in R caudate head.
- EEG: severe encephalopathy with no specific diagnostic features.
- Video laryngoscopy 5 days later: much reduced swelling.

**Issues in ICU**

- Bradycardia with haemodynamic compromise: managed with isoprenaline and noradrenaline.
- Tonic-clonic seizures and myoclonic jerks: managed with levetiracetam, phenytoin, lacosamide and midazolam. Propofol also used for myoclonic jerks.

**Clinical Course**

Neurology team advised that despite a relatively unremarkable MRI brain, the history, clinical examination & EEG were all in keeping with hypoxic-ischaemic encephalopathy with profound myoclonus. The prognosis for meaningful neurological recovery was very poor. The patient passed away after palliative extubation.

Although the cause of the angioedema was not certain, the ACE inhibitor appears to be the most likely culprit, in a non-allergic, bradykinin-mediated process.

**Case 2:** A 39 year old woman, 29 weeks pregnant presented with sudden onset swelling of her cheek and lip following minor trauma

PMH: Hereditary angioedema Type 3 (bradykinin-mediated)

**On the scene**

Airway, breathing, swallowing and speech were unaffected. There was no tongue, throat or neck swelling. She was admitted to the intensive care unit for monitoring but no interventions were required. Figure 1 shows a series of images over 24 hours. Examination: Mallapati grade 1 view of oropharynx. Chest examination NAD. The advice from her immunology team was to use her prescribed C1 esterase inhibitor if there was swelling above the shoulders, however on this occasion she preferred not to use it, having used it before with little effect.

**Investigations**

- Encephalopathy screen, LP: NAD
- Tryptase level: normal; C1 esterase inhibitor: normal; Functional C1 inhibitor: high, normal
- Inflammatory markers, Hb, Plt, clotting NAD. Urea 10.9, Creat 182
- pH 7.18, pO<sub>2</sub> 47.8, pCO<sub>2</sub> 6.1, HCO<sub>3</sub> 17.2, BE neg 11.2, lactate 6.6
- 17.2, BE neg 11.2, lactate 6.6
- Chest XR: enlarged heart, left-sided pleural effusion/collapse (not new), calcified aorta.
- MRI head: new small R cerebellar infarct. Subacute infarct in R caudate head.
- EEG: severe encephalopathy with no specific diagnostic features.
- Video laryngoscopy 5 days later: much reduced swelling.

**Discussion**

90% of angioedema cases are attributed to allergy. Exposure to an allergens causes production of type 1 IgE-mediated hypersensitivity: mast cells degranulate and histamine is released, leading to vascular dilation and increased permeability of vessels. Urticaria is associated and oedema is non-pitting. Non-allergic aetologies can be divided into drug-induced, hereditary, or acquired. ACE-inhibitors cause most drug-induced angioedema and onset can be much later than first initiating the medicine. Angiotensin converting enzyme breaks down bradykinin, leading to increased levels of bradykinin released from from basophils and mast cells. This leads to increased inflammation and vascular dilatation and permeability. Hereditary angioedema types 1 and 2 are due to low plasma concentrations of, or functionally impaired C1 esterase inhibitor, respectively. The third type, as seen in Case 2, is not yet fully understood, but is thought to be due to a mutation in the gene for coagulation factor XII.

2. Dewald G, Bork K. Missense mutations in the coagulation factor XII (Hageman factor) gene in hereditary angioedema with normal C1 inhibitor. Biochemical and Biophysical Research Communications 2006;343:1286-1289
Use of a Simulation Training Programme to Practice Tracheal Intubation during the COVID-19 pandemic

Acknowledgements: Many thanks to the hardworking members of our GSTT AIP directorate and strategy team who put a simulation programme together within 2 weeks and ensured we were adequately prepared for the COVID-19 pandemic.

Background

- Airway management in the Coronavirus-19 (COVID-19) era: how do we train skilled airway managers to perform a familiar task in an unfamiliar way?
- There is a high risk of airborne transmission of COVID-19 during tracheal intubation, suctioning and bag mask ventilation[1]. There is an understandably high degree of staff anxiety around procedures involving airway manipulation.
- Use of medical simulation allows for rapid upsizing of large numbers of staff. During high risk procedures such as tracheal intubation, it reduces the cognitive load of potentially stressed and fatigued anaesthetists[2].
- Simulation allows anaesthetists to practice and make mistakes without the risk of exposure to the disease itself. It also allows for feedback and continuous evaluation of hospital systems and processes.
- In mid-March, we set up a series of simulation sessions to train anaesthetists and ODPs in COVID-19 intubations. They have gone on to form our Mobile Emergency Rapid Intubation teams (MERIT) who have to date, intubated over 150 COVID-19.

Results

- Over a period of 4 weeks, 97% of the anaesthetists in the trust received MERIT intubation training. This consisted of 101 consultant anaesthetists and 58 anaesthetic trainees. 30 ODPs also received MERIT training.
- This was in addition to other simulation sessions set up by the anaesthetic department which included donning and doffing for PPE, ICU upskilling, disaster simulation and COVID-19 advanced life support.
- In addition to simulation sessions, a number of videos were produced which demonstrated the scenarios being taught.
- We identified a number of active failures and latent hazards during our scenarios. Technical difficulties included remembering to turn oxygen flow down and clamping the endotracheal tube before disconnection of the circuit. Non-technical difficulties were mainly centered around communication whilst wearing PPE.

Discussion

- We feel that use of simulation has helped alleviate some of the fears of the unknown, and provide a safe space to ask questions and make mistakes.
- Despite our success in setting up MERIT, we have also reflected on the difficulties of setting up this programme.
  - COVID-19 was an entirely new disease for us and guidelines regarding airway management changed continuously.
  - We were also given regular feedback from MERIT as clinical experience in COVID-19 intubations increased. Adapting our scenarios became a dynamic process throughout training.
  - We recognise that teaching a group of airway expert in relatively basic airway management may be difficult. We had to encourage each other to try and put aside our own ingrained behavior to learn the MERIT method of intubation.
  - As the number of COVID-19 cases in the UK is dropping steadily, our frontline staff are in need of a break. We will continue our delivery of high-quality medical education which enables staff to safely treat our patients and stop protect ourselves.

Clinical Audit of EtO2 Achieved Prior to Intubation in a Tertiary Referral Centre

O’Riordan E., Morris O., O’Sullivan E. St James’ Hospital Dublin

Introduction:
Pre-oxygenation is a key component in the preparation of patients for tracheal intubation. Successful pre-oxygenation increases the body’s oxygen reserve and extends the safe apnoea time before desaturation occurs up to 8 minutes. End tidal oxygenation (ET02) is a more reliable measure of adequate pre-oxygenation than more traditional methods. The time to successful intubation is also a key factor in determining the length of time an apnoeic patient is not oxygenated.
Guidelines on what the optimum ET02 level we should target vary, however the Difficult Airway Society recommend achieving an ET02 level of 0.87-0.9[1].
In this audit we aim to establish if the recommended level of pre-oxygenation is being achieved in a tertiary referral university hospital, and to determine the mean time to intubation.

Methods:
This observational study took place in St James’ Hospital in December 2019. ET02 levels were recorded at the point of removal of the face mask prior to laryngoscopy and attempted endotracheal intubation. Other data collected included the experience of the doctor attempting intubation and the number of attempts made.
We also measured ‘time to intubation’, which we defined as the time from when the face mask is removed until tube placement is confirmed with observed ETC02.

Results:
12 intubations were observed, all carried out with a Macintosh laryngoscope.
• 66.6% of endotracheal intubation attempts adhered to the DAS guidelines.
• The lowest recorded ET02 was 70.
• Experience appeared to correlate with level of preoxygenation achieved. The average ET02 attained by those with >5 years’ experience was 88.2%, while those with <5 years’ experience attained an ET02 of 89%.
• The average time taken to intubate a patient was 45 seconds (range 10 – 90 seconds).
• 11 intubations were successful at the first attempt and 1 was initially abandoned due to oesophageal intubation but successful on the second attempt.
• The average time taken for those with >5 years’ experience was 52 seconds and the average time for those with <5 years’ experience was 44 seconds.

Conclusions:
In this limited observational audit there was good adherence to the guidelines for adequate pre-oxygenation prior to intubation. This was seen across stages of training in anaesthesia, however the more junior trainees showed better adherence to the guidelines than their more experienced counterparts. A larger audit would be beneficial to assess department-wide adherence to these guidelines. We also audited the time to intubation for each case. A surprising finding was that those with less experience intubated faster. A reason for this may be that more junior staff tend to carry out easier intubations as per pre-assessment. Establishing a guideline for time to intubation and time at which an attempt should be abandoned may be a key future addition to Intubation guidelines.

References:
1. DAS Difficult Intubation Guidelines 2015
INTRODUCTION

- SAD - Rescue airway devices for ventilation; Definitive devices as well
- Failure of rescue devices can be catastrophic. Thus prediction of likely failure is very important.
- Independent factors for difficult SAD use – male sex, age <45 years, restricted neck movements, short TMG, high BMI
- No consensus regarding the predictors of difficult SAD placement/function
- Present Study takes a look at these predictors

RESULTS

- Incidence of difficulty/failure SAD placement/function = 1.1-18.1% vs. Our 25.2%
- More stringent criteria of ‘difficult’
- More operators within-1years experience
- The ‘difficult’ group had significantly higher age, incidence of snoring, incidence of modified Mallampati class III and IV, neck circumference and incidence of neck range of motion of less than 90°.
- AGE – Upper airway becomes more elliptical, less uniform and less compact, which probably explains the difficult ventilation via SAD with increasing age.
- SNORING – Shown to be related to upper airway collapse, which is most likely due to the presence of large amount of soft tissue in the back of throat.

DISCUSSION

- MAMP CLASS III/IV and Higher Neck CIRCUMFERENCE – This large amount of soft tissue is present in the oropharyngeal space - Difficulty in negotiating the device
- NECK ROM<90° – Non-alignment of OP & tracheal axis; inadequate OP Space opening.
- Sniffing position is superior to other head positions for SAD placement

PREVIOUS VS OUR STUDY

- Age > 45 years significant risk factor for difficult SAD
- Age of our patients much lower;
- Even then, age of SAD-D significantly more than the other group.
- TMG < 8cm – strong predictor for difficulty in SAD placement/function
- Contraction neck (very short TMG) – many case reports
- Only 3 patient with TMG<8cm in our study (so can’t comment)
- More difficult SADs in males1 and in those with high BMI
- Not in our study; similar number of males/females and similar BMI in the two groups

CONCLUSION

- SAD use seems to become difficult with increasing age, worse modified Mallampati class and increasing neck circumference.
- It is also likely to face more difficulty in sorens and those with reduced neck range of motion.
- When faced with any of these, choose SADs with caution and decide for optimizing SAD placement and for alternate technique of airway access.

METHODOLGY

- Prospective observational study
- Pre-operative airway assessment of all consenting/aspiring patients (310 years) in the list by an independent observer
- 302 patients studied
- Elective surgery under GA
- SAD as the first choice; Placed by eligible operator under GA 3min after NMB
- Pre-operative airway examination conducted 1-4h

PREOPERATIVE AIRWAY ASSESSMENT

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years) (Median (Range))</td>
<td>31 (12-90)</td>
</tr>
<tr>
<td>Females</td>
<td>76%</td>
</tr>
<tr>
<td>Body mass index (BMI) kg/m² (Median (Range)):</td>
<td>22.6 (14-44.2)</td>
</tr>
<tr>
<td>Obese/ Overweight/ Normal/ Underweight</td>
<td>T/24/30/19</td>
</tr>
<tr>
<td>Significant airway history</td>
<td>22%</td>
</tr>
<tr>
<td>Anterior-posterior neck gap (Mm): (Median (Range))</td>
<td>4.0 (2-6)</td>
</tr>
<tr>
<td>Thyromental distance (TMD) cm (Median (Range))</td>
<td>8.5 (6-13)</td>
</tr>
<tr>
<td>Suprasternal distance (SMD) cm (Median (Range))</td>
<td>16 (10-21)</td>
</tr>
<tr>
<td>Neck circumference cm (Median (Range))</td>
<td>31 (20-47)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>SAD-D (n=226)</th>
<th>SAD-D (n=78)</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (Mean ± SD)</td>
<td>44.88 ± 14.72</td>
<td>58.56 ± 16.48</td>
<td>0.03</td>
</tr>
<tr>
<td>Gender (Males):</td>
<td>179 (78%)</td>
<td>107 (78%)</td>
<td>0.8</td>
</tr>
<tr>
<td>BMI (Mean ± SD) kg/m²</td>
<td>28.04 ± 6.48</td>
<td>25.04 ± 4.88</td>
<td>0.48</td>
</tr>
<tr>
<td>Snoring present</td>
<td>22 (9.7%)</td>
<td>14 (18.4%)</td>
<td>0.043</td>
</tr>
<tr>
<td>Hypoxia/mucosal airway</td>
<td>21 (8.3%)</td>
<td>11 (13.9%)</td>
<td>0.43</td>
</tr>
<tr>
<td>Diabetes Mellitus</td>
<td>12 (5.3%)</td>
<td>5 (6.5%)</td>
<td>0.76</td>
</tr>
<tr>
<td>Pregnancy</td>
<td>12 (5.3%)</td>
<td>9 (11.8%)</td>
<td>0.31</td>
</tr>
<tr>
<td>Visceral herniating</td>
<td>8 (3.5%)</td>
<td>3 (3.9%)</td>
<td>0.76</td>
</tr>
<tr>
<td>Laparoscopic surgery</td>
<td>123 (50.8%)</td>
<td>45 (56.6%)</td>
<td>0.38</td>
</tr>
<tr>
<td>Experience &lt;2years</td>
<td>159 (60.3%)</td>
<td>61 (80.2%)</td>
<td>0.28</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Group SAD-D (n=226)</th>
<th>Group SAD-D (n=78)</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1G (Mean ± SD cm)</td>
<td>4.68 ± 0.25</td>
<td>4.58 ± 0.17</td>
<td>0.34</td>
</tr>
<tr>
<td>H (3±cm) mm</td>
<td>94 (9%)</td>
<td>45 (5.3%)</td>
<td>0.72</td>
</tr>
<tr>
<td>Poor Dentition</td>
<td>22 (9.7%)</td>
<td>9 (12%)</td>
<td>0.6</td>
</tr>
<tr>
<td>MAMP Class III &amp; IV</td>
<td>42 (18.6%)</td>
<td>28 (35.9%)</td>
<td>0.0009</td>
</tr>
<tr>
<td>ELBT (II &amp; III)</td>
<td>26 (11.5%)</td>
<td>14 (17.9%)</td>
<td>0.2</td>
</tr>
<tr>
<td>Non-compl. Mand, Space</td>
<td>4 (1.7%)</td>
<td>5 (6.5%)</td>
<td>0.23</td>
</tr>
<tr>
<td>TMD (Mean ± SD cm)</td>
<td>8.86 ± 1.60</td>
<td>7.83 ± 1.52</td>
<td>0.31</td>
</tr>
<tr>
<td>TMD (&gt;6cm)</td>
<td>3 (1.3%)</td>
<td>0</td>
<td>0.5</td>
</tr>
<tr>
<td>Neck circumference</td>
<td>15.90 ± 2.43</td>
<td>15.40 ± 2.93</td>
<td>0.05</td>
</tr>
<tr>
<td>Neck ROM (50°)</td>
<td>0</td>
<td>0</td>
<td>0.001</td>
</tr>
</tbody>
</table>

REFERENCES

Simulation of Water Droplet Spread During Preoxygenation

1 Queen Elizabeth Hospital, London

Introduction

The COVID-19 pandemic has led to rapid changes in anaesthetic practice. Current research suggests spread occurs via respiratory droplets and via aerosol [1]. The use of high flow nasal cannulae (HFNC) has been scrutinised due to concerns of aerosol generation. Using readily available equipment, this experiment simulates the ejection of respiratory droplets during preoxygenation of a patient. Comparisons are made between normal ventilation, HFNO and standard preoxygenation.

Methods

A self-inflating bag was attached into the trachea of a simulation mannequin, and a mucosal atomiser device (MAD) into the mannequin’s oral cavity. The model could therefore simulate breathing at 0.5nl/s of UV luminescent fluid was sprayed through the MAD. (See Figure 1). The spread of UV luminescent fluid was visualised at 3 minutes and distance from the mouth measured. Normal ventilation without supplemental oxygen was compared to simulated preoxygenation by a consultant anaesthetist using a Water’s circuit, and Fisher and Paykel HFNO.

Results

Simulated normal ventilation spread water droplets up to 96cm laterally and 40cm laterally from the mouth. Simulated normal ventilation with a Water’s circuit for preoxygenation spread no water droplets beyond the inside of the face mask. Simulated normal ventilation with HFNO at flows of 3.5l/min spread water droplets 84cm laterally and 69cm laterally from the mouth. There was also visually more water droplets present around the head and neck of the mannequin using this method.

Conclusions and Discussion

This research suggests that the use of HFNO during preoxygenation spreads water droplets more widely than a face mask and Water’s circuit. Of note is the increased concentration of water droplets around the head during HFNO preoxygenation compared to a self-ventilating patient. This may be of use for consideration in oxygen therapy using HFNO in ward environments, and the anaesthetic team during preoxygenation. This study is limited by the simulation not necessarily reflecting physiological breathing, and the lack of assessment of vertical spread.

References


Assessing a novel 2\textsuperscript{nd} generation LMA – an ADEPT Approach: Provisional Results from the LMA-Protector Observational Study

Morris O, Ma M, O’Sullivan E, St James’s University Hospital, Dublin, Ireland

Introduction
An ever-increasing range of airway devices are available to anaesthetists. There is no research required before these devices are released on to the market, and no standardised approach to their assessment.

In 2011 the Difficult Airway Society released the Airway Device Evaluation Project Team (ADEPT) guidelines hoping to standardise the model for device evaluation.

We are assessing the LMA Protector, a second generation LMA, using the suggested criteria from ADEPT.

Methods
This prospective cohort study measures 3 primary outcomes:

1. First go insertion success rate
2. Successful ventilation rate
3. Percentage complication free insertions.

Multiple secondary endpoints are recorded.

Results
Of the 14 patients to date, 7 were male and 7 female, ASA grade 1-3, with a BMI range of 19.5 – 33.2.

Primary outcomes:
1. First go insertion success: 86%
2. Successful ventilation rate: 100%
3. Complication rate: 33%

Notable secondary endpoints:
• Average insertion time was 41 seconds (range 20-60s)
• 79% cases requiring 1 or 2 manoeuvres to assist insertion
• Median ease of insertion score of 7/10
• Median adequacy of ventilation score of 9/10

Conclusion
Our provisional results demonstrate that the LMA Protector can be used successfully in a range of patients and surgeries, with favourable ease of insertion and performance scores.

A high rate of complications from insertion are noted, but these are noted to be mostly mild, and no patient harm was observed. We await completion of our data collection to assess the incidence of all complications but are reassured that there were no episodes of patient harm recorded, particularly desaturation.

We encourage colleagues to adopt the ADEPT protocol when assessing airway devices in the future.
INTRODUCTION

- Hyperoxemia: emerging topic of interest with research focusing on its beneficial effects.
- Avoiding optimal perioperative 
  

METHODLOGY

- IBR approval, RCT, 52 patients enrolled, 2 groups (26 in each) - CONTROL AND STUDY. Consent, BaseLine MoCA score for cognition.
- COMMON: to both groups, Standardized induction with O₃ (6LPM) + N₂O (4LPM) for demingination (3 minutes), Drugs, SAD for airway access, 3 ABG samples: F1 at room air (Baseline), 2nd at 10 minutes of 1st, 3rd after Neuromuscular reversal.
- STUDY GROUP: Maintained on FIO₂ 25%-33% at ALL TIMES with SP0₂ of 98-99% or target, N.O STOPPED during reversal. Ventmair mask after SAD removal to maintain SP0₂ 295% at all times (to check diffusion hypoxia).
- CONTROL GROUP: FIO₂ 33%-50%. Rebreath with 100% O₂, No ventmair mask post SAD removal.
- Post Operative assessment of:
  - Chest Discomfort or Sore throat
  - Nausea and Vomiting
  - MoCA score

TOTAL patients included after post-anesthetic check-up was 20

BASAL measurements with IBR, 6LPM and N₂O 4LPM

STUDY group, n=15

CONTROL group, n=15

RESULTS

- Both the groups were comparable in Age, Gender, ASA grade, BMI and type of surgery (laparoscopy).
- Both the techniques/materialization were used efficiently.
  - SpO₂ levels of 98-99% and trolled O₂ in the STUDY GROUP maintained 
    PaO₂ close to normal baseline limits (GRAPH).
  - PaO₂ levels never dropped below 80 mm of Hg in STUDEY GROUP.
  - PaO₂ levels of 100% in CONTROL GROUP lead to moderate to severe levels of hyperoxemia. (Range 154-383 mm of Hg) (TABLE).

Post-operatively:
- PO2V was significantly more in the study group -reatable with supportive treatment.
- Chest discomfort and sore throat were similar.
- MoCA scores were also comparable.

DISCUSSION

- We compared 2 groups which were similar across patient and surgery characteristics and looked for changes of hyperoxemia and hyperhyperoxemia.
- No incidence of mild hyperoxemia was seen in our STUDY group, while the CONTROL group had moderate to severe hyperoxemia.
- STUDY group maintained normoxemia with the PaO₂ levels close to 100 mm of Hg.
- Hyperoxemia can be:
  - Divided into three subsets - Mild (PaO₂: 100-120 mm of Hg), Moderate (PaO₂: 120-200 mm of Hg), and severe (>200 mm of Hg).
  - Fracture- check by assessing nerve burst and chest discomfort by removing all contrainters like ET insertion.

REFERENCES