European Society of Anaesthesiology

ESA

AIRWAY MANAGEMENT

One of the most critical issues regarding 2019 nCoV patients is the transitory phase between initial symptoms and potentially severe evolution requiring critical care, while taking into account the comorbidities. The choice of supplementary oxygen delivery interface and the decision to provide invasive ventilatory support is crucial.
These decisions have the potential of impacting outcome and may lead to consequences on saturation of critical care beds.
Non-invasive support methods (CPAP, BiPAP, NIV, HFNO) might correct hypoxemia and counterbalance respiratory failure (though univocal data are missing) and may either delay or avoid endotracheal intubation (with potential complications and effects on outcome). Nevertheless, data from the SARS epidemic provide evidence showing that these ventilatory techniques might favor the risk of airborne viral spreading. Given the nature of nCoV 19 in terms of contagiousness, should the patient require, or be expected to necessitate invasive ventilator support, an elective endotracheal intubation should be preferred,or even anticipated, rather than waiting for an emergency procedure (in the precipitating patient) as to minimize complications of intubation itself and also to reduce both the risks of procedural errors and the contamination of healthcare providers.
Adoption of early warning scores (EWS), shared and predefined strategies, multidisciplinary team training and simulation of possible scenarios are highly recommended, taking also into account the available levels of care and feasibility of critical care levels of assistance in a non-ICU environment.
The decisional elements for airway management, oxygenation and invasive ventilator support thus include competencies and organization and available human and environmental resources.
Vigilance in prevention, strict adhesion of donning/doffing of PPE, preparedness for the care of infected patients remain priority and of utmost importance.

COVID-19

HIGHLIGHTS

- ▶ **INTEGRATED COMPETENCIES FOR EVERY PHASE/STEP**
- ▶ **AIRBORNE PROTECTION FOR EVERY PHASE/STEP**
- ▶ **ANTICIPATE NEEDS, MAXIMIZE FIRST-PASS SUCCESS**

DOUBLE-CHECK INDICATIONS FOR ENDOTRACHEAL INTUBATION

- ▶ Adopt **Early Warning Scores** for intubation/quod vitam prognosis (consider DNR cases)
- ▶ **Identify negative pressure environment**
- ▶ **Balance benefits** of CPAP/BiPAP/NIV/HFNO **versus risks of airborne diffusion**
- ▶ **IF INTUBATION** is required, prefer **ELECTIVE** procedure (in emergency >> patient risk)

TEAM PREPARATION

▶ **Minimize the number of team members:**

1. The most expert team member should perform the intubation and advanced airway control/ventilation (with donned PPE) [INSIDE the chamber]
2. EXPERT assistant on protocols and devices (doctor/nurse with donned PPE) [INSIDE the chamber]
3. Second doctor with donned PPE if complex maneuver/difficult airway is expected/planned [INSIDE the chamber]
4. Doctor available with donned PPE [OUTSIDE the chamber]
5. PPE donning/doffing Observer [OUTSIDE]

CARRY OUT PRELIMINARY BRIEFING FOR ROLE DEFINITION, STRATEGY DEFINITION, IDENTIFICATION OF DONNING/DOFFING OBSERVER

PPE DONNING

- ▶ **Second level PPE** *(airway management)* FFP3, facial shield, long sleeve fluid-resistant scrubs, double gloves, overshoes
- ▶ **Third level PPE** *(aerosol generating procedures - bronchoscopy, awake endotracheal intubation, etc..)* helmet in place of FFP3, facial shield, long sleeve fluid-resistant scrubs, double gloves, overshoes

DONNING/DOFFING OBSERVER EXTERNALLY CHECKING, INDIVIDUAL DONNING

CLINICAL CHECKLIST (wearing PPE)

- ▶ COMPLETE EVALUATION OF AIRWAYS AND OXYGENATION (accept difficult airway management risk overestimation)
- ▶ HEMODYNAMIC EVALUATION ➧ PRE-EMPTIVE HEMODYNAMIC OPTIMIZATION

AIRWAY INSTRUMENTATION

- ▶ HME FILTER ON EVERY OXYGENATION INTERFACE (face mask, circuit, endotracheal tube, supraglottic airway devices, introducer, airway exchange catheters)
- ▶ AIRWAY CART READY (DISPOSABLE devices preferable)
- ▶ SUCTION: CLOSED SYSTEM
- ▶ ANTIFOGGING
- ▶ MEDICATIONS: PREPARED AND DOUBLE-CHECKED
- ▶ EMERGENCY CART READY (DISPOSABLE devices preferable)

AWAKE INTUBATION NOT INDICATED:

- ▶ **PREOXYGENATION** (according to respiratory and hemodynamic status)
  - 3min' at TV FiO_2=100%
  - or 1min' at FVC 8 breaths FiO_2=100%
  - or CPAP/PSV 10 cm H_2O + PEEP 5 cm H_2O FiO_2=100%
- ▶ **RSI** in all patients (limit BMV **unless** unavoidable and **apply** Cricoid Pressure only in case of ongoing regurgitation)
- ▶ NASAL PRONGS 3 LT/MIN FIO2=100% FOR APNOIC PHASE **(NODESAT)**
- ▶ **FULL DOSE NEUROMUSCULAR BLOCK**
  RESPECT onset time for laryngoscopy
  - > 1st LARYNGOSCOPY: prefer **VIDEOLARYNGOSCOPE with separate screen + endotracheal tube pre-loaded on introducer**
    Re-oxygenate with low TV/pressure between attempts -Early switch (after failed second attempt) to supraglottic airway devices **(prefer second generation - intubable SADs)**
  - > INTUBATION THROUGH SUPRAGLOTTIC AIRWAY DEVICES: flexible endoscope with **separate screen** (prefer **DISPOSABLE**)
- ▶ **EARLY CRICOTHYROTOMY IF CI-CO**

AWAKE INTUBATION INDICATED *(only if really mandatory):*

- ▶ AIRWAY TOPICALIZATION: no aerosol/vaporization
- ▶ TITRATED SEDATION (INFUSION PUMP) - sedation depth monitoring
- ▶ FLEXIBLE ENDOSCOPE WITH **SEPARATE SCREEN** (PREFER **DISPOSABLE**)
- ▶ RESCUE: INTUBATION THROUGH SUPRAGLOTTIC AIRWAY DEVICES (see above)
- ▶ **EARLY CRICOTHYROTOMY** if CI-CO

TUBE POSITION CONTROL - PROTECTIVE VENTILATION

- ▶ **CAPNOGRAFIC CURVES** repeated and with standard morphology *(if in doubt take it out)*
- ▶ **AVOID** unuseful circuit disconnections (if needed: ventilator on stand-by/clamp endotracheal tube)
- ▶ **CONSIDER** indications for advanced techniques: ECMO - experts advise

PPE DOFFING

- ▶ During and after PPE doffing, hands hygiene mandatory
- ▶ Donning/doffing observer externally checking, individual doffing
- ▶ Waste disposal

TRANSPORT

- ▶ Follow bio-containment regulations

S - Secure airway: anticipated intubation
T - Team briefing
O - Organize (competencies - team - pathways)
P - Prepare (devices)

C - Checklist - controls- crisis management
O - Optimize (hemodynamics - oxygenation)
V - Vigilated donning/doffing
I - Invasive airways - evaluation and integrated airway management
D - Debriefing

SIAARTI
PRO VITA CONTRA DOLOREM SEMPER

Massimiliano Sorbello, Ida Di Giacinto, Filippo Bressan, Flavia Petrini
on behalf **SIAARTI Airway Management Research Group**

Reference

Wang C, Horby PW, Hayden FG, Gao GF (2020). A novel coronavirus outbreak of global health concern. The Lancet, 395(10223), 470–473

Centers for Disease Control and Prevention. Coronavirus. https://www.cdc.gov/coronavirus/ about/index.html. Accessed February 2020

Livingston E, Bucher K, Rekito A. Coronavirus Disease 2019 and Influenza. JAMA. Published online February 26, 2020. doi:10.1001/jama.2020.2633

WHO - Clinical management of severe acute respiratory infection when Novel coronavirus (2019-nCoV) infection is suspected: Interim Guidance.

Jansson M, Liao X, Rello J. Strengthening ICU health security for a coronavirus epidemic. Intensive Crit Care Nurs. 2020 Feb 7:102812. doi: 10.1016/j.iccn.2020.102812

Phelan AL, Katz R, Gostin LO.The novel coronavirus originating in Wuhan, China: challenges for global health governance. JAMA. Published online January 30, 2020. doi:10.1001/jama.2020.1097

Wax RS, Christian MD. Practical recommendations for critical care and anesthesiology teams caring for novel coronavirus (2019-nCoV) patients. Can J Anaesth. 2020 Feb 12. doi: 10.1007/s12630-020-01591-x

Hongbo Zheng, Wenlong Yao, Li Xu, Xiaohui, Chi, Wei Mei. Current Protocol for Emergent Tracheal Intubation in Patients with 2019 novel coronavirus (COVID-19) Pneumonia Department of Anesthesiology, Tongji Hospital, Tongji Medical College, Huazhong University of Science and Technology, Wuhan, Hubei, China

Yul T, Li Y, Wong TW, et al. Evidence of airborne transmission of the severe acute respiratory syndrome virus. N Engl J Med. 2004;350(17):1731- 1739

Peng, Philip W.H. et al. Outbreak of a new coronavirus: what anaesthetists should know. British Journal of Anaesthesia. In press. doi: https://doi.org/10.1016/j.bja.2020.02.008