Newsletter

July **2020**

Indian College of Anaesthesiologists

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Editorial

New Age - New Challenges - New Solutions!

After the outbreak of CoVID pandemic, the life has gone for a roller-coaster ride all over the world. The medical fraternity along with the administrative authorities is playing a key role in the fight against this new-age menace. Anaesthesiologists, being trained in life-saving skills have a crucial role in this colossal challenge to humankind.

Anaesthesiologists did take up the responsibility to man the extra ICU beds setup to meet the increasing demand. We have also trained doctors and supporting staff to improve the healthcare facility provided to sick patients with CoVID. The understanding of the pathophysiology and the disease profile of the new virus disease is still emerging and different treatment modalities are being investigated in various parts of the world. Global organizations are geared up to disseminate the latest information to the healthcare providers and administrative authorities.

As an aftermath of this calamity the routine academic programs have come to a halt in most institutions. The online teaching has been the mainstay of academic endeavors, as it allows to keep social distancing norms, yet not compromising on the quality of education. It may take a while to come to terms with the new-age use of the communicating medium. We have to accept that these online platforms were already in place and being used in many academic programs well before the CoVID era. The only difference now is that we do not have many alternatives before us, at least for some time from now. Given the fact that when school education is being implemented via virtual classrooms, technology-based specialty like Anesthesiology should be best placed to adapt to this mode of teaching and training.

Indian College of Anaesthesiologists is planning a webinar-based academic involvement. This initiative is intended to undertake the full Anaesthesiology syllabus as interactive lectures, demonstrations and faculty-led seminars / panel discussions in once-a-week webinar program. This will also enable our trainees to learn from the best faculty in respective topics. The academic programs will be live-streamed in YouTube and the recordings will be available in ICA's YouTube channel. Thus, the trainees can revise and get the maximum out of the academic session, irrespective of their duty/assignments in their parent institutions. There will be a platform to interact with the senior faculty for further clarifications.

Our specialty of Anaesthesiology has evolved through many challenges in the last decades. ICA is committed to stand with the fraternity and the humanity in facing the present-day demands. In this bulletin we have included a detailed write-up on the standard operating protocols for Anaesthesiologists. We shall pursue our effort to keep you abreast of the latest developments in our specialty.

Dr Saneesh P J
for the EDITORIAL TEAM - ICA

NEWSLETTER

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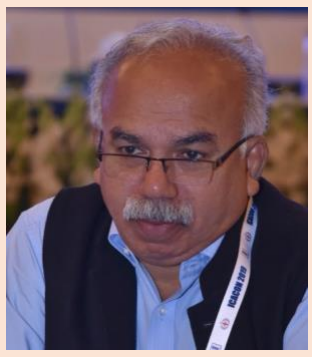
President's message



Dr B Radhakrishnan

Amidst the miseries sustaining from global pandemic, Anaesthesiologists, world over are working to their maximal efficiency to contain the disease and to make the ongoing life comfortable. Indian College of Anaesthesiologists (ICA), ever since the outbreak of epidemic strive for excellence in management, delivery of protocols, physical and fiscal support as well as laying guide lines for adaptation to post CoVID scenario. With every body's relentless service we believe we could rehabilitate our fellow human beings at the earliest.

ICA is progressing in our mission to achieve committed goals of instituting equitable standards in anaesthesia education and practice delivery. Academic support is ensured through publications, conduct of courses at national/international level, conduct of interactive webinar focusing at international standard in content/dissemination. Various ICA sponsored courses are run two times an year for the specified duration. In addition to the practice guide lines published earlier, a compendium of protocols will be released soon and will be in addition to our publication of year book.

ICA is pleased to announce that we signed an MOU with American Society of Anaesthesiologists (ASA) and Society for Ambulatory Anaesthesia (SAMBA) on mutual support and academic development. Same sort of Academic linking is worked out between Royal College of Anaesthesia of UK and Canada.

ICA regret to inform that owing to the present socioeconomic situation resulting from the viral pandemic ,We may not conduct the Annual international conference scheduled for September 2020 at Bangalore, instead ICA may conduct a virtual conference in December. ICA appeal to all our members to be involved in health care charity works such as prevention of life style diseases, reduction of environmental pollution, voluntary blood donation.

Wishing you all bright days ahead.

President ICA

Special Article

COVID-19
OPERATING PROTOCOL FOR ANAESTHESIOLOGISTS

The outbreak of COVID-19 is putting up considerable miseries to mankind and the nature of the spread shows, that this pandemic may trouble humanity for next 6-9 months or till we achieve herd immunity. We are forced to accept our citizens seeking hospitals for surgical procedures and this protocol gives guide line we have to enforce to keep us as well as our patients healthy and protected. The view of ICA on the matter is released and this protocol will be updated on getting further inputs. Kindly treat this as an advisory.

Based on the corona disease outbreak, pattern of disease in the country and the requirement of the service of anaesthesia specialists, the ICA is prepared to provide all available man power, technical and clinical advice as well as to coordinate such activities in the country.

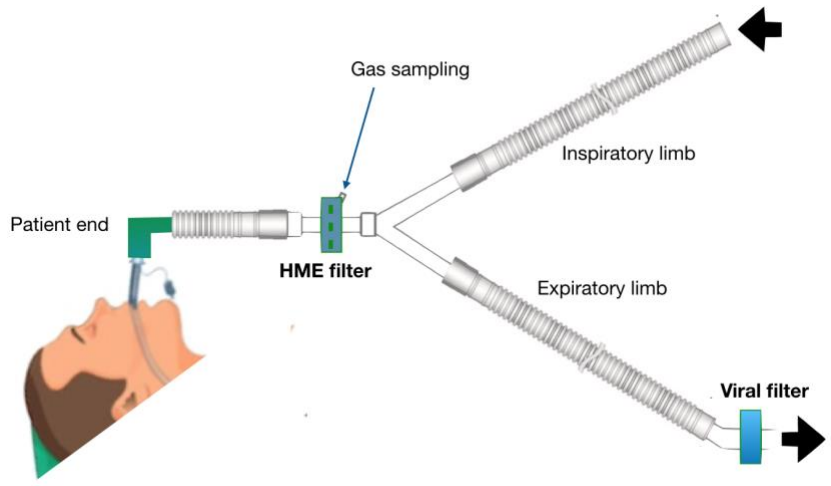
- In all work places like preoperative clinics, operation theaters, post-operative care units and intensive care units, use of PPE, regular hand disinfection and social distancing protocols to be followed as per available standards.
- Educate all members regarding the use and disposal of PPEs and ensure protection during general / regional anesthesia procedures.
- Prefer regional anesthesia wherever possible and advice all patients to use protective mask during the entire stay in the operation theater.
- During general anesthesia, practice as far possible rapid sequence induction with adequate muscle relaxation. Avoid manual ventilation, Use closed suction devices, avoid supraglottic air way devices (unless in emergency situations) and avoid practices which generate aerosols like nebulisation. Always use closed circuits with change of disposables used for each patient.
- During cardiopulmonary resuscitation “protected code blue strategy” with use of PPE and disposable resuscitation kits as there is high aerosol generation and high risk of viral transmission during the procedure.
- Associate with other organizations of doctors involved in COVID 19 care to provide coordinated support in crisis situations and conduct regular discussions on that.
- Use the services of teaching institutions to formulate protocols and to modify it based on the available scientific data.
- Follow Government guidelines regarding all management protocols and offer all possible support to Government activities.
- ICA shall coordinate between Government and Private health institutions on matters of difference in formulating protocols and its implementation.
- Participate in public education regarding prevention of COVID 19 transmission in the community. Conduct regular academic program to update the members on COVID 19 related to Anaesthesia practice.

General Instructions

- The COVID 19 situation in the World is expected to last for a few more months. The elective surgical work cannot be deferred indefinitely. We should do these procedures taking adequate personal protection. All patients should be considered as COVID positive till such time that routine preoperative COVID screening of real time RT PCR (rt RT-PCR) is recommended by Government.
- Ideally there should be a sustained reduction in the rate of new COVID 19 patients in the relevant geographic area for at least 14 days before resumption of elective surgeries. Studies from Wuhan, China showed that ICU admission was required in 44.1%patients and increased mortality (20.5%) in asymptomatic COVID positive patients who underwent elective surgery.
- COVID theaters have to be set up if feasible. Three COVID OTs are ideal. One for OB-GYN, one for Surgery and one for emergency care. The theaters should preferably be in the topmost floor or towards one end of the building. The theaters should be labeled boldly as COVID OT. These should be situated adjacent to the COVID isolation wards. Suspected and confirmed COVID patients are to be done in these theaters.
- There should be two changing rooms with toilet facilities.
- Purses, bags, mobile phones, text books are not allowed within the OT. These should be placed in the lockers within the changing rooms. Intercom facilities should be made use of within the OT complex.
- It is preferable not to take the case records and imaging films into the theater as they can be a source of fomites.
- There should be separate donning and doffing areas. Donning area should be adjacent to the changing rooms. Doffing area should be away from these areas.
- PPE should include a cover all suit, properly fitting N95 mask, goggles, shoe cover, surgical cap and double gloves. Cover all, suit should be one piece wear, fluid impermeable and has at least 90 GSM.
- PPE donning should be done using the “buddy technique”. Your name can be affixed on the PPE and try to communicate loudly or through sign language which should be familiar to the team members. Sequence for doffing and donning should be pasted in the respective areas. Mock drills should be practiced for familiarization of wearing.
- Minimum staff should be present within the OR. Also OR should contain only the bare minimum required disposables, linen, dressing, equipment and drugs required for the safe conduct of the surgical

procedure. The OR should be prepared before wheeling in the patient. Anaesthesia machine with back up oxygen cylinder/ working suction apparatus/drug trolley should be available and checked prior.

- The monitors, defibrillators, syringe pumps, USG/ECHO machines, cautery and anaesthesia machine should be covered with transparent plastics and these should be changed after each procedure.
- Try to avoid GA where ever possible. Make maximum use of regional anaesthesia techniques.
- Use disposable endotracheal tubes, anaesthesia face masks, breathing circuits, laryngoscope blades etc. along with closed circuit for all GA.
- Two HMEF are to be used for each GA. One should be placed between the ETT and breathing circuit and the other between the expiratory limb and the anaesthesia machine.



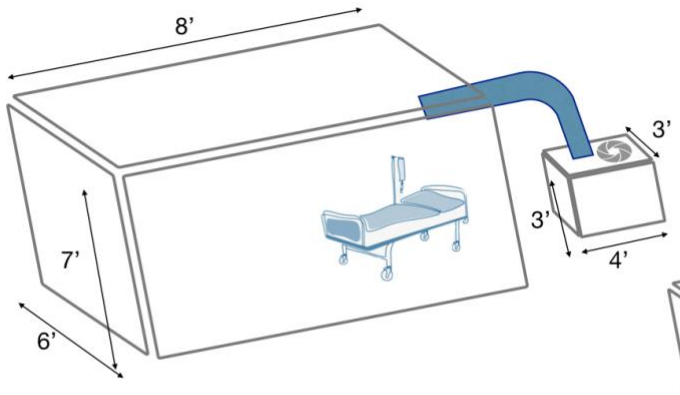
Note: Preferred filter Configuration. VEF >99.99% for each filter. Gas sampling on machine side of the filter

- Use disposable drapes for surgery if feasible. If linen is being used, the soiled linen should be put in clearly labeled leak proof bags and taken to the laundry. These should be soaked in warm 700-900 C water with detergent. They can further be soaked in 1% sodium hypochlorite solution and later with soap/detergent. Washed and rinsed in clean water; dried in sunlight. It can then be put for autoclaving.
- A one hour time gap between surgeries should be provided for proper disinfection of OT. Hence the number of procedures done per theater will have to be decreased. Cleaning staff should be provided with adequate PPE. Scrub, floors with detergent based solutions. 1% sodium hypochlorite to be used for mopping the floors and the walls. 70% Alcohol based sprays can be used to disinfect exposed areas like the electrical cords or the OT lights after they are switched off. The equipment should be switched on only after 20 minutes. If needed, Super hydrogen peroxide can be used for fumigation of the OR. UV lights if present can be left on for half an hour between surgeries for adequate sterilization of the OT.
- Negative pressure Operating rooms are ideal. They can be constructed using the biomedical expertise available in the hospital. To convert an existing OT or ICU into a COVID-19 compliant area, it is first necessary to convert the room into a non-recirculatory system (100% once through system). On an emergency basis, this can be achieved by blanking (blocking) off the return air vents in the COVID-19 OT/area. It is important to make sure that the Air Handling Unit (AHU) will have provision to receive adequate outdoor air supply. The outdoor air source for the AHU shall not be from within the building and all care shall be taken to avoid intake of outdoor contaminants, to the best possible extent. Additionally, an independent exhaust blower shall be provided to extract the room air and exhaust out into the atmosphere, preferably, after suitable "exhaust air treatment". The exhaust air quantity shall be greater than the supply air quantity such that a negative pressure of minimum 2.5Pa (preferably >5 Pa) is achieved in the room. It is advisable to install differential pressure meters to measure this metric. The supply air quantity shall be such that it will provide a minimum of 12air changes per hour.

The exhaust air is most likely to contain particles carrying a viral load and hence a suitable technique should be deployed to prevent the spread of infections. Treatment of exhaust air can be done preferably by additional HEPA filtration. (HEPA filters shall be tested and certified for performance in accordance to international standards like IEST, EN, ISO, IS, AB etc.). These HEPA filters shall be minimum of H13 (EN1822-1) filter class or equivalent. When not possible, treatment of exhaust air by chemical disinfection with 1% sodium hypochlorite is acceptable. When both the methods are not viable, the exhaust air shall be let off into the atmosphere through an upward plume at a height of 3 m above the tallest point of the building, thereby lowering the viral load concentrations to insignificant levels by dilution. This exhaust discharge shall be well away from other air intake points and populated places.

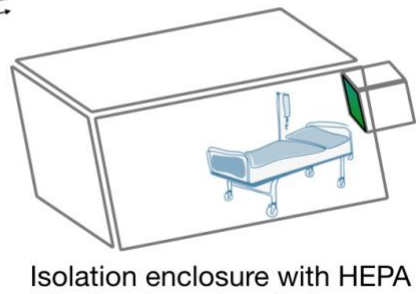
When HEPA filters are used to treat the exhaust air, it is preferable to install them at the primary point of air extraction in the room and the exhaust blower shall be at the discharge end of the exhaust duct (where applicable).

Chemical disinfection of the exhaust air from COVID-19 patient room can be done by bubbling the exhaust air through a "Diffused air aerator tank" (preferably of non-metallic material) holding a 1% sodium hypochlorite solution. The concentration shall be checked on a regular basis and dosing undertaken based on need. The aeration tank shall be placed in an unpopulated outdoor area and not inside enclosed space.



Isolation enclosure with chemical disinfection for exhaust air.

(Dimensions are only indicative)



Isolation enclosure with HEPA filtration for exhaust air.

- The other two options available for exhaust air treatment being UV irradiation and heating. It is observed that, an exposure time of 45min at a temperature of 75 °C resulted in complete inactivation of SARS-CoV. Similarly, an UVC (254 nm wavelength) irradiation with an exposure time of 15 minutes at irradiation intensity of 4016 μW/Cm2 resulted in complete inactivation of SARS-CoV.
- In OR having window/split AC and no AHU, the AC should be switched off both during aerosol generating procedures (AGP) and also for a period of at least 20 minutes after any AGP. These OTs can be converted to negative pressure OR by the addition of 2-3 exhaust fans, which create a negative pressure by driving air out of the room. This can lead to significant noise pollution and warming of the theater. Hence the existing number of air conditioners within the OR should be doubled or tonnage load to be increased.
- Existing OT with laminar flow having an Air Handling Unit (AHU) with a variable frequency drive blower can be converted into a negative pressure theater by manipulating the blower settings. The air change per hour (ACH) recommended in a positive pressure OR is twenty five.
- A concept of creating a negative pressure temporary vestibule with a HEPA unit in front of the positive pressure OR has been suggested. This creates a buffer zone of negative pressure, but maintains the OR sterility.
- The recommended temperature to be maintained within the COVID OT is 240C – 260C with a relative humidity between 50%-70%.
- Aerosol generating procedures (AGP) are tracheal intubation, extubation, airway suctioning, nebulisation, CPAP, HFO, HFJV, HFNO, HFPPV, Jet ventilation, bronchoscopy etc. AGPs should be minimized.
- Scavenging system use should be used for disposal of waste anaesthetic gases. In the absence of the same, corrugated tubing can be attached to the scavenging port and the other end can be dipped in a canister containing 1% sodium hypochlorite solution so that the gases pass through the solution before exhausting to the atmosphere. It can cause a 4cm of water increase in the airway pressure. Continuously keep a watch on the airway pressure waveform to detect development of auto PEEP.
- Special COVID consent to be taken in addition to the standard surgical and anaesthesia consent.

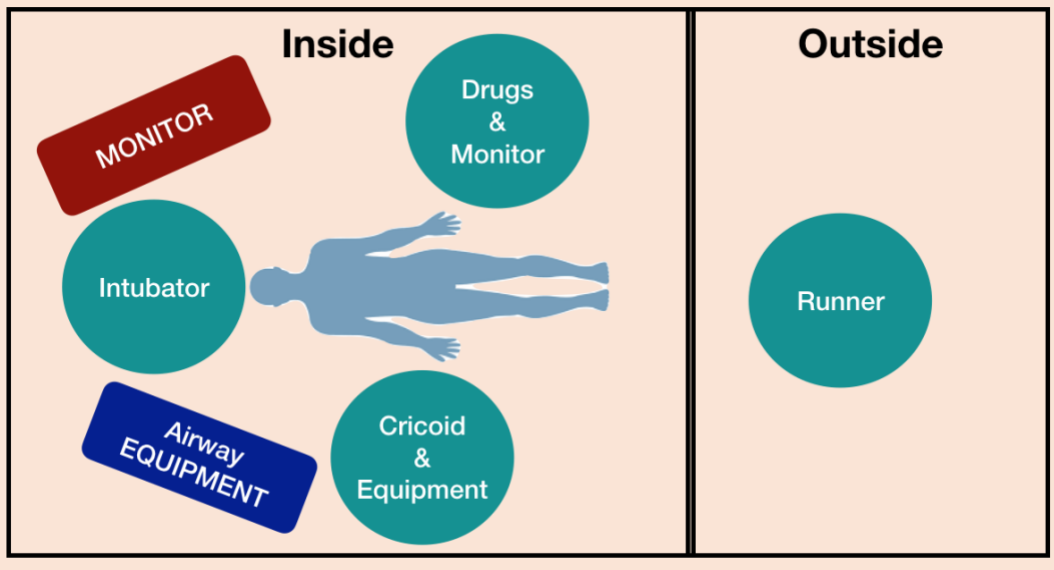
Specific Instructions to Anaesthesiologists

a. Preanaesthetic Area

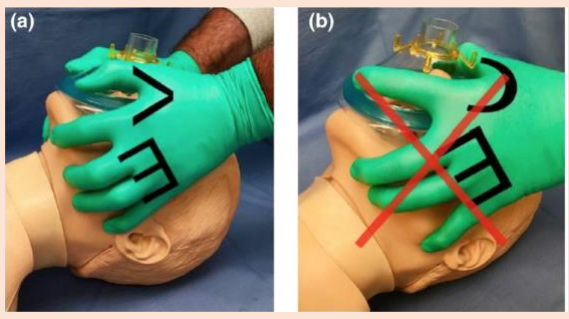
- Strict social distancing to be followed outside PAC clinic.
- Patient and bystanders should wear masks.
- Anaesthesiologist to be in scrubs with N95 respirator mask and face shield.
- Non-contact thermometer to be used for temp monitoring
- As far as possible avoid bystander to accompany the patient to PAC room.
- Advisable to have COVID test result for every patient one day prior to surgery. However history of travel, exposure and clinical history of signs and symptoms of COVID should be sought from all.
- Any patient with a COVID positive result should have his/her elective surgery deferred.
- Clean the seat and table after each patient examination with 1% sodium hypochlorite spray
- Periodic cleaning of stethoscope, sphygmomanometer should be done with 70% ethanol based solution
- Floor and furniture to be cleaned every three to four hours within the PAC clinic.
- Advice betadine gargles for patients on the previous night and the morning of surgery.

b. Operating Room

- Change into hospital scrubs in the changing room
- All OR staff should be provided with standard PPE kits. (surgeon, anaesthesiologist, technicians, scrub nurses, floor nurse, cleaning staff etc.)
- In minor procedures, in COVID negative patients where the risk of aerosol exposure is less likely, the uses of disposable surgical scrub with N95 mask and face shield is advised.
- A donning sequence suggested is hand wash- cap- shoe cover- hand rub- inner glove- cover all gown- N95 mask- goggles- hood- isolation sterile gown-outer gloves. Pay close attention to avoid self contamination.
- Patient should wear a surgical three layer mask and be wheeled into the OR directly. No stay in the premedication/pre-op area.
- Regional anaesthesia preferred wherever feasible.
- Standard monitoring, IV access, instruments, drugs, ventilator and suction should be prechecked.
- Use minimal oxygen flow over the surgical mask, where supplementary oxygen is needed.
- In case GA is required, the most experienced anaesthesiologist available should perform the intubation if possible. Limit the number of health care worker (HCW) in the room prior to intubation. (Three individuals are likely to be required: an intubator, an assistant and a third person to give drugs and watch the monitors. A runner should be watching from outside and be able to summon help rapidly if needed.)

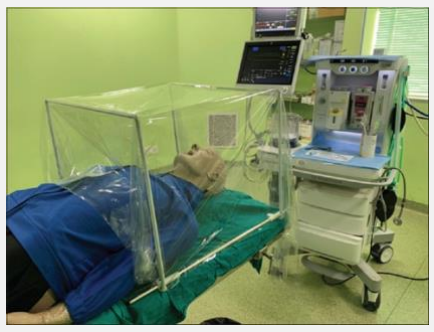


- Airway management should be safe, accurate and swift. Plan for RSI and ensure that a skilled assistant is able to provide cricoid pressure.
- Use 5 minutes pre-oxygenation with 100% oxygen and RSI techniques to avoid manual ventilation of patient's lungs and the potential aerosolization of the virus from the airways. Use both hands to hold the mask to ensure a tight seal using the V-E technique rather than the C-E technique. A HMEF is interposed between the face mask and breathing circuit or between the face mask and the AMBU bag.



Aerosol containment box *

(a) 

(b)* 

- An aerosol box or shield made of acrylic or plastic sheet can reduce the spread of the aerosolised virus and can be used if available.
- Induction agents to be used depend on the hemodynamic status of the patient. Muscle relaxant can be either succinylcholine (1.5 mg/kg) or Rocuronium (1.2mg/kg). Ensure adequate neuromuscular blockade before attempting intubation.
- After tracheal intubation clamp the ETT and inflate the cuff before starting ventilation. If a HMEF is applied on the ETT then it need not be clamped.
- Video laryngoscope is preferred for intubation as it increases the distance between the patient and anaesthesiologist. Moreover the chance of first pass intubation increases with this modality and avoids multiple attempts.
- Proper tube positioning identified by EtCO2 monitoring and bilateral chest rise.
- Re-sheath the laryngoscope blade immediately post intubation using the outer glove. Seal all used airway equipments in zip locked plastic bags. It must then be removed for decontamination & disinfection.
- Use of second generation supraglottic airway devices (SGAD) in, cannot ventilate cannot intubate (CVCI) situations only.
- Surgeons and other supporting staff are allowed inside the OR only after twenty minutes following intubation.
- Laparoscopic procedures are better avoided as desufflation of the pneumoperitoneum is associated with surgical plumes with potential viral load. It has to be desufflated using a suction device with a HEPA filter to prevent venting to the OR.
- Limit the use of surgical cautery to minimum.
- Tracheal extubation should be done within the OR as far as possible. Deep extubation is a preferred technique to avoid a coughing patient. Drugs to minimize coughing at emergence include Dexmedetomidine, Lignocaine and Opioids. Immediately after extubation a N95 or Three layered surgical mask is placed over the patient's airway.
- If the patient is kept intubated, then a disposable AMBU bag with an HMEF is used for transferring the patient to a dedicated COVID ICU. The shifting team has to use adequate PPE kits and transfer the patient using a dedicated corridor or elevator.
- After the case the anaesthesiologist proceeds to the doffing area and the following sequence is followed: Surgical gown- outer gloves- hood- cover all gown- shoe cover-hand rub on gloved hand- goggles- N95 mask- cap- Inner glove- hand wash or rub.
- Then move onto the changing room and discard the OT scrubs. A warm shower is advised before changing into street clothes.

c. PACU & ICU

- Patient beds to be separated by 1 meter
- Only essential staff to enter these areas
- Floor to be cleaned with 1% hypochlorite solution 6th hourly
- All monitors to be covered with transparent disposable plastic sheet/film
- Hand wash/rub between patients
- Closed in line ET suctioning system to be used as it prevents aerosolisation of the virus.
- Put a HMEF at the expiratory port of the ventilator.

d. **Resuscitation**

- Protected Code Blue is advocated.
- Resuscitation should be done preferably in an airborne isolation room given the possibility of AGP. The management of COVID patients requires meticulous conservation for safety of all health care workers.
- All members of the resuscitation team must wear PPE.
- Team size should be minimal. Typically 4 people with designated roles.
- Rather than bringing the crash cart into the room, necessary equipments and modular packs can be brought inside by the team.
- A plastic sheet may be draped over the patient before initiating CPR compressions.
- Doffing after the procedure should be carried out meticulously.

*
The device consists of two cross bars held in place by two rods that pass through small metal tubes fixed at the base of the cross bars. The cross bars can be moved up and down on the rods that connects them. The device is placed on the patient covering the head up to the lower part of chest. Over it is stretched a transparent plastic sheet, which is tucked under the mattress on the head end as well as the sides. The distal part of the sheet is folded over the abdomen and tucked there. On the head end side of the sheet, two vertical linear cuts, 6-8"are given with their center at the level of the patient's forehead and about 7-8 inches apart. Another vertical cut of similar length is given on the right side for assistance at the time of intubation.
Singh B, Singla SL, Gulia P, Kumar A, Bhanwala R. Aerosol containment device for use on suspected COVID-19 patients. Indian J Anaesth 2020; 64, Suppl S2:154-6.

Negative pressure Aerosol Hood

This one combines the rigid Aerosol Box structure with active suction through a HEPA filter mounted at the top of the device (akin to a fume hood).

APSF Newsletter: June 7, 2020. A Portable System for Healthcare Worker Safety and Patient Isolation during COVID-19 and Other Respiratory Infections. Kumar Belani et al. (accessed on July 5, 2020)

Emergency tracheal intubation checklist COVID-19

Personal Protective Equipment | Prepare Equipment | Prepare for Difficulty | In the Room | Post-procedure and Safety

OUTSIDE ROOM

PPE – be thorough, don't rush
- ❑ Wash hands
- ❑ Buddy with checklist
- ❑ Put on PPE
  - ❑ Long sleeved gown
  - ❑ FFP3 (or equivalent) mask
  - ❑ Gloves
  - ❑ Eyewear
  - ❑ Headwear and wipeable shoes as per local protocol
- ❑ Final buddy check
- ❑ Names on visors

- ❑ Allocate roles:
  - **A:** Team leader and intubator
  - **B:** Cricoid force and intubator's assistant
  - **C:** Drugs, monitor, timer
  - **D:** Runner (outside)
  - Decide who will do eFONA

- ❑ How does runner contact further help if required?

- ❑ Check kit (kit dump)
  - ❑ Mapleson C **with HME attached** (preferred to BVM)
  - ❑ Catheter mount
  - ❑ Guedel airways
  - ❑ Working suction
  - ❑ Videolaryngoscope
  - ❑ Bougie/stylet
  - ❑ Tracheal tubes x2
  - ❑ Ties and syringe
  - ❑ In-line suction ready
  - ❑ Tube clamp
  - ❑ 2nd generation SGA
  - ❑ eFONA set available

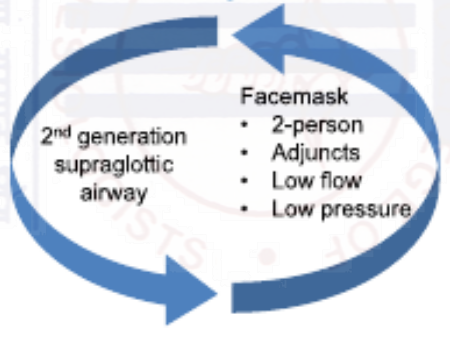
- ❑ Do you have all the drugs required?
  - ❑ Ketamine (or other)
  - ❑ Muscle relaxant
  - ❑ Vasopressor/inotrope
  - ❑ Maintenance sedation

- ❑ Weight?

- ❑ Allergies?

- ❑ If the airway is difficult, could we wake the patient up?

- ❑ VERBALISE the plan for a difficult intubation?
  - **Plan A:** RSI
  - **Plan B/C:** 2-handed 2-person mask ventilation & 2nd generation SGA



  - **Plan D:** Front of neck airway: scalpel bougie tube

- ❑ Confirm agreed plan

- ❑ Does anyone have any concerns?

INSIDE ROOM

- ❑ Airway assessment
  - ❑ MACOCHA
  - ❑ Identify cricothyroid membrane

- ❑ Apply monitors
  - ❑ Waveform capnography
  - ❑ SpO_2
  - ❑ ECG
  - ❑ Blood pressure

- ❑ Checked i.v. access (x2)

- ❑ Optimise position
  - ❑ Consider ramping or reverse Trendelenburg
  - ❑ Firm mattress

- ❑ Optimal pre-oxygenation
  - ❑ ≥ 3 min or ETO_2 > 85% (No NIV, no HFNO)

- ❑ Optimise patient condition before tracheal intubation
  - ❑ Fluid/vasopressor/ inotrope
  - ❑ Aspirate nasogastric tube
  - ❑ Delayed sequence induction?

- ❑ Now proceed

AFTER AND LEAVING

- ❑ Airway management
  - ❑ Inflate cuff before any ventilating
  - ❑ Check waveform capnography
  - ❑ Push/twist connections
  - ❑ Clamp tracheal tube before any disconnection
  - ❑Avoid unnecessary disconnections

- ❑ Other
  - ❑ Insert nasogastric tube
  - ❑ Consider deep tracheal viral sample

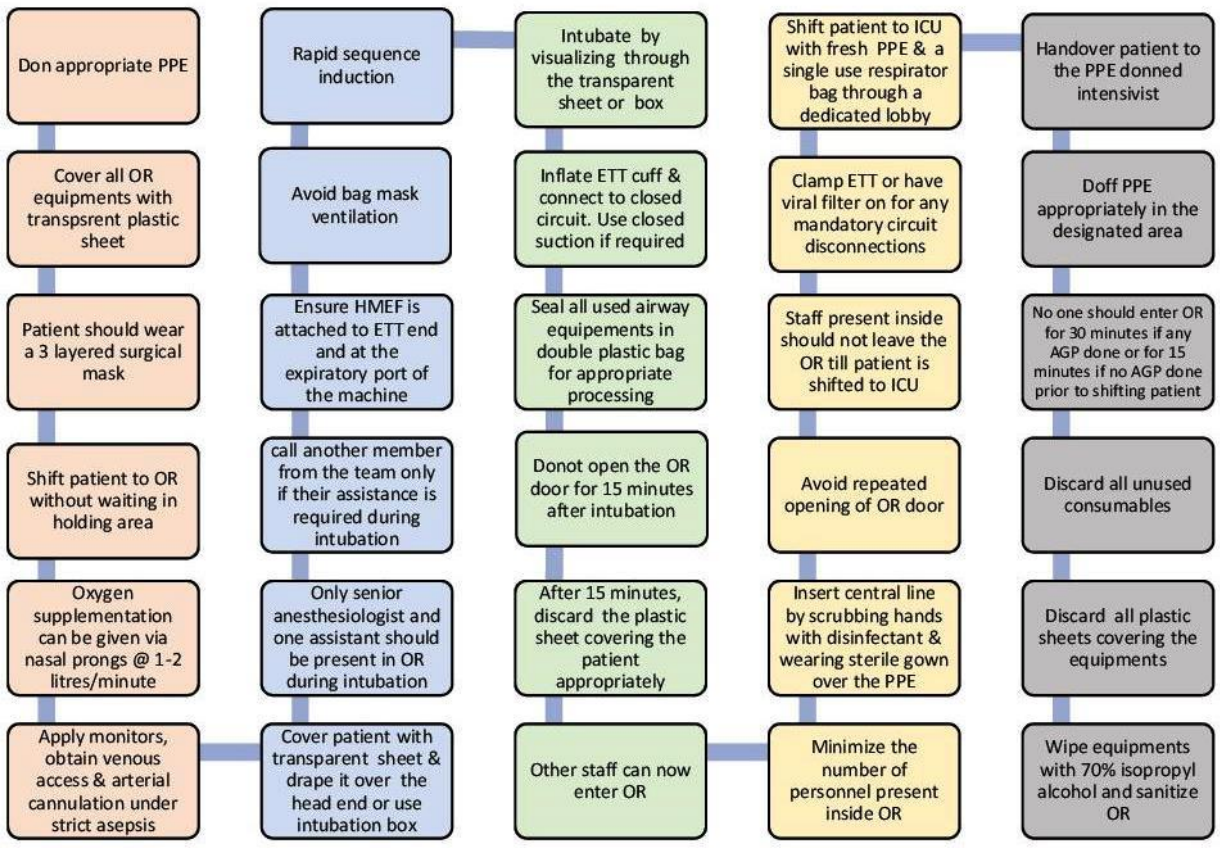
- ❑ Careful equipment disposal

- ❑ Decontamination of reusable equipment
- ❑ Complete and display intubation form

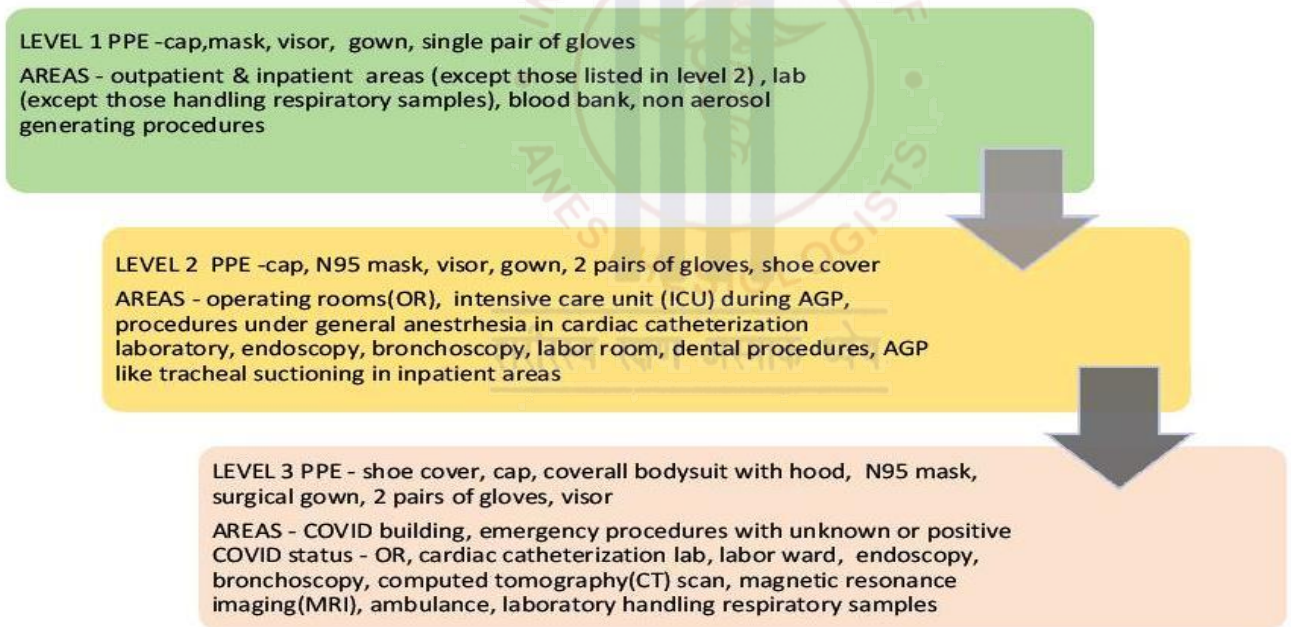
- ❑ Remove PPE
  - ❑ Observed by buddy
  - ❑ Use checklist
  - ❑ Meticulous disposal
  - ❑ Wash hands

- ❑ Clean room after 20 minutes

Flow chart of anaesthesia management



Flow chart of Level of PPE required



Conclusion

The management of COVID patients requires meticulous considerations to safety for the staff and patients. Accuracy is critical and clinicians should avoid unreliable or unfamiliar techniques for airway management. Safe, accurate and swift care without rushing and avoiding risks lead to success. The flowchart shows a way but it could be tailored. We have pointed out the principles that can achieve these goals but these principles may be subject to change as and when new evidence emerges. Resources may not be equal at all areas but conscious use of facilities and our competence will score.

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Regional Anesthesia in Cardiac Surgery: An Overview of Fascial Plane Chest Wall Blocks

Optimal analgesia is an integral part of enhanced recovery after surgery (ERAS) programs designed to improve patients' perioperative experience and outcomes. Regional anesthetic techniques in a form of various fascial plane chest wall blocks are an important adjunct to the optimal postoperative analgesia in cardiac surgery. The most common application of fascial plane chest wall blocks has been for minimally invasive cardiac surgical procedures. An abundance of case reports has been described in the anesthesia literature and reports appear promising, yet higher-level safety and efficacy evidence is lacking. Those providing anesthesia for minimally invasive cardiac procedures should become familiar with fascial plane anatomy and block techniques to be able to provide enhanced postsurgical analgesia and facilitate faster functional recovery and earlier discharge. The purpose of this review is to provide an overview of contemporary fascial plane chest wall blocks used for analgesia in cardiothoracic surgery. Specifically, we focus on relevant anatomic considerations and technical descriptions including pectoralis I and II, serratus anterior, pectointercostal fascial, transverse thoracic muscle, and erector spine plane blocks. In addition, we provide a summary of reported local anesthetic doses used for these blocks and a current state of the literature investigating their efficacy, duration, and comparisons with standard practices. Finally, we hope to stimulate further research with a focus on delineating mechanisms of action of novel emerging blocks, appropriate dosing regimens, and subsequent analysis of their effect on patient outcomes.

Kelava, Marta; Alfirevic, Andrej; Bustamante, Sergio; Hargrave, Jennifer; Marciniak, Donn
Anesthesia & Analgesia. 131(1):127-135, July 2020

Ten years of the Helsinki Declaration on patient safety in anaesthesiology: An expert opinion on peri-operative safety aspects

Patient safety is an activity to mitigate preventable patient harm that may occur during the delivery of medical care. The European Board of Anaesthesiology (EBA)/European Union of Medical Specialists had previously published safety recommendations on minimal monitoring and postanaesthesia care, but with the growing public and professional interest it was decided to produce a much more encompassing document. The EBA and the European Society of Anaesthesiology (ESA) published a consensus on what needs to be done/achieved for improvement of peri-operative patient safety. During the Euroanaesthesia meeting in Helsinki/Finland in 2010, this vision was presented to anaesthesiologists, patients, industry and others involved in health care as the 'Helsinki Declaration on Patient Safety in Anaesthesiology'. In May/June 2020, ESA and EBA are celebrating the 10th anniversary of the Helsinki Declaration on Patient Safety in Anaesthesiology; a good opportunity to look back and forward evaluating what was achieved in the recent 10 years, and what needs to be done in the upcoming years. The Patient Safety and Quality Committee (PSQC) of ESA invited experts in their fields to contribute, and these experts addressed their topic in different ways; there are classical, narrative reviews, more systematic reviews, political statements, personal opinions and also original data presentation. With this publication we hope to further stimulate implementation of the Helsinki Declaration on Patient Safety in Anaesthesiology, as well as initiating relevant research in the future.

Preckel, Benedikt; Staender, Sven; Arnal, Daniel; Bratteb, Guttorm et al
European Journal of Anaesthesiology. 37(7):521-610, July 2020.

Simulation in obstetric anesthesia: an update

Simulation training is becoming more integrated in the modern education of anesthesiologists. Research regarding the most effective way to perform simulation training in terms of learning outcomes and long-term skill retention has started to appear. Scenarios which are played independently and that allow for simulated mortality, as well as relaxation techniques before debriefing might have positive effects in this regard. Furthermore, simulation has been investigated as a tool to improve patient safety in low-resource settings. In addition, simulation training in the domain of obstetrics has been rapidly expanding and has an important role in this field of medicine as well.

Simulation training has acquired a central role in modern education of anesthesiologists. Further research regarding elements to optimize simulation training in terms of learning outcomes and long-term skill retention is desirable. In addition, little data exist concerning the effect of simulation training on possible improvement of patient outcomes in anesthesia.

Marynen, Frederik; Van Gerven, Elke; Van de Velde, Marc
Current Opinion in Anaesthesiology: 33(3): 272-276, June 2020.

Compassionate Use of Remdesivir for Patients with Severe Covid-19

BACKGROUND: Remdesivir, a nucleoside analogue prodrug that inhibits viral RNA polymerases, has shown in vitro activity against SARS-CoV-2.

METHODS: We provided remdesivir on a compassionate-use basis to patients hospitalized with Covid-19, the illness caused by infection with SARS-CoV-2. Patients were those with confirmed SARS-CoV-2 infection who had an oxygen saturation of 94% or less while they were breathing ambient air or who were receiving oxygen support. Patients received a 10-day course of remdesivir, consisting of 200 mg administered intravenously on day 1, followed by 100 mg daily for the remaining 9 days of treat- ment. This report is based on data from patients who received remdesivir during the period from January 25, 2020, through March 7, 2020, and have clinical data for at least 1 subsequent day.

RESULTS: Of the 61 patients who received at least one dose of remdesivir, data from 8 could not be analyzed (including 7 patients with no post-treatment data and 1 with a dosing error). Of the 53 patients whose data were analyzed, 22 were in the United States, 22 in Europe or Canada, and 9 in Japan. At baseline, 30 patients (57%) were receiving mechanical ventilation and 4 (8%) were receiving extracorporeal mem- brane oxygenation. During a median follow-up of 18 days, 36 patients (68%) had an improvement in oxygen-support class, including 17 of 30 patients (57%) receiving mechanical ventilation who were extubated. A total of 25 patients (47%) were discharged, and 7 patients (13%) died; mortality was 18% (6 of 34) among patients receiving invasive ventilation and 5% (1 of 19) among those not receiving invasive ventilation.

CONCLUSIONS: In this cohort of patients hospitalized for severe Covid-19 who were treated with compassionate-use remdesivir, clinical improvement was observed in 36 of 53 patients (68%). Measurement of efficacy will require ongoing randomized, placebo- controlled trials of remdesivir therapy.

Grein J, Ohmagari N, Shin D, et al. Compassionate Use of Remdesivir for Patients with Severe Covid-19. N Engl J Med. 2020;382(24):2327-2336.

Effect of Convalescent Plasma Therapy on Time to Clinical Improvement in Patients With Severe and Life-threatening COVID-19: A Randomized Clinical Trial.

OBJECTIVE To evaluate the efficacy and adverse effects of convalescent plasma therapy for patients with COVID-19.

DESIGN, SETTING, AND PARTICIPANTS Open-label, multicenter, randomized clinical trial performed in 7 medical centers in Wuhan, China, from February 14, 2020, to April 1, 2020, with final follow-up April 28, 2020. The trial included 103 participants with laboratory- confirmed COVID-19 that was severe (respiratory distress and/or hypoxemia) or life-threatening (shock, organ failure, or requiring mechanical ventilation). The trial was terminated early after 103 of a planned 200 patients were enrolled.

INTERVENTION Convalescent plasma in addition to standard treatment (n = 52) vs standard treatment alone (control) (n = 51), stratified by disease severity.

MAIN OUTCOMES AND MEASURES Primary outcome was time to clinical improvement within 28 days, defined as patient discharged alive or reduction of 2 points on a 6-point disease severity scale (ranging from 1 [discharge] to 6 [death]). Secondary outcomes included 28-day mortality, time to discharge, and the rate of viral polymerase chain reaction (PCR) results turned from positive at baseline to negative at up to 72 hours.

RESULTS Of 103 patients who were randomized (median age, 70 years; 60 [58.3%] male), 101 (98.1%) completed the trial. Clinical improvement occurred within 28 days in 51.9% (27/52) of the convalescent plasma group vs 43.1% (22/51) in the control group (difference, 8.8% [95% CI, −10.4% to 28.0%]; hazard ratio [HR], 1.40 [95% CI, 0.79-2.49]; P = .26). Among those with severe disease, the primary outcome occurred in 91.3% (21/23) of the convalescent plasma group vs 68.2% (15/22) of the control group (HR, 2.15 [95% CI, 1.07-4.32]; P = .03); among those with life-threatening disease the primary outcome occurred in 20.7% (6/29) of the convalescent plasma group vs 24.1% (7/29) of the control group (HR, 0.88 [95% CI, 0.30-2.63]; P = .83) (P for interaction = .17). There was no significant difference in 28-day mortality (15.7% vs 24.0%; OR, 0.65 [95% CI, 0.29-1.46]; P = .30) or time from randomization to discharge (51.0% vs 36.0% discharged by day 28; HR, 1.61 [95% CI, 0.88-2.93]; P = .12). Convalescent plasma treatment was associated with a negative conversion rate of viral PCR at 72 hours in 87.2% of the convalescent plasma group vs 37.5% of the control group (OR, 11.39 [95% CI, 3.91-33.18]; P < .001). Two patients in the convalescent plasma group experienced adverse events within hours after transfusion that improved with supportive care.

CONCLUSION AND RELEVANCE Among patients with severe or life-threatening COVID-19, convalescent plasma therapy added to standard treatment, compared with standard treatment alone, did not result in a statistically significant improvement in time to clinical improvement within 28 days. Interpretation is limited by early termination of the trial, which may have been underpowered to detect a clinically important difference.

Li L, Zhang W, Hu Y, et al. Effect of Convalescent Plasma Therapy on Time to Clinical Improvement in Patients With Severe and Life-threatening COVID-19: A Randomized Clinical Trial. JAMA. Published online June 3, 2020.

Low-cost dexamethasone reduces death by up to one third in hospitalised patients with severe respiratory complications of COVID-19 — RECOVERY Trial.

The RECOVERY Trial is conducted by the registered clinical trials units with the Nuffield Department of Population Health in partnership with the Nuffield Department of Medicine. The trial is supported by a grant to the University of Oxford from UK Research and Innovation/National Institute for Health Research (NIHR) and by core funding provided by NIHR Oxford Biomedical Research Centre, Wellcome, the Bill and Melinda Gates Foundation, the Department for International Development, Health Data Research UK, the Medical Research Council Population Health Research Unit, and NIHR Clinical Trials Unit Support Funding.

The RECOVERY trial involves many thousands of doctors, nurses, pharmacists, and research administrators at over 175 hospitals across the whole of the UK, supported by staff at the NIHR Clinical Research Network, NHS DigiTrials, Public Health England, Public Health Scotland, Department of Health & Social Care, and the NHS in England, Scotland, Wales and Northern Ireland.

Overall dexamethasone reduced the 28-day mortality rate by 17% (0.83 [0.74 to 0.92]; P=0.0007) with a highly significant trend showing greatest benefit among those patients requiring ventilation (test for trend p<0.001). But it is important to recognise that we found no evidence of benefit for patients who did not require oxygen and we did not study patients outside the hospital setting. Follow-up is complete for over 94% of participants.

https://www.recoverytrial.net/news/low-cost-dexamethasone-reduces-death-by-up-to-one-third-in-hospitalised-patients-with-severe-respiratory-complications-of-covid-19. Accessed June 25, 2020.

No clinical benefit from use of hydroxychloroquine in hospitalised patients with COVID-19 — RECOVERY Trial.

‘Hydroxychloroquine and chloroquine have received a lot of attention and have been used very widely to treat COVID patients despite the absence of any good evidence. The RECOVERY Trial has shown that hydroxychloroquine is not an effective treatment in patients hospitalised with COVID-19. Although it is disappointing that this treatment has been shown to be ineffective, it does allow us to focus care and research on more promising drugs.’

https://www.recoverytrial.net/news/statement-from-the-chief-investigators-of-the-randomised-evaluation-of-covid-19-therapy-recovery-trial-on-hydroxychloroquine-5-june-2020-no-clinical-benefit-from-use-of-hydroxychloroquine-in-hospitalised-patients-with-covid-19. Accessed June 25, 2020.

Tocilizumab therapy reduced intensive care unit admissions and/or mortality in COVID-19 patients.

Introduction. No therapy has yet proven effective in COVID-19. Tocilizumab (TCZ) in patients with severe COVID-19 could be an effective treatment.

Method. We conducted a retrospective case-control study in the Nord Franche-Comté Hospital, France. We compared the outcome of patients treated with TCZ and patients without TCZ considering a combined primary endpoint: death and/or ICU admissions.

Results. Patients with TCZ (n=20) had a higher Charlson comorbidity index (5.3 [±2.4] vs 3.4 [±2.6], p=0.014), presented with more severe forms (higher level of oxygen therapy at 13 L/min vs 6 L/min, p<0.001), and had poorer biological findings (severe lymphopenia: 676/mm3 vs 914/mm3, p=0.037 and higher CRP level: 158 mg/l vs 105 mg/l, p=0.017) than patients without TCZ (n=25). However, death and/or ICU admissions were higher in patients without TCZ than in the TCZ group (72% vs 25%, p=0.002).

Conclusion. Despite the small sample size and retrospective nature of the work, this result strongly suggests that TCZ may reduce the number of ICU admissions and/or mortality in patients with severe SARS-CoV-2 pneumonia.

Klopfenstein T, Zayet S, Lohse A, et al. Tocilizumab therapy reduced intensive care unit admissions and/or mortality in COVID-19 patients. Med Mal Infect. Published online May 6, 2020.

Supraglottic airway devices for Caesarean delivery under general anaesthesia: for all, for none, or for some?

Currently, there is insufficient evidence to recommend universal or selective replacement of tracheal tubes with SGA devices during general anaesthesia for Caesarean delivery. Aspiration remains the main concern. Whatever airway strategy modifications take place, it is important to remember that changing our practice of airway management in pregnant women should not go against de- cades of improving maternal safety. With further progress and more widely available expertise in gastric ultrasonography, we might be able to identify women at low risk of aspiration (non- solid contents and low volume), and depending on body habitus and co-morbidities, these women might be candidates for airway management with an SGA device.

Yavor Metodiev1, Mary Mushambi
British Journal of Anaesthesia, 125 (1): e7ee11 (2020) doi: 10.1016/j.bja.2020.02.012

Effectiveness of Prescription Monitoring Programs in Reducing Opioid Prescribing, Dispensing, and Use Outcomes: A Systematic Review

Prescription monitoring programs (PMPs) house and monitor data about the prescribing practices of health care providers, as well as medications received by patients. PMPs aim to promote the appropriate use of prescription opioids by providing this information to prescribers and dispensers. Our objective in this systematic review was to comprehensively identify and assess the available evidence about the impact of PMPs on opioid prescribing and dispensing, multiple provider use for obtaining opioids, inappropriate opioid prescribing, and the extent of nonmedical prescription opioid use. We used a comprehensive search strategy and included study designs that could determine changes in outcomes with the implementation of a PMP. We included 24 studies; 75% of studies were conducted in the United States, and studies encompassed data years from 1993 to 2014. Overall, we did not find evidence to support an association between PMPs and decreased opioid prescribing and dispensing. We found limited, but inconsistent, evidence that PMPs were associated with reduced schedule II opioid prescribing and dispensing, as well as multiple provider use. Covariate adjustment was often inadequate in analyses, as was the timing of outcome and PMP measurement. Future studies should broaden their geographic scope to other countries and use more recent data with standard measurement.

Maria N. Wilson, Jill A. Hayden, Emily Rhodes, Alysia Robinson
The Journal of Pain, 2019; 20 (12): 1383–1393

Pediatric obstructive sleep apnea: Preoperative and neurocognitive considerations for perioperative management

Obstructive sleep apnea (OSA) affects up to 7.5% of the pediatric population and is associated with a variety of behavioral and neurocognitive sequelae. Prompt diagnosis and treatment is critical to halting and potentially reversing these changes. Depending on the severity of the OSA and comorbid conditions, different treatment paradigms can be pursued, each of which has its own unique risk:benefit ratio. Adenotonsillectomy is first-line recommended surgical treatment for pediatric OSA. However, it carries its own perioperative risks and the decision regarding surgical timing is therefore made in the context of procedural risk versus patient benefit. This article presents the seminal perioperative and neurocognitive risks from pediatric OSA to aid with perioperative management.

Arvind Chandrakantan Mary F. Musso Thomas Floyd Adam C. Adler
Pediatric Anesthesia, 2020; 30(5): 529-536

Management of neonatal difficult airway emergencies in the delivery room

Neonatal airway emergencies in the delivery room are associated with significant morbidity and mortality. Etiologies vary, but often predispose the neonate to life threatening airway obstruction. With the recent expansion of fetal medicine programs, pediatric anesthesiologists are increasingly being asked to care for these patients. In this review, we discuss common etiologies of difficult airway at delivery, management tools and techniques, and surgical approaches.

Maria N. Wilson, Jill A. Hayden, Emily Rhodes, Alysia Robinson Elaina E. Lin Olivia Nelson Rebecca S. Isserman Alicia A. Henderson Natalie E. Rintoul Janet Lioy Luv R. Javia Kha M. Tran John E. Fiadjoe
Pediatric Anesthesia, 2020; 30(5): 544-551

Prophylactic use of acid suppressants in adult acutely ill hospitalised patients: A systematic review with meta-analysis and trial sequential analysis

Acutely ill patients are at risk of stress-related gastrointestinal (GI) bleeding and prophylactic acid suppressants are frequently used. In this systematic review, we assessed the effects of stress ulcer prophylaxis (SUP) with proton pump inhibitors (PPIs) or histamine-2 receptor antagonists (H2RAs) versus placebo or no prophylaxis in acutely ill hospitalised patients.

We conducted the review according to the PRISMA statement, the Cochrane Handbook and GRADE, using conventional meta-analysis and trial sequential analysis (TSA). The primary outcomes were all-cause mortality, clinically important GI bleeding and serious adverse events (SAEs). The primary analyses included overall low risk of bias trials. We included 65 comparisons from 62 trials (n = 9713); 43 comparisons were from intensive care units. Only three trials (n = 3596) had overall low risk of bias. We did not find an effect on all-cause mortality (RR 1.03, 95% CI 0.94 to 1.14; TSA-adjusted CI 0.90 to 1.18; high certainty). The rate of clinically important GI bleeding was lower with SUP (RR 0.62, 95% CI 0.43 to 0.89; TSA-adjusted CI 0.14 to 2.81; moderate certainty). We did not find a difference in pneumonia rates (moderate certainty). Effects on SAEs, Clostridium difficile enteritis, myocardial ischaemia and health-related quality of life (HRQoL) were inconclusive due to sparse data. Analyses of all trials regardless of risk of bias were consistent with the primary analyses. We did not observe a difference in all-cause mortality or pneumonia with SUP. The incidence of clinically important GI bleeding was reduced with SUP, whereas any effects on SAEs, myocardial ischaemia, Clostridium difficile enteritis and HRQoL were inconclusive.

Søren Marker Marija Barbateskovic Anders Perner Jørn Wetterslev Janus C. Jakobsen Mette Krag Anders Granholm Carl T. Anthon Morten H. Møller
Acta Anesthesiologica Scandinavica, 2020; 64(6): 714-728

Periprocedural Anticoagulation Management For Nonoperating Room Anesthesia Procedures: A Clinical Guide

Non-operating room anesthesia presents unique challenges for anesthesiologists. Limited preprocedural optimization and unfamiliarity with the location and procedure itself add to the difficulties in delivering safe care for these patients. Management of chronic oral anticoagulation can prove especially problematic since risks of bleeding for non-operating room procedures vary widely and differ from traditional surgeries. In addition, many physicians may not be familiar with the growing number of newly approved oral anticoagulants and their periprocedural management. This review will examine common non-operating procedures, their risks of bleeding, as well as pharmacokinetics of oral anticoagulants available on the market and periprocedural management options.

Jing Tao, Adriana D. Oprea,
Seminars in Cardiothoracic and Vascular Anesthesia, 2019; 23(4), 352–368.

Point-of-care ultrasound in pregnancy: gastric, airway, neuraxial, cardiorespiratory

Gastric ultrasound is a useful aspiration risk assessment tool in pregnant patients. Total gastric fluid assessment models and specific cut-offs between high-risk and low-risk stomachs are presented. Airway assessment is useful to detect specific changes in pregnancy and to guide airway management. Handheld ultrasound devices with automated neuraxial landmark detection capabilities could facilitate needle placement in the future. Lung and cardiac ultrasonography is useful in the management of preeclampsia, pulmonary arterial hypertension and peripartum cardiomyopathy.

Owing to its noninvasiveness, ease of accessibility and lack of exposure to radiation, PoCUS plays an increasing and essential role in aspiration risk assessment, airway management, neuraxial anaesthesia and cardiorespiratory diagnosis and decision-making during pregnancy.

Van de Putte, Peter; Vernieuwe, Lynn; Bouchez, Stefaan
Current Opinion in Anaesthesiology. 33(3):277-283, June 2020.

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