

Anesthesiologi

- Malaysian Society of Anaesthesiologists
- College of Anaesthesiologists, Academy of Medicine of Malaysia



Message from the President of the MSA

PROFESSOR DR MARZIDA MANSOR



Malaysian Society
of Anaesthesiologists



College of
Anaesthesiologists, AMM

This is probably my last message as the President to members before I step down in August 2021. By now, we have been in the pandemic for more than 18 months. The situation in our country is regrettable with regards to the management of the pandemic thus far. We are now like many other countries struggling to cope with COVID-19 variants especially the Delta variant. Despite the country employing multiple strategies to curb the pandemic which include the MCO 3.0 (FMCO), ramping up the rate of vaccination, adherence to strict SOPs, mass testing, contact tracing and immediate isolation, the number of cases and deaths continue to rise.

Meanwhile, the MSA has been tirelessly involved in trying to help the government to manage the pandemic in whichever way possible. The MSA has been providing guidelines related to the management of the pandemic especially relevant to anaesthesiologists. Members can find these guidelines on the MSA website. We have also worked closely with the College of Anaesthesiologists, Malaysian Society of Intensive Care and Malaysian Health Coalition (MHC) in making press statements to promote advocacy of health system reform.

Allow me to share with you some of the Society activities since March 2021.

Press Statements

We have released a press statement on 13th June 2021, to debunk the myth regarding vaccination and anaesthesia. The fake news that had gone viral suggested that anyone who receives the coronavirus vaccine is prohibited from taking any type of anaesthetic including local anaesthetic as this poses an extreme danger to the life of the vaccinated person. We decided not to allow such false statements to propagate as they may impact many vulnerable individuals awaiting anaesthesia for surgical procedures.

A Joint Press statement was released on 22nd June 2021 in response to the press statement by the Health Minister, Datuk Seri Dr Adham Baba, as reported by Bernama News Agency on 20th June 2021 with regards to the purchase of 500 negative pressure ambulances to transport COVID-19 patients. We are of the opinion that negative pressure ambulances do not improve outcome nor help improve the COVID-19 situation. The purchase of these ambulances will have serious monetary consequences.

Donation to Labuan Hospital

As we are all aware, Labuan had been hit badly by the Delta variant recently, leading to a high mortality rate and an overwhelming health services. The MSA, together with the CoA, the AMM and other affiliated medical organisations have made a donation to Hospital Labuan Sabah where we have provided five high flow nasal cannulae oxygen delivery devices (HFNCs) to help them cope with cases in the interim period.

MSA and CoA Annual Scientific Meeting - MyAnaesthesia 2021

I would like to encourage members to participate in the upcoming main anaesthesia conference for this year that will be conducted virtually. We have prepared an interesting scientific programme and are looking forward for full support from members.

Annual General Meeting 2021

The AGM will also be held virtually this year on 6th August 2021. It will be held in conjunction with the ASC. We hope that more members will be joining us this time from their homes or work places.

MSA/CoA Series of Webinar

The following have been conducted and scheduled:
27th March 2021 - Paediatric Anaesthesia Update Webinar

- 27th March 2021 - Perioperative ERAS Approach Webinar (In collaboration with Baxter)
- 10th April 2021 - Critical Care Webinar
- 24th April 2021 - Neuroanaesthesia Webinar (in collaboration with Persatuan Kakitangan Anestesiologi Hospital Umum Sarawak)
- 8th May 2021 - Ultrasound SIG Webinar
- 12th June 2021 - Extracorporeal Membrane Oxygenation (ECMO) Webinar
- 26th June 2021 - Pain SIG Webinar - Hypnotherapy in Pain Management
- 3rd to 4th July 2021 - Neuroanaesthesia Symposium

17th World Congress of Anaesthesiologists (WCA)

The 17th WCA will be held from 1st - 5th September 2021 virtually, by the WFSA (World Federation of Society of Anaesthesiologists). The MSA will be participating in the WCA 2021's Global Anaesthesia Village to promote our organisation alongside a range of organisations interested in anaesthesia and surgical safety.

We have also recommended three MSA members for the WCA scholarship. Successful applicants will gain full access to the virtual platform, abstract presentations, networking events and much more. Members are reminded that they can also apply for MSA sponsorships if they are presenting oral or poster presentations at the conference.

K Inbasegaran Research Fund

Applications are called for the K Inbasegaran Research Fund valued up to RM10,000 per year. The purpose of this fund is to support partially or fully one or more research projects in the study of anaesthesia, intensive care medicine, pain medicine and related sciences and branches of medicine. This fund is available for application annually from the 1st June till 30th September. Approval for the funds will be made known to applicants by November. Administration of this fund is executed by MSA Research Committee.

Korea Anaesthesia 2021

4th to 6th November 2021, Bexco, Busan, Korea (Hybrid)

The MSA has nominated three speakers and three moderators to represent Malaysia for the congress. The speakers are Associate Professor Dr Azarinah Izaham (Ambulatory Anaesthesia), Dato' Dr Wan Rahiza Wan Mat (Critical care) and Dr Sanah Mokhtar (Paediatric Anaesthesia).

It has been a very challenging and debilitating year for all of us especially the general public. I hope everyone continues to stay safe and strong. See you at the upcoming ASC!

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Last Defence of The South: Our Story

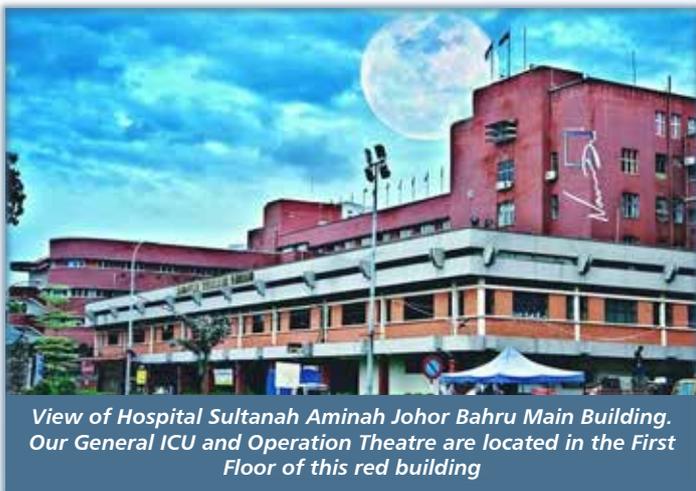
by Dr Nur Fadhlina Arifin

حَسْبُنَا اللَّهُ وَنِعْمَ الْوَكِيلُ

ALLAH is sufficient for me, and He is the best Disposer of affairs.

2020/21 has been a difficult period for all of us, and yet the end of this pandemic is nowhere near in sight. It never occurred to us that we would ever face a situation similar to the 2011 movie, Contagion. All existing plans had to be set aside as the pandemic rages on. It is unprecedented in magnitude, affecting the entire world, with most health care workers having no experience in managing COVID-19.

In Malaysia, the first three cases were reported on 26th January 2020, with the numbers gradually increasing after. The first intubation of a COVID-19 patient in Malaysia was performed in March 2020 by our Hospital Sultanah Aminah (HSA) team. In the earlier stages of this pandemic, the psychiatric hospital, Hospital Permai (HP) became the admission centre for COVID-19 patients in Johor. An anaesthetic team was on standby in the event of any deterioration. For our first Category 5 COVID-19 patient, the whole process of preparation, intubation, and transfer from HP to the Isolation Room in HSA took nearly six hours, even though the two hospitals are only 15km apart. This was the first time we donned the powered air purifying respirator (PAPR) with assistance from the Forensic Department. Despite being fully protected, the fear of contracting the disease was overwhelmingly present. "Patient No. 26" eventually recovered after two weeks in the Intensive Care Unit (ICU).



View of Hospital Sultanah Aminah Johor Bahru Main Building. Our General ICU and Operation Theatre are located in the First Floor of this red building

HP has ample space compared to the cramped and busy HSA but lacks the monitoring and resuscitative equipment including oxygen supply. HSA on the other hand is a tertiary and referral centre for most major medical and surgical disciplines with 25 general ICU beds including two Isolation Rooms. Hence, the decision was made to triage and transfer potential deteriorating patients to the HSA ICU and the Officer Ward.

In March 2020, with the increasing numbers of COVID-19 positives from the Sri Petaling Cluster, there was an urgent need to increase our COVID-19 ICU bed capacity in anticipation of more critically ill patients. We started to find more areas that could be utilized as COVID-19 intensive care areas and even proposed for a mobile ICU. HSA, unlike other newer hospitals, was built in 1882. Even the addition of our main building (the T-shaped five-story building) was completed way back in 1941. After being hit by a deadly fire tragedy in our old South ICU which was on the second floor of the main building back in 2016, the General ICU was shifted to the first floor near the Operating Theatre (OT).



On site user training when transporting our first intubated COVID-19 patient from Hospital Permai to ICU, HSAJB

Unexpectedly, there was light at the end of the tunnel, as the Paediatric and Neurosurgical departments offered their ICU beds to accommodate our needs. After mutual agreement between the various heads, six Paediatric ICU beds (in a different block) were transformed to become a full COVID-19 ICU in exchange for our six General ICU beds and we took over four out of 10 Neuro High Dependency Unit (HDU) beds for our non-COVID ICU patients. Intensivists, Specialists and Medical Officers of

HSA and Hospital Sultan Ismail (HSI) were rotated between the two hospitals to ensure optimal care for both COVID and non-COVID patients. We had to adapt fast to be able to effectively manage the patients without compromising on our own safety. Donning and doffing Personal Protective Equipment (PPE) and PAPR became our daily routine. The major challenges then were unfamiliarity, lack of protective equipment and our own fear of this relatively unknown disease. There were even days when we had to put on colourful plastic trash bags as hood covers due to insufficient supply.

The six beds in the new COVID-19 ICU were filled up fast in just a few days. On 17th March 2020, Malaysia recorded two deaths from COVID-19, the first fatalities due to the pandemic. The death involved case number 358, reported in Sarawak and case number 178 from our very own centre, barely just a few minutes apart. The unexpected deterioration and sudden death of the patient left us grieving despite the short acquaintance. On 27th March 2021, the Johor Health Department made the drastic move to turn Hospital Enche' Besar Hajjah Khalsom (HEBHK) in Kluang into a COVID-19 designated hospital for the state. It was a huge challenge to equip HEBHK with the proper equipment and staffing, to cater for the sudden increase of patient load especially from the Simpang Renggam Cluster. All the intubated COVID patients were gradually transferred to HEBHK. More manpower from all the hospitals in Johor were rotated to HEBHK on a one or two-week basis to support the extension of beds.

The months of June to September 2020 were our cooling period in Johor as the new confirmed COVID-19 cases were on a decline. The public started to relax as CMCO was declared in place of the stricter MCO. In HSA, the elective operating list, the pre-operative anaesthetic clinic, and two post anaesthesia care unit (PACU) beds were reopened, and the General ICU was back in the original location. We thought that the worst of the pandemic was over, when it actually had only just begun.

The third wave of the pandemic came in early September 2020 with a sudden surge of cases due to the two largest contributors: the Benteng Lahad Datu cluster in Sabah and Tembok cluster in Kedah. Daily confirmed cases of COVID-19 reached between 2000 to 4000 cases. Healthcare workers including doctors, nurses and other frontliners were found to be tested positive for COVID-19. The challenges faced by our healthcare system were tremendous and started taking a toll on the frontliners. The wave initially observed in East Malaysia was now



Converting Paediatrics ICU into Adult COVID ICU during our early days. The patient survived after all the difficulties

coming to Peninsula Malaysia with the political campaigners. And in a blink of an eye, 10 COVID ICU beds became 34 beds in HEBHK. Another huge mobilization of staff and doctors from other hospitals was initiated to assist HEBHK in this crisis. Under the leadership of our dedicated Intensivist and Infectious Disease Consultants, the doctors from various hospitals formed a formidable team. Meanwhile, those who were not mobilized continued to hold the fort managing the non-COVID patients. We kept our spirits high by cheering each other on and focusing on the positive things. Nowadays, wearing PPE is a new norm in the workplace and we can do the donning in 5-10 minutes.

Days turned into weeks; and weeks turned into months. From HEBHK, we returned to HSA. out of the 25 General ICU beds, seven were converted for ventilating COVID patients in HSA. Although it was not ideal but that was the best option to offer. Two layers of plastic coverings were the only barrier that separated us from the patients for both the COVID and non-COVID cubicles. Although we were managing COVID patients; the trauma, medical and surgical patients were never neglected.

As we entered the 2021, we were all hoping for a better year. The pandemic had either brought out the best (or the worst) in each of us. The National Immunization



From one cubicle, we extended ourselves to two cubicle and subsequently all were converted to become COVID ICU

Programme prioritizing frontliners was started in March 2021, to ensure protection for the healthcare workers who are managing COVID patients. However, the rise of new variants with more severe clinical presentations was causing serious concern. Although the real-time reproductive numbers has been maintained at around 1.0, the upcoming religious and social traditions in the month of Ramadan and Hari Raya in May 2021 might lead to a resurgence of COVID-19 cases. As expected, despite the movement control order, the ICU utilization rate increased to 60% by the end of April 2021. All these patients were scattered in every district in Johor, with the majority from Johor Bahru. Furthermore, the manpower in HEBHK had been called back to their original hospitals, leaving us with no other choice but to manage our own COVID patients.



Our current ICU situation; separated by plastic barrier

On the ground, there was an increase in younger category four patients in the ward, appearing helpless on high flow masks with poor oxygen saturations. At one point, we had more COVID patients than non-COVID patients who needed to be seen during the periphery rounds. The situation peaked when we had twelve ventilated COVID patients with portable ventilators, forty patients on high flow masks pending intubation in the medical ward, and we were running out of portable ventilators to support them. This led us to set up an acute care unit for 12 beds in the Officer Ward (designated COVID medical ward) while converting another six GICU beds to COVID beds. It was definitely a challenging task to convert a medical ward to become a 'mini ICU' with limited trained nurses and equipment within such a short period of time. The perfectionist in you wants to give the best to the patients

but the circumstances demand otherwise. There is hardly any ventilation in the medical ward and working in PPE makes you feel suffocated. The whole picture could best be described as a war zone. Seeing all these ventilated patients with nothing much that we could offer brought our morale down further. The suction machines and infusion pumps were shared between the patients; the much-needed equipment did arrive later. Most of the doctors and nurses were experiencing burnout at the end of their shift.

The setting up of an 'acute care unit' in the medical ward was planned as a temporary measure while mobilizing in-house intubated non-COVID patients in the General ICU. As the number of COVID patients who needed intubation rose rapidly, acute measures were needed. At the end of the first week of May, all 27 beds had been converted to COVID ICU beds, whereas 10 non-COVID ICU beds were created in CCU, Cardiothoracic Rehabilitation Ward, Cardiothoracic ICU and even three beds in the Operation Theatre. As a hybrid hospital, we were obliged to deliver optimum care to both categories of patients within our means.



Utilisation of Operation Theatre to accommodate three non-COVID ICU beds

As compared to the previous waves, the current fourth wave hit us harder with more and more people whom we knew or were close to, becoming affected directly by the pandemic.

Exhausted mentally and physically, healthcare workers have to persevere to prevent the collapse of our healthcare system. Not only are we overburdened with work, we have also become the target of the people's dissatisfaction. Circulating fake news and disbelief of the pandemic further frustrated us. Getting psychological aid or professional help is recommended to off-load mental stress.

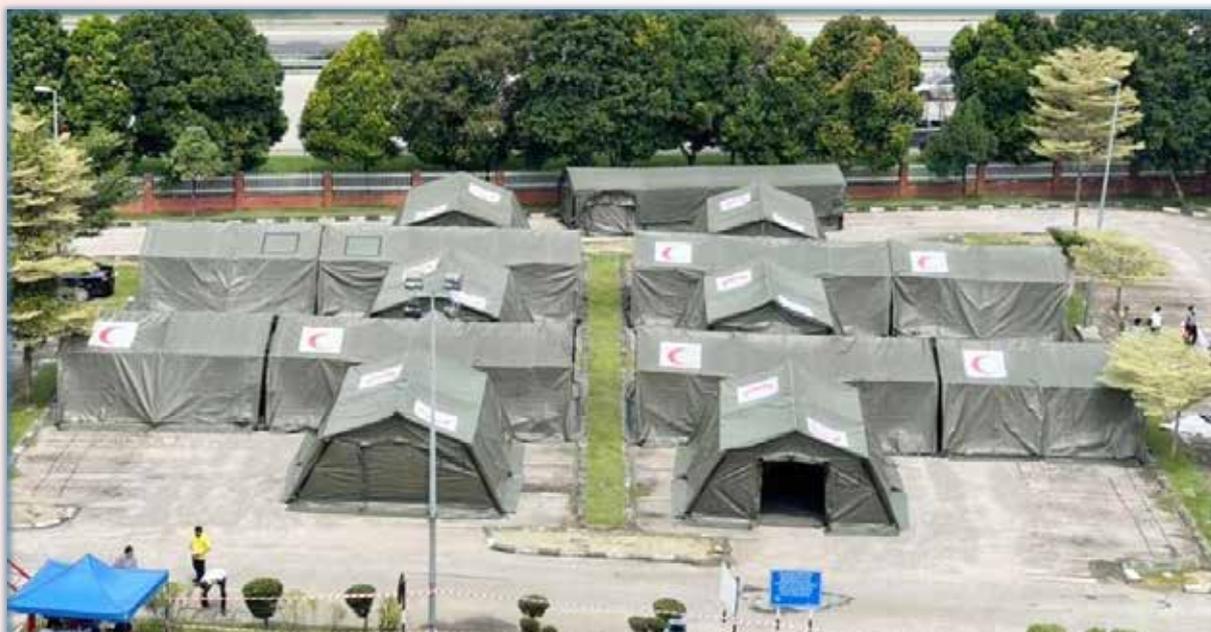
Although we are already into the third quarter of 2021, there is still no sign that this pandemic will be over any

time soon. Here in HSA, a mobile ICU with four beds and a field hospital with 40 beds has been set up in anticipation of a higher demand in the upcoming weeks. Whether it will be a success or just a political show, we are expected to give our whole commitment and effort.

Handling this pandemic has not been easy, regardless of whether you are a clinician or administrator. Hard decisions need to be made at times, and often these decisions will affect others inversely. Every decision has a ripple effect. Beds, equipment and staff inadequacy will constantly be a vicious cycle. All we can do at this point is hope for the best and do what we can within our capacity. Our utmost appreciation to all the leaders, clinicians,

medical assistants, nurses, supporting staff who have all been in this together, working tirelessly day and night. Also many thanks to the NGOs, numerous associations and organisations as well as individuals who have contributed in one way or another to support the medical community.

At the end of the day, nothing can quite beat the feeling of seeing your previously ill patient coming back to see you after recovery, walking on their own and living their second chance in life. If our deeds are not compensated adequately or not appreciated by anyone here on Earth, have faith that may we all be rewarded in the afterlife. Amin.



Ongoing field hospital in collaboration with the ATM Forces to increase bed capacity



When the going gets tough, the tough gets going. This pandemic has seen every level of staff step up, learning from and supporting one another

Dynastat[®]
(parecoxib) is
recommended
as an **effective**
component
of multimodal
analgesia for
the management
of acute
postsurgical pain
in all
ERAS society
guidelines.¹

ERAS; enhanced recovery after surgery



Images for representation purposes only

Abbreviated Prescribing Information²

Composition: Parecoxib sodium powder and solvent for solution for injection. **Indications:** For management of post-operative pain in the immediate post-operative setting only. **Recommended dosage:** Initial dose – 40mg (given IV or IM) followed by 20 or 40mg every 6 to 12 hours, as required, up to a maximum daily dosage of 80mg. There is limited clinical experience with parecoxib treatment beyond three days. Reduce to half the dose for elderly patients <50kg. For moderate hepatic impairment, use lowest recommended dose. Not recommended in severe hepatic impairment patients. Caution should be observed in patients with severe renal impairment or patients who may be predisposed to fluid retention. Parecoxib should be initiated at the lowest recommended dose. **Contraindications:** Patients with known hypersensitivity to parecoxib or to any other ingredient of the product. Patients who have demonstrated allergic-type reactions to sulfonamides. Patients who have experienced asthma, urticaria, or allergic-type reactions after taking acetylsalicylic acid (aspirin) or non-steroidal anti-inflammatory drugs (NSAIDs), including other cyclooxygenase-2 (COX-2) specific inhibitors. Severe hepatic impairment (serum albumin <25g/L or Child-Pugh score ≥10). The third trimester of pregnancy and breast-feeding. Active peptic ulceration or gastrointestinal (GI) bleeding. Inflammatory bowel disease. Congestive heart failure (NYHA II-IV). Treatment of post-operative pain following coronary artery bypass graft (CABG) surgery. Established ischaemic heart disease, peripheral arterial disease and/or cerebrovascular disease. **Special Precautions:** COX-2 inhibitors have been associated with an increased risk of cardiovascular and thrombotic adverse events when taken long term. Upper gastrointestinal (GI) perforations, ulcers, or bleeds have occurred in patients treated with parecoxib. Valdecoxib, the active moiety of parecoxib, contains a sulfonamide moiety and patients with a known history of a sulfonamide allergy may be at a greater risk of skin reactions. Serious skin reactions, including erythema multiforme and Stevens-Johnson syndrome, hypersensitivity reactions (anaphylactic reactions and angioedema), and drug reaction with eosinophilia and systemic symptoms syndrome (DRESS syndrome) may occur. Cases of severe hypotension shortly following parecoxib administration have been reported in post-marketing experience with parecoxib. Anticoagulant activity should be monitored, particularly during the first few days after initiating parecoxib, in patients receiving warfarin or similar agents, since these patients may be at increased risk of bleeding complications. As with all NSAIDs, parecoxib can lead to the onset of new hypertension or worsening of pre-existing hypertension, either of which may contribute to the increased incidence of cardiovascular events. As with other drugs known to inhibit prostaglandin synthesis, fluid retention and edema have been observed in some patients taking parecoxib. Caution should be used when initiating treatment in patients with dehydration. A patient with symptoms and/or signs of liver dysfunction, or in whom an abnormal liver function test has occurred, should be monitored carefully for evidence of the development of a more severe hepatic reaction while on therapy with parecoxib. By reducing inflammation, parecoxib may diminish the utility of diagnostic signs, such as fever, in detecting infections. The concomitant use of pain, constipation, dyspepsia, vomiting, edema peripheral, alveolar osteitis (dry socket), dizziness, insomnia, oliguria, sweating increased, pruritus, hypotension. **Presentation:** 5 x 1's vial of 40mg parecoxib with 5 x 2mL solvent and 10 x 1's vial of 40mg parecoxib.

Full prescribing information is available upon request.
API-DYNASTAT-1120

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For Healthcare Professionals only



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COVID-19 in Pregnancy - An Update

by Dr S Praveena Seevaunnamtum

COVID-19 has proven to be a public health emergency of international concern.

Coronaviruses typically cause the common cold with the emergence of SARS-CoV and Middle East respiratory syndrome coronavirus (MERS-CoV) which can cause pneumonia, respiratory failure, and death.

This was followed by the novel beta coronavirus that was named SARS CoV-2 when it was identified as the causative agent for the pneumonia outbreak in late 2019. When first identified, we were not prepared with any antivirals or vaccines. This coupled with the presence of asymptomatic carriers contributed to the rapid fire spread globally that lead WHO to declare a COVID-19 a pandemic.

Pregnant women are considered a high-risk group because of concerns about the effects of COVID-19 on them during and after pregnancy, and on the neonates. With the initial war, clinicians did not have much published data to support clinical practice especially in pregnant mothers with severe COVID-19 pneumonia. Publications on COVID-19 in pregnancy have risen steeply through individual case reports, case series, observational studies, and systematic reviews. As of 26th June 2020, more than 86 reviews have been published in this area of pregnancy and COVID-19. Limitations in the external and internal validity of studies make it challenging for guideline developers and policy makers to make evidence based recommendations for the management of pregnant and recently pregnant women with COVID-19. Recognising the evolving nature of COVID-19, the Royal College of Obstetricians and Gynaecologists (RCOG) website often publishes new information and evidence as it comes to light.

The aim of this article is mainly to provide updated information based on available data. Much of the data at best is classified as level 3 or 4 or otherwise grade D.

Transmission

COVID-19 is transmitted via direct, indirect, vertical and perinatal transmission in pregnant mothers. With regards to vertical and perinatal transmission, fetal pathologists deem that true intrauterine infections are rare (1%) and mother-to-fetus transmission of SARS-CoV-2 during the first trimester almost unlikely. The reason being RNA expression profile of ACE2 in the trophoblast appears very low between 6 weeks' gestation and 14 weeks' gestation at the maternal-fetal interface.¹ However, perinatal

infection through respiratory droplets and potentially maternal faeces during vaginal delivery can cause COVID-19 infection in the neonate. Majority of the reported COVID-19 positive neonates were thankfully asymptomatic.

Prevalence

PregCoV-19 Living Systematic Review Consortium is a landmark living systematic review and meta-analysis. It analysed 64,676 pregnant patients with COVID-19 versus 569,981 non-pregnant reproductive age women with COVID-19.² The study showed that pregnant women do not appear more likely to contract the infection than the general population. In fact, overall rate of COVID-19 diagnosis in pregnancy was 10%.

Most importantly, more than two-thirds of pregnant women who were tested positive with COVID-19 are asymptomatic with a cited estimation of 74% (95% CI 51-93).

Clinical Manifestation

The most common symptom in a pregnant mother with COVID-19 is cough (41%) followed by fever (40%). Less frequent symptoms are dyspnoea (21%), myalgia (19%), loss of sense of taste (14%) and diarrhoea (8%).

The most prevalent laboratory findings were raised C-reactive protein (49%) followed by lymphopaenia (33%) and raised white cell counts (26%).

Severe COVID-19 in Pregnancy

Severe COVID-19 in adults is defined as dyspnea, a respiratory rate of 30 or more breaths per minute, a blood oxygen saturation of 93% or less, a ratio of the partial pressure of arterial oxygen to the fraction of inspired oxygen (Pao₂:Fio₂) of less than 300 mm Hg, or infiltrates in more than 50% of the lung field.³

Allotey et al and PregCov19 Systematic review shows that of the one-third of women that were symptomatic, 10% were defined as severe COVID-19. Four percent required ICU admission and 3% invasive ventilation cumulating with a mortality rate of 0.02%.

When comparing non pregnant versus pregnant mothers with COVID-19, there were higher rates of ICU admission, invasive ventilation and ECMO usage. However, of note was they were not at increased risk of death when compared between these two groups. (Picture 1)

Non pregnant vs Pregnant



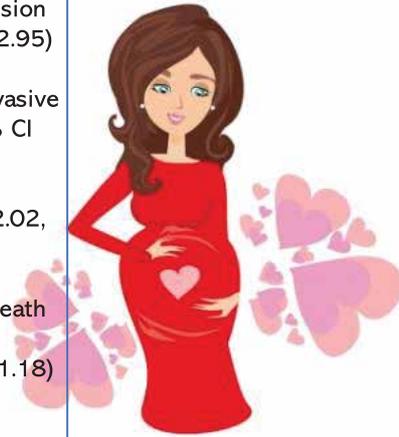
Not Pregnant, Covid PCR +VE

Higher rates of ICU admission
OR 2.13, 95% CI 1.53 – 2.95)

Higher requirement of invasive ventilation OR 2.59, 95% CI 2.28 – 2.94)

Higher ECMO usage OR 2.02, 95% CI 1.22-3.34)

Not at increased risk of death from COVID-19
OR 0.96 (95% CI 0.79 – 1.18)



Pregnant, Covid PCR +VE

Picture 1: COVID positive non pregnant women versus COVID positive pregnant mothers

However, we understand the pregnancy itself causes many physiological changes to a woman. It involves changes in multiple organ systems. Hence, it is more appropriate to compare data between pregnant ladies who are with or without Covid infection. This gives a better reflection of the disease outcome.

Immediately, in the same PregCov19 Systematic Review we come across data of higher mortality rate with OR 2.85 (95% CI 1.08 - 7.52). The study by Karola S Jering in January 2021 also supports similar data of higher mortality rate in pregnant mothers with COVID-19 infection. The figures given were 141 deaths per 100 000 women who were pregnant with COVID-19.⁴

January 15, 2021

Clinical Characteristics and Outcomes of Hospitalized Women Giving Birth With and Without COVID-19

Karola S. Jering, MD¹; Brian L. Claggett, PhD¹; Jonathan W. Cunningham, MD¹; et al
[» Author Affiliations](#) | [Article information](#)
 JAMA Intern Med. Published online January 15, 2021. doi: 10.1001/jamainternmed.2020.9241

Control:

- 0.4% ICU
- 0.1% invasive ventilation
- 0.004% MI
- 0.1% VTE
- 0.005% death



Pregnant, Covid PCR -VE
5 deaths per 100 000 women

Worse overall maternal outcome



With COVID:

- 3.3% ICU
- 1.3% invasive ventilation
- 0.1% MI
- 0.2% VTE
- 0.1% death

Pregnant, Covid PCR +ve, Symptomatic
141 deaths per 100,00 women

Picture 2: Pregnant women COVID negative versus COVID positive pregnant mothers

Overall, there were worse maternal outcomes in terms of ICU admission, invasive ventilation, myocardial infarction and venous thromboembolism (Picture 2). The consensus though is that although there was an increased risk of death, that risk remains very low. Mortality rate is likely inflated by under-reporting of women with asymptomatic or mild COVID-19 in pregnancy as we understand that the 75% majority of COVID-19 positive mothers are asymptomatic and not universally screened.

Clinical Outcomes

Karola S Jering and team noted that rates of preterm deliveries were higher in pregnant mothers with COVID-19 infection. Placental histopathology studies have found that abnormalities, including fetal vascular malperfusion and villitis of unknown aetiology, are more frequent among COVID-19 cases than controls.⁵ Despite these findings, there has been no evidence to date that fetal growth rate (FGR) is affected by COVID-19. The study by Karola S Jering and team, preterm deliveries were attributed to mainly iatrogenic decisions that were made to improve maternal oxygenation. Caesarean section rates were slightly higher at 28.9% in pregnant mothers with COVID-19 infection as opposed to 27.5% in pregnant COVID negative mothers.

It is worth to note that our local guidelines by Ministry of Health stipulates that delivery is best delayed more than 14 days if possible, unless need to improve maternal oxygenation. Patients should be offered Caesarean delivery in view of lack of negative pressure ventilation in labour rooms in Malaysia. However, vaginal delivery is not contraindicated in cases of imminent labour. Also, second stage of labour is not considered an aerosol generating procedure.

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Risk Factor for Severe COVID-19 Infection

Evidence suggests that there were higher risk of developing severe complications of COVID-19 in certain subgroups. Risk factors identified were increasing age, Black, Asian and minority ethnicity, high BMI, individuals with pre-existing maternal co morbidities of chronic HPT, pre-eclampsia, pre-existing or gestational diabetes.

Vaccination during Pregnancy

Pregnant healthcare workers should ideally be vaccinated. Pregnant women who opt for vaccination should receive 1st dose between 14 to 33 weeks gestation. The reason being the issue of uncertainty regarding duration of protection that vaccination confers. Hence, vaccinating in the 2nd trimester of pregnancy protects against COVID-19 which has a more severe outcome in 3rd trimester if the parturient is infected.

Pregnant women who conceive soon after receiving 1st dose may choose to delay 2nd dose after 14 weeks of pregnancy. If receiving the Pfizer vaccine the 2nd dose can be delayed up to a gap of 12 weeks from 1st dose.

Transfer of SARS COV2 maternal antibodies to infant is inefficient when compared to vaccine induced influenza antibodies. As such, it is unlikely that COVID-19 vaccinations will provide protection to the newborn.

In conclusion, the tragedy of COVID-19 is immediate, real and epic. Coronavirus has made the mighty kneel and brought the world to a halt like nothing else could. We need to empower ourselves with new knowledge to help us justify decision making. With the combination of available literature, good practice and expert consensus opinion we strive to provide safe women centred care during birth and thereafter in mothers affected with COVID-19 infection.

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References: 1. Precedex Hospira Malaysia PI, October 2018. 2. Cooper L, et al. A randomized, controlled trial on dexmedetomidine for providing adequate sedation and hemodynamic control for awake, diagnostic transesophageal echocardiography. J Cardiothorac Vasc Anesth, 2011, Apr; 25(2): 233-237.

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COVID-19: An Update from Hospital Universiti Sains Malaysia

by Mohd Zulfakar Mazlan, Wan Fadzlina Wan Muhd Shukeri & Zeti Norfidiyati Salmuna @ Ayub

The COVID-19 outbreak continues to be a major concern for patients, relatives, students, and healthcare and non-healthcare workers in our institution. It was not until early this year that Hospital Universiti Sains Malaysia (HUSM) was involved in admitting COVID-19 patients. Prior to this, all COVID-19 cases were treated at the neighbouring hospital, Hospital Raja Perempuan Zainab II (HRPZ II). However, as COVID-19 cases surged, it was announced that HUSM would become a COVID-19 admitting hospital. The announcement came following a meeting between our hospital director, the Kelantan State Health Director, and representatives from the private hospitals in Kelantan on 11th January 2021.



Figure 1: Positive test RTK antigen for rapid COVID-19 detection

Subsequently, HUSM prepared a dedicated ward and ICU to receive COVID-19 patients. All equipment, laboratory testing methods, and drugs needed to manage COVID-19 patients were procured. These patients were managed jointly by emergency physicians, general physicians, microbiologists, anaesthesiologists, and intensivists led by our infectious disease specialist. Upon arrival of a suspected COVID-19 patient in our emergency department or ward, screening and confirmatory tests are performed. The available screening test is the rapid test kit (RTK) for detection of SARS-CoV-2 antigen, which is specific but less sensitive (Figure 1). Available confirmatory tests for diagnosis of COVID-19 in our institution are real-time PCR and rapid molecular tests, such as GeneXpert and Abbott ID NOW (Figure 2), which are more sensitive and specific.



Figure 2: Medical Laboratory Technologist (MLT) performing ID NOW test for rapid COVID-19 detection

Each month, a specific roster for an anaesthesiologist and trainees was arranged. To facilitate the handover process and discussion among team members, a dedicated WhatsApp group was created. Our team was fortunate that hospital administrators were able to quickly secure a few Power Air Purifying Respirators (PAPRs) (Figure 3) and video laryngoscopes, which have helped us in our work.

The main treatment for our COVID-19 patients includes oxygen, antiviral drugs (favipiravir), steroids (dexamethasone or methylprednisolone), anti-coagulants (subcutaneous enoxaparin), anti-interleukin-6 receptor (tocilizumab), antibiotics, and antifungals. Oxygen was delivered via nasal prong, Venturi mask, high-flow mask, high-flow nasal cannula (HFNC), non-invasive ventilation (NIV), or invasive mechanical ventilation. Negative

pressure room (Figure 3) is available for intubation procedures and treating those patients requiring NIV. On a particular note, we observed that failure of HFNC or NIV was highly attributable to mortality in patients with multiple comorbidities and late presentation. Most of our COVID-19 patients died due to multi-organ failure.



Figure 3: Anaesthesiology trainees donning PAPRs for intubation in COVID-19 ward



Figure 4: Negative pressure room in our hospital

A dedicated operation theatre (OT) was allocated for confirmed and suspected COVID-19 cases. This facility was set up outside of the main OT complex to minimize risk of infection transmission. Dedicated guidelines for in-hospital use were developed to ease the process of admission and discharge from OT, for which the main reference is from the Ministry of Health, Malaysia. A dedicated ambulance is available for intra-hospital transfers (Figure 5). When transferring suspected or confirmed COVID-19 patients, the isopod is used to reduce risk of transmission to staff (Figure 6).



Figure 5: An ambulance used for intra-hospital transfer of COVID-19 patients



Figure 6: An isopod used for transferring COVID-19 patients

Some Category 5 COVID-19 patients who were de-isolated developed long-term complications, such as organising pneumonia. These patients tended to require prolonged ventilation, with a few developing ventilator-associated pneumonia and/or cardiac events, eventually leading to death in the ICU. We practice de-isolating Category 5 COVID-19 patients after day 20 of illness, while de-isolation began as early as after day 10 of illness for Category 3 and 4 in-patients. Until now, no specific treatment has been practiced in our institution besides those recommended by the Ministry of Health.



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COVID-19 Nursing Crash Course for Non-ICU Trained Nurses

Hospital Kepala Batas Field-ICU, 14th June 2021

by Dato' Dr Yong Chow Yen, Dr Helmi Abdul Halim & Dr Mafeitzeral Mamat

In the past few months, we have witnessed a rapid increase in intensive care bed capacity in our hospitals as the COVID-19 pandemic continued to rage across the country. Frantic repurposing of non-ICU infrastructure in existing hospital facilities to COVID-19 ICUs were constantly falling behind the number of increasingly critically sick patients needing intensive care. With the number of deaths increasing on a daily basis in Penang state and nationwide, the task to set up the first Army Field ICU in the country at Hospital Kepala Batas (HKB) was thrust upon the Anaesthesiology and Intensive Care Services, Penang State Health Department.



In our Herculean attempt to go ahead with the plan and do our utmost to save every single life, amongst many other critical issues we took on to resolve, we came to the realization that the manner on how we were going to staff these beds with paramedics/nurses having the necessary knowledge, skills and grit to take on the challenge was not a much discussed topic. To our surprise there was no shortage of willing nurses; just a shortage of nurses who could be spared from their original work places. This augured well and gave us much encouragement; the base competency level matters but if we share the same purpose, we can move a mountain. We managed to recruit a group of nurses and paramedics from three different agencies in a short two weeks. They were from the Ministry of Health, private hospitals in Penang and Angkatan Tentera Malaysia, with very varied background ICU experience.

Rapid deployment of non-ICU trained nurses into COVID-19 ICUs has been on-going for the past year since the first wave in March 2020, but not on the scale we are experiencing in the current third wave. The model of rostering in the same shift a certain number of experienced ICU nurses who will oversee all patients and also provide on-the-job training for the non-experienced nurses is no longer feasible when the number of non-experienced nurses far exceeds those with experience.



Hence, we embarked on a one-day workshop consisting of a morning of virtual lectures delivered in a zoom meeting style, and hands-on skills stations in the afternoon. The workshop aimed to introduce COVID-ICU nursing concepts, with topics chosen to address patient safety and managing anxiety and stress at work. Out of the recruits, we enrolled 13 participants, out of whom 11 had no prior ICU experience. Four were from the MOH hospitals, six were private hospital volunteers and three from Angkatan Tentera Malaysia.

Dr Mafeitzeral Mamat, Dr Shahridan Mohd Fathil and Ms Masniza Mustaffa from Mercy Malaysia were roped in to deliver the didactic lectures on Fundamentals of ICU Care, Covid-ICU Complication Considerations, ARDS & Prone Position, Psychological First Aid (PFA) for Healthcare Workers in ICU and COVID End-of-Life Management Principles and Communications. We would like to compliment the above-mentioned teachers who were able to engage the participants absorbingly even on a virtual platform.

The practical stations in the afternoon were conducted by Dr Helmi Bin Abdul Halim, Head of Department of Anaesthesiology and Intensive Care, Hospital Kepala Batas and Dr Harriszal Bin Amiruddin from Hospital Pulau Pinang with the assistance of senior paramedics from both hospitals. The stations covered haemodynamic monitoring, arterial blood gas, prone position, assisting endotracheal intubation, extubation, high flow nasal cannula and introduction to invasive and non-invasive ventilators.

Recent literature and online resources were available to assist us to transit non-ICU nurses to ICU nurses focusing on patient management in the form of training modules, including programmes composing of didactic lectures. We fully understand that a morning of didactic lectures and a rushed afternoon of skill stations is far from adequate to prepare our nurses to work in a novel field of COVID-19 ICU. Under the prevailing pandemic circumstances, this workshop, most importantly, provided

participants with encouragement and emotional support to move forward, in addition to introduce topics that will help them understand online resources. The best evidence practice is to follow this up with team-based nursing

model, using experienced support nurses for inexperienced nurses in the 'buddy' system and the presence of on-site critical care education specialists.

We wish to record our sincere appreciations to Mercy Malaysia for the academic support, and the Malaysian Society of Anaesthesiologists and College of Anaesthesiologists, Academy of Medicine of Malaysia which provided initial virtual meeting advice for the workshop.

Below are references available online that you may find useful for your team:

1. MALAYSIA COVID-19 ONLINE TRAINING.
<http://tinyurl.com/covid19malaysia>
2. TORONTO COVID-19 ICU TRAINING.
<https://www.quickcuttraining.com/>
3. IRELAND COVID-19 ICU/HDU NURSING.
<https://rise.articulate.com/share/BDSZkwB-l50YUj2c9K6bWldCMQx4zYVC>





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Paediatric Anaesthesia in Private Practice: A Tertiary Private Centre Experience

by Dato' Dr Azmil Farid Zabir

"If he decides to, a child under anaesthesia will go into laryngospasm regardless how competent the consultant is. They just don't give a damn"

Dato' Dr Azmil Farid Zabir

Paediatric anaesthesia is a daunting subspecialty. I remember not too long ago when many budding anaesthetists of my generation will take up anything but Paediatric Anaesthesia. Most are more than happy with a postgraduate qualification. No small feat by all means. The tough ones go into Cardiac Anaesthesia since they enjoy the heavenly companion of cardiothoracic surgeons. The brainiest pursue Intensive Care to teach physicians and nephrologists a thing or two about lung recruitments and fluid balance. The compassionate ones who actually like their patients to be awake, and complaining painfully go into Pain Management. The technically gifted and anatomically inclined dabbled with ultrasonography. So enthusiastic they are that having scanned all superficial and deep veins and peripheral nerves down to their roots, their expertise now extends even into the lung parenchyma and beyond. Of course those with research interest sign up with the varsities...until greener pasture comes a calling.

So why then would some among us find love and joy venturing into a world of big headed green snorts, with unique multiple perioperative challenges from non-existent venous accesses, airway spasms and emergence deliriums? I suppose it must be "*minat yang mendalam*" above all else.

I have to admit that my first foray into paediatric anaesthesia in private practice involved being tricked into running a Saturday locum list with a certain renowned Paediatric Surgeon needing one lung ventilation for thoracotomy partial lobectomy in a Somalian child. This could have been my second or third time doing locum. What a baptism of fire that was. Both the child and I survived the ordeal. The next patient on the list was the child's father for foreign body removal (bullet / shrapnel embedded in his calf).

A stint in the Royal Children's Hospital Melbourne circa 2011-2012 of just under 18 months put things in perspective. Working alongside 21 consultant paediatric anaesthetists with many years of experience smoothed rough edges and calmed nerves.

What does it take to be an expert in the field of paediatric anaesthesia or any subspecialty for that matter? A lot of emphasis is given on the certain number of years (quantity) spent in a training programme with log books and such. Those are indeed important components to gauge objectively the core skills and knowledge acquired by an advanced trainee. Peer recognition is paramount. However, the level of competency can also be judged by the ultimate stake holders: the patient, the parents and the surgeon. I will actually add on the nurses too.

One might have read about the concept of 10,000 hours of practice to become an expert in any chosen field. It was pioneered by Professor Dr Anders Ericsson from the University of Colorado who in 1993 wrote a paper titled "The Role of Deliberate Practice in the Acquisition of Expert Performance". He wrote about the findings of a group of psychologists in Berlin who studied the level of competencies among young violinists from the time they started learning the instrument (roughly aged five, most had similar practice times) and followed them up for three years (aged eight, where interests diverge, less time playing the violin) and up through to the age of 20 where some emerged as elite performers. Compared to the less able violinists who spent on average 4,000 hours of practice, those elite performers clocked on average 10,000 hours of practice.

The psychologists were surprised that there were no naturally gifted and talented performers discovered from that cohort of children. One that would have achieved a level of competency with an approximate 5,000 hours of practice. Professor Dr Ericsson concluded that "many characteristics once believed to reflect innate talent are the result of intense practice extended for a minimum 10 years".

Malcolm Gladwell then wrote a book entitled "Outliers" which has a chapter called "The 10,000-hour Rule". This popular book introduced this concept to the mass audience. Gladwell did put more emphasis on talent, citing The Beatles, for example, as being born geniuses, blessed with masses of natural talent.

Personally, I like to look at the WTA professional tennis players to answer the debate of whether expertise is achieved through talent or quality deliberate practice. For me, the fact that the big three (Rafa-Djoker-Fedex) still win numerous major tournaments despite the likes of Thiem, Zverev, Medvedev, Tsitipas & Kyrgios knocking on the door for a number of years adds another variable: Confidence. Confidence that comes with triumphs and failures which does not appear if one does not try or try half-heartedly without putting your soul into it.

I think it is the trilogy of sufficient practice, blessing of natural talent and adequate dose of confidence that makes one an expert in a chosen field. Feel free to add more.

So now that expertise is achieved, there should always be room to improve. Contentment signifies the death of higher mental faculty. We should always aim to be better. I am reminded of a concept introduced to me a few years back. It is known as aggregation of marginal gains. The theory that gained worldwide publicity when applied by Sir Dave Brailsford who was, back then in 2002, head of the British cycling team. In essence, by identifying and improving each of the key cycling components by a mere 1%, the aggregation of the marginal gains led to team Great Britain winning 7 out of the 10 gold medals in Beijing 2008 Olympics and retaining the similar number of gold medals in London 2012. Prior to those successes, Team Britain only managed a single gold medal over a span of 76 years.

Now that we have got the right mindset, let's finally address the topic. Paediatric anaesthesia in private practice comes with a number of challenges.

MANAGING AS THE SOLE CONSULTANT

We often find strength in numbers. What numbers? It gets lonely and scary at times. You became dependent on a good / well trained GA assistant who may range from a certified experienced technician to a registered staff nurse with post basic training, depending on the institution. It is well accepted that the margin of error is much smaller in the paediatric patients. Imagine that, while not having someone to look up (or down) to when things go awry.

So I adapt by managing the variables that I can control. From ensuring that our equipment is in perfect working order to making sure cases are being done while other anaesthetists are on site or within the vicinity at least. It makes good sense to take advantage of the wealth and abundance of expertise amongst the other six esteemed colleagues.

In honesty, once you find yourself a safe, solid and workable template which works for you, you become

reluctant to venture too far from the comfort zone to learn new tricks.

MANAGING SURGEONS' EXPECTATION

Our tertiary centre previously had a world renowned paediatric laparoscopic surgeon who is now retired. There were times when his surgeries were broadcasted live during conferences involving international audience. This would include laparoscopic procedures like nephrectomy, pyeloplasty and choledochal cyst. There were other times when he invited his colleague over from Great Ormond London Hospital to perform a complicated procedure on an international patient from Pakistan. The job spec can be very demanding.

At present, there are three consultant paediatric surgeons in my tertiary centre. The key to a healthy professional relationship is understanding each other's strengths and limitations.

I am indeed lucky to be working with a Paediatric Surgeon whom I have known from my days at a premier boarding school. It makes life less strenuous. The other colleague of mine is a great surgeon who has an excellent track record both locally and in UK/Australia. Their reputation however invites complicated and difficult cases through our OT doors.

Plus, if you do not already know, in private practice, anaesthetists do not control OT time. Enough said.

MANAGING PARENTAL EXPECTATIONS

It is a given that cases are cancelled or postponed if the surgeons are unavailable. Surgeons both in public and private institutions alike are also known to reschedule cases if their trusted anaesthetists are not free. But seldom will parents cancel their children's surgery if a certain anaesthetist is not available. I experienced this on a few occasions. Mostly with children with a need for repeated procedures and thus a bond of trust is forged. While this can be flattering, it does come with the heightened and unnecessary pressure of meeting the parental expectations of nothing less than "perfection". These cases are usually accompanied by repeated solemn prayers to heavens above to get the job done uneventfully.

Unlike in public setting where although the consultants supervise / are in charge of the list, the anaesthesia "front man" is the MO/Registrar/Trainee who meet parents during premed rounds. In private practice, most parents expect (demand) professional accessibility and direct accountability. This is why the premed round becomes very important. You need to gain the trust of the parents. This involves practice, talent and confidence.

It is in my honest opinion, the biggest challenge.

Since I do not share my mobile number freely, some young and savvy parents on occasion have turned to social media requesting to be friends on FB or follow my IG. However, being an anesthetist, I prefer to be anonymous behind the scene although this pandemic has inadvertently announced our presence, existence and importance to the Joe Public.

MANAGING PROFESSIONAL AND PEER EXPECTATIONS

Over the last decade, I see colleagues in public service achieve phenomenal career milestones and climb up the hierarchy to earn their rightful place. I am proud to see my contemporary holding professorial posts and I am ecstatic to see juniors handling challenging cases like liver transplant and separating conjoint twins. Strength in numbers! Up till recently, it was very difficult to make time even to attend academic talks and forums to keep abreast with new knowledge, let alone make time to contribute to MSA. Webinars and online meets are a blessing.

MANAGING UTILITIES AND COST

Premier tertiary centres have the resources to provide more than sufficient equipment and consumables for our perusal. While it is true that cases are covered by insurance, there are instances where paediatric surgical conditions are deemed congenital. Hence, expenses come out of parents' own pocket, which can be painful since

every consumable is of single use. Our fees and charges are pretty much standard. So I do have a role and face the challenge of balancing the comfort and certainty of, for example, using CMac videolaryngoscopy (oh yes patients will be billed) and Bridion against an ever escalating cost to keep hospitals afloat and maintain an economically viable ecosystem.

MANAGING THE LITTLE ONES (THE PAEDIATRIC ANAESTHESIA POPULACE)

This is where all the fun begins and ends. Once a child understands that his own parents trust you, half the battle is won. If he decides to, a child under anaesthesia will go into laryngospasm regardless how competent the consultant is. They just do not give a damn. They do not care if you have 30 years paediatric anaesthesia under your belt. They do not care if you are alone in theatre and the closest help is 30 minutes away.

As MO/Registrar/Trainee, sometimes you do quietly pray that when you need to SOS call your boss in, he/she too will not get the IV/ETT in the first time right? I have done that too. But until it is proven otherwise; if the consultant anaesthetist gets it on this first shot, that is because he is an expert. If they don't, that's because the patient is difficult. Just remember this. And keep the patients warm. The science of paediatric anaesthesia is the same regardless of where you practice. It is the art which we should all aspire to attain to perfection.



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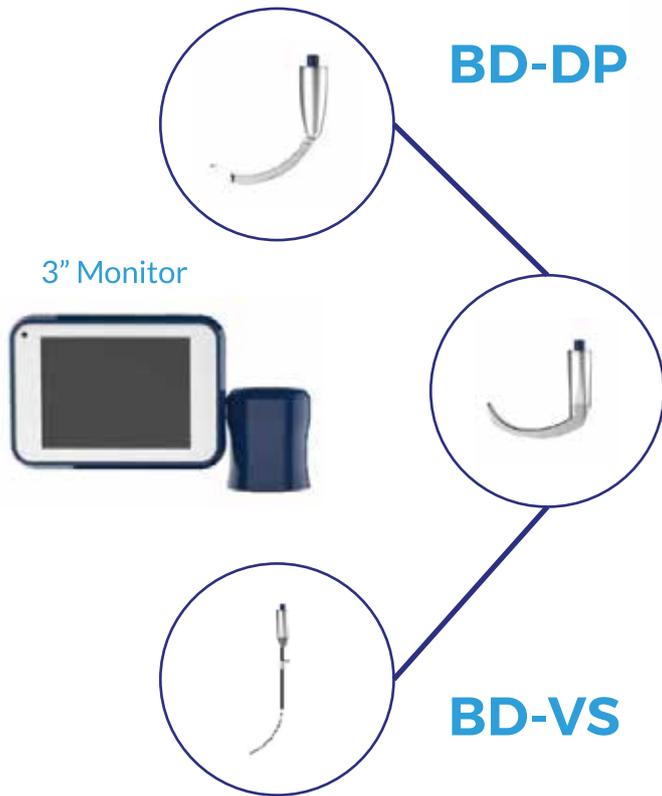
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Successful Anaesthetic Management of a Child with Noonan Syndrome - Experience in Hospital Tengku Ampuan Afzan (HTAA), Kuantan, Pahang, Malaysia

by Mohd Hafizuddin, Sivaraj Chandran, Rosleeni Mohd Yusof, Wan Marzuki Wan Ramli

This case report describes the anaesthetic management in a five-year old boy with Noonan syndrome and underlying pulmonary stenosis posted for comprehensive dental treatment, orchidopexy, and circumcision.

Keywords

Paediatric Anaesthesia, Noonan's Syndrome, Pulmonary stenosis

INTRODUCTION

Noonan's Syndrome is a rare clinical multisystem congenital disorder. It is an autosomal dominant disorder that represents the phenotype of Turner's syndrome.¹ The incidence can be as common as 1:1000 live births and is the second most common syndromic cause of congenital heart disease after Down's syndrome.¹ Perioperative anaesthetic management for this group of children is particularly challenging. These patients have facial, cardiovascular and skeletal abnormalities which may pose great difficulties to the anaesthesiologist.² Pulmonary stenosis, hypertrophic obstructive cardiomyopathy (HOCM) are the common cardiac lesions found in combination with other cardiac lesions such as atrial septal defect, ventricular septal defect, aortic stenosis and coarctation of the aorta.² Main anaesthetic issues in patients with Noonan's syndrome are difficult airway and impairment of cardiovascular function.² In this case, we have reported successful anaesthetic management of a five-year old boy with Noonan's syndrome, a difficult airway and underlying pulmonary stenosis who underwent dental clearance, herniotomy and circumcision.

CASE REPORT

A five-year old boy, weighing 17 kilograms was listed under the elective operation of comprehensive dental treatment, orchidopexy & circumcision. Diagnosis of Noonan's syndrome was made when the child was two years of age. He was born term with a birth weight of 3670 grams. Antenatal was uneventful. He had the clinical features of Noonan's syndrome such as hypertelorism, down slanted eye, flat occiput, web neck, short hair line, wide space nipples, and rocker bottom feet. He has moderate pulmonary stenosis with an underlying atrial septal defect. He has no heart failure symptoms and not on any medication. The patient was planned for valve repair after dental clearance. Upon pre-operative assessment, the child appeared active with dysmorphic features. Development milestones were up to age. Vital signs showed a pulse rate of 100/min, blood pressure of 100/60 mmHg, Mallampati score - grade 3, limited neck movement and a small mouth opening. On auscultation, there was a systolic murmur heard on the left second intercostal space. The hemoglobin was 13.0 gm/dl. Serum electrolytes, blood glucose and creatinine were normal. Hematological investigations showed no coagulation or platelet defects. Echocardiography showed dilated right atrium/right ventricles with moderate pulmonary valve stenosis. On arrival in the operating room, a pulse oximeter, electrocardiographic monitor and blood pressure cuff were attached. The child was cooperative. Peripheral venous access was secured using a 22 G cannula. Antibiotic prophylaxis was given before induction. Induction was done with intravenous propofol 1mg/kg and intravenous fentanyl 1mcg/kg. The patient was spontaneously breathing and was able to maintain a saturation of 100% on

oxygen flow 5L/min. After induction, the patient was started on target control infusion propofol 2mcg/ml. Direct laryngoscopy was attempted once the patient was more relaxed and noted a laryngoscopic view of Cormack-Lehane grade 3. The patient was successfully intubated with an endotracheal tube cuffed size 4.5mm using gum elastic bougie. Placement of tube was confirmed from chest expansion, auscultation and presence of capnography. Spontaneous ventilation was maintained throughout the procedure of intubation. There were no episodes of desaturation or haemodynamic instability. Anaesthesia was maintained with target control infusion propofol 3-4 mcg/ml. The entire surgical procedure lasted for 3.5 hours. Maintenance fluid was given according to the Holiday-Segar regime using Hartmann's solution. Total IV fentanyl given was 3mcg/kg. Ventilation was controlled to achieve end-tidal CO₂ 35-40 mmHg. Saturation and haemodynamic parameters were stable throughout the procedure. The ilioinguinal and penile block was performed before herniotomy and circumcision. IV paracetamol 15mg/kg was given towards the end of the procedure as a part of multimodal analgesia. Temperature and blood glucose were within normal limits. The patient was extubated fully awake in the left lateral position. Postoperative monitoring at recovery was uneventful, pain control was good and the patient was discharged back to the ward.

DISCUSSION

The main anaesthetic challenge in our case was airway management due to the typical dysmorphic features as well as cardiac considerations for pulmonary stenosis. Cardiac considerations such as prevention of tachycardia due to sympathetic stimulation and stress response together with a decrease of afterload was our prime motive to maintain cardiovascular stability. Propofol with fentanyl at low doses provides good control in the heart rate and reduction of afterload. We started the induction with a loading dose of propofol 1mg/kg and fentanyl 1mcg/kg, then continued with target control propofol infusion running at 2mcg/ml until the patient was intubated then increased to 3-4mcg/ml post-intubation. This regime maintains the child's spontaneous respiratory effort as well as maintains a good depth of anaesthesia during airway manipulation. We planned to visualise the vocal cords first with direct laryngoscopy and access the feasibility for intubation. If we failed to visualise the vocal cords, then we planned to proceed with fiberoptic intubation. Fortunately, we could intubate with the aid of a gum elastic bougie, with a laryngoscopic view of Cormack Lehane 3. Muscle relaxant was not necessary as the child was able to maintain adequate depth of anaesthesia and relaxation with the propofol infusion. Fentanyl was used as our opioid of choice because it has a relatively benign effect on myocardial contractility avoiding drug-induced myocardial depression, short duration of action, and lesser propensity for respiratory depression postoperatively. In summary, we would like to emphasize that for successful airway and anaesthetic management in the case of Noonan's syndrome, one should have thorough knowledge about various anaesthetic concerns most commonly airway and cardiac issues. Vigilant and prompt anaesthesia management is necessary during the perioperative period to ensure a successful outcome.

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Di Mana Ada Kemahuan, Di Situ Ada Jalan

by Dr Isnul Hady Ismail

Non-neuraxial regional anesthesia (RA), namely peripheral nerve blocks and fascial plane blocks, is now a realistic alternative to general anesthesia. It has been proven to improve patient outcomes in our daily practice.

RA techniques represent a well-established component of perioperative care; providing site-specific, high quality pain relief while reducing systemic opioid consumption. Furthermore, block catheters provide continuous postoperative analgesia; facilitating early mobilization and rehabilitation, and contributing to increased patient satisfaction.

I was trained in the performance of ultrasound-guided RA and procedures during my postgraduate study at the University of Malaya. However, when I ventured into private practice eight years ago, I was not able to practise it liberally. There were more pushing rather than pulling factors. First of all, the concept of "blocks" was new and unheard of in private surgical practice. Besides that, I did not have the privilege of an ultrasound machine in the operating room.



A supraclavicular block as the sole anaesthesia technique

Performing RA was troublesome during that period. I persevered as I felt it was the future of modern anaesthetic practice with beneficial outcomes to all stakeholders.

A lot of anticipated planning was needed due to several factors:

- 1) I have to loan the ultrasound unit from the radiology department.
- 2) Patients were not keen after considering being "awake" during surgery.

- 3) Surgeons' scepticism and always rushing for time (it is alright for them to appear late in the Operating Theatre).

Being in a small centre with limited critical care facilities, it took a while to convince the surgeons of the benefits of RA with regards to patient safety, particularly in high-risk cases. Slowly but surely, they accepted RA as part and parcel of anaesthesia practice.

Fortunately, I have rejoined my former postgraduate colleagues in a new centre recently. My current practice is in a full-fledged tertiary hospital with a dedicated ultrasound unit in the operating theatre, a dynamic acute pain service team, and respectable critical care services.

Furthermore, I am blessed with the presence of "sifus" of the Specialist Interest Group in Regional Anaesthesia (SIGRA). RA is like bread and butter in our daily practice. Being in a tertiary centre, complicated cases with significant comorbidities seem to be a common theme and RA in these cases was the preferable mode of anaesthesia and analgesia.

There were instances for elective surgeries where the patients themselves requested for RA! They are ASA 1 patients who were well learned about the benefits of RA as compared to general anesthesia. There were occasions too that I was able to perform difficult blocks better and faster than my sifus! Rare occasions... 😊



A colleague, Dr Yoga, performing a femoral block

I urge all my fellow anaesthesiologists in government or private practice to take up RA. Embrace RA or become obsolete. "When there is a will, there is a way".

This is the way.

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For healthcare professionals only

Perioperative Lung Ultrasound

by Dr Lim Teng Cheow

Lung ultrasound is useful in the perioperative setting to serve as a tool to screen for any significant lung abnormalities, and also to guide us during procedures such as intubation.¹ Perioperative lung ultrasound is an element of point-of-care ultrasound as this can be performed in real-time conveniently at the bedside to improve patient outcomes.² Lung abnormalities can be ruled in or out by recognizing the patterns produced from ultrasound examination so that immediate diagnoses can be made to enable prompt action.^{3,4} Besides being a non-invasive technique, lung ultrasound has demonstrated higher diagnostic accuracy compared to chest radiography and auscultation for many conditions.⁵ As sonographic diagnosis is mainly made based on patterns as mentioned, we have to familiarize ourselves with the common ultrasound patterns encountered preoperatively. These common patterns will be described here.

Sonography of Normal Lung

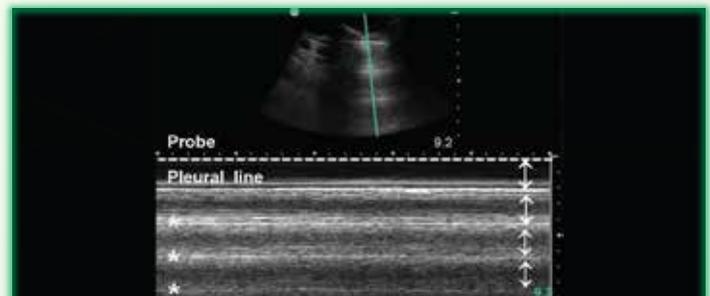
In order to appreciate abnormal lung sonographic patterns, one must first be familiarized with patterns associated with normal lung. The sonographic features of the normal lung are summarized below^{6,7}

- (a) **Pleural line:** This line indicates the interface between soft tissues over the chest wall (which is rich in water) and lung tissue or alveoli (which is rich in air). It represents both the parietal and visceral pleura. This artifact is due to the near-complete reflection of the ultrasound beam at aerated lung since air is a strong ultrasound beam reflector.
- (b) **A-lines:** They are lines formed by repetition of pleural lines, and are horizontal hyperechoic lines parallel to pleural lines. This series of lines are regularly spaced at multiples of the distance between the probe and the pleural line. These artifacts are generated from the strong reflectivity of the pleural line, as each ultrasound beam travels several times between probe and pleura.
- (c) **Curtain sign:** This is a sign demonstrated by the descent of the lung and diaphragm during full inspiration, obscuring the liver (right side) and spleen (left side) which were previously seen when the subject expires. With expiration, all these organs reappear.
- (d) **Lung sliding:** It is a sign arising from the pleural line, representing inspiratory descent and an expiratory ascent of visceral pleura against parietal pleura. On ultrasound, this is demonstrated as a shimmering mobile pleural line moving in synchrony with the respiratory cycle

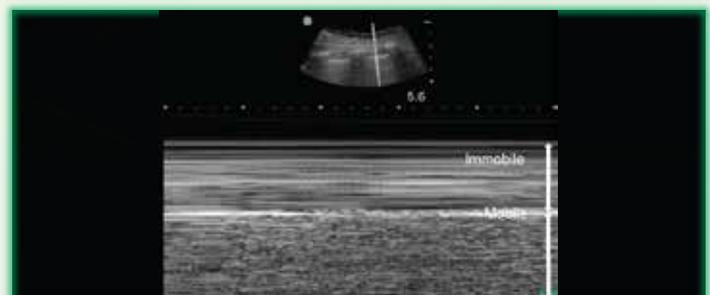
- (e) **Sea-shore sign:** This is a sign produced with M mode to indicate the presence of lung sliding, which can be used for purpose of documentation or data recording, as M mode is good in providing dynamic information unlike a snapshot-type of information obtained from a frozen image with B mode. The motionless superficial layers (skin and subcutaneous tissue) generate horizontal lines mimicking waves in the ocean, while lung sliding produces a sandy pattern akin to sand on the beach. Collectively this is known as the seashore sign.



A lines. These are a series of sonographic artifact indicative of aerated lung. A lines (marked with asterisk) appear parallel and are equidistant from each other. The production of these artifacts is due to repetitive travel of ultrasound beams between the ultrasound probe and pleura. Because of this, A lines are regularly spaced at multiples of the distance between the ultrasound probe and pleural line.



A lines. The similar artifacts are demonstrated in M mode. A lines are seen to be evenly spaced at multiples of the distance between ultrasound probe and pleural line.



Seashore sign. This sign consists of two parts, the sea (ocean) and the beach (sand). The sea component is formed by the immobile structures like skin and subcutaneous tissue while the beach is an artifact due to the mobile pleura. Collectively these two parts are known as seashore sign as one can find the sea and beach at the seashore.

Diagnosis of Perioperative Dyspnoea: Common patterns

Lung ultrasound can be used to diagnose various causes of dyspnoea, namely pneumothorax, pleural effusion, interstitial syndrome including infective and non-infective causes, and alveolar syndromes. Lung ultrasound is sensitive to changes in the ratio of pulmonary air to fluid contents, hence lung abnormalities that impair alveolar content or increase interstitial and alveolar fluid may lead to the production of specific ultrasound artifacts.^{8,9} Recognition of these various patterns is essential as this fundamental knowledge can be assimilated into an algorithm-based approach to diagnose various conditions contributing to perioperative dyspnoea and hypoxaemia.

Interstitial Syndrome

This syndrome is characterized by the presence of three or more B lines between two successive ribs. Common causes of interstitial syndrome include cardiogenic (fluid overload, cardiac failure) or non-cardiogenic (permeability-induced) pulmonary oedema, interstitial pneumonia and pulmonary fibrosis.¹⁰ The use of ultrasound for this purpose is further supported by the fact that perioperative pulmonary oedema is not uncommon. Even in patients admitted for elective surgery, the incidence of perioperative pulmonary oedema was quoted to around 7.6% with a mortality rate near 12%.¹¹ B-line is a discrete laser-like vertical hyperechoic line that originated from the pleural line, extending to the bottom of the screen and moves synchronously with the lung sliding.¹² The presence of B lines may signify partial deaeration of the lung caused by fluid accumulation or deposition of collagen tissue in these conditions.^{13,14,15} There is no clear correlation between B lines and a specific anatomical structure. The presence of B lines merely represents a change that has occurred in the physical properties of the lung.¹⁶ Lung ultrasound has a high (>90%) sensitivity when used to diagnose interstitial syndrome.⁵

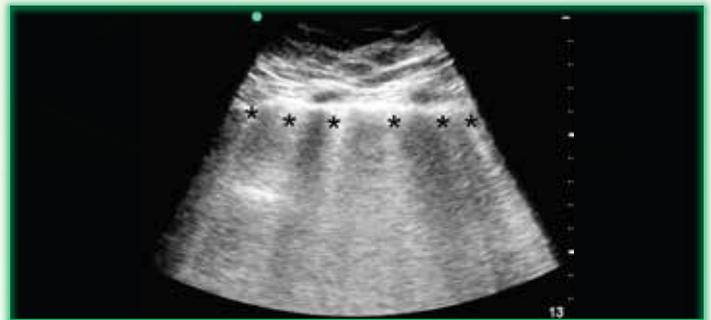
Number of B lines

As the number of B lines increases with decreasing air content and increasing lung density, it can be used to estimate the severity of lung disease.¹⁷ Three or four B lines between two ribs indicate thickened subpleural interlobular septa while the presence of five or more B lines correlates with ground-glass opacities on computerized tomography representing severe interstitial syndrome.¹⁸ As there is a good correlation between B lines and extravascular lung water and levels of NT-proBNP,^{19,20} the number of B lines can therefore be used to monitor the progress of disease or response to treatment in conditions like acute pulmonary oedema.²¹

Diagnosis of Various Conditions

As interstitial syndrome comprises a variety of abnormalities consist of fibrotic conditions and pulmonary fluid accumulation, various factors have to be considered to make a likely diagnosis when B lines are seen, namely distribution of B line, characteristics of the

pleural line as well as the presence of other associated artefacts.^{14,22}



B lines. They are hyperechoic white lines arising from pleura and extend to the edge of the screen, which move with respiration. B lines are marked with asterisks in the diagram.

All the relevant considerations are summarized in the table below^{14,22,23}

Conditions	Characteristics
Pulmonary fibrosis	B lines + irregular thickened pleural line, consolidation artifacts below pleural line
Pulmonary oedema	B lines + bilateral, diffuse distribution
Acute respiratory distress syndrome	B lines + dishomogenous and irregular pattern with areas of patchy B lines alternating with regular A-lines zones (spared areas or skip lesions)

Advantages

Detection of B lines may be more sensitive than crackles upon auscultation or even reduced arterial oxygen partial pressure in the diagnosis of acute pulmonary oedema.⁵ As lung ultrasound provides early detection of pulmonary oedema, it may be utilized to monitor the real-time fluid status. It was proven to be reliable in diagnosing pulmonary oedema with high sensitivity, specificity, positive predictive value and negative predictive value which has the value of 94%, 84%, 88% and 91% respectively.²⁴ Under optimal conditions, the diagnostic accuracy of lung ultrasound (95%) is higher than chest x-ray (72%) and auscultation (55%) when utilized in the diagnosis of interstitial syndrome in patients with ARDS.²⁵ Lung ultrasound characterizes ARDS severity more accurately than do lung compliance and oxygenation index.^{26,27}

Pleural Effusion

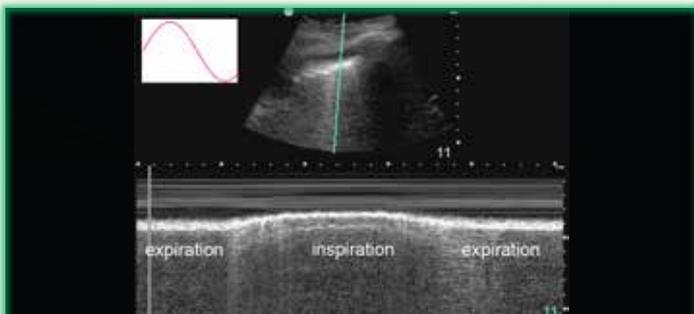
The typical sonographic features representing pleural effusion are the quad sign and sinusoidal sign. A quad sign is a pattern consisting of an anechoic area surrounded by 4 borders namely the pleural line, lung line and shadows formed by 2 successive ribs. A sinusoidal sign is a sonographic sign obtained when pleural effusion is examined in M mode. When the visceral pleura moves towards and away from the chest wall with inspiration and expiration, this creates a sinusoidal waveform pattern on M mode.²⁸ Identification of pleural effusion, in fact, is the most established application of lung ultrasound.^{12,29}



Sonographic features in pleural effusion. Pleural effusion is represented by an anechoic region marked with (a). As the relative water-to-air content in the lung has now changed, the lung now appears to have tissue-like pattern (suggestive of consolidation), comparable to that shown by the spleen in this figure. There are also air bronchograms (linear hyperechoic artifacts within area of consolidation) seen in the region marked with (b). As fluid is a good ultrasound window, the underlying vertebral column deep to the lung is now visible and is marked with (c).



Sonographic image of pleural effusion in transverse scan. Pleural effusion is seen as an anechoic area marked with (a), with the underlying lung showing consolidation and air bronchogram (b).



Pleural effusion in M mode. As the visceral pleura moves throughout the respiratory cycle, a sinusoidal pattern is seen, similar to a graph of a sinusoidal function (inlet).

Advantages

The advantages of ultrasound in the diagnosis of pleural effusion can be discussed under three headings namely the reliability, nature of effusion and quantification of fluid in the effusion. Ultrasound has proven to give 100% sensitivity and specificity when used to diagnose pleural effusion.³⁰ In addition, it is also proven to be more sensitive to detect pleural effusion. Erect lateral chest X-ray can produce blunting of posterior costophrenic angle with 50 mL of fluid but lung ultrasound is capable of detecting as little as 20 mL in the pleural cavity.^{31,32,33,34} The nature of effusions, either exudate or transudate, can

be sometimes deduced from lung ultrasound. Pleural effusions with complex non-septated or septated patterns are always exudates, while homogeneously echogenic effusions are typically seen in haemorrhagic effusion and empyema.³⁵ Quantification of pleural effusion can be made with ultrasound by using various mathematical models. As various models have been constructed for the pleural cavity, various formulae have been derived to quantify the amount of fluid in the effusion. The method proposed by Balik et al is believed to be the most feasible and reproducible one although none of the currently available formulas can be thought of as being the best.³⁶ In this method, a transverse scan is done at the posterior axillary line and the maximal distance between parietal and visceral pleura at end-expiration is determined at the lung base. The volume of pleural fluid in mL is estimated to be 20 times this distance in mm.³⁷ Once the diagnosis of pleural effusion is made, thoracentesis and chest drain insertion can be made under sonographic guidance to minimize injury.³⁸ In addition to this, lung ultrasound is useful to monitor the progress of the pleural effusion after drainage so that further decisions on chest drain removal can be made.³⁶

Pneumothorax

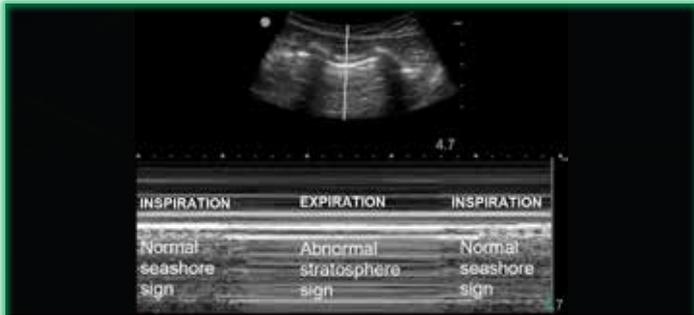
Diagnosis of pneumothorax is confirmed sonographically with the presence of lung point together with an absence of lung sliding, B lines and lung pulse.¹² The presence of lung point, absence of lung sliding and lung pulse can be demonstrated more readily with M Mode in a patient with pneumothorax. Normal lung gives rise to sea-shore sign on M mode to indicate sliding but in pneumothorax, this sliding is absent and bar code or stratosphere sign is shown. The absence of lung sliding per se cannot be used alone to diagnose pneumothorax as this sign is not exclusively specific for pneumothorax. Other conditions which may give rise to the absence of lung sliding include adult respiratory distress syndrome (ARDS), massive atelectasis, pleural adhesions, endobronchial intubations, cardiopulmonary resuscitations, and phrenic nerve palsy.^{39,40,41} The lung pulse is the rhythmic movement of the pleura in synchrony with the cardiac rhythm. It is caused by the presence of a parenchymatous cushion transmitting the vibrations of the heart through a



Bar code (stratosphere) sign. This sign is caused by absence of lung sliding with the static chest wall and lung. Although this sign by itself suggests pneumothorax but it is not an absolute distinctive feature of pneumothorax.



Lung pulse. Transmission of cardiac contraction to ultrasound probe through a poorly aerated lung is observed as lung pulse on M mode. Its presence rules out pneumothorax. Cardiac contraction pulse is indicated by arrows in the diagram.



Lung point. Alternating normal seashore sign during inspiration and abnormal stratosphere sign during expiration is seen at the border of the pneumothorax. This sign can also be used to delineate the border of pneumothorax and hence the approximate size of pneumothorax.

motionless lung.⁴² As the presence of B-lines indicates intact and adherent pleura, pneumothorax can be ruled out confidently when B-lines are visualized with lung ultrasound.⁴³ Lung point sign occurs at the border of pneumothorax, and is typically described as alternating seashore and stratosphere patterns that occur over time.⁴⁴

Advantages

Lung ultrasound is again superior to chest x-ray in terms of specificity and sensitivity in diagnosing pneumothorax. The sensitivity and specificity for lung ultrasound are at 88% and 100% respectively, while chest x-rays give sensitivity and specificity of around 28-75% and 100%. Due to the low sensitivity, pneumothorax cannot be ruled out confidently when a chest x-ray does not show any positive sign.^{45,46,47} As the sensitivity of lung ultrasound reaches 100%, it is extremely useful in ruling out pneumothorax. The presence of lung sliding excludes the diagnosis of pneumothorax accurately while the presence of lung point rule in the diagnosis of pneumothorax confidently.^{28,44,46} A lung point sign can also be utilized to estimate the size of a pneumothorax.⁴⁸

Alveolar Syndrome

The alveolar syndrome consists of a collection of conditions with massive loss of air in the lung due to fluid collection in the alveoli, as opposed to an interstitial syndrome in which the alveoli still contain air.⁸ Alveolar syndrome can be diagnosed by the presence of a poorly echogenic or tissue-like image arising from a pleural line

on lung ultrasound (hepatization).¹² The deep margins of this pattern are usually irregular, separating consolidated and aerated lung (shred sign).⁴⁹ Common examples of the alveolar syndrome include consolidation and atelectasis.¹⁰ As alveolar syndrome represents a collection of conditions, clinical history and other relevant sonographic findings are important to pinpoint the differential diagnosis. Among the sonographic features which are useful in determining the aetiology include shape, margin, distribution, vascularization pattern and presence of air bronchograms.^{8,49,50,51,52} Air bronchograms refer to punctiform or linear hyperechoic artifacts within the consolidated lung and the possibility of atelectasis can be ruled with this sign.⁵²

Advantages

Lung ultrasound produces good sensitivity and specificity when used to diagnose lung consolidation which is reported to be at 83% and 96% respectively. It is still better than a chest x-ray in diagnosing lung consolidation (sensitivity 81% vs 64%, and specificity 94% vs 90%).⁵³ Dynamic air bronchogram has 94% specificity and 97% positive predictive value for diagnosing pneumonia, so this sign is good in distinguishing it from resorptive atelectasis.⁵²

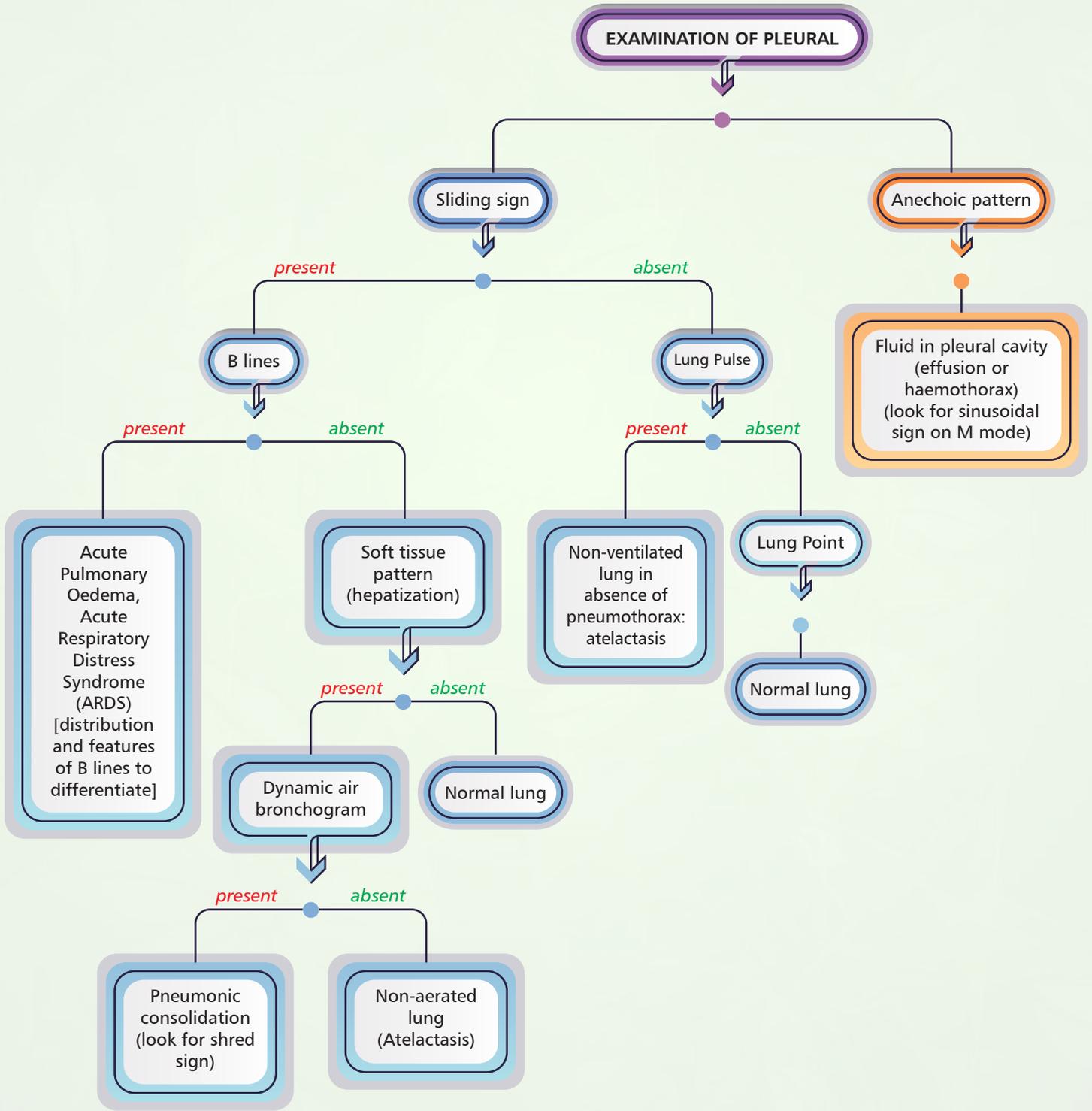
Diagnosis of Perioperative Dyspnoea: Approach

Generally, utilization of perioperative lung ultrasound can be considered under various aspects:

- 1) Investigation for the causes of perioperative hypoxaemia, which can be done by adopting an algorithm-based approach
- 2) Guidance in various procedures such as pleural tapping
- 3) Surveillance lung scan to detect any procedure-related lung complication such as pneumothorax after a central venous line insertion or performance of brachial plexus block
- 4) Monitoring of progress of a lung condition such as acute pulmonary oedema and pneumothorax

Investigation for Perioperative Hypoxaemia

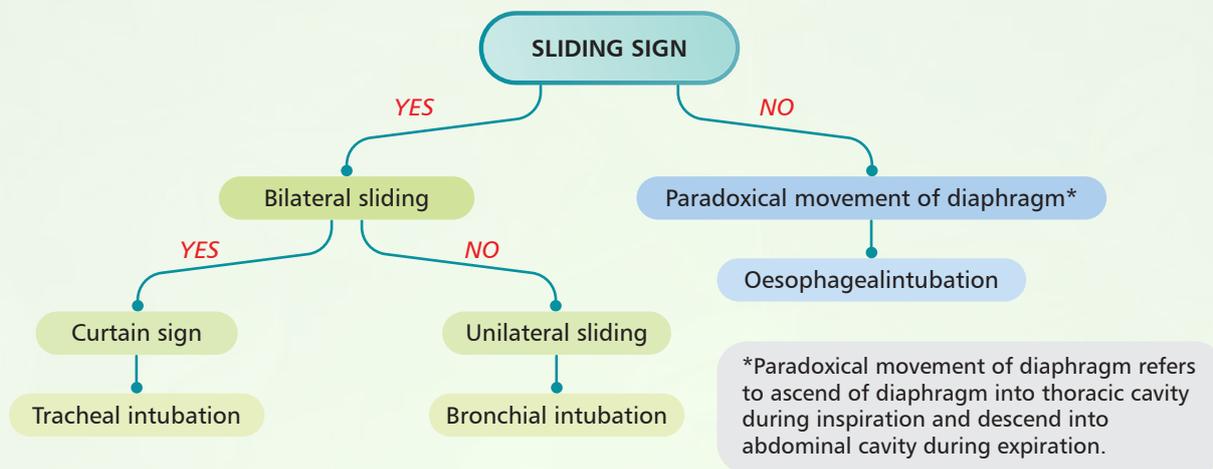
Blue protocol⁴⁶ which was initially created to diagnose the common conditions leading to acute respiratory failure in an intensive care unit, can be adapted to investigate for causes of perioperative hypoxaemia. The initial step involves an examination of the pleural line to look for either a sliding sign or anechoic pattern. With the presence of a sliding sign, further patterns like B lines and hepatization are sought for. If the sliding sign is not there, we may proceed to look for patterns indicative of pneumothorax like lung point and lung pulse. The anechoic pattern is a clear indicator of fluid in the pleural cavity. The whole algorithm is summarized with a diagram as shown here.



Surveillance Lung Scan

A surveillance lung scan can be conveniently performed after a procedure to make early detection of certain mishaps and the common applications include lung scan done following intubation, invasive central lines through subclavian or internal jugular routes, and brachial plexus block as well. The purpose of the lung scan is to look for

any sign suggestive of pneumothorax, or to detect oesophageal or endobronchial intubation. Diagnosis of pneumothorax can be made by looking for patterns like the absence of sliding sign, together with the absence of lung pulse and presence of lung point; while oesophageal intubation can be ruled in or out by following an algorithm as summarized below.



CONCLUSION

As ultrasound machine has become more and more portable and handy today, its use has gain wide popularity in various disciplines of medicine including anaesthesia and perioperative medicine. The other common modes of investigation of lung abnormalities

like a chest x-ray and computed tomography are typically time-consuming and may not be so practical in certain clinical scenarios. Hence point-of-care lung sonography may have a distinctive role here to aid the treating clinicians to make an instant decision in managing perioperative hypoxaemia.

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How TIVA Changed Our Practice in Avisena Specialist Hospitals

by Dr Navina Thiagarajah

Total intravenous anaesthesia (TIVA) is a technique of general anaesthesia that uses a combination of intravenous agents only. The history of intravenous anaesthesia dates back to 1656 in Oxford University, where dogs were provided “anaesthesia” in the form of opium and alcohol.¹ Major development to intravenous anaesthesia only took place towards the late 19th century. Propofol was then developed in the 1970s² and took another 10 years to be formulated into a lipid emulsion to reduce the undesired side effects. Propofol was licensed to be used in the United Kingdom and Europe in 1986 and United States Food and Drug Administration (FDA) approve it in 1989.

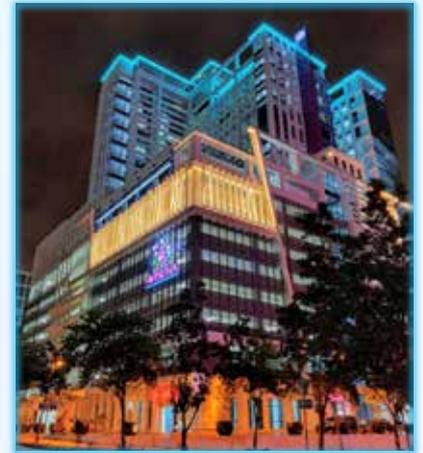
In Malaysia, propofol only arrived in the late 1990s with the older formulation and remifentanil was later registered in December 2010. It was used as an induction agent and an infusion controlled manually by anaesthesiologist using a regular infusion pump. Remifentanil and computer-assisted infusion pumps were made available in our hospital since 2011. Propofol 2% was only available two years later. Over the years with good training from various centres within Malaysia and internationally, TIVA-TCI emerged and has changed the way most anaesthesiologist practise anaesthesia. In 2018, Malaysia hosted the World Congress for Total Intravenous Anaesthesia and Target Controlled Infusion in Kuala Lumpur and this further amplified our knowledge, interest and usage of TIVA-TCI technique of anaesthesia.



Avisena Specialist Hospital (ASH) and Avisena Women's and Children's Specialist Hospital (AWCSH) are two hospitals under Avisena Healthcare Sdn Bhd, located in Shah Alam, Selangor. The former hospital rose in 2010

and hosts 118 beds while the latter came along in 2019 and hosts 133 beds. Collectively, these two hospitals can accommodate 251 beds.

Our hospital caters for a variety of surgeries, ranging from daycare procedures, minor surgeries to major surgeries. The second hospital opened its doors to patients in May 2019 and this doubled the number of surgeons who performed a vast



variety of both simple and complex surgeries and procedures. Our TIVA-TCI anaesthesia technique evolved harmoniously as part of our general anaesthesia technique to accommodate this increased surgical demand. As the operating theatre load started increasing, our priority was to overcome obstacles like delayed extubation in order to increase OT efficiency.



Prior to 2015, inhalation (sevoflurane/desflurane) anaesthesia technique was employed for a majority of the cases that were done under general anaesthesia. Propofol/Remifentanil based anaesthesia usage was very limited and was only reserved for long surgeries or for surgeries requiring neurophysiological monitoring. One of our resident doctors had returned from the World Congress on TIVA-TCI in Timisoara, Romania in 2014. The knowledge gained from the Congress was brought back and shared with the other residents. Fortunately by then,

propofol 2%, remifentanil and specialised TCI pumps were available in Avisena hospital. We embarked on this journey after acquiring the knowledge and skills needed to perform TIVA-TCI.

The favourable pharmacokinetics and pharmacodynamic properties of propofol and remifentanil and the combination of these two eventually gained popularity amongst all the anaesthesiologists practicing here. In addition to this, we noticed a marked increase in both surgeon and patient satisfaction. TIVA allowed us to better manage anaesthesia controlled-time and patient turnover. Both these factors ensure that our OT was optimally utilized. Dexter & Epstein³ recommends to record extubation time and monitor the incidence of prolonged extubation especially at a facility like ours that has a minimum of eight hours of cases and turnovers per day. Hou-Chuan et al⁴ published a study in 2017 on 343 patients, randomly divided to receive TIVA and Desflurane based anaesthesia. There was a significantly faster emergence time in the group receiving TIVA based anaesthesia.

Table I: Comparison between total procedures/surgeries done in 2017 and 2020

	ASH	AWCH	Total
2017	3899	-	3899
2020	3859	2635	6494

THE CLIMB

These factors ensured that smooth transition happened seamlessly:

- 1) Specialised TIVA-TCI infusion pumps with module along with electrical extension cords and drip stands were made available in each operating room. These are the examples of the pumps we use in our hospitals; Fresenius Kabi Injectomat TIVA Agilia, Alaris PK syringe pump by BD, Bbraun perfusor space, Mindray Benefusion nSP pumps. These pumps incorporate the following models; Marsh, Schneider, Paedsfusor, Kataria for Propofol and Minto model for Remifentanil.
- 2) A well designed TIVA tubing and luer-locked syringes were key items to reduce risks of disconnections, leakages or kinks, in addition of having minimal dead space.

- 3) Bispectral index monitoring modules were added to our monitors to help monitor the depth of anaesthesia for patients on TIVA.
- 4) Rigorous training was given to the anaesthetic nurses on this technique of anaesthesia, the principles, method of administering, risks involved and its benefits.

The entire process of converting from an inhalation based anaesthesia practice to a predominant TIVA based practice took almost a year. In order to succeed in providing a safe and high standard of practice, we had to overcome certain hurdles:

- 1) Refining the delivery of TIVA to the patient required a deep understanding and experience of the pharmacokinetics and pharmacodynamics of these drugs. Our goal was to individualise and customise an appropriate technique for each patient. Our mastery of these skills improved with time.
- 2) Once the specialised pumps and BIS monitors were acquired, the next thing to do was to find an efficient delivery system; one that would deliver the drugs with precision. It had to be a well structured, unidirectional, multi luminal conduit delivering the drugs from the pump into the intravenous cannula to the body. The design of this tubing also had to be kink free to avoid interruptions in drug delivery.
- 3) Educating our surgeons on the benefits of this technique. Initially TIVA technique was not favoured by some surgeons due to unfamiliarity. However it did not take long before they too saw the benefits in their patients.
- 4) The desirable analgesic effects of TCI remifentanil gained popularity as an adjunct in multimodal analgesia for acute pain management. We had to educate and train our post anaesthetic care unit nurses to deliver nurse-controlled analgesia and to titrate according to the prescribed dosage. Its constant context-sensitive half-life of three minutes, independent of the duration of infusion and the fact that it does not accumulate after prolonged use makes it an almost ideal analgesic agent.

- 5) TIVA practice in paediatric patients was made easy with specialised pumps programmed with Paedfusor and Kataria model for propofol. These special groups of patients require more vigilance and meticulous attention in ensuring a flawless delivery system, correct drug concentrations and a good functioning intravenous line that is checked every 15 minutes.⁵



CONCLUSION

The beauty of TIVA became apparent to our recovery room nurses as they observed its benefits. Patients emerged from anaesthesia more smoothly, clear headed, less likely to have somnolence or episodes of desaturations with far less nausea or vomiting. Patients had a faster recovery in the post surgical wards and this in turn reduced length of stay in hospital, thus increasing hospital turnover. A randomised controlled trial done by Se Hee Na et al⁶ revealed that propofol based total intravenous anaesthesia provided significantly better quality of recovery on the day of surgery compared to desflurane inhalation anaesthesia. Propofol based TIVA provided rapid resumption of normal activity and other added advantages included lowering cost and early hospital discharge for patients.

We are proud to say that currently TIVA-TCI is practised in more than 95% of adult patients and above 30% of paediatric patients undergoing general anaesthesia in our hospitals.



From left to right: Dr Esa Kamaruzaman, Dr Navina Thiagarajah, Dr Raveenthiran Rasiah, Dr Wan Afaf Zainal Abidin, Col (R) Dato' Dr Jaseemuddeen Abu Bakar, Dr Muhd Helmi Azmi

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From a Medical Officer to a Specialist, from a Student to a Teacher; Experiences and Challenges during the Era of COVID-19 Pandemic

by Dr Iqbalmunauwir Ab Rashid

The eight candidates from the International Islamic University Malaysia (IIUM), Kuantan was scheduled to sit for the final examination in Master of Medicine (Anaesthesiology) in May 2020. However, COVID-19 had reached Malaysia in January 2020 and the increase of cases in February and March 2020 had pushed the Malaysian government to execute the Movement Control Order (MCO). Hence, the Deans' Council had decided to postpone the planned exam. We had to wait for another six months to sit for the exam in October and November of the same year. Some considered the postponement as a misfortune, but we take it as an advantage for more time to study. Classes and discussions continued, either online through Google Meet and Zoom platform or face-to-face with social distancing and wearing mask in practice.



During the viva-voce examination day; writer on the most left

Alhamdulillah, we managed to sit for the exam in the new norm of COVID-19 pandemic. The written exam had been decentralized to each university, while the viva-voce session done fully online through the Zoom platform. It was a different experience that others might not have the opportunity to go through. 21st November 2020 marked the end of the exam, and an appreciation lunch was held on the next day. We started our journey on 1st December 2020 with a different role, position and responsibilities. Two of us, who are Assistant Professors for the Department of Anaesthesiology and Intensive Care, Kulliyah of Medicine, remained to serve in Sultan Ahmad Shah Medical Centre (SASMEC) @IIUM.

Clinical Works

Being a specialist comes with responsibilities. We need to care for the staff under our care including all the medical officers and staff nurses. This responsibility comes with

trust. As the trust grows, the responsibility seems to be slightly lighter than before. Equipment needed for the service are reviewed by us, for the institute to proceed with purchase. This is equally important to ensure smooth running of the service.



At the appreciation lunch; writer on the second left at the back

For us in SASMEC @IIUM, we are responsible for two elective operation theatres (OT) simultaneously. Apart from that, we cannot run away from being on-call. Active calls are as what we had before as a medical officer, except that more responsibilities and more area to care for. We take care of Intensive Care Unit (ICU), general emergency OT and maternity OT, including reviewing patients in need of intensive care in general wards. Recently we need to be on stand-by as passive specialists in case help is needed especially for COVID related issues.



Service MO receiving referral from wards, working with Islamic values in shariah compliance hospital

Teaching Responsibilities

We are no longer students anymore, but teachers. We have to take up teaching responsibilities for undergraduates, postgraduates and service medical officers.

Our undergraduates come to anaesthesiology posting for two weeks as a speciality posting in their fourth year.

Previously, it was a face-to-face teaching process, whereby students came for tutorial and went into OT and ICU to gain experiences. Unfortunately, due to the pandemic COVID-19, all classes need to be done online through Zoom or Google Meet platforms. We had to alter our teaching methods to a case discussion and video review. Luckily, decision from top management of Kulliyah, who agreed to allow students to come to respective areas later on had opened an opportunity for the students to have some experience of being in a specialty posting.

Postgraduate students are more in need of our attention for classes and discussions. This applies to both primary and final exam takers. Hybrid methods have been implemented for the postgraduate students involve in clinical service where face-to-face teachings are possible. Occasionally, we proceed with online teaching after hours and during weekends.

Last but not least, our own service medical officers (MO), do need guidance and teaching through Continuous Medical Education (CME), workshops, bedside teachings and discussions. Our service MOs are as important as our postgraduate students as they work side-by-side representing the backbone of the department.

Research, Publication and Presentation

Besides clinical work and teaching responsibilities, we also had to achieve certain research and publication requirements as Assistant Professors. This is important to ensure our progression in academic career. We are lucky enough to have our bosses, Professors, Associate Professors and seniors to guide us in this path. As we finish our gazettement, this will become a priority as we will be considered as full-time staff under the supervision and monitoring of our management.



Writer participating in master student research

Expanding our wings to have collaborations with other kulliyah, other universities and companies, either locally or internationally, is of utmost importance to improve our pathway and journey as academicians. We are looking forward for such opportunities. Occasionally, we would

be involved directly as a subject in the studies performed by our postgraduate students.

Giving talks and lectures are part of the job of being lecturers in the universities. This would include giving lectures for CMEs, and company talks.

Establishing New Services

Having a new specialist in the hospital would mean that expansion of services is in line. SASMEC @IIUM still have a lot more services to be offered to public, and expansion of anaesthesia service is mandatory. Two of the services that we are now planning to expand include Labour Analgesia and Invasive Cardiac Lab (ICL) service.

We have been planning for Labour Analgesia service for years. Workshops were done, CME were given, and staff were sent out for training. However, we have yet to establish the service will need a kick start. We are praying hard and hope that the service can soon be started in the near future and expanded further.

Our Cardiologists have been sent for subspecialty training and expected to come back to the hospital in October or November this year. With their return, we plan to expand our services to the remote areas catering for ICL services mainly COROS and stenting. This will then further be expanded for electrophysiology service which may need more attention.

Modification to Help Fighting the Pandemic

In the era of COVID-19 pandemic, we are mainly helping nearby main government hospitals catering for non-COVID patients. This was what we have been doing in the previous waves of pandemic. Unfortunately, due to the rising number of cases in the recent wave, we need to be a hybrid hospital in catering both COVID and non-COVID cases. Changes in duty and roster are part of daily life. Taking care of the Covid cases really drain us physically and mentally.

We, as part of front-liners, pray hard and really hope that we can handle this pandemic efficiently and eventually be able to go back to our previous norm.



Writer giving talk through Zoom platform



"Majlis Doa Selamat" for exam takers conducted by the department



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Embracing New Teaching Methods During Coronavirus Pandemic: A Paradigm Shift

by Associate Professor Dr Azarinah Izaham & Associate Professor Dr Raha Abdul Rahman

The pandemic caused by the novel Coronavirus-19 (COVID-19) has changed many norms in our life. As we are focusing on treatment and controlling the spread of the pandemic, we are also struggling to continue the medical education process that is facing unprecedented disruption. The highly contagious nature of the virus has made it difficult to continue conventional clinical teachings which have always been patient orientated. It is a big challenge to the medical educators to continue educating, preserving the learning process so as to provide adequate training and exposure. Most of those involved in medical teachings are clinicians who have been juggling their time between managing patients and teaching their students. Many teaching centres have been sharing the burden of managing the pandemic, directly and indirectly, and to a certain extent their function in providing medical education has been compromised.

Border closures and confinement measures have limited the process of medical training. Specifically, the concern that students may contract the virus during their training and spread it to the community and vice versa cannot be overstated. While undergraduate students are trainees in the purest sense, graduate trainees are qualified medical practitioners who are involved in patient care whether for COVID-19 infected patients or otherwise. These graduate trainees are required to assist in treating patients and face the same COVID-19 risk themselves, and constitute the same risk to the public as any other practitioner. The undergraduate medical students are required to stay at home and abide by social distancing guidelines. Their main classroom has changed from the patients' bedside to their own study desk and computers, when most teaching is now done on virtual platforms.



clerkships and clinical skills development are significantly affected. Certain areas of subspecialties may be affected more than others and students are at risk of inadequate training. Many aspects of medical training are not suited to self-reading-based learning especially in acquiring new skills, clinical observations and professionalism.

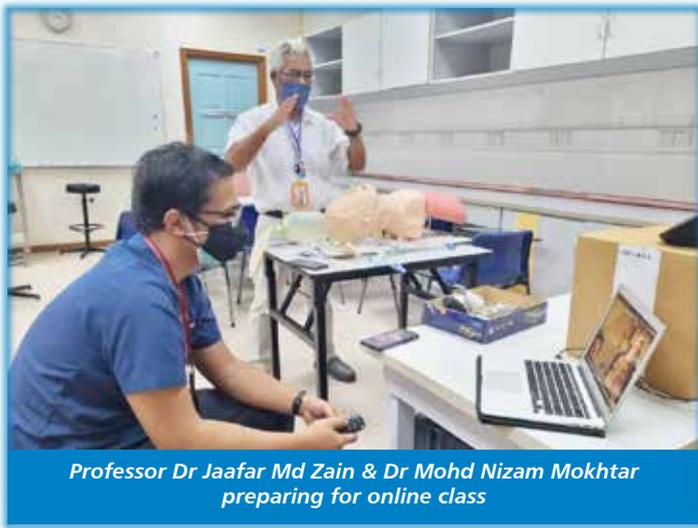
The medical education system is facing challenges which demands an entirely new delivery paradigm. The medical education curriculum should be redesigned to adapt to the new norms, so as to provide students with opportunities for continuous learning without compromising standards. Although we have been using advancements in technology in monitoring and treatment of patients, we have not exploited much of its potential for teaching. For the past decade, the concept of blended learning in which traditional in-person teaching is supplemented with electronic and online media was considered less effective for medical training. There are many platforms available such as Google Meet, Zoom, Microsoft Teams, Cisco WebEx and others. Most medical educators also prefer patient-based methods which are more easily included in their daily clinical schedule.

Undergraduate Medical Students Training

The traditional training of undergraduate medical students in anaesthesiology consists of lectures, tutorials, skills laboratories, clinical clerkship, bedside and perioperative hands-on teaching. Face-to-face lectures and tutorials in big groups are substituted with scheduled live online video lectures with interactive discussions. Students are provided with, and expected to utilise, recorded lectures that are made available online for self-study. Clinical clerkship rotations are substituted with simulated case discussions where role play is used. The modules are designed for the students to role play as healthcare professionals with simulated patient's next of kin to diagnose, plan for treatments, and to even 'counsel' patients regarding illness and prognosis, while remaining physically distanced.

In our faculty, depending on the provisions of the movement control orders, permitted tutorials or skill laboratories sessions are conducted in accordance with prevailing physical distancing guidelines. These sessions are carried out with limited numbers of participants, strict distancing, compulsory face masks and in areas which have adequate ventilation. During the 'lockdown' period, even these sessions were carried out online. Certainly, the formerly hands-on bedside teaching remains a big challenge for the educator to deliver online. As an example, demonstrating a procedure using a mannequin is definitely not 'realistic' and may not function as an effective clinical exposure.

Additionally, the pandemic has caused a glut in COVID-19 patients and most teaching centres have limited numbers of non-infective patients. This shortage limits the availability of bedside teaching and hands-on training opportunities for medical students. Consequently, their



Professor Dr Jaafar Md Zain & Dr Mohd Nizam Mokhtar preparing for online class

Postgraduate Training

On the other hand, the postgraduate trainees are not behind their computers. Most of the trainees are in the hospitals that are providing services and are part of the main frontliners in providing care during this pandemic. They play a major part of the active anaesthesia team involved in intensive care management which has expanded to near double of their usual strength. The teaching centres are operating in the dual role of providing care to non COVID-19 infected patients while at the same time providing care to COVID-19 infected patients. Although the operating theatres are still operating up to 50-70% of their usual strength, the number and variety of cases addressed are limited. Only emergency or semi-emergency cases are given priority and many elective cases are postponed. Even the general intensive care unit received a reduced number of patients. This definitely affects the training process. The trainees are kept busier than usual, with less hours of self-study and are at risk of inadequate clinical exposure. For most trainees, it is not easy to achieve the balance between providing health care services as a part of their training and at the same time preparing for their examinations.

Unlike the undergraduate training in anaesthesia that is limited to exposure and observations, postgraduate training includes ongoing observations in the operating theatres and intensive care unit as well as the management of patients in addition to skills development experiential learning. An overnight change to virtual online classroom is almost impossible. Therefore, the training of anaesthesia has to be reformed and modified to achieve the learning outcome without compromising on standards. Remote tutorials in place of classroom sessions and online discussions for exam preparations have been adopted to fill up the training gaps.

Additionally, these remote sessions are carried out after office hours or during the weekends in order to accommodate the time limitations of these trainees. For the previous two examinations, part of the examinations viva sessions were carried out online in place of face to face ones. There are many more changes that need to be

made to maintain and hopefully improve the delivery of training.

Challenges

The virtual classroom may not be an ideal solution for the challenges facing the educators system during the pandemic. In addition to the educator needing to be more creative, proactive and pragmatic in designing their teaching tools and modules, they must understand the challenges that their students are facing in order to accommodate their educational needs. Adapting to the new norms, lifestyle changes, coping with the inherent limitations of self-learning and interactive sessions in place of in-person sessions with their teachers and peers over and above acquiring adequate devices such as computers with good internet connections are part of the problems that may be unappreciated by some but are a big stumble block for the unfortunate.

The drastic changes caused by the pandemic has made us realise the potential of the technology that is already in existence. It is time for educators to equip themselves with the unfamiliar tools available to us in order to create new modules on virtual platforms. The future of medical education is at a very important turning point and needs a strong bold push to move forward and adapt to these new challenges. Embracing these changes will move us forward into the next phase of the development of our practices and careers.



Examiners for online viva via Zoom



Behind the exam scene



Perioperative ERAS Approach Defining The Role of Desflurane in Multifarious Patients & Surgeries

Dr Omar Hj Sulaiman

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Anesthesia Summit 2021

Enhanced Recovery After Surgery (ERAS) is an evidence-based, multimodal, multidisciplinary care approach that has led to substantial improvements in patient outcomes, acceleration in post-surgical recovery and cost savings.¹ Successful implementation of ERAS protocol requires proper coordination between key disciplines in the ERAS team. Here, an anesthesiologist plays an active role especially in choice of anesthetic regimen that supports ERAS.²

Desflurane embodies many desirable features that supports ERAS. Desflurane's chemical structure and unique pharmacodynamic profiles results in its low blood and tissue solubility that offers several advantages over isoflurane and sevoflurane with higher solubility.³ The low solubility of desflurane facilitates a rapid onset, precise control of alveolar anesthetic concentration during maintenance of anaesthesia, and a faster wash-out during recovery.^{4,5} Desflurane is least metabolized (10 times less metabolized than isoflurane and 250 times less than sevoflurane) which contributes to low potential for hepato-renal toxicity.^{3,6} Desflurane has shown to be comparable, and in some studies, better than TCI or TIVA in maintenance of anesthesia for prolonged surgery. Several studies reported emergence from desflurane, including extubation and response to command, was significantly earlier than from propofol, isoflurane and sevoflurane. In a large meta-analysis, desflurane was shown to reduce the variability in time to extubation and time to follow commands by 26% and 39% respectively, when compared to propofol. This reduction in variability exceeded that of sevoflurane. Variability mattered clinically as it contributes to the incidence of prolonged extubation times.⁷⁻¹¹ The outcomes of desflurane were consistent across broad spectrum of patient populations, surgical procedures and anesthetic administrative methods (Figure 1) and was extensively demonstrated in various clinical trials (Figure 2).¹²⁻¹⁸

Figure 1: The low blood and tissue solubilities of desflurane supports rapid and predictable recovery in broad spectrum of patients and surgical procedures.

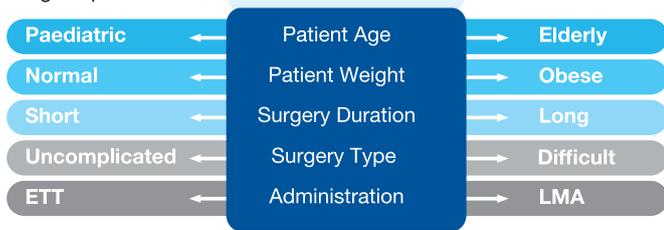
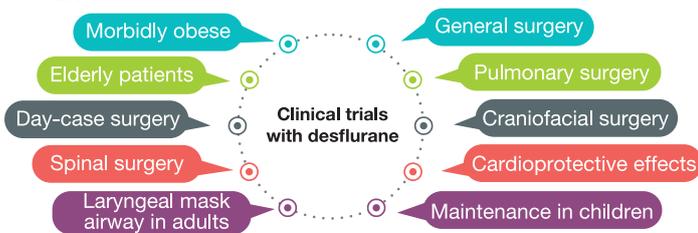


Figure 2: Desflurane's efficacy was demonstrated in various clinical trials.



Desflurane can be considered as the ideal inhaled anesthetic in overweight and obese patients. Obese patients present a challenge to safe general anesthesia because of impaired cardiopulmonary physiology and increased risks of aspiration and acute upper airway obstruction. Patients on desflurane, independent of their BMIs, have shown significantly faster return of pharyngeal reflexes vs sevoflurane.¹⁹ A meta-analysis with 11 RCTs with morbidly obese patients showed that the times required for eye opening, hand squeezing, extubation, and name stating were significantly shorter in patients given desflurane than in those given sevoflurane, isoflurane, or propofol. No significant difference was observed among the groups regarding the PACU discharge time, PONV incidence, or analgesia requirement.²⁰

Desflurane has been known to cause transient airway irritant effects at higher MAC value, 1.5 and above. However, a meta-analysis with 13 randomised controlled trials (RCTs) using LMA reported similar incidence of upper airway adverse reactions between desflurane and those noted in sevoflurane, isoflurane or propofol anesthesia with significant faster emergence reported in desflurane group. The incidence of intraoperative cardiovascular events associated with desflurane is not significantly different from that with isoflurane and sevoflurane.²¹ Transient sympathetic-mediated cardiovascular stimulation (i.e. tachycardia, hypertension) has been observed upon rapid initial increases in the end-tidal concentration of desflurane >1.0 MAC during induction of anaesthesia. This effect is self-limiting and can be blunted by opioids premedication.^{5,6}

Optimal use of Desflurane can be achieved via these methods:

When titrating desflurane during maintenance, increase or decrease desflurane concentration in increments of 1% and increase the fresh gas flow rate to 4-6L/min until the desired anaesthetic depth is reached.²²

Desflurane appears to be a cost-efficient anesthetic agent in terms of lower maintenance cost of anesthesia and better recovery profile. A meta-analysis showed that the cost of desflurane was significantly lower than that of propofol by approximately \$11.57 per patient-anaesthetic episode (p < 0.001).²³ Additional advantages of desflurane include no drug wastage or cost associated with ancillary equipment or disposals.²⁴

Ecological footprint of anesthetic gases is gaining global attention with the incorporation of life cycle management. All anesthetics (isoflurane, sevoflurane, and desflurane) contributes to global warming. Ozone depleting potential (ODP) related to CI containing halothane and isoflurane can be addressed by fluorinated sevoflurane and desflurane. Fluorine does not destroy ozone; thus, sevoflurane and desflurane have no ODP. Medical waste like syringes, energy consumption of pump delivery system and production of phenol related to propofol use should also be considered when making informed choices in reducing environmental footprint.²⁵⁻²⁶

Summary: Desflurane has been shown through extensive published evidence to provide rapid recovery and to improve outcomes in a broad spectrum of patients or surgical procedures. The favourable physical and pharmacokinetic characteristics of desflurane makes it a valuable anaesthetic agent for ERAS.

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What the TWIITTT-er ?? #it's time to get socialized!

by Dr Anand Kamalanathan

The devastating COVID-19 pandemic has united the world to coalesce against a common enemy. From an optimist's point of view, these new norms have ushered in an age of sophistication, solitude and confinement, and the Anaesthetist has not been spared. Long gone are the days when one sips coffee in one hand and browses through a newspaper in the other after successfully inducing a case whilst patiently waiting for the surgeon to arrive. I apologize if I have offended some of you who practise this archaic method of keeping abreast with the latest in medicine; but in this age of smartphones and tablets and to appease the 'Gretha Thunbergs' of the world and their cry for climate change mitigation, we must embrace change and a clean green-friendly technology in its entirety. Resist change, and you will be left behind like a certain Finnish-ed phone company, pun intended.

Before you throw saline bottles at me in detest, allow me to clear the air. I am not advocating for anaesthetists to begin posting daily selfies on Instagram or K-pop inspired TikTok dance videos (it is my professional opinion that certain nightmares cannot be unseen no matter how much Midazolam is self-injected). However, if you find solace in such amusement, by all means, you do what you want. My aim for this article is to focus on the academic intentions of social media for the advancement of learning as well as to highlight its pitfalls and shortcomings if used irresponsibly.

Why Do We Need It?

Traditional printed journals and even websites such as Google Scholar, Wikipedia, BJA, CEACCP etc. have largely been superseded by platforms such as Twitter, Facebook, YouTube, SlideShare, Podcasts and even Instagram that encourage a more engaging and stimulating readership that better appeals to the nuances of millennials. Unlike textbooks, journals, or websites where users are limited to sleep-inducing and passive viewing of content, social media facilitates intense and mind-blowing debates, explosive knowledge sharing and meaningful social interaction on a real-time basis with users from around the world. Most anaesthesiology residents are of the millennial generation (1980's onwards, including yours truly) and are digital natives; therefore, integrating social media into medical education is a natural evolution, an expectation of learners and an imperative for educators.

I recognize that anaesthetists are busy bees and must divide their limited time between administration, research, teaching and saving lives from dusk till dawn. During those brief pauses in a busy day, whilst we enjoy that well balanced, mouthful and aromatic cup of coffee; social media allows one to quickly engage on topics as hot as an espresso without having to endure lengthy and detailed descriptions found on peer-reviewed journals that often require expensive yearly subscription fees. Hence its appeal among our junior colleagues.

Twitter currently stands out for its quick dissemination of medical knowledge and the latest in innovation. It promotes medical research by tweeting links to peer-reviewed journal articles but more importantly they share images, videos, and PDFs all in one convenient platform. Twitter based journal clubs now exist in almost all specialties, including ours. These journal clubs typically provide articles and discussion questions with an associated hashtag, engaging discussions from students, healthcare providers, and basically anyone from the public with a smartphone. This provides the anaesthetists with a platform to dispel misinformation or 'fake news' from unreliable sources for the public in a format that is easy to interpret.



Interestingly, a survey in the United States revealed that Anaesthesiology residents have been shown to spend more time preparing presentations from Twitter journal clubs than from other traditional website-based journal clubs which further enhances its use as an academic tool. Traditional journals from paper-based models of scientific publishing or PDFs just can't compete with these newer forms that provide content-rich materials such as videos and links that cannot be published on paper. Since many scientific journals do not allow free access, social media aids "rapid viral information dissemination".

Medical conferences too, are enhanced by Twitter as attendees discuss presentations and workshops and describe content to others who attend 'virtually'. By measuring engagement, an organiser of a conference can further elevate the status of their conference and hence, attract more sponsorships especially in these harsh economic times. A good example of this was the recent ASRA 2021 event in Orlando, Florida in April 2021. The use of its catchy hashtag #ASRASpring21 brought about 19.5 million impressions, which is a good metric to

The Numbers

19.588M Impressions

4,866 Tweets

493 Participants

7 Avg Tweets/Hour

10 Avg Tweets/Participant

Tweet

Twitter data from the [#ASRSpring21](#) hashtag from Fri, April 16th 2021, 6:05PM to Sun, May 16th 2021, 6:05PM (America/Chicago) - Symplur.

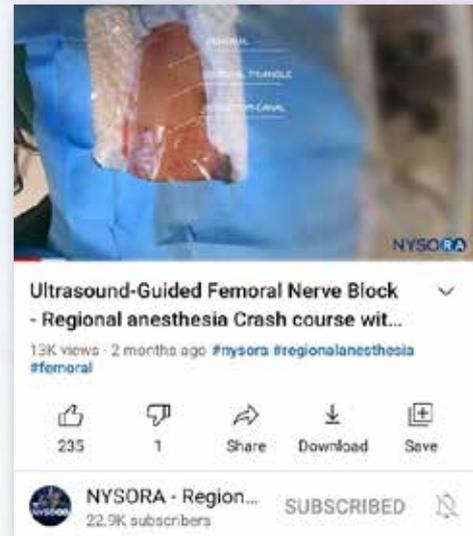
measure brand presence by tallying the total number of times the Tweet has been seen.

In this new era where the number of physical attendees is limited, the only way forward is to market our conferences internationally and to do that we need to compete on social media as well, to be on par with our foreign colleagues. The recently concluded IndoAnesthesia 2021 conference in March 2021 by our neighbours in Indonesia similarly employed aggressive online engagement via Facebook and Instagram to entice anaesthetists regionally including Malaysians who are starved of quality conferences.

The impact of social media on our patients is an interesting point to ponder. Nearly 30-50% of patients scheduled for surgery and anaesthesia consult the internet regarding their upcoming procedures, and it may affect the choice of the surgical team or hospital of choice. It is unsurprising to find gynaecologists discussing lung changes in COVID-19 or orthopaedic surgeons describing antibiotic treatments for pneumonia on social media to stay relevant and establish a good online reputation; as these have a significant impression and positive influence on patients. Anaesthesiologists, especially pain physicians, may benefit from embracing social networking sites to showcase their expertise and enhance their career prospects exponentially.

YouTube is quickly becoming the first point-of-access for last minute reviews on regional nerve blocks before the patient is wheeled into OT. It has been objectively validated as an effective adjunct educational tool. It is free (though recently becoming annoyingly ad-filled), instantaneous, and often in high resolution. Videos are also a great way to demonstrate concepts that are not easily explained in text form, hence its popular appeal

amongst the young. From my own experience, watching J.B West's respiratory physiology on Youtube certainly augmented the experience of reading his book.



How do we start responsibly?

The temptation of getting lost in socially trending sagas of celebrities, scandals and politics is a real dilemma for one with constant access to a smartphone. The tips below are suggested to ensure successful academic integration into social media.

- 1) **CREATE** a social media account purely for academic purposes only. Use a professional Twitter handle (name) and maintain this consistency between social media platforms like Facebook and Instagram. This creates brand awareness, and it helps if you have a professional-quality headshot that reflects your professional interest.
- 2) **FOLLOW** only relevant academic bodies of interest, no matter how strong the urge of following interesting bodies may appeal. Keep hobbies such as movie stars, football, or fashion to a separate personal account. This helps to streamline the onslaught of Twitter or Facebook newsfeeds that line up on your account.
- 3) **CONNECT** with anaesthesia social media 'influencers' by following and possibly engaging with them. Create a list of Twitter accounts that offer relevant news, some of the better ones include the American Society of Anesthesiologist (@ASALifeline), Royal College of Anaesthetists (@RCoANews), Anaesthesia Reports by AAGBI (@Anaes_Reports), European Society of Anaesthesiology (@EJA_Journal), just to name a few. In time, one could identify personal accounts of world-renowned names in the field of anaesthesia who re-tweet important updates and findings in research before they are even published in journals. Interacting with these famous figures offers an opportunity to share ideas and thoughts on achieving safer anaesthetic practices or attempting bold and radical interventions.

- 4) **SIZE MATTERS** - Metcalfe's Law states that the value of a network is directly proportional to the square number of users of the system. While focusing on quality in social media's sharing economy, pay attention to the numbers so you can grow your influence steadily.

Twitter allows you to pick "hot" topics with high public/academic interest to encourage higher density discussions and participation and then to re-tweet these articles to your followers so that it receives traction, or as the millennials would say- becomes "viral".

When re-tweeting, do add media attachments as it increases tweet engagement by a factor of three. Include photos, videos, or a link to improve your "retweetability".

What NOT TO DO?

The gravest mistake a social media 'abuser' can do is to assume that words are harmless, for the pen is certainly mightier than the sword. Unprofessional content by violating patient confidentiality is highly irresponsible and when provincial privacy laws are breached, litigation ensues.

DO NOT provide unnecessary thoughts on politics, unrelated world events or controversial personal opinions, at least not via your academic account. Be mindful of your local institutional corporate social media policies. Consider the value you hope to bring to your followers and your standing in the profession. Adhere to the Peter Parker rule - "With great power comes great responsibility".

DO NOT participate in arguments on social media or make derogatory statements when disagreeing with a colleague. Airing your dirty laundry or grievances regarding patient management instead of following formal processes could land you in hot soup, hence strict adherence to recommended guidelines on social media interaction would be wise. The American Medical Association's Ethics Opinion on "Professionalism in the use of Social Media" could be used as a guideline.

DO NOT share compromising contents of yourself, which is not as obvious as it should. A paper published by Yousuf R et al suggests that medical students and residents at the early stage of their career may not be aware of how publicly available content is a reflection of their

professionalism. Unknowingly, medical educators, colleagues, employers and even patients have access to view their content online. This may affect the confidence and trust in the relationship between either party. Current employers may find uploaded contents inappropriate and that can lead to disciplinary actions. Even future employers can scrutinize contents in social media as part of their recruitment process and any bad impressions can damage the career prospects of the individual. Hence, to nip it in the bud, medical schools should begin educating students on the ethics of social media interaction as part of their curriculum.

DO NOT believe everything you read or see. The caveat here is that every piece of content must be used with the awareness that some if not all tweets, images or videos, are neither peer-reviewed nor certified for accuracy. A recent study in New Jersey, 2020 concluded that while convenient, the five most popular user-uploaded YouTube videos by views for nerve blocks provided misinformation that may lead to potential danger to patients if used as a sole source of information. Each of these videos had more than 100,000 views, proving that popularity alone was not a good predictive factor in safety or accuracy.

Last but certainly not least, DO NOT get caught by the surgeon using social media when he is struggling to secure hemostasis. That usually results in a poor outcome for both the surgeon and the patient.

Bottomline

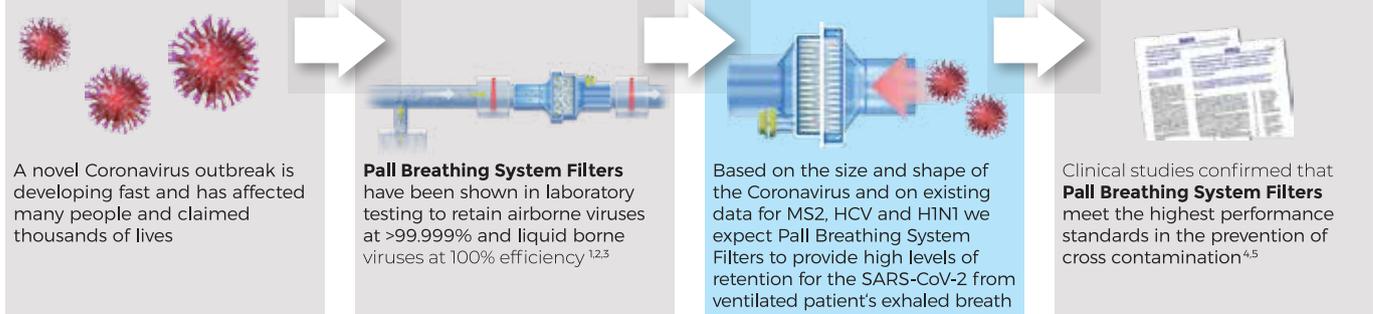
We may never know whether a social media strategy increases our knowledge or translates to better care for patients. My heavily biased opinion is that it does, as well as provides a face and voice to the men and women behind the masks. For too long have we as a profession taken a backseat and remained behind the shadows, but Covid-19 has brought about a new appreciation from the public and colleagues alike on the role of the Physician Anaesthesiologist.

It is time for the world to hear us speak. But beware, social media is akin to lighting a scented candle with fire. When used responsibly, it could illuminate your entire study table providing sensations to tingle your alpha waves to ensure a productive learning session. However, that spark could just as easily burn down your copy of Peter Kam or CY Lee if you're irresponsible, or worse your hands. Anaesthetists need our hands so be responsible and TWEET away!

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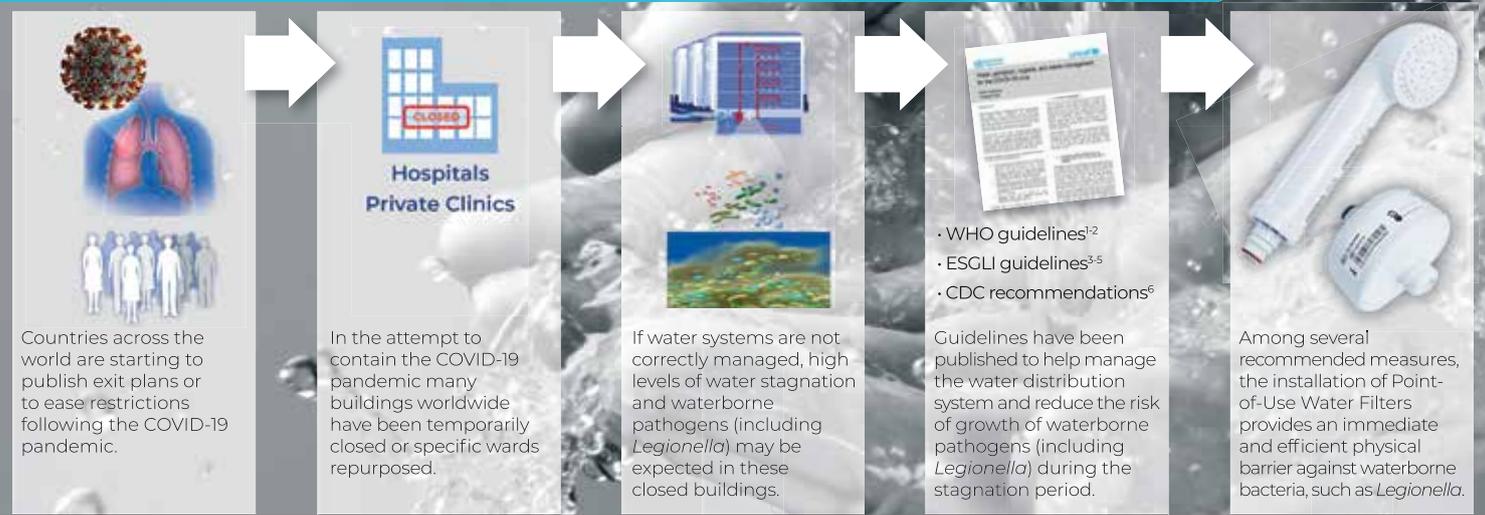
- Bronchoscopy
- Endotracheal intubation
- Airway suctioning
- Positive pressure ventilation via facemask (e.g. BiPAP, CPAP)
- High frequency oscillatory ventilation
- Sputum induction
- Aerosolized or nebulized medication application⁶



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1 Heuer et al (2013); GMS HygInfect Control 8(1):Doc09
 2 Lloyd C et al. AnaesthesiaIntensive Care (1997) 25: 235
 3 Lloyd G & Howells J, CAMR (1997)
 4 Hübner et al.(2011); GMS Krankenhaushygiene Interdisziplinär Vol. 6(1 ISSN 18635245
 5 Dubler et al.(2016); Acta AnaesthesiologicaScandinavicaOct;60(9):1251-60
 6 www.cdc.gov/sars/guidance/i-infection/healthcare.html

MANAGEMENT OF WATER DISTRIBUTION SYSTEMS DURING THE CORONAVIRUS DISEASE (COVID-19)



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References:
 1 WHO Technical Brief, Water, sanitation, hygiene and waste management for COVID-19
 2 WHO Interim guidance, Operational considerations for COVID-19 management in the accommodation sector
 3 ESGLI Guidance for managing *Legionella* in building water systems during the COVID-19 pandemic
 4 ESGLI Guidance for managing *Legionella* in hospital water systems during the COVID-19 pandemic
 5 ESGLI Guidance for managing *Legionella* in nursing & care home water systems during the COVID-19 pandemic
 6 CDC, Guidance for Building Water Systems
 (https://www.cdc.gov/coronavirus/2019-ncov/php/building-water-system.html, Accessed on 7 May 2020)

Peri-Operative Airway Management Workshop

by Professor Dr Ina Ismiarti Shariffudin, Associate Professor Dr Rhendra Hardy Mohamad Zaini, Associate Professor Dr Mohd Fahmi Lukman, Dr Shahrizan Mohd Fathil, Dr Wan Aizat Wan Zakaria & Dr Nadia Md Nor

Change is never easy, yet it is inevitable. Such was the case with the Peri-Operative Airway Management Workshop which took place on 19th - 20th February 2021. The initial plan was to mix the morning lecture sessions with hands-on skill stations in the afternoons. Unfortunately, the nation's daily coronavirus statistics prevented us from going ahead with the face-to-face workshops and the Special Interest Group had to adapt. The practical components were modified to become problem-based learning (PBL) sessions. However, in order to adhere to the standard operating procedure then, conversion to a totally online workshop allowed all 143 registered participants to be involved compared to the originally planned hands-on stations, which would have been limited to just a small on-site group.

healthcare worker's eyes, mouth and nose, together with proper hand hygiene. Despite being an online event, a very lively Q&A session followed by discussion on other issues including coronavirus test validity and cycle threshold.



The Malaysian presenters were made up of Associate Professor Dr Mohd Fahmi Lukman, Hospital Angkatan Tentera Tuanku Mizan (Guidelines and Predictors of the Difficult Airway), Dr Wan Aizat Wan Zakaria, University Malaya Medical Centre (UMMC) (Awake Intubation), Associate Professor Dr Rhendra Hardy Mohamad Zaini, Hospital Universiti Sains Malaysia (Making the Most of Videolaryngoscope), Associate Professor Dr Muhammad Maaya, Universiti Kebangsaan Malaysia Medical Centre (UKMMC) (Managing the Airway of Obese Patients), Professor Dr Ina Ismiarti Shariffuddin, UMMC (The Paediatric Airway), Dr Shahrizan Mohd Fathil, Gleneagles Hospital Medini Johor (Airway Ultrasound) and Dr Nadia Md Nor, UKMMC (Intubating Scope). This combination of various topics over the two mornings covered the scope and breadth of airway management from the simple, commonly performed procedures to the complex, rarely used devices. After a few presentations, Associate Professor Dr Azarinah Izaham wonderfully moderated the Q&A sessions, which were full of questions from the curious participants.

The workshop began on Friday morning with a presentation by Professor Dr Orlando Hung from the Department of Anesthesia, Pain Management & Peri-operative Medicine, Dalhousie University, Victoria General Hospital, Nova Scotia. The renowned Canadian anaesthesiologist spoke on "Updates on Airway Management During the COVID-19 Pandemic". It was interesting to note the similarities of airway management and safety concerns between Canada and Malaysia, with emphasis of minimising exposure and protecting the



The last presentation on Saturday morning was delivered by Dr Deborah Khoo from the National University Hospital, Singapore. She spoke on "Advances of the Supraglottic Airway". The lecture was an overview of the supraglottic airway, which is often taken for granted as it is so commonly used. Its role as a rescue device was also stressed upon.



Dr Deborah Khoo and Dr Nadia Md Nor

Participants were rotated to three breakout rooms on either afternoon of the two-day workshop. Each room comprised 10 to 12 participants who were smoothly "transitioned" to a succession of breakout rooms, which was expertly co-ordinated by the secretariat. The afternoon sessions included pre-recorded video demonstrations on manikins and patients, and the uses of the various airway devices were highlighted during the



Bonfils demonstration by Dr Nadia Md Nor

lectures. The impeccably recorded videos were the best substitute to the usual real-time hands-on session.

The accompanying problem-based learning (PBL) sessions also engaged the participants in diverse clinical scenarios, where various initial and backup airway management options, their justification, and associated problems were discussed at length. In addition, novel approaches of airway management using devices, or a combination of devices unfamiliar to the participants, was shared. We hoped this further enriched existing knowledge among our partakers.



Dr Shahridan Mohd Fathil demonstrating airway ultrasound



Supraglottic airway demonstration by Prof Dr Ina Ismarti Shariffudin

Online education approach such as this workshop utilizes the advantages of a convenient platform, enabling universal participation and sharing of knowledge and experience, literally 'at one's finger tips'. A streamed workshop is cost effective, easily accessible, and creates an ambience of lesser stress to the attendees. Undoubtedly, potential technical glitches disrupting the smooth running of the program caused unrest in our minds. Fortunately, thorough planning, prior dry runs, previous experience with online seminars, and remarkable teamwork and coordination amongst all involved, contributed to a favourable outcome, and a beneficial symposium, we hope, for our audience.



Some of the PBL participants



Acumen HPI software combined with a treatment protocol achieved statistically significant reduction in hypotension vs. standard of care^{1,2}



Two randomized controlled trials have shown that using Acumen HPI software in combination with a hemodynamic treatment protocol significantly reduced the incidence and duration of hypotensive events* in patients undergoing noncardiac surgery.^{1,2}

Results from Wijnberge, et al publication in JAMA¹

- Elective, noncardiac surgery patients monitored with Acumen HPI software in combination with a treatment protocol, had a median time of hypotension per patient of 8 minutes compared to 32.7 minutes in the control group, a 75% reduction in intraoperative hypotension
- Time-weighted average of hypotension combines the duration and the severity of hypotension corrected for the total duration of the procedure; with Acumen HPI software and a treatment protocol, the study showed a reduction of 77% in the median time-weighted average of hypotension in comparison to the control group (0.10 mmHg in the interventional group versus 0.44 mmHg in the control group)
- The Acumen HPI software secondary screen provided insight into the potential root cause of hypotension, enabling clinicians to identify the appropriate treatment course

Results from Schneck, et al publication in Journal of Clinical Monitoring and Computing²

- Acumen HPI software combined with protocolized treatment was shown to reduce the relative and absolute duration of hypotensive events in total hip arthroplasty patients, in comparison to a historical and prospective control group
- The interventional group also saw a 50% reduction in the incidence of intraoperative hypotension



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Scan here to see Wijnberge, et al & Schneck, et al clinical data

*A hypotensive event is defined as MAP <65 mmHg for a duration of at least one minute.

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Inaugural Anaesthesia Finals Examiners' Workshop and The Almost-Online Mode of Finals Conjoint Examination 2021

by Dr Shairil Rahayu Ruslan & Associate Professor Dr Noorjahan Haneem Md Hashim

Ever since Malaysia announced its first Movement Control Order (MCO) on 18th March 2020, the nation has been gripped within the coronavirus's fist and thrown into multiple situations where collectively it was felt that a return to the previous norm was far from becoming a reality. This sentiment applied to all sectors, one of which included the education and training of our Anaesthetic trainees, for whom much of their working and student life was now peppered with frequent encounters with Covid-positive patients and being rostered into the Covid Rota was not limited to non-exam goers.

Despite such disruption to everyone's lives, aspirations were still maintained, and the Conjoint Board decided that to create a more neutral and more professional method of assessment, a list of potential examiners were invited to attend the Examiners' Workshop which was organised for 17th February 2021. This project involved the collaborative effort of the Department of Anaesthesiology, University of Malaya (UM) and Medical Education and Research Development Unit (MERDU) from the Faculty of Medicine, UM. The workshop was designed to define holistically the objectives of the conjoint examination as well as the level of competency that is expected to be assessed during the examinations (especially during the VIVA components). Additional objectives included the training of examiners in the creation of high-order questions as well as calibration of the scoring system during the marking of the candidates' performances.

On the part of the Department of Anaesthesiology, UM, this endeavour was a pioneer effort and one that required the continuous guidance from the experts from the MERDU team. Esteemed speakers Professor Dr Christina Tan Phoay Lay and Professor Dr Vinod Pallath, were invited to deliver the teaching material and the workshop was moderated by Professor Dr Ina Ismiarti Shariffuddin as well as

Associate Professor Dr Noorjahan Haneem Md Hashim. It was a one-day online workshop involving about 20 potential examiners from UM, UKM, USM, UPM, IIUM as well as MOH. Materials included presentations, interactive Q&As and discussions, as well as evaluations of pre-recorded videos of "candidates" performing at various competency standards to assess and calibrate the examiners' perceptions of what is deemed to be "excellent", "borderline", or "true-fail" candidates. The workshop went very well mostly because of the efficient technical setup and troubleshooting done by Dr Siti Jawahir Rosli and Dr Selvan Segaran from the Dean's Office. All in all, by the end of the day, yours truly here who was present during the workshop as part of the organising committee and observer found herself immersed in a whole load of new information, all very good and well, and we left the session with hopes that the upcoming Finals Examinations would be conducted in a manner that would fulfil the objectives of the workshop as well as we can.

With the lingering effects of the Examiners' Workshop still ringing in our minds, the team of Coordinators from all the universities set to work on organising the Conjoint Finals Examinations which were planned for 29th March 2021. From the get-go, it was decided that the examinations would be decentralised and held at the



Image 1: Screenshot of some of the participants of the Examiners' Workshop 2021. Professor Dr Vinod Pallath was not in the screenshot as he had to excuse himself early for another engagement

respective universities in view of the uncertain situations relating to the COVID-19 pandemic. Within the team, frequent Whatsapp messaging, emails and out-of-the-blue weekend phone calls became another kind of new norm as everyone tirelessly sought to ensure that the examinations could proceed without a hitch. The Written component of the examinations went by smoothly except for a couple of small hiccups that were to be expected in a decentralised examination. Again, a lot of phone calls and some emails rectified the problem in time, and everyone managed to sit for the examinations peacefully.

Following that, the host Coordinator team had less than three weeks to organise the VIVA component of the exams, but at that point we felt that we were well prepared as we had made reservations and preparations as early as November 2020. The checklists included various audio-visual equipment, IT support and paraphernalia, as well as more than enough number of rooms to accommodate what we thought would be a totally online approach to hold the VIVA examinations. We even had a date planned for a "VIVA session simulation" - that was how nervous and untrusting of the situation, we were. However, two weeks before the VIVAs, we were inspired to reconsider a centralised method of



Image 2: Written component of the Conjoint Final Examination



Image 3: Strict adherence to spatial distancing and SOPs were enforced during the decentralised written examination, combined with continuous videoconferencing during the examination itself



Image 4: Examiners, coordinators as well as the heads of departments from the respective universities during the Examiners' Meeting

examination because this was about the time when almost all of us (healthcare workers a.k.a “FRONTLINERS”) were given our COVID-19 vaccination shots, either first shot or even completed the second shot. The situation at the time were also quite cool and given the fact that a centralised, face-to-face approach to any examination would still be the best in terms of fairness and neutrality, we collectively decided to go ahead with an offline approach.

Again, as it was quickly proving to become a routine of late, just days before the VIVA examinations, we received news that the East Coast (especially Kelantan) was declared to be under MCO. Again, we found ourselves relooking into our options (at this point, everyone was told to be on standby and these included the IT support team, the OSHE team, the Dean’s Office team). However, a lot of signs were telling us that we were good for a centralised approach... and our East Coast counterparts were already on their way to our location by that point. With a lot of prayers as well as trepidation, we proceeded with the traditional, offline method of examinations, amidst some minor heart-attacks and last-minute adjustments... and by the end of the week, we successfully coordinated the almost-online-but-turned-

offline VIVA examinations, and no casualties were reported on the part of the examiners or organising team.

The whole process would not have been possible without the joint effort from the Coordinators representing all universities, and the team of examiners were wonderful as their high-spirits and professionalism contributed to the success of the whole affair. It was a close call too as the following week, Klang Valley saw a spike of COVID-19 cases and the whole situation shifted to one that was very similar to the initial stages of the pandemic. Even now, we are facing daily rising number of cases and the training of our Anaesthetic trainees are hanging in the balance again as the working roster is shifted back to the COVID Rota. Whether or not the next round of examinations may proceed the traditional way, remains to be seen but for now, we will count our small successes and wish that the situation will become better soon, for everyone’s sake. Inshaallah, with the collective efforts of everyone in the country, healthcare workers and the public combined, coupled with the eventual vaccination of majority of the population, we pray that the situation will turn around and our country rises from this dark era to a brighter future.



Image 5: VIVA examination candidates adhering to SOP

“ Perseverance is not a long race; it is many short races one after the other ”
- Walter Elliot

Examination in the COVID Era, Tackling the Uncertainties

by Assistant Professor Dr Nur Fariza Ramly

April 2020. It was the International Islamic University Malaysia's (IIUM) turn to be the host of the Conjoint Board Part 1 Examinations. It was our second time in hosting the exam, and so all the experiences from the previous stint in 2018 came in handy. As the chief coordinator of the exam, it was my responsibility to make sure the preparations were in place and ready, as it was only three weeks shy of the examinations date.

It was in March when the pandemic started to hit us hard. As the host, we took some extra steps by arranging for reserved examiners in case our external examiners were unable to come due to the COVID-19 situation. As a matter of fact, in mid-March, both the examiners from Singapore and New Zealand had to cancel their trip because of the travel restrictions. To top it off, one day prior to the first movement control order (MCO), the Council of the Medical Faculty Deans announced the postponement of all medical specialty examinations between 1st April to 31st May 2020. It was the first time in history that our major postgraduate examinations had to be postponed.

As the fiery pandemic did not die down in the months after, everyone was overwhelmed with anxiety and kept on their toes. The conjoint board finally came out with a new date of exam in October. Due to so many uncertainties and logistic issues surrounding the pandemic, it was not feasible to organise the examination in a single centre. Thus, it was agreed that the examination was to be co-hosted by two universities: IIUM and Univesiti Putra Malaysia (UPM). It took a lot of efforts and countless discussions, to reach a decision.

The candidates were divided into two centres for the written examinations. Those in Sabah, Sarawak and Klang Valley were scheduled to sit for exams in UPM, while the rest of the candidates were set up to take the exams in IIUM. The nightmare began for the coordinating parties when the standard operating procedures (SOPs) for travel were strictly enforced. All the passengers from Sabah were required to undergo mandatory home quarantine for fourteen days upon arrival to the Peninsular. Hence, all the six candidates from Sabah had to leave the state two weeks earlier to make time for the exams. One of the candidates was in contact with COVID-positive

passengers on a flight, and consequently home quarantined.

The situation was very dynamic in the few days before the examinations. We had to sort out so many logistic issues with regards to the candidates. Some of the candidates came from the high-risk areas such as the red zones, the enhanced MCO areas and the targeted enhanced MCO areas. The host universities took precautions by performing risk assessment for all the candidates, coordinators and examiners. Those from the high-risk area were requested to do a swab test prior to the examinations. We even had to arrange for a swabbing session in our IIUM centre for some of the candidates who did not have the chance to do it before their travel to Kuantan. Some of the candidates drove all the way from Johor and Pulau Pinang to IIUM to avoid the risks of exposure with the public transport.



Figure 1: The distance between candidates' table is measured to assure distance according to guideline

The written examinations in two centres went smoothly and were held according to very strict SOPs. All the candidates were required to wear their wear face masks at all times throughout the examinations. The number of candidates per hall and the distance between each candidate were observed according to the guideline. On the last day of the examination, the government imposed an immediate interstate travel ban. The candidates had to apply permission from the police to travel back to their state. Even though the candidates were faced with a lot of obstacles, the universities did provide the best assistance to all the candidates involved.



Figure 2: Written examination in IIUM centre

In view of the travel ban and the evolving situation of the pandemic, the decision was made that the examiners and markers to remain in their place, and the answer sheets to be delivered to them in softcopies for marking. It was the longest couple of days, when we, in IIUM, had to scan almost four thousand pages of answer sheets to be encrypted in files and distributed to the examiners and markers. During the whole process, we were constantly on videoconference with our co-host, UPM, to maintain communication and coordination.

The preparation for viva examination was equally hectic. Both centres had no experience in hosting online examination and we were only left with three weeks to pull everything together. By that moment, the Klang Valley and some other areas had become the red zones, therefore the decision was made to decentralize the examinations to multiple centres. UPM held the online viva examination in their centre, for the candidates from Klang Valley and other red zones.



Figure 3: The viva room setup in IIUM centre

The other non-red zone areas were hosted by us in IIUM, while the candidates remained in their own hospital. It was such an exhaustive effort to organise candidates from nine different centres. Fortunately, we gained full supports and commitments from all the heads of

department and coordinators from the candidates' hospital, namely Hospital Melaka, Hospital Pulau Pinang, Hospital Raja Permaisuri Bainun, Hospital Sultanah Aminah, Hospital Sultanah Bahiyah, Hospital Tuanku Jaafar, Hospital Umum Sarawak, Universiti Sains Malaysia and IIUM. Despite having to prepare everything in a very short time and with limited resources, all the centres were able to provide good online exam facilities for the candidates. Some of the centres even went the extra mile with providing the best venue, equipment, and uninterrupted internet connection. We are very grateful to all the heads of departments, coordinators, and other staff involved. Without their assistance, the online examination might have been disastrous.



Figure 4: During the trial of video conference with one of the centre

As for us in IIUM, we had to do some reallocation of the budget for urgent purchasing of the video conference equipment for the online exam. We also sought the support from the IT department to ensure reliable internet connection during the examination. We equipped our four rooms with brilliant webcams, omnidirectional speakers, large screen televisions, Zoom software and the other necessities. It was indeed a humbling experience to coordinate the online viva session during the pandemic. There were a few minor interruptions, but they were anticipated and handled efficiently. There were no major issues with the sessions and the first time online Conjoint Board Part 1 Oral Examination went smoothly. We thank everyone who worked very hard around the clock to make the examination successful despite all the minor challenges. This will indeed become the new norm for our postgraduate medical education in Malaysia.

Anaesthesia Fees: How Is It Done Worldwide

by Dr Gunalan Palari Arumugam

In part three of our series of articles touching on the fee schedule, let us look at how some countries practise the aspects of charging for the professional services rendered. Every country has its own way or method in which fees are calculated which pretty much depends on how the payment structure for the overall cost of treatment is developed. Some are single payor structure, some do not have a standardised central payment structure, and some will be a hybrid of both a centralised funding combined with private payors. Let us look at some examples in this article.

UNITED STATES OF AMERICA

The United States remains one of the most complicated and expensive countries that we wish not to emulate its fee schedules. They are extremely complex, and you would need a lengthy lecture for it to be explained adequately.

Most of us would have heard of Medicare and Medicaid. Medicare is a Federal health insurance programme for people 65 years or older, certain people with disabilities, and people with end-stage renal disease (ESRD).¹ Medicaid on the other hand is the public health insurance programme that is jointly funded by both the Federal and State health insurance. The programme helps many people who cannot afford medical care pay for some or all of their medical bills especially for people with low income. The Medicaid programme covers 1 in 5 Americans, including many with complex and costly needs for care. Over the years there have been various modifications to the programme including the Affordable Care Act in 2010.²

You would be shocked to know that the annual budget for Medicare in 2019 was almost USD 800b while Medicaid spending was about USD 613 billion. This is however only a portion of the USD 3.8 trillion spent by the USA for healthcare. The balance of the payments was via out of pocket as well as private insurance payors.³ In comparison to our national budget for 2020, an allocation of about USD 10 billion was set aside for the Ministry of Health to manage a population of 30 million people.⁴ The private sector in Malaysia may probably

account for another USD 5 billion of healthcare expenditure.

Part of this huge financial burden stems from the fact that the US is a very capitalistic environment and every aspect of the ecosystem including healthcare has an inherent cost for which a fee or remuneration is attached to it. This includes the CPT system or what is known as the Current Procedural Terminology that was developed by the American Medical Association to which all practitioners, hospitals and the insurance industry rely upon for their charges. The CPT is not to be confused with the ICD codes which are more representative of the diagnosis of the patient.

The general formula for calculating anaesthesia charges is to use the following formula⁵

(Base units + Time units + Modifying units) x Conversion factor.

Base units

Each anaesthesia CPT code has a base unit value. The base unit value is reflective of the difficulty and skill required for the procedure.

Time units = Total Minutes of Service / 15 minutes blocks

Begins when the anaesthesia provider prepares the patient for the induction of anaesthesia in the operating room or equivalent area and ends when the anaesthesia provider is no longer in personal attendance and the patient is safely placed under post-operative supervision. The American Medical Association and the American Society of Anesthesiologists recommend that 1 unit of time is equal to 15 minutes of anaesthesia time.

Modifying units

Modifying units such as ASA Physical Status, age, position for surgery and other specific circumstances are grouped under the modifying units.

Based on the above formula, for example, an appendectomy is calculated as six base units while a

coronary bypass surgery is valued at 20. From this base unit, time units and modifying units are added. A 2010 survey by the American Society of Anesthesiologists showed a median of about USD 60 to USD 64 per unit. So, an anaesthesiologist might bill USD 600 for an ASA 1 appendectomy that takes an hour, or bill USD 2,500 or more for an ASA 3 heart surgery that takes six hours.

The advantage of this method of calculation is that every variable that may make rendering anaesthesia for a particular patient is factored into, including the time factor as well. The obvious disadvantage would be that the final cost to the patient may indirectly reflect on the skills of the surgeon i.e., slower, or faster surgeon which may not necessarily be a fair reflection to the surgeon as well. Although we may be compensated for the additional time it takes to provide anaesthesia for the surgeon to perform his operation, the payors (insurance companies, healthcare management organisations) may query on why a certain surgeon's fee costs more than another surgeon of the same hospital.

AUSTRALIA

In Australia, the healthcare financing system is a combination of Medicare and Private Healthcare Funds/Insurance Schemes.⁶ The Government legislated rebates from Medicare and Private Health Funds have failed to increase in line with medical practice costs (especially compulsory Medical Indemnity Insurance, staff salaries and inflation) since the very beginning of Medicare. As such, the payment of fees for the anaesthesia rendered will be a combination of what is provided for by Medicare and the health fund as well as out of pocket expenses borne by the patient.

In an almost similar fashion to the CPT system in USA, the anaesthesia fees are calculated according to relative value guides (RVG) and billed in "units". The number of units charged for a surgery depends on its complexity, including the type of surgery, the duration of the service, whether any monitoring devices are used, the patient's classification on a scale of illness severity, the patient's age (if they are less than 12 months or over 70 years) or after hours emergencies which attract a 50% surcharge.

A simple procedure usually comes in at around 10 units and might include just anaesthesia and the time count.

The bill for a more complex operation like a laparotomy for a perforated bowel is as below:⁷

Description	Units	Unit Price	Fee
Anaesthesia for resection of perforated bowel	6	\$35	\$210
Time - 4 hours 40 minutes	24	\$35	\$840
Modifier - physical status	1	\$35	\$35
Central venous pressure monitoring	3	\$35	\$105
Total	34		\$1190

The Unit Price is determined by the Australian Medical Association in consultation with the Australian Society of Anaesthetists.

The problem is the fact that Medicare does not cover 100% of the bill and the patient may require a separate payment arrangement either via out-of-pocket payment or using their private insurances. Some of the complaints about this would be that different areas or states or even surgeons may have a different range of payments. Some localities may have a lower cost to run their business as such the co-payment required will be lower. Some surgeons may feel that they are in demand as such they may want to charge a higher price for patients who are keen to secure their expertise. In principle, you pay for what you get. Private health care generally has shorter waiting times when compared to public care as such many patients will be agreeable to fork out more money than what the actual cost is if they were to wait for the procedure to be done at a public hospital.⁸

SINGAPORE

Let us look at how our neighbour, Singapore, is doing. Of course, for a population of about 6 million with a land size less than Penang (mainland and island combined), the complexities for delivering a national healthcare system arguably may be less complex than what we encounter for Malaysia.

The Ministry of Health (MOH) Singapore is heavily involved in providing and ensuring quality and affordable basic medical services for all. Singapore's healthcare system is designed to ensure that everyone has access to different levels of healthcare in a timely, cost-effective, and seamless manner. Charges are heavily subsidised

according to the ward class that the patients desire.⁹ There are various healthcare financing schemes and subsidies available in Singapore such as MediShield Life, Care Shield Life, MediSave, CHAS and ElderShield as well as individual private insurance schemes.

There are eight public hospitals comprising six general hospitals, a women's and children's hospital, and a psychiatry hospital which mainly provide multi-disciplinary inpatient and specialist outpatient services and 24-hour emergency departments while six national specialty centres provide cancer, cardiac, eye, skin, neuroscience, and dental care.¹⁰ Apart from these hospitals, the private healthcare system in Singapore boasts of some of the regions most advanced hospitals and are heavily marketed by the Singapore government as a medical tourism hub. They have been successful at it is more than three decades now, attracting patients from all over the world who are looking at cost effective state-of-the-art healthcare expertise for their medical conditions.

However, the private healthcare charging mechanism has been largely left to a willing buyer willing seller kind of basis until some issues cropped up of late. The most famous among this would be the case of Dr Susan Lim of whom the Singapore Medical Council handed down a

suspension of three years and a fine for what it deemed as egregious overcharging and professional misconduct.¹¹

As a result of similar issues and to offer some overview to what is reasonable and customary to the patients, the Fee Benchmarks Advisory Committee was appointed in January 2018 by the Ministry of Health Singapore to develop an approach for setting reasonable fee benchmarks for surgical procedures and services. It was intended as a common reference for all stakeholders and aims to guide doctors in setting their fees, support patients and caregivers in making more informed decisions on their care options and enable payors (insurers and employers) to better manage and assess claims. However, the fee benchmarks may not be applicable for patients whose conditions are of high complexity or who may be extremely ill.

Anaesthetist fee benchmarks are meant for the anaesthetist providing anaesthesia support. The fee range covers the single continuous episode of anaesthetic care in support of the surgical procedure, including pre-operative anaesthesia consultation immediately before the surgical procedure, intra-operative anaesthetic management (at the time of operation and immediate post-operative care and monitoring of the patient in the recovery unit.

For example, below is a description of the doctors' fees for a coronary angiogram/stenting and CABG.¹²

S/N	TOSP	Description	Table No.	Surgeon Fee Benchmarks		Anaesthetist Fee Benchmarks	
				Lower bound (\$)	Upper bound (\$)	Lower bound (\$)	Upper bound (\$)
16	SD713H	Heart, Percutaneous Transluminal Coronary Angioplasty (PTCA) + stenting (more than 1 vessel), with/without IVUS/FFR or other physiological studies.	4B	9,000	13,900	1,670	2,650
		<i>Note: This code is for multivessel stenting, with or without invasive intracoronary imaging or physiologic guidance.</i>					
17	SD742H	Heart, Coronary Disease, Coronary Artery Bypass Graft (Open/MIS/off pump).	6C	16,050*	25,000*	3,470*	5,050*
		<i>Note: Higher end of surgeon fees may be associated with high risk surgeries, and/or repeat heart bypass surgeries, including: (1) cases with operative risks that are Logistic Euroscore 6 and above, and/or (2) re-do Coronary Artery Bypass Graft with failed grafts, and/or (3) cases requiring haemodynamic support (e.g. IABP, Impella or LVAD).</i>					

The fee benchmarks takes into account the risks, expertise and time associated with anaesthetic care for an expected range of patients for a procedure; where the lower bound represents cases for a healthy patient; or where no anaesthetic problems are identified while the upper bound represents more complex cases where the patient has poorly controlled, severe or multiple medical conditions that significantly increase the risk and/or effort of anaesthetic care; or has serious anaesthetic issues, e.g. airway problems, anaphylaxis; or is ASA 2 with presence of other anaesthetic issues or multiple medical conditions; or is ASA 3 or equivalent.

If a case departs from the routine, e.g. the patient who was an ASA 1, but due to unforeseen circumstances, the duration of the surgery is significantly longer than usual, the anaesthetist has the discretion to vary the fees to reflect the added risk, effort and time required.

SUMMARY

In a nutshell, I hope that you have achieved a clear picture of the progress and evolution of the Fee Schedule developed over the years in Malaysia by our senior doctors. You can also see from the global overview that I have prepared that there is no one-size-fits-all solution that will be applicable for our doctors in Malaysia. The

current fee schedule i.e., the 13th Fee Schedule which was amended in 2013 is here to stay for the foreseeable future.

The main drawback to the Fee Schedule being part of the Private Healthcare Facilities and Services Act 2006 is that any amendments will have to be forwarded to the Attorney General Chambers which will then draft and submit to Parliament for debate and voting before it is passed. This process is a long winded one. The Fee Schedule in my opinion and the opinion of a number of senior colleagues should be based along the Relative Value Unit System where fees commensurate with the complexities of the patient, the anaesthesia challenges as well as the time it takes for the involvement of the anaesthesiologist. At the moment, our fees are still tied in to the surgeons' codes (i.e. the fees take into account the complexities of the surgeons' procedures).

It is up to the future generation of anaesthesiologists in the country to voice their views and opinions, be involved and take up leadership roles within the Society and College so that our voice can be heard in unison. We need to impress to the powers-that-be that only us and us alone should be dictating what is our worth.

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A Major Milestone for Critical Care in Malaysia: The First Field Intensive Care Unit

by Lt Kol (Dr) Mohamad Azlan Ariffin

The 4th wave of COVID-19 which hit Malaysia in April 2021 is the worst since the start of the pandemic. The daily infection rate average is more than 5000 cases per day and the critical care units are significantly affected with the national intensive care unit (ICU) bed occupancy over 90% with a few states exceeding beyond 100%. The care for non-COVID patients is affected as the common wards and ICUs were overrun with COVID-19 patients. Our national healthcare system is at the edge of collapse.

Kor Kesihatan Diraja (KKD) a branch of Tentera Darat Malaysia has been helping the Ministry of Health (MOH) in fighting COVID-19 from the beginning with the establishment of Pusat Kuarantin dan Rawatan Risiko Rendah COVID-19 (PKRC) 1.0 at the Malaysia Agro Exposition Park Serdang (MAEPS), Field Hospital Penjara Pokok Sena, Field Hospital Tawau and Field Hospital Kapit. Field Hospital, a temporary establishment, can be set up within a short time and shifted to other locations if needed. KKD has two medical battalions strategically stationed in both east and west Malaysia which can be deployed to support combat troops in response to any threat to national security. Those medical battalions can be ordered by the Panglima Tentera Darat to support MOH as necessary. However, there is a need to preserve their ability to function in the event of an emergency security threat.

In mid-May 2021, MOH announced that critical care services in certain states were beyond 100% capacity. MOH had enquired about the feasibility of ATM to assist in the setting up of a Field Hospital equipped with ICU in certain states. This would be a challenge as a Field ICU would require robust logistic support and equipment suitable for the field. The latest deployment of a field hospital with ICU beds was in Cox's Bazar, Bangladesh.

Since this would be our first high-capacity field ICU, a dry run was done on the 16th May 2021. Batalion Perubatan Kedua from Kluang arrived with their logistic at the Hospital Angkatan Tentera Tuanku Mizan for the dry run. The aim was to test the feasibility of the Field ICU to meet civilian ICU standards. Simulation of Modified Positive Pressure Tent was performed, and the requirement for power supply and oxygen was calculated. The Director-General of Health, Tan Sri Dato' Seri Dr Noor Hisham Abdullah; the MOH Health of Anaesthesia Service, Dr Melor Mohd Mansor; with MOH engineering and procurement teams visited the site on the next day.

The main issues with the field ICU would be the limited supply of high-pressure oxygen from oxygen tanks. The dry run data showed the average normal ICU ventilator with a setting of FiO₂ 0.5 and Minute Ventilation between 6-8L/min would deplete the biggest oxygen tank size J within 12-14 hours. It would be laborious work to change the tanks twice a day. In our deployment experience, we



Field ventilator compatible with both high pressure and low flow oxygen source



Collaboration between ATM and MOH

did not rely on oxygen tanks as it would be impossible to maintain a timely resupply in a Humanitarian Assistance and Disaster Response (HADR). Our last Field Hospital in Operation Starlight catered for 56 beds with two ICU beds and two operating theatres. Both our general anaesthesia machine and portable ICU ventilator were designed to be able to operate with low flow oxygen up to 5L/min from oxygen concentrators. We were able to conserve oxygen for emergency use. This is not an uncommon practice in field. In reference to infection control, it was impossible to create negative pressure inside modular structures or tents. To prevent COVID-19 transmission, we adopted the new Modified Positive Pressure Tent concept.

The issue of oxygen supply was raised to MOH. The described field practice may not be acceptable by MOH. Management of COVID-19 pneumonia patients will be difficult with low flow oxygen technique. High Flow Nasal Cannula widely used for COVID-19 critically ill patients nowadays will even deplete the J size oxygen tank faster as very high flow of up to 60L/min is needed. MOH decided to proceed with the tapping on the central Vacuum Insulated Evaporation of the local hospital and building an oxygen network to the field hospital.

Our ATM epidemiologist and coordinator for the field Hospital, Brig Gen (Dr) Mohd Arshil Moideen, suggested modified positive pressure tents as a solution for infection control in the Field ICU. This can be achieved by having only one entrance to the tent complex and placing two 5hp Air Conditioning Ventilation Unit at a calculated distance in between the units. This will generate adequate ventilation flow to sustain positive pressure and maintain an acceptable temperature in the tent. The field hospital area will be designated as a red zone and all staff will don before entering. The field hospital complex will be fenced with barbed wire with a distance of 10 meters from the nearest tent. The 10 meter radius was chosen as evidence in the medical literature support the notion that the spread of COVID-19 is by droplet and airborne

transmission, and the furthest distance is about 5 meters. Mechanical and electrical logistics as well as clinical support will be jointly managed by ATM, MOH, state governments and other government agencies.

Hospital Kepala Batas parking area was selected with Jabatan Kesihatan Negeri Pulau Pinang, after considering the suitability of the area, logistic support and power supply. On the 18th May 2021, the Batalion Kedua Perubatan comandered by Lt Kol (Dr) Zamri Dehraman with his 33 staff were given the task to set up the field hospital with the help of ATM anaesthesiologist, close collaboration with multiple government agencies and private entities. The Kepala Batas field hospital was officially opened on 25th May 2018. The next field hospital of 56 beds for general ward and 4 ICU beds was built in Hospital Sultanah Aminah Johor Bharu. The first discussion between ATM and the HSA started on 6th June 2021. The assets were moved by Batalion Kedua Perubatan for this project on 9th June and officially opened on 17th Jun 2021. A manifold system with 12 tanks for the oxygen supply in the HSA field hospital was discussed as an option, however this would require more time to build. At this moment the operational logistic of this field hospital will be supported and maintained by ATM and the clinical service will be provided by MOH due to the limited number of KKD anaesthesiologists and critical care staff.

ATM with its central command leadership was able to set up the field hospitals in the shortest time possible. Even though some of our colleagues in the fraternity might be sceptical with the feasibility of the Field ICU, our limited experience has proven that countless lives can be saved with the field hospital during our deployment outside our borders. Last but not least, our Corp will uphold the motto of "Khidmat Diutamakan", and we will complete our mission wherever it will be.



The dry run test and visit by MOH



The modification of field ICU in modular assets

Contribution to Hospital Labuan

by Dato Dr Hjh Jahizah Hassan

The surge in the third wave of the COVID-19 cases nationwide continues unabated. Who would have thought that the idyllic island of Labuan with a population of about 100,000 would also be having issues. Most of us imagine it as an island with minimal people movement except for those who are there relating to work. However clusters began to appear at the end of May 2021 and part of the reason why there was an increase in the number of cases was attributed to the presence of the Delta variant in the community. As of 24th June 2021, Labuan reported a cumulative number of 7,507 cases with a total of 107 deaths.

The CoA reached out to our members at Hospital Labuan in the early part of June 2021 to find out how they were faring with the onslaught of COVID-19 cases. They indicated that it would be helpful if they could have some much-needed equipment while waiting for these from the Ministry of Health which might take a while due to the administrative processes. The MSA and the CoA as well as the Master and Scribe of the Academy of Medicine of Malaysia were approached. We pulled our resources together and the following have been arranged and donated to the Department of Anaesthesiology & Intensive Care, Hospital Labuan.

No	Society / Person	HFNC	PAPR
1	Academy of Medicine of Malaysia	1	
2	(a) College of Anaesthesiologists, Academy of Medicine of Malaysia (b) Malaysian Society of Anaesthesiologists (c) Malaysian Society of Cardiothoracic Anesthesiologists & And Perfusionists	2	2
3	Persatuan Dermatologi Malaysia (Dermatological Society of Malaysia)	1	1
4	Malaysian Orthopaedic Association	1	
5	Tan Sri Mohamed Azman bin Yahya		1
	Total	5	4

The equipment arrived in the Department on 25th June 2021. We hope this will tide them over while they wait for further reinforcements from the Ministry of Health. Our

prayers and well wishes goes out to the brave frontliners and we hope that they too will overcome this surge as soon as possible.



Welcoming the Anaesthesiologists of MMed Anaesthesiology 2021

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Dr Noor Hanis binti Ismail
Dr Lim Su Sian
Dr Wong Cheng Weng

UNIVERSITI PUTRA MALAYSIA

Dr Aini Safira binti Che Abdul Rahim
Dr Jee Chiun Chen

SP50



Pro Syringe Pump



VP50



Pro Infusion Pump



UNIFUSION SP50

- High accuracy: $\pm 2\%$
- Fast start function against start delay
- Anti-bolus function
- DERS (Dose error reduction system)
- IP Level: IP34
- 11 hours battery back-up time
- 4.3" colour touch screen
- Intuitive operation system
- Automatic calibration
- Inter-Lockable

UNIFUSION VP50

- High accuracy: $\pm 5\%$
- Double air bubble detect
- Double pressure detect
- Anti-bolus function
- DERS (Dose error reduction system)
- IP Level: IP34
- 9 hours battery back-up time
- 4.3" colour touch screen
- Intuitive operation system
- Automatic calibration
- Inter-Lockable

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2. Workshop (virtual) - This was one of our first collaborative virtual effort with the MSA on training and teaching at ATM Field hospital in Kepala Batas, Penang. Suffice to say, it was well received with active interactive participation from the attendees. A huge thank you to Dr Mafeitzeral Mamat, Consultant Anaesthesiologist from Gleneagles Hospital Medini, Johor for taking time to teach and guide the young medical officers and staff nurses.
3. First successful virtual FCAI, CCT assessment exams were recently conducted smoothly for 7 candidates. The CoA was delighted to be able to render assistance in provision of media platform for the assessment which was conducted virtually for candidates from Penang.
4. Vaccination and Anaesthesia press statement to quell myths about undergoing anaesthesia after COVID-19 vaccination - COVID-19 Vaccinated Individual Requiring Anaesthesia.
5. Joint media statement with MSA and MSIC on Procurement of the Negative Pressure Ambulances Do Not Curb COVID-19 Pandemic.
6. Joint Statement with MSA and MSIC on Implementation of Public-Private Partnership during COVID-19 pandemic.
7. We continue to lend voice and support to the numerous advisories in collaboration with the Academy of Medicine of Malaysia (AMM) and the Malaysian Health Coalition (MHC). We have endorsed an additional six joint statements with MHC and one press statements with the AMM since our last edition of this newsletter. They are as follows:
 - Total lockdown must be supported by other measures 29/5/2021
 - Prepare to vaccinate more people 1/6/21
 - Conduct Science Based COVID-19 Interventions 3/6/21 AMM
 - No COVID-19 Patient Should Be Brought in Dead 9/6/2021
 - Provide More Details for the Recovery Plan 19/6/2021
 - Spend Public Funds Based on Science and Good Judgement 23/6/2021
 - Ivermectin Must Follow Malaysia Standard Approval Success 26/6/2021

8. Donation drive with the MSA and the AMM for Labuan Hospital Anaesthesiology and Intensive Care department.

9. Maintenance of Competency - A Subcommittee appointed with Dr Gunalan as the chair.

The way forward is to consistently keep abreast with evidence-based practices and advisory from the experts from the respective fields while practicing evidence-based SOPs. The CoA hereby pledges that we will strive to deliver quality advisory guidelines to keep up with the constant changes in management of this novel COVID-19 virus. The vaccine is at our shores, and the inoculation process is already enroute. It is a race against time and survival for many, particularly the vulnerable group of patients. We are hopeful that the vaccination drive will step up pace soonest possible and provision to all Malaysians will be made with good speed. We continue to be a voice of reason and strength for our fraternity.

I end on a positive note with this last message as President of the CoA. The CoA is as bustling as ever, always seeking ways to reach out in relevance to our profession and fraternity. Our voice has grown in strength as too our presence. I thank you for your continuous support and trust in me when I held the reign, and I am sure the CoA will grow in ranks, stability, and fortitude with the new incoming team. The past year has showcased our worth, may the years ahead continue to shine light on us all. Stay safe in the interim and hopefully we can start our journey back to normalcy soon. Last but not least, I wish to take this opportunity to thank each of the Council Members and shower my utmost gratitude for your continuous support during this pandemic especially to Professor Dr Marzida Mansor (MSA President), Dr Gunalan Palari and Dato' Dr Wan Rahiza Wan Mat, for the joint press statements, Associate Professor Dr Azarinah Izaham and Dr Hasmizy Muhammed for the webinars, Datin Dr Vanitha Sivanaser for being my unofficial speechwriter, Dato' Dr Subramanyam Balan, Dr Seah Keh Seng and Dr Melor Mansor for their input and last but not least our stalwart Miss Y M Kong who constantly has our best interests at heart.

Best wishes, stay safe.

Thank you.

Message from the President of the College of Anaesthesiologists, AMM

Dato Dr Hj Zahidah Hj Hassan



'The formidable adversary is far from vanquished. The past year has proceeded with uncertainty. What remains constant is our quest to try and keep trying, our adaptability to manoeuvre unknown terrains and our ability to take stock of a situation and formulate contingency strategies with steadfast pace'... extract from COA President's message March 2021 edition.

Four months to this date, I wrote the above. These words resonate ever more urgently today with a timely punctuation. We must remain committed in our faith, determination and quest to adapt to the ever-evolving nature of the COVID-19 pandemic.

COVID-19 has dislocated clinical services and training in epic proportions. However, in spite of the hard blow delivered by the pandemic to the medical fraternity, anaesthesia and intensive care services have remained steadfast with remarkable strength. Both intensivists and anaesthesiologists have set aside all expectations of normalcy to ascend and deliver admirable and outstanding medical care for the ailing patients requiring intensive care therapy. Setting aside work related anxieties in the form of risk of infection to oneself, colleagues and family, provision of sustainable adequate PPE's at work to domestic disruption as a consequence to work commitments; we continue to deliver the best of us. These expectations have seismic changes to mental well-being and health of all front liners. With the uncertain direction forward compounded by the impact of the constant rollercoaster surges in infected numbers, anaesthesiologists and intensivists as the last line of defence are subjected to undeniable fatigue and pressures to perform under given circumstances. We cannot understate this fact.

Today as I pen this message, I am still filled with optimism amidst uncertainty. Ominous signs loom in the horizon of an impending 5th wave. As I reflect in contemplation, I take comfort in consolidating that the CoA has risen to monumental prominence as we navigated the many challenges faced by our fraternity whilst cementing relationships with sister colleges to come as one voice in steering the course of our expertise in this pandemic.

As a team, we are constantly evolving; from the traditional landscape of physical conferences, we have rapidly emerged from novice capabilities to experts in disseminating educational materials via webinars and on-line social platforms. We continue to accomplish a sizable number of webinars to acquaint our members with the latest in guidelines, developmental protocols and special interest topics.

We look forward to present our first virtual Annual Scientific Congress on 6th to 8th August 2021. Behind the scenes we continue to work tirelessly to ensure that we have, before you, a showcase of the best scientific content, speakers, and latest advances in medical equipment. For now, I passionately implore your support by marking this date on your calendar and ensuring your presence for the ASC to make it a resounding success.

Our SIGs have in production an array of webinars. The Cardiac, Pain, Paediatric and Neuroanaesthesia SIG have brought forth an array of educational webinars in collaboration with world renowned international speakers. We are truly spoilt for choice. Kudos to all SIG convenors who have enriched many with a flurry of activities till date. Kindly check the dates on our official website and tune in. Herewith are a summary of activities undertaken thus far

1. Webinars:

	Webinar	Dates
I.	Ultrasound SIG Webinar Series 1	23 rd January 2021
II.	Peri-Operative Airway Management Workshop	19 th - 20 th February 2021
III.	To covid or not to covid that is the question...	7 th February 2021
IV.	Paediatric Anaesthesia Update	27 th March 2021
V.	Anaesthesiology Updates (AU) 2021	28 th March 2021
VI.	Neurovascular Anaesthesia Webinar	24 th April 2021
VII.	Critical Care Webinar	10 th April 2021
VIII.	Ultrasound SIG Webinar Series 2	8 th May 2021
IX.	Obstetric & Paediatric Anaesthesia	30 th May 2021
X.	Paediatric Neuroanaesthesiology	19 th June 2021
XI.	Hypnosis Webinar	26 th June 2021
XII.	Extracorporeal Membrane Oxygenation (EMCO)	12 th July 2021
XIII.	Neuroanaesthesia Symposium (NAS) 2021	3 rd - 4 th July 2021

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