

Editorial

COVID-19: A Challenge to Our Traditional Education and Training Systems

Albert Einstein once said “In the midst of every crisis, lies great opportunity”. This COVID-19 challenge has given us all plenty of opportunities to ‘think out of the box’ and look for newer ways to approach and provide safe anaesthesia, step up scientific knowledge, continuing research looking for answers for new clinical queries and contemplate on life in general. COVID-19 has had a substantial impact on many aspects of our lives and the impact of disruption of clinical services and postgraduate training has been immense. The drastic reduction in elective admissions and limited clinical exposure have affected anaesthesia trainees especially to subspecialty cases. In addition, trainees have faced uncertainty with regard to scheduling of examinations and have had to deal with a new form of virtual examinations. Specialty fellowship programmes have been put on hold and this has led to insecurity with regard to further training and new job opportunities.

Dr Ekta Rai,
Vellore



During the peak periods of the COVID-1 crisis, most of the larger hospitals were transformed into COVID-19 care centers resulting into anaesthesia postgraduates and consultants mobilization towards COVID-19 related areas. This augmented the level of anxiety among our fraternity, especially because of working in unfamiliar areas and environments, uncertain availability of personal protective equipment (PPE), social isolation, managing the home with no house-help and having to perform household chores as well. In addition, the constant fear of getting infected and passing it on to their near and dear ones was a frightening reality. This pandemic has presented unparalleled challenges for all clinicians and trainees, with significant effect on their physical and mental wellbeing. This editorial presents a snapshot of training opportunities, methodology shifts during COVID-19 times and to reflect inwards about how we have been able to cope.

Education and training in pre-COVID-19 times without the physical presence of both the teacher and learner was unimaginable. Postgraduate training thus far, has been based on hands-on operation theatre-based teaching, class based didactic lectures, case discussions and seminars. These later evolved into blended learning with e-learning modules, lectures and hands-on simulation learning added to the older module e-Learning methods were not so well established in India and was often self-directed learning from on-line free videos, e-content and assessment modules.

During this pandemic, various modes of oxygen delivery and airway management of patients posed a potential health hazard to all present in operation theatre especially when performed by to novice learner. Therefore , only trained and senior anaesthetists could perform these procedures swiftly and efficiently for the sake of safety for all. This has led to diminished exposure to learning, especially for the novice trainee and resulted in reduced confidence in handling crisis situations. This fact was soon apparent and resulted in the initiation of one-on-one simulation-based training sessions in the operation theatre, thereby giving the opportunity to first-year residents to appreciate near real life experiences. This was only possible when the number of elective operations reduced significantly, making operation theatres and senior anaesthesiologists available. As per an Indian survey by Halder et al,60.84% of the post graduate received simulation-based training of some sort.¹

With the pandemic, established curriculum and educational activities were drastically affected. Reduced clinical exposure led to development of easy-to-follow video-linked problem-based learning sessions . The greatest impact was obviously on the final year postgraduate who required more clinical exposure prior to their transition from managing cases under supervision to managing independently as senior residents . The biggest challenge during the early days of the pandemic was the need for rapid transmission of medical information on management issues from one part of world to the rest of the world and rapid learning from others through literature and simulation. This period has helped us develop alternative options for the traditional teaching and better forms of education methodology which can be continued even after the pandemic settles.

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The brighter side to COVID 19's impact on anesthesia training

As we reflect, many triumphs have been witnessed during this difficult period . This pandemic spread in a staged manner in western countries before it hit most developing countries and the swift sharing of knowledge via the internet with regard to prevention and management protocols made it easier for developing countries to prepare for and respond in a more controlled manner. A sense of togetherness and amity among medical professionals and between technical and medical staff developed, like never witnessed before this pandemic. People have supported each other both within the medical profession and in their communities.

Several educational changes have their beneficial effects e.g., virtual lectures attendance has increased especially since lectures by renowned speakers are now just a click away at little or no cost. Long distances are no longer an issue and continuing education programmes on various virtual platforms have saved time, money and the trouble of travelling to far off conferences venue. Many of these lectures can be recorded and viewed later at a convenient time.²This gives delegates more time to focus on their weak areas and allow them to revisit the topics to better understand them. In the past , attending a conference meant leaving your home, family and the expenses for registration, travel and stay which for many postgraduates would limit their attendance of useful educational meetings and restrict them to only those nearby. Similar observations were made by Halder et al, who state that 43.38% of postgraduates have attended on-line sessions.¹ The excitement of acquiring knowledge from renowned specialists, free of cost at a convenient time has been a huge boon for postgraduates and consultants as well.

The darker side of COVID-19's impact on anesthesia training

Clinical learning is the mainstay for training medical students and postgraduates and the same holds true for anaesthesiologists . This new system of online education has its own drawbacks and challenges, mainly that of limited social interaction which is essential for humans. For this virtual system to be effective one has to be technically savvy and have uninterrupted, good internet connectivity . The physical presence of a teacher or trainer is missing completely for the learner and similarly for the teacher it is difficult to know whether the students have understood a concept. This modality of learning has reduced the warmth of one-to-one interaction which is possible in small-group classroom teaching. In the survey conducted by Halder et al, more than 50% of respondents felt that quality and quantity of teaching programs declined during the pandemic.¹Unfortunately, intraoperative teaching was affected by the dramatic reduction in elective operations. At the same time, the increased demand for intensive care for patients with COVID-19, resulted in more exposure in this area of subspecialty for anaesthesiologists and paediatric anaesthesiologists had to move to adult care depending on the need of the hour.³

Many anesthesiologists fell victim to the disease and were kept in isolation which has affected our physical and mental health. The quarantine period required during the earlier part of the pandemic was as long as 14 days and this completed paused normal life for the individual and caused tremendous anxiety with regard to one's health, spread of infection to family and impact on training. One had no other option and this experience has taught many of us to continuously adapt and innovate.

What have we learnt from the COVID-19 pandemic?

COVID-19 is here to stay for some more time especially with the second wave engulfing the world again. Many layers of medical education have been affected and we must address them with innovative solutions rather than waiting to revert back to old methods once the crisis is over. "e-Education" is the new norm . Adaptation to these changing circumstances is the key to survival. The focus now is to have interactive sessions without physical proximity but with the economical and time-saving advantages for all concerned. Web-based learning, simulation, tele mentoring, e-learning and online examinations may now be here to stays even after covid leaves us. For anaesthetists, new technology-based learning, emphasis on hygiene, regional anaesthesia techniques, video laryngoscopes, team work, and simulation are the big positives that have emerged during this pandemic.

References

1. Halder R, Kannaujia AK, Shamim R, Dongare P, Modal H, Agarwal A. A national survey evaluating the effect of COVID -19 pandemic on the teaching and training of anaesthesiology postgraduate students in India. IJA 2020;64(4):227-234.
2. Martinelli SM, Chen F, Isaak RS, Huffmyer JL, Neves SE, Mitchell JD. Educating anesthesiologists during the coronavirus disease 2019 Pandemic and beyond. Anesth Analg. 2021;132(3):585-593
3. Medical education in the COVID-19 era: Impact on anesthesiology trainees. J ClinAnesth.2020; 66:1-2.

IAPA State Branches

IAPA Maharashtra

IAPA Telangana

IAPA West Bengal

IAPA Delhi

IAPA TN - Puducherry

IAPA ACTIVITIES 2020-2021**First virtual IAPA mid-term CME 2020 organized by the Dept of Anaesthesiology, KMC Manipal held on Sept 5th 2020****Dr Manjunath Prabhu, Manipal**

The Department of Anaesthesiology, Kasturba Medical College, Manipal in association with the IAPA hosted the first Virtual IAPA Mid-Term CME 2020 on 5th September 2020 from 4.00 pm to 8.00 pm. Eminent speakers from India and overseas participated in this event. The impressive online turnout of more than 1000 registrants included qualified and trainee anaesthesiologists from India and abroad. Manjunath Prabhu, Professor & HOD, KMC Manipal, welcomed the participants and Dr Sharath K Rao, Dean of KMC Manipal addressed the gathering. The IAPA presidential address was delivered by Dr Elsa Varghese.

Dr Joy Dawes, of the Great Ormond Street Hospital for Children, London UK, spearheaded the scientific programme with his lecture on 'Anaesthetic challenges in preterm neonates'. Dr TP Raghavendra from Royal Manchester Children's Hospital, Manchester, UK spoke on 'Anaesthetic concerns in lower airway obstruction in infants'. The panel discussion 'Anaesthetic considerations for paediatric burn patients' followed, with Drs Ekta Rai, CMC Vellore, Sanjay Prabhu, Apollo Hospitals, Chennai, Indu Sen, PGIMER, Chandigarh and Sapna Bathla VMMC, Delhi. Dr Peter Brooks, Chelsea and Westminster Hospital, London UK, lectured on 'Paediatric total intravenous anaesthesia'. A video session on 'Vascular access in preterm/low birth weight infants' was conducted by Dr Nandini Dave, SRCC Children's Hospital, Mumbai. This was followed by a lecture 'Recent advances and ongoing challenges in paediatric peri-operative pain management' by Dr H M Krishna, KMC Manipal. The concluding talk of the event was 'High flow nasal oxygen therapy in children' by Dr Subhash Balhara, Aarhus University, Denmark. The audience interaction with the speakers via the chat box was actively utilized. Dr Malavika, KMC Manipal, the organizing secretary concluded with a vote of thanks.

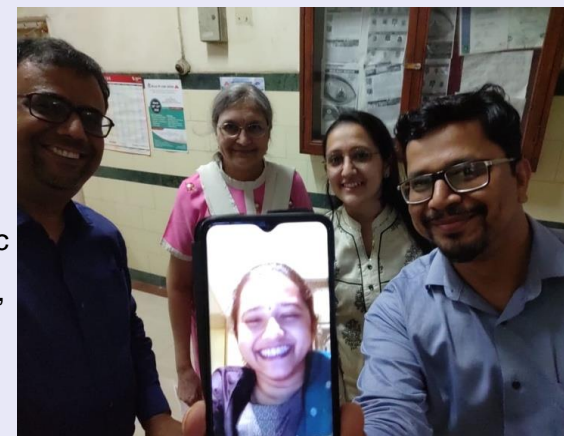
More than 50 delegates participated in the poster presentation. After an initial first round, a week later, the nine best posters selected were presented on a zoom platform and the winners were selected. Excellent feedback was elicited through an online survey was for the speakers, topics and discussion sessions. 98% of participants felt the sessions delivered the information that was expected by them. The usefulness of the session for clinical practice was rated high for all the sessions (60-81%). 94% felt that the pace and the duration of CME was appropriate. Overall, it was a delightful virtual experience with absorbing sessions in a relaxed atmosphere despite the COVID pandemic, Congratulations Team Manipal for the efficient and well-organized virtual meeting

Webinar on 'Anaesthesia for Neonatal Emergencies', Organised by Dept of Anaesthesiology, Lokmanya Tilak Municipal General Hospital & Medical College Dr Anila Malde, Mumbai

This Webinar was conducted under the leadership of Dr. Anila Malde, HOD Dept. of Anaesthesiology, LTMMC, Mumbai along with the IAPA Maharashtra Chapter on 2nd January 2021 between 2.30-5.30 pm.

Topics covered included; general considerations, anaesthesia for specific conditions of tracheoesophageal fistula, congenital diaphragmatic hernia, abdominal emergencies for atresia, anorectal malformation, necrotizing enterocolitis, abdominal wall defects, congenital hypertrophic pyloric stenosis and neural tube defects.

Two hundred and seventy participants actively participated during the interactive discussions. The Webinar was a grand success.

**Webinar on 'Fluid and Blood Transfusion Therapy in Paediatric Surgical Patients-What, When, How Much?' organised by Department of Anaesthesiology, SRCC Children's Hospital.****Dr Nandini Dave, Mumbai**

Department of Anaesthesiology, SRCC Children's Hospital, Mumbai along with IAPA Maharashtra

CME on "Fluid and Blood Transfusion Therapy in Paediatric Surgical Patients - What, When, How much?" on Saturday, 12th September 2020 as part of the Comprehensive Review Of Paediatric

Anaesthesia (CROP) series. The webinar was conducted on zoom platform and included interesting talks on 'Perioperative crystalloid therapy Guidelines & Guidance' by Dr. Nandini Dave, Senior Consultant, SRCC Children's hospital, 'Colloids in paediatric patients What is the evidence?' by Dr Raylene Dias, Assistant Professor, Paediatric Anaesthesia, KEM Hospital and 'Blood Transfusion therapy Triggers & Tips' by Dr Priyanka Karnik, Junior Consultant, SRCC Children's hospital. The webinar had engaging 1.5 hours talks followed by active interaction under Q & A session. This academic activity was well received by 200 plus attendees from Maharashtra and a few from other parts of the country.

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conducted a

Report on the first ever virtual ASPA ePPLS workshop organized by the IAPA on January 23rd -24th 2021

Dr Elsa Varghese, Dr Vibhavari Naik and Dr Rebecca Jacob

The two-day ePPLS workshop was jointly organized by the ASPA and IAPA. The program was conducted over two days (23rd & 24th January 2021) between 0900 -1330 hours)

The planning and process was initiated in by Drs Rebecca Jacob, Elsa Varghese, Vibhavari Naik, Agnes Ng and Teddy Fabila. Brain storming by the first three above named, lead to modifications of the original PPLS material for a virtual platform. Hands-on sessions like CPR, defibrillation and interosseous access demonstrations were made as videos. Ten faculty participated; Drs. Anisha De, Chandrika YR, Elsa Varghese, Ekta Rai, Muralidhar Aavula, Nandini Dave, Rebecca Jacob, Ruchi Gupta, Sandhya Yadanapuddi and Vibhavari Naik. 24 participants registered from the IAPA website. Following registration, they were allowed access to the PPLS hand book on the ASPA website, and undertook the MCQ pre-test. Registration charges were INR 1000.00 paid to IAPA.

The ePPLS workshop was conducted on the Zoom platform. This was set up by Dr Teddy Fabila of Singapore. Three faculty practice sessions were conducted prior to the final presentations to help the faculty familiarize themselves with the process of sharing screen and move to break out rooms for the virtual interactive small-group discussions. These sessions occurred simultaneously in three rooms with eight participants and two faculty moderators in each. All sessions had moderators to keep tab on questions from participants written in chat box.

The following topics were delivered as 20-minute lectures, Day 1: Causes of perioperative cardiac arrest and recognition of the critically ill child. Day 2: Updates on paediatric resuscitation, recognition and management of arrhythmias, intravenous and interosseous access and breaking bad news. The following topics were discussed by the moderators over the two days. Each session lasted for 30 minutes: Day 1: Recognition of the airway at risk, blood loss during major surgery, desaturation in the recovery room, management of the tight bag, sudden fall in EtCO2 in an infant during surgery and Cardiac arrest in an infant after caudal. Day 2: Management of arrhythmias, effective CPR skills, team work in a crisis, and breaking bad news case discussion.

22 Registrants who actually participated, they were middle to senior level consultants from all parts of India. This being the first ASPA ePPLS, there were ten observers from ASPA member countries who attend and observed interactive sessions in allotted break out rooms

The feedback with regard to course content, quality of talks, topics discussed and usefulness of the sessions were all rated between very good to excellent. The results of the post-test were analysed. The averages of pre-test score were 14.14 and post-test score was 17.82 All registrants had a post test score of more than 80% and received PPLS certificates. The first virtual ASPA ePPLS workshop was a success thanks to the tremendous ground work and careful planning. We are especially grateful to Dr Vibhavari Naik and Dr Teddy Fabila for the intricate planning, preparation and technical expertise involved to ensure smooth conduct of this programme. We thank all the ASPA observers for their useful feedback.

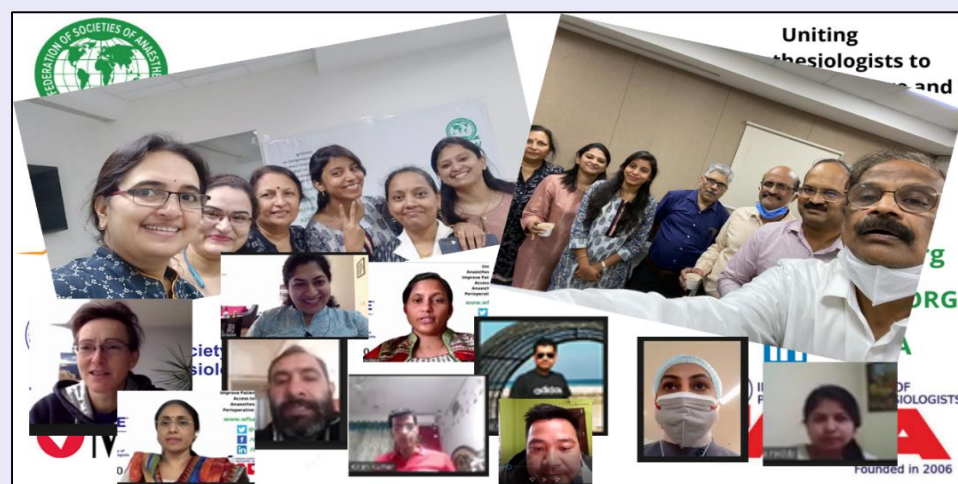


First Virtual SAFE Paediatric Anaesthesia Course - IAPA Telangana

Dr Gita Nath, Telangana

The WFSA SAFE Paediatric course was conducted virtually for the very first time on 30-31st January 2021. It was organized by the IAPA Telangana, supported by the paediatric anaesthesia teams from Rainbow Hospital, Niloufer Hospital, Basavatarakam Cancer Hospital and LV Prasad Eye Institute, Hyderabad. The course was conducted on the Zoom virtual platform and the schedule was modified for online delivery. Instead of hands-on sessions and scenario enactment by the participants, the scenarios were enacted by the faculty and videotaped. These videos were used as discussion points during the break-out sessions. The break-out rooms facility in Zoom enabled active interactive group discussions which are such an essential part of the course. A slide showing the main take-home messages was displayed at the end of each break-out session to ensure that the core content of the course was delivered.

The course was run from Rainbow Children's Hospital, Banjara Hills, Hyderabad. Local faculty were physically present at the site, in addition three faculty members participated from the UK. The pre-course evaluation, post-tests and feedback from participants were conducted through Google forms. 36 doctors participated including 3 from Pakistan and 1 from Bahrain. The feedback from participants was uniformly positive, with regard to the academic sessions and general aspects. The response from office bearers of National IAPA, ISA and WFSA representatives was also positive and appreciative.



Paediatric airway crisis management workshop organized by IAPA & Niloufer Hospital for Women and Children on February 27th 2021.

Dr Aavula Muralidhar, Hyderabad

The one-day workshop started with a prayer. Prof Dr PV Shiva, Dept of Anaesthesiology of Niloufer Hospital welcomed all, the academic session started with a lecture on 'Paediatric airway assessment' by Dr CH Sunil Kumar, Dr R N Prasad then discussed the different paediatric difficult airway algorithms currently advocated. Dr Vibhavari Naik gave a lecture on 'Surgical airway management, indications and management' followed by Dr Aavula Muralidhar who spoke on 'Neonatal airway, how it differs from child and adult, anatomically and physiologically and neonatal intubation techniques'. This workshop had a mixed participation of live and on-line participants.

Following these lecture, the hands-on workshop sessions were divided into three sections: with demonstrations and hands-on training on intubating manikins. Basic airway management with Drs Aavula Muralidhar, E Aditi Devi and Hemavathi as moderators trained participants on manikins. The difficult airway management session was moderated by Drs N Srinivas Reddy, Shwetha and Neelima who explained how to use supraglottic airway devices, video laryngoscopes and fiberoptic laryngoscopes. Surgical airway management was dealt by Dr Vibhavari Naik and Dr Christopher who explained the use of Ultrasound-guided techniques, demonstrated on the manikin and on goat tracheas. All three hands-on stations initiated good discussion with off-line and on-line participants.

The post-lunch session had lectures by Dr Aavula Muralidhar on 'How to identify the air way at risk and its management', the use of actual case pictures children with difficult air way helped explain the problems faced. Dr N Srinivas Reddy spoke on 'Air way management of the syndromic child' where he explained how to approach the specific airway problems posed with various syndromes.

The second session of Case Scenarios was conducted with the help of videos, pictures and demonstrations on manikins. These included, discussion on early recognition and intervention to prevent complications, how to manage the situations of accidental extubation and blocked endotracheal tubes. These sessions were conducted by Dr R N Prasad and Dr Mridula. Overcoming challenges in upper airway obstruction and hypercarbia were dealt with by Dr Damodara Rao and Dr Nitish. Airway management in cervical spine trauma were managed by Dr Sailaja and Dr Shilpa.

The work shop ended with a panel discussion on airway crisis with Dr K Prabhavathi, Dr Subramanyam, Dr MSRC Murthy and Dr Ravi Naga Prasad as panellists



Inauguration of the IAPA Tamil Nadu and Puducherry State Chapter, March 14th 2021

Dr Sanjay Prabhu, Chennai

The Tamil Nadu and Puducherry Chapter of the IAPA was inaugurated on 14th of March 2021 in a virtual event with Prof Suresh Santhanam, Board President of The American Board of Anesthesiology, as chief guest. Senior members of the IAPA who were present during the inauguration include Dr Elsa Varghese [President IAPA], Dr Neerja Bhardwaj [Vice-President IAPA], Dr MSRC Murthy [Secretary IAPA]. The event was well attended with over 100 delegates from all over India and abroad. Prof Suresh Santhanam gave an excellent lecture on 'Head and neck blocks in children'.

The aim of creating the IAPA Tamil Nadu and Puducherry State Chapter is to promote high standards of care in pediatric anesthesia and to achieve excellence in our practice by means of regular academic sessions and workshops and to promote this by regular communication and liaison with other practicing pediatric anesthesiologists and professional organizations. The office bearers of this association have been selected from different parts of the state and are working in different settings [Government/ private /teaching hospitals]. They practice exclusive or have a major interest in pediatric anesthesia. We also aim to increase our membership and create more awareness about perioperative care for children, by targeting anesthesia trainees and the occasional pediatric anesthesiologist, by organizing educational symposia and interactive teaching sessions.

The following members will serve as the office bearers for TN and Puducherry state branch of IAPA

No	Post	Name	Institute
1	Advisory member	Dr N Krishnan	Institute of Child Health, Chennai
2	President	Dr S Ramesh	KKCTH, Chennai
3	Vice President	Dr RajaniSundar	GKNM, Coimbatore
4	Secretary	Dr S Sanjay Prabhu	Apollo Children's Hospital, Chennai
5	Joint Secretary	Dr Ekta Rai	CMC, Vellore
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4		Dr Dinesh Kumar G	GKNM, Coimbatore
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IAPA participation in ASPA Flex webinars

Dr Vibhavari Naik

The ASPA education committee initiated the ASPA FLEX Webinar series to provide continuing education during the global COVID-19 pandemic. These are conducted virtually on the third Sunday of each month with the sole purpose to continue to spread knowledge in paediatric anaesthesia amongst the anaesthesiologists in Asian countries. IAPA members who are also ASPA members actively contributed to the ASPA FLEX webinar series in various capacities. Dr Rebecca Jacob, being a part of the ASPA education committee, was actively involved in curating topics, speakers and giving feedback for the webinar sessions. She was the lead moderator for the Webinar on 'Abdominal emergencies in infants' and Dr Elsa Varghese, spoke on 'Anaesthesia for infant abdominal emergencies' on 20th September 2020. Dr Vibhavari Naik was inducted for backend IT support for these webinars. On 21st March 2021, Dr Vibhavari Naik moderated the webinar on 'Non-Operating Room Anesthesia for kids', while Dr Sanjay Prabhu delivered a talk on 'Anesthesia for paediatric endoscopy'. Dr Ekta Rai is invited speaker for the upcoming webinar on 'Anaesthesia for paediatric ambulatory surgery' and will be delivering a talk on 'Preoperative evaluation of children for ambulatory surgery' on 16th May 2021. These activities have promoted IAPA and our members to international circles.

GOOD READ

Dr Ruchi Gupta,
Amritsar

1. Gai N, Maynes JT, Aoyama K. Unique challenges in pediatric anesthesia created by COVID-19. J Anesth. 2020. <https://doi.org/10.1007/s00540-020-02837>
2. Dongare PA, Bhaskar SB, Harsoor SS, Garg R, Kannan S, Goneppanavar U, et al. Perioperative fasting and feeding in adults, obstetric, paediatric and bariatric population: Practice Guidelines from the Indian Society of Anaesthesiologists. Indian J Anaesth. 2020;64:556-84.
3. Dave N, Varghese E, Jacob R. Challenges and Opportunities Facing Pediatric Anesthesia Providers in Low-and Middle-Income Countries (LMICs), India. Pediatr Anesth. 2020; 31(1):47-52
4. Nasr VG, Staffa SJ, Zurakowski D, DiNardo JA, Faraoni D. Pediatric risk stratification is improved by integrating both patient comorbidities and intrinsic surgical risk. Anesthesiology. 2019;130(6):971-80.
5. Gálvez JA, Acquah S, Ahumada L, Cai L, Polanski M, Wu L, et al. Hypoxemia, Bradycardia, and Multiple Laryngoscopy Attempts during Anesthetic Induction in Infants. A Single-center, Retrospective Study. Anesthesiology. 2019;131(4):830-9.
6. Chatterjee D, Richard J, Gien J. Update on congenital diaphragmatic hernia. Anesth Analg. 2020 Jan 20;131(3):808-21.

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Answers Crossword IAPA

Across	Down
3. Calcium	1. Third
5. Rehabilitation	2. CAB
7. Steroids	4. Intraosseous
9. EEG	6. Attenuator
11. Recovery	8. Hemorrhagic
13. Toxins	10. Cardiomyopathy
15. Amiodarone	12. Five
17. Jawthrust	13. Ten
18. Naloxone	14. Twenty
19. PEWS	16. Recoil
20. Ten	
21. Infrared	

Paediatric Airway Management- An Update

Dr Manpreet Kaur, Dr Abhishek Nagarajappa
AIIMS, New Delhi

The paediatric airway can be a challenge to manage. Advancements in airway management techniques have enhanced our ability to safely manage the airway of infants and children. This update focuses on recent developments in airway assessment and management tools, difficult airway protocols, newer gadgets e.g., advanced supraglottic airways, videolaryngoscopes, the issue of cuffed versus uncuffed endotracheal tubes (ETTs) and advances in airway training.

Airway assessment

Airway assessment, planning and preparation should be personalized for each child and include; detailed history, physical examination and relevant investigations. Assessing the airway is difficult in an uncooperative child. (1) History taking should be specific and relevant for each patient from presence of upper respiratory infection to difficulty in breathing or speaking. Snoring should alert the examiner for potential obstructive sleep apnea and any preferential position of the child during sleep should alert suspicion. In children who have undergone previous surgery, details about the previous airway management or any difficulty faced should be elicited.



Figure1: Syndromic children: Pierre Robins' sequence, Crouzon syndrome

Physical examination should start with looking for any obvious deformity, movement of the neck, mandibular position and space, tongue thickness. The lateral profile of the child helps identify mandibular hypoplasia. (Figure 1) Beware of airway difficulty in a child with an abnormally shaped head like in Pierre Robin's sequence or Crouzon syndrome. (Fig 1) Congenital syndromes may be associated with some form of airway difficulty.(2) If one abnormality is found, we have to actively search for another one. Proper work up of all syndromic children especially in terms of airway is a must. An online encyclopaedia about all genetic syndromes "Online Mendelian Inheritance in Man Website (omim.org) clinical synopsis" can aid in assessment of associations of various syndromes.(3)

Many of the scoring system or mnemonics used for adult airway assessment do not hold good for paediatric patients. The use of the Mallampati score in paediatrics is questionable. The Colorado Paediatric Airway Score (COPUR) is more reliable for airway assessment in children. Distances like sterno-mental distance, thyromental distance etc. can be measured however, there is lack of standardization in the paediatric population. Mirghassemi et al. have tried to correlate the Cormack Lehane grading with distances from nose to upper lip, lower lip to mentum, tragus to mouth, ear lobe to mouth, horizontal length of mandible and thyromental distance.(4)

Imaging modalities like x-ray, computed tomography (CT), magnetic resonance imaging (MRI) have often been relied upon for assessment of the airway, especially when difficulty is anticipated. 3-dimensional images of the airway can be re-constructed from serial CT / MRI images. Ultrasound of the upper airway has become another aid for anaesthesiologist. Point-of-care Ultrasound (POCUS) of the airway has many advantages. It is useful for assessing both static and dynamic airway anatomy, vocal cord pathology identification, assessment of airway size, prediction of endotracheal and tracheostomy tube sizes, differentiate between endotracheal and oesophageal intubation, identification of cricothyroid membrane for cricothyroidotomy and tracheal rings for tracheostomy. It also aids in diagnosis of pneumothorax, visualization of diaphragmatic excursion, and quantification of the volume of gastric contents. (5,6)

Paediatric Airway Anatomy

The traditional teaching about the anatomical shape of larynx being conical below 8 years old has been a topic of great discussion. Three landmark studies by Dalal et al (6 months to 13 years), Wani et al (1 month to 10 years) and Litman et al (2 months to 13 years old) have one reinforcing point that the cricoid ring is not the narrowest part of the paediatric airway and the paediatric airway is more cylindrical than being funnel shaped as thought earlier.(7-9)

The practical implication is that, there is drastic shift toward the use of cuffed ETTs in small children and that uncuffed ETT be used in a few unique clinical situations like bronchial intubation for neonatal lung isolation. Though, uncuffed tubes are generally safe, they have the drawback of leak around the tube, inaccurate end-tidal anaesthetic gas measurements, inability to regulate the tracheal seal with altered respiratory compliance and carry the risk of micro aspiration. Micro cuffed tubes on the other hand have an ultra thin (10 microns) polyurethane cuff which provides a more effective tracheal seal, and which is located more distally on the tube shaft. This places the cuff below the non-distensible cricoid and reduces the chances of endobronchial migration. Claims of cuffed endotracheal tubes predisposing to glottic injury have not been authenticated clinically.(10) In fact, uncuffed tubes have more likelihood of intubation-related subglottic stenosis because of need to use large outer diameter uncuffed tubes for leak prevention and movement related tube displacement. However, it is mandatory to closely monitor intracuff pressure to avoid trauma to the airway.

Answer key IAPA Quiz :

1. C, 2. A, 3. D, 4. B, 5. B, 6. A, 7. A, 8. B, 9. C, 10. C

Difficult airway in Children

The incidence of difficult intubation is 0.24%-4.7% in infants and 0.07%-0.7% in older children. (11,12) Difficult airway in paediatrics is either due to associated congenital syndromes or an acquired defect, and most often are anticipated prior to induction. However, the margin of safety is low in children and minor mismanagement can result in catastrophe.

Management of the difficult airway in paediatrics was previously managed by extrapolating data from adult airway. Guidelines for airway management in paediatrics were lacking. Over the last decade, there has been establishment of different registries like the All India Difficult Airway Association (AIDAA) in 2010, Paediatric Difficult Intubation (PeDI) Registry group by Society for Paediatric Anaesthesia in 2012, National Emergency Airway Registry for Children (NEAR4KIDS) with 20 participating centres in the North America, which aim at quality improvement for paediatric airway care. (13,14). A more systematic approach and guidelines have come Ben described for airway management. The Difficult Airway Society (DAS) has released three guidelines for the management of the unanticipated difficult airway in children aged 1 to 8 years (difficult mask ventilation, unanticipated difficult tracheal intubation, cannot intubate and cannot ventilate (CICV) in a paralysed anaesthetised child). (15) The All India Difficult Airway Association(AIDAA) guidelines on the management of unanticipated difficult tracheal intubation in paediatrics were released in 2016 for children between 1 and 12 years of age. (16)

Supraglottic airway devices (SAD) are now part of difficult airway algorithms of all international guidelines and should be a part of a difficult airway cart owing to their ease of use, and usefulness in maintaining an open airway. They are used as a back-up airway for ventilation in case of an inability to ventilate with a facemask or inability to intubate. They can be used as a conduit for endotracheal intubation with the help of FOB or as a primary airway equipment for a variety of procedures. A myriad variety of SADs are available for management of the paediatric airway since the past decade. Newer SADs have high first attempt insertion rates due to a preformed curvature, higher seal pressures for better ventilation and a wider airway tube to act as a conduit for endotracheal intubation. First-generation SADs are those with only airway tube. Ambu Aura has a single preformed airway tube with the capability for endotracheal intubation. AirQSP is a single tube SAD with self-inflating cuffs. (Fig2)

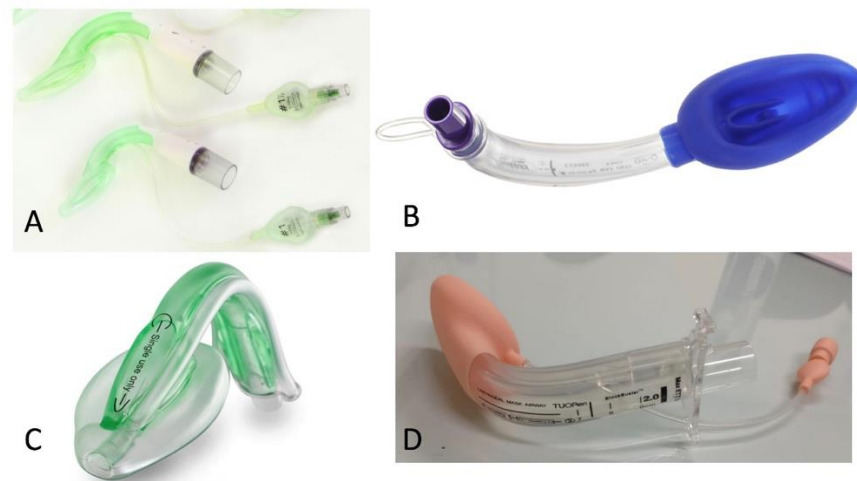


Fig 2: Supraglottic airway devices: (A)AMBU AURA-I, (B) AIR QSP, (C) Ambu Aura Gain, (D) LMA Blockbuster

Second generation SADs are those which have additional functionality like gastric aspiration port or/and intubation capability. Ambu Aura Gain and LMA Block Buster have both gastric access ports along with intubation capability. They also have built-in bite blocker to maintain the airway in case of emergencies. Ambu Aura Gain is available in all paediatric sizes. The LMA blockbuster is available only from size 1.0 onwards (suitable for <5 kg children).

Over the last decade, videolaryngoscopy (VL) has gained immense popularity and has been incorporated by many paediatric practitioners either as an alternative to direct laryngoscopy or as reserve for difficult laryngoscopy. Both standard and hyper-angulated videolaryngoscopes are available for paediatric patients. (Table 1) Though hyper-angulated videolaryngoscopes provide good laryngeal inlet views, there is the issue of 'view-tube discrepancy'.(17) Many varieties of blades are available within each category e.g., usable or disposable blades, channelled and non-channelled, portable or complete setup.(Table 1) Amongst all videolaryngoscopes, the C-MAC with Paediatric blades (Miller 0,1) and McIntosh (0,1,2, D) are very useful aids for difficult airway.(Fig 2) Hybrid techniques like simultaneous use of VL with flexible bronchoscopy, SGA with flexible bronchoscopy can aid in establishing a difficult airway(Fig3).(17)

	Blades
Glidescope	Hyperangulated
Karl Storz C-MAC	Nonangulated and hyperangulated both
McGrath	Nonangulated
Airtraq	Channelled hyperangulated
Truview	Hyperangulaed blade
UE Scope	Nonangulated neonatal and hyperangulated paediatric
King vision	Channelled hyperangulated



Figure 3: (A) C-MAC Miller 0,1; (B)C-MAC Macintosh 0,2,D ; (C) C-MAC Disposable blade with portable monitor

Rapid Sequence Induction

There has been continued debate upon the utility of rapid sequence induction in children for prevention of aspiration risk on one hand and the risk of distortion of the airway in the paediatric population on the other. Traditional rapid sequence induction and intubation (RSII) in paediatric patients has been scrutinised and the concept of “controlled rapid sequence induction and intubation” (cRSII) is now being recommended. In cRSII, a nondepolarizing neuromuscular blocking agent is administered and with gentle face mask ventilation provided before intubation without the application of cricoid pressure. The largest study on cRSII by Neuhaus et al has not shown an increase in the aspiration risk with this method(18) but more studies are needed to further support this.

Difficult Airway Training

Advanced paediatric airway management is considered an art, where only a handful of experienced people are usually at the helm of things. While it must be reinforced that the most experienced person should manage a difficult paediatric airway, it is also important to train a new generation of competent and confident anaesthesiologists, who would lead the baton for tomorrow. Many approaches have been pondered upon in training and acquisition of both technical and non-technical skills. (19)

Paediatric airway simulation has gained immense popularity in the last decade due to its unlimited application, diverse clinical scenario creation, absence of unintended patient harm, repeatability, skill acquirement, team management skill and communication development. These simulated learning lessons range from single focused objective skill-based learning to multiple objectives, team-based learning and from single discipline to multidisciplinary interdepartmental cooperation-based programs.(20) Some of the well-structured simulation based paediatric airway training programs include; bag and mask ventilation, laryngoscopy, endotracheal intubation and supraglottic airway placement on low-to-high fidelity manikins or difficult airway manikins, computer-simulated virtual motion sensitive fibreoptic bronchoscopy, complex clinical scenarios like the ‘cannot intubate, cannot oxygenate situation’. However, simulation-based training has its own set of limitations associated with it like lack of reality, lack of meaningful interaction with the patient, wear and tear in the manikin during usage. Training on low fidelity manikins provide an incomplete real-life experience. (19)

Point-of-Care-Ultrasound (POCUS) of the upper airway, thorax and gastric cavity is like an extended arm of a vigilant anaesthesiologist. (21). This simple bedside investigation, can guide the anaesthesiologist in selecting an appropriate-size ETT, detect a major airway pathology, detect life-threatening complications like tension pneumothorax or cardiac tamponade and the presence or absence of food particles in the stomach when doubtful of the preoperative fasting status. Conferences and workshops with live volunteers remain an excellent situational learning tool to learn for novices and practitioners. One of the tools available online, the Ultrasound Airway Breathing Circulation Dolor (USABCD) provides free online e-learning workshops on airway ultrasound. (22)

Conclusion: Over the last decade, some of the new innovations in airway management are the establishment of difficult airway protocols in paediatrics, the availability of a myriad of paediatric SADs and videolaryngoscopes, hybrid airway techniques, POCUS, 3-dimensional (3-D) printing and artificial intelligence . All these developments have revolutionised the management of a paediatric airway.

Bibliography

1. Raj D, Luginbuehl I. Managing the difficult airway in the syndromic child. *ContinEducAnaesthCrit Care Pain*. 2015 Feb;15(1):7–13.
2. Harless J, Ramaiah R, Bhananker SM. Paediatric airway management - *Int J Crit Illn Inj Sci* [Internet]. [cited 2021 Jan 13]. Available from: <https://www.ijciis.org/article.asp?issn=2229-5151;year=2014;volume=4;issue=1;spage=65;epage=70;aulast=Harless;type=0>
3. About OMIM [Internet]. [cited 2021 Jan 14]. Available from: <https://omim.org/about>
4. Mirghassemi A, Soltani AE, Abtahi M. Evaluation of laryngoscopic views and related influencing factors in a paediatric population. *Paediatr Anaesth*. 2011 Jun;21(6):663–7.
5. Daniel SJ, Bertolizio G, McHugh T. Airway ultrasound: Point of care in children-The time is now. *Pediatr Anesth*. 2020;30(3):347–52.
6. Gooden CK. An Update on Paediatric Airway Management. *Int Anesthesiol Clin*. 2017;55(1):86–96.
7. Litman RS, Weissend EE, Shibata D, Westesson P-L. Developmental changes of laryngeal dimensions in unparalyzed, sedated children. *Anesthesiology*. 2003 Jan;98(1):41–5.
8. Dalal PG, Murray D, Messner AH, Feng A, McAllister J, Molter D. Paediatric laryngeal dimensions: an age-based analysis. *Anesth Analg*. 2009 May;108(5):1475–9.
9. Wani TM, Bissonnette B, Rafiq Malik M, Hayes D, Ramesh AS, Al Sohaibani M, et al. Age-based analysis of paediatric upper airway dimensions using computed tomography imaging. *Pediatr Pulmonol*. 2016 Mar;51(3):267–71.
10. Litman RS, Maxwell LG. Cuffed versus Uncuffed Endotracheal Tubes in Paediatric Anesthesia: The Debate Should Finally End. *Anesthesiology*. 2013 Mar 1;118(3):500–1.
11. Heinrich S, Birkholz T, Ihmsen H, Irouschek A, Ackermann A, Schmidt J. Incidence and predictors of difficult laryngoscopy in 11,219 paediatric anesthesia procedures. *Paediatr Anaesth*. 2012 Aug;22(8):729–36.
12. Murat I, Constant I, Maud’huy H. Perioperative anaesthetic morbidity in children: a database of 24,165 anaesthetics over a 30-month period. *Paediatr Anaesth*. 2004 Feb;14(2):158–66.
13. NEAR4KIDS [Internet]. [cited 2021 Jan 12]. Available from: <https://near4kids.research.chop.edu/preliminary-documents>
14. The Paediatric Difficult Intubation Registry [Internet]. The Paediatric Difficult Intubation Registry. [cited 2021 Jan 12]. Available from: <https://www.pediregistry.org>
15. Paediatric Difficult Airway Guidelines | Difficult Airway Society [Internet]. [cited 2021 Jan 12]. Available from: <https://das.uk.com/guidelines/paediatric-difficult-airway-guidelines>
16. Pawar DK, Doctor JR, Raveendra US, Ramesh S, Shetty SR, Divatia JV, et al. All India Difficult Airway Association 2016 guidelines for the management of unanticipated difficult tracheal intubation in Paediatrics. *Indian J Anaesth*. 2016 Dec 1;60(12):906.
17. Hsu G, Fiadjoe JE. The Paediatric Difficult Airway: Updates and Innovations. *Anesthesiol Clin*. 2020 Sep;38(3):459–75.
18. Neuhaus D, Schmitz A, Gerber A, Weiss M. Controlled rapid sequence induction and intubation - an analysis of 1001 children. *Paediatr Anaesth*. 2013 Aug;23(8):734–40.
19. Hunyady A, Polaner D. Paediatric airway management education and training. *Paediatr Anaesth*. 2020 Mar;30(3):362–70.
20. Lind MM, Corridore M, Sheehan C, Moore-Clingenpeel M, Maa T. A Multidisciplinary Approach to a Paediatric Difficult Airway Simulation Course. *Otolaryngol--Head Neck Surg Off J Am Acad Otolaryngol-Head Neck Surg*. 2018 Jul;159(1):127–35.
21. You-Ten KE, Siddiqui N, Teoh WH, Kristensen MS. Point-of-care ultrasound (POCUS) of the upper airway. *Can J Anaesth J Can Anesth*. 2018 Apr;65(4):473–84.
22. USabcd - effective Point of Care Ultrasound (POCUS) learning. [Internet]. [cited 2021 Jan 13]. Available from: <https://usabcd.org/>

Declaration: Consent for publication has been obtained from children’s parents

IAPA PAEDIATRIC ANAESTHESIA FELLOWSHIP TRAINING EXPERIENCE AT AMRITA INSTITUTE OF MEDICAL SCIENCES, KOCHI

Dr Apurva Sadhoo.
Noida, U.P

Anaesthetic management of paediatric patients is a challenging task. Although we are taught that “children are not small adults” , only with training does one understand why! A child’s anatomy, physiology and responses are different from that of an adult. The level of their anxieties and emotional needs are different and one needs to be perceptive about their requirements. My fellowship training of 1 year at Amrita Hospital, Kochi helped me in understanding how best to handle different ages of pediatric patients presenting for surgery.

Amrita Hospital, Kochi is recognized as one of the premier hospitals in South Asia. Founded in 1998 by Mata Amritanandamayi Devi (known worldwide as AMMA), Amrita Hospital is a 1100-bed tertiary referral and teaching hospital, serving more than 10 lakh outpatients and more than 70,000 inpatients annually . The hospital’s extensive infrastructure offers facilities comprising 28 modern operating theatres, 275 equipped intensive-care beds and a fully computerized and networked hospital information system (HIS).

Under the esteemed guidance of Dr. Lakshmi Kumar, my one year fellowship in paediatric anaesthesia began in a fully equipped operation theatre designed for paediatric surgeries with dedicated staff trained in handling paediatric cases. Being a tertiary centre with advanced super specialty care, I was privileged to train through various subspecialties under the same roof.

I learned how to give anaesthesia in a 750gm preterm neonate posted for tracheoesophageal fistula repair in my first week as a fellow! I learnt the basics of paediatric anaesthesia in this operation theatre. Skills including IV cannulation, bag and mask ventilation, LMA insertion, endotracheal intubation, extubation, invasive monitoring, use of ultrasound guided regional anesthesia in children were taught during the period of my training . The system in this hospital allows the parents to accompany the child to the preoperative room. Our survey on parental satisfaction showed that most parents(80%) were happy with the communications and handling by the anaesthetists at the time of separation to the OR.

The team of paediatric anaesthesiologists included highly experienced teachers Dr.Rekha Varghese , Dr.Shyamsundar, Dr.Rajesh Kesavan and Dr. Sindhu Balakrishnan, from whom I learnt how to react early and yet stay calm in the face of a crisis. Spending time with each consultant exposed us to different sets of skills and practices that we could use at work and adapt .

The highlights of the paediatric surgical programme at AIMS was the advanced minimally invasive urological procedure and neonatal emergencies. The centre is also a tertiary referral for neurosurgical procedures in children and spine surgeries and under the guidance of Dr. Mathew I learnt the anaesthetic protocols for these procedures. As part of specialty rotations, I had the opportunity to work with Dr. Jerry who made every difficult airway appear as easy as a normal one.

During the fellowship I was fortunate to be a part of the team for an EXIT procedure performed for CHAOS (congenital high airway obstruction).The planning, execution as well as the outcome of the procedure was a surreal experience for me. This procedure made me realize that with proper planning, communication and practice nothing is impossible. It also emphasized how important it is to have a second(back up) plan in case the first one fails!

Rotation through paediatric cardiac anaesthesia allowed me to gain confidence in central venous cannulation, arterial cannulation and insights on the principles of intraoperative management of paediatric cardiac patients.

The scheduled rotations for NORA(non operating room anaesthesia) was challenging and provided me with confidence to handle children under sedation and monitoring their airway. It taught me on how important it is to give clear instructions on fluids to keep the child(and the parents!) quiet and comfortable. A brief rotation through the neonatal ICU taught me the practices of fluid management, prone positioning, bubble CPAP, phototherapy and umbilical lines.

The academic activities within the department were ongoing and I got to present cases and didactic seminars that were moderated by the teachers. Under the able guidance of the consultants, I could ensure that all areas of learning were covered. I also had the opportunity to complete a research study during my tenure. Regular in-houses assessments kept me on my toes and updated with the factual knowledge on the cases I was witnessing and providing anaesthesia for.

At the end I would like to thank Amrita Institute and the IAPA for giving me this opportunity to work in a premier institute, with a large volume of paediatric cases and experienced faculty. I also wish to thank IAPA for bringing me to the National group of paediatric anaesthesiologists through conferences and exit examinations. I believe that this one years training has provided me with insights on the safe management of anaesthesia for children and I hope to pursue this while updating myself of the ongoing advances in this field.



Anaesthesia Faculty at AIMS



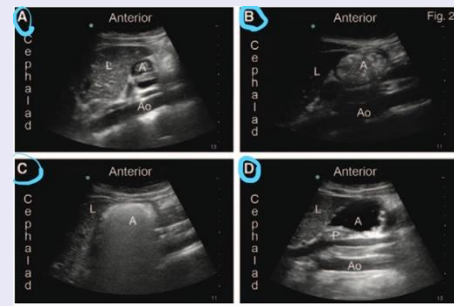
Paediatric Surgical Team at AIMS

Quiz yourself with Ultrasound

Dr Rakhee Goyal, Delhi

1. Figure below represents gastric ultrasound. Choose the answer that best describes the ultrasound images:

- A: empty antrum B: clear fluid C: thick fluid D: gastric air
- A: clear fluid B: thick fluid C: gastric air D: solid food
- A: empty antrum B: solid food C: gastric air D: clear fluid
- A: solid food B: gastric air C: empty antrum D: clear fluid



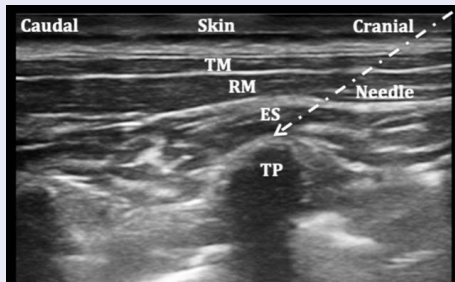
2. What does optic nerve sheath diameter assessed on ultrasound in the figure suggest:

- An estimate of intracranial pressure
- Exact intracranial pressure
- No relation to intracranial pressure
- Not relevant at all in children



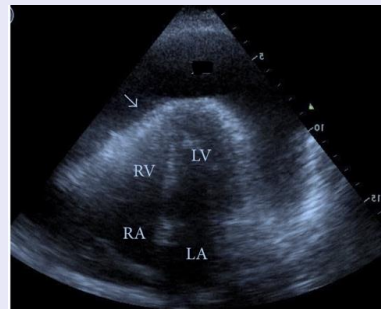
3. The arrow on the ultrasound image in the figure represents the needle tip. Identify the block that would be best described if local anesthetic is injected through this needle. TM: Trapezius muscle, RM: Rhomboid muscle, ES: Erector spinae, TP: Transverse process.

- Lumbar plexus
- Quadratus lumborum
- Paravertebral
- Erector spinae



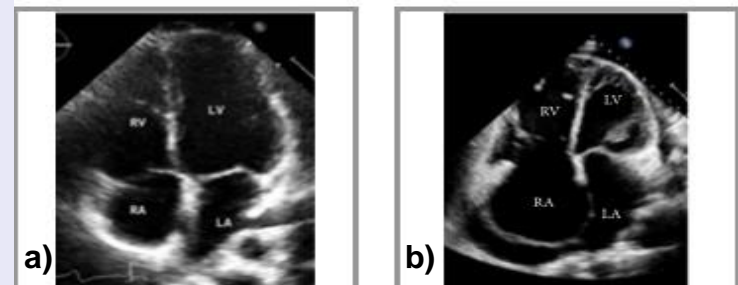
4. What does the echocardiography show in the figure:

- Pericardial effusion with diastolic collapse of left ventricle
- Cardiac tamponade with large pericardial effusion and diastolic collapse of right ventricle
- Normal heart
- Mild pericardial effusion



5. Echocardiography picture in the figure illustrates:

- Figure 5a: normal heart Figure 5b: LV dilatation
- Figure 5a: normal heart Figure 5b: RV dilatation
- Figure 5a: RV dilatation Figure 5b: normal LV
- Figure 5a: RV dilatation Figure 5b: LV dilatation



6. The indicators of intravascular volume status in children are:

- IVC collapsibility index
- IVC/aorta ratio
- CVP
- All the above

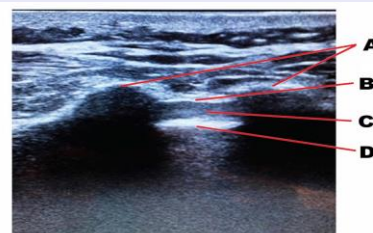


7. Which of the following is correct about the Ultrasound scanning of the neck as in the figure below:

- Subglottic diameter on USG is a good predictor of the estimation of endotracheal tube size.
- Ultrasound cannot be used in the airway assessment.
- Needle cricothyrotomy is preferred over tracheostomy for emergency airway in children < 8 years of age.
- Ultrasound cannot help in detecting oesophageal intubation.

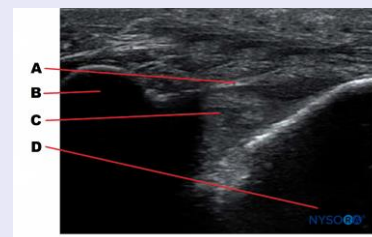


8. A low frequency probe placed transversely while administering a caudal block elicits the image as shown in the figure. Which of the following choices is the correct representation of the labelled structures:



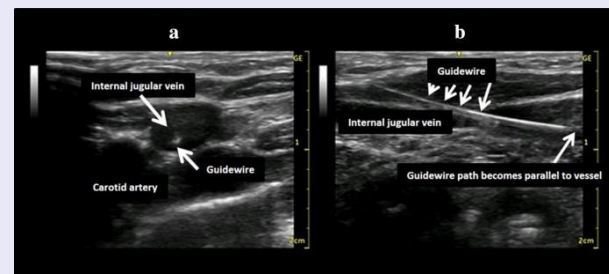
- a) A- Sacrococcygeal ligament B-Base of sacrum
- b) A- Sacral cornu C-Sacral canal
- c) B- Base of sacrum D- Sacrococcygeal ligament
- d) A- Sacrococcygeal ligament C-Sacral canal

9. A low frequency curvilinear probe placed in the sagittal plane along the long axis of caudal canal generates an image as shown in the figure. The correct level of drug deposition for the caudal block will be



- a) Above the level of A
- b) Above the level of B
- c) At the level of C
- d) At the level of D

10. Central line placement under ultrasound guidance in children as shown in figure:



- a) It is mandatory to place central line under ultrasound guidance in children
- b) Ultrasound is always misleading in children and should not be used for central line placement
- c) Ultrasound can add safety to a central line placement in children, and there is growing evidence of its use
- d) Ultrasound machines do not have a probe that can be used in infants or small children

IAPA Member Achievement Section

Congratulations to our achievers!

➤ **Winners of IAPA midterm 2020 paper presentation:**

First Prize: **Dr. Vishal Saxena**, Seth GSMC & KEM Hospital, Mumbai.

Second Prize: **Dr. Tejaswini Jambotkar**, LTMMC & LTMGH, Sion, Mumbai.

Third Prize: **Dr. Harsha**, PGI, Chandigarh

➤ **IAPA PPLS team for conducting the first ASPA ePPLS workshop:** ASPA had requested the IAPA to design and conduct the first virtual PPLS workshop, to be a template for other Asian countries. The two-day ePPLS workshop was conducted online which included interactive sessions and didactic lectures. This was the first of its kind conducted in India. Congratulations to the IAPA team for showing the way especially to the leadership of Drs Rebecca Jacob, Elsa Varghese and Vibhavari Naik.

➤ **Dr Neerja Bhardwaj** for being nominated to the Editorial Board of the international journal Pediatric Anesthesia to represent the IAPA.

➤ **Drs Nandini Dave, Lakshmi Kumar, Manjunath Prabhu and Ekta Rai** for being nominated as Associate Editors of the international journal Pediatric Anesthesia to represent the IAPA

➤ **Dr Pradeep Bhatia** for his election as Editor of the Journal of Anaesthesiology and Clinical Pharmacology (JOACP)

Best paper IAPA Mid-term 2020

ERECTOR SPINAE BLOCK IN PAEDIATRIC VATS SURGERIES: A CASE SERIES

Dr Vishal Saxena, Dr Harick Shah, Dr Raylene Dias, Dr Akhil Goel

DEPARTMENT OF PAEDIATRIC ANAESTHESIA, SETH GSMC & K.E.M. HOSPITAL, MUMBAI

INTRODUCTION

- Video-assisted thoracoscopic surgery (VATS) is being performed for diagnosis and treatment of various diseases of the thorax. Post op pain is managed with opioids and paravertebral/epidural blocks
- The Erector Spinae Plane block (ESPB) was first described for the management of acute and chronic thoracic pain (1)
- Very little experience of ESP block in paediatric patients undergoing VATS

PROCEDURE

- After induction of GA, patient taken in lateral position
- USG guidance with GE Logiq™ e, 4-10 MHz straight transducer – ESP block performed with 20 G B Braun Contiplex® needle. 20 G catheter threaded
- Plane is between transverse process and erector spinae muscle
- 0.3 ml/kg 0.25% Bupivacaine injected
- Post op Baxter® elastomeric pump with 0.125% Bupivacaine+1µg/ml Fentanyl
- Pain assessed Wong Baker (<3yrs) FLACC (<3 yrs) at 6, 12, 24, 36, 48 hr
- Rescue analgesia – Inj Diclofenac 1mg/kg slow iv

RESULTS

- Maximum pain score in the first 12 hrs post op was 2/10
- Rescue analgesia was required in only one of the seven patients (Case 6)
- Catheter could not be threaded in Case 7. Single shot block given
- No adverse effects observed – motor block, nausea, urine retention, pruritus, respiratory depression

PATIENT DETAILS

- ESP block was given to 7 cases who underwent VATS

S/no	Age	Sex/ Wt	Diagnosis/ Surgery
Case 1	2yrs	F/11.2 kg	Rt Emphysema/ VATS decortication
Case 2	4.5yrs	F/11.6 kg	Rt Emphysema/ VATS decortication
Case 3	8yrs	M/17kg	Rt Emphysema/ VATS decortication
Case 4	4yrs	F/11kg	Rt Emphysema/ VATS decortication
Case 5	5 yrs	F/16 kg	Rt Emphysema/ VATS decortication
Case 6	4.5 yrs	F/13kg	CDH/ LA CDH repair
Case 7	1.5 yr	M/9.3 kg	CDH/ LA CDH repair

Caudal Skin Cranial
TM RM Needle
TP-Transverse process
ES-Erector Spinae
RM-Rhomboidus
TM-Trapezius

DISCUSSION

- Mechanism is by diffusion of the local anaesthetic into the paravertebral space through the non-osseous spaces (1,2)
- Feeder branches of Sympathetic chain also blocked (4)
- Simple and safe – far from neuroaxis, pleura, and large vascular structures (3)
- Extensive spread with single injection (3)
- Can be an excellent alternative to thoracic epidural/ paravertebral blocks due to easily visualized transverse process on USG

PAIN SCORE

References

1. Forero M, Adhikary SD, Lopez H, Tsui C, Chin KJ. The erector spinae plane block: a novel analgesic technique in thoracic neuropathic pain. *2016;41:621-627.*
2. Ueshima H, Otake H. Clinical experiences of ultrasound-guided erector spinae plane block for thoracic vertebra surgery. *J Clin Anesth 2017; 38:137*
3. Muñoz F, Cubillos J, Bonilla AJ, Chin KJ. Erector spinae plane block for postoperative analgesia in pediatric oncological thoracic surgery. *Can J Anaesth 2017;64:880-2.*
4. Chin KJ, Malhas L, Pertas A. The erector spinae plane block provides visceral abdominal analgesia in bariatric surgery: A Report of 3 cases. *Reg Anesth Pain Med 2017; 42:372-6.*

IAPA Survey of Paediatric Anaesthetic Practice During the COVID-19 Pandemic

Dr Poonam Motiani, Dr Anisha De, Dr Sanjay Prabhu,
Dr Nandini Dave, Dr Elsa Varghese

The COVID-19 pandemic has had a global impact on healthcare, its delivery systems and the healthcare workers. India is a diverse country with wide ranging differences in health care. The IAPA conducted a survey to assess the impact on work practices, teaching and training, and also the psychological and economic repercussions in the wake of the pandemic. It was conducted between the months of May and November 2020. A response from 40% of the 400 members to whom the Google form survey was sent via email was received. Female members consisted of 59% of the respondents and males 41%, Those aged 30 to 40 years comprised 44% of respondents, the rest were older. The following is a summary of the survey.

The majority of the respondents (84.6%) had over 5 years of working experience following postgraduate training, 30% provided exclusive paediatric anaesthesia services, and 44% of the anaesthetists surveyed also worked in ICUs. The majority (73%) worked in a multi-speciality facility and 58% of them worked in large hospitals with >300 beds. The rest (27%) were freelancing practitioners with attachments at multiple hospitals

The majority (72%) worked in hospitals that treated COVID-19 cases, providing active care in COVID-19 ICUs or wards and 58% provided mainly anaesthesia or sedation services. The RT-PCR test was the most common preoperative test performed for all scheduled patients, the results of which took more than 12 hours according to 62% respondents, and this contributed to delay in surgery. The majority (83%) did not test neonates scheduled for emergency surgery and 52% tested did test neonates prior to elective surgery. A significant number of respondents (59%) worked in departments where the anaesthesia consent forms were suitably modified to cover complications related to COVID-19.

The survey covered questions related to their working environment and on call duties. 71% were confident handling cases as they had received special training just prior to this period. The majority (68%) worked in shifts by rotation. Prophylactic hydroxy chloroquine (HCQ) medication was taken by one third of the respondents and 99% used personal protective equipment (PPE). PPE was freely available as reported by 84%, while 15% reported erratic supply. Though most operating rooms had face shields, shoe covers and goggles available, these were not freely available in pre anaesthetic clinics and in non-operating room anaesthesia areas. 72% reported that they were required to quarantine for 7 to 14 days post exposure to positive cases.

On being asked about adequacy of infrastructure and equipment availability, 84% of respondents had adequate access to disinfectants and hand washing facilities in preoperative assessment clinics. Dedicated COVID-19 operating rooms (OR) were available to 66 % of respondents and 30% stated these were negative pressure ORs (31% worked in neutral pressure ORs and 37% in positive pressure ORs). With regard to the air conditioning systems available in their ORs, only 7.4% reported <10 air changes per hour and 46% reported > 10 air changes per hour and 30% had active scavenging systems available. Interestingly, 54% respondents reportedly switched off air conditioning both during induction and extubation, despite hot conditions.

With regards to anaesthetic techniques, 83% preferred IV induction of children, 77% used a rapid sequence intubation technique, 76% had access to video laryngoscopes and 83 % preferred using the paediatric circle system to the Jackson Rees modification of Ayre's T Piece (JR Circuit). When asked about their preference of breathing circuit for pediatric cases, 21% respondents reported using closed circuit and low flow even prior to the pandemic. 23% changed practice and stopped using the Ayre's T piece during the pandemic and 8.2 % reportedly used it only during induction and extubation.

Heat and moisture exchange (HME) filters were utilized by 99 % of respondents, of which 53 % used two HMEs for each case (between the airway and the end of the expiratory limb of the circuit) and 23% used one HME between the airway and circuit, 14% reported using three HMEs, the additional one placed at the inlet of the inspiratory limb.

Single use equipment was available for 31% of the respondents, though face masks, supraglottic airway devices, laryngoscope blades and breathing circuits were reused after washing with soap and water and sterilized using either sodium hypochlorite or glutaraldehyde solution. Workstation, monitors and surface disinfection was achieved with; alcohol-based solutions (38%), Chlorhexidine and alcohol (34%), and bleach (9.3%), a small number used sodium hypochlorite, hydrogen peroxide and Bacillocid®

Increased turnover time (30 minutes to one hour) was reported by 87% after dealing with a COVID-19 positive case in the OR. 43 % of respondents reportedly changed the soda lime after each COVID-19 case and 44% changed the soda lime after it was exhausted.

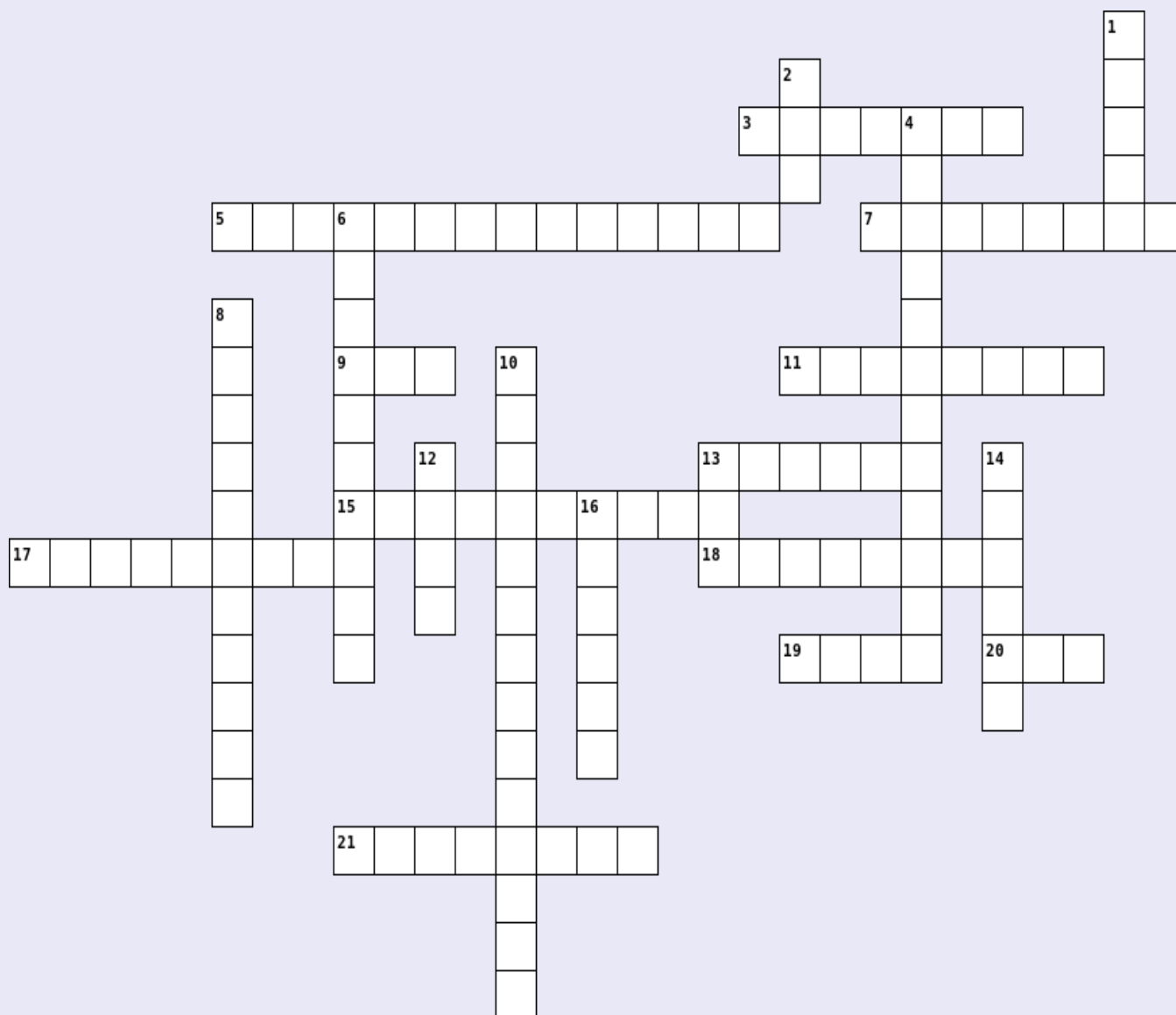
Of concern were the reduced operating room teaching and teaching programmes being kept on hold by 88% involved with training residents. The number of patients scheduled for elective surgery saw a sharp decline during the pandemic with 48% reported doing less than 10 children per week, compared with 4% who did less than 10 cases a week prior to the pandemic. Prior to the pandemic, 60% did more than 30 pediatric cases per week as opposed to during the pandemic where only 8% of respondents did more than 30 paediatric cases a week.

The physical and psychological impact of this pandemic on our members is a cause for concern. 23 % experienced longer working hours, while 47% (older individuals) reported reduced working hours. Demands of work increased anxiety and stress in 86% of respondents; 75% reported fear of getting infected and 91% were worried about passing on the infection to close family members. Uncertainty of the future (58%) and social isolation (36%) were also mentioned. Financial worries were reported by 40% and 53% experienced a reduction in income.

Conclusion

Though the response rate to this survey was lower than expected, the findings are of interest. India had the advantage of facing the brunt of the impact well after China, the Far East, Europe and USA and the majority of our larger hospitals in cities had time to plan and prepare for the onslaught. The availability of PPE for our health care personnel appears to have been adequate. There is a huge variation across India in the theatre infrastructure and facilities to handle such pandemic situations. The majority of respondents worked in larger hospitals and in cities, so the true nature of facilities and impact of the pandemic on smaller hospital anesthetic services could not be assessed. The physical strain and psychological impact on our colleagues have been significant. In addition, hands on training of anaesthesiology residents and fellows has certainly been affected.

Paediatric Advanced Life Support Crossword

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Hyderabad**Across**

3. This drug is not routinely recommended in cardiac arrest unless associated with hypermagnesemia or hyperkalemia.
5. Paediatric cardiac arrest survivors should be evaluated for these services.
7. For children in septic shock unresponsive to fluids and vasopressors, these may be considered.
9. Test performed in the first week post cardiac arrest for prognostication.
11. The sixth link in the chain of survival added to 2020 AHA resuscitation guidelines.
13. One of the reversible causes of cardiac arrest.
15. Drug recommended for VF/pulseless VT in children.
17. Airway manoeuvre in trauma patients to maintain patent airway.
18. Drug to be considered for children in respiratory arrest due to suspected opioid overdose.
19. Score to pick up clinical deterioration in children to prevent cardiac arrest.
20. Maximum energy in joules per kg for defibrillation in refractory VF.
21. The technology useful for venous cannulation in case of difficult venous access.

Down

1. The chest compression depth during CPR should be at least a ___ of anteroposterior diameter.
2. The sequence for initiating resuscitation in children.
4. Rescue vascular access when peripheral and central intravenous access is difficult.
6. Device recommended to be connected to AED in children less than 8 years of age.
8. Blood products are recommended over crystalloids in this type of shock.
10. For children with this diagnosis, use of extracorporeal support can be considered if available for prevention of cardiac arrest.
12. The minimum time in seconds that central pulse should be felt for, before initiating chest compressions.
13. The maximum time allowed for central pulse check, before initiating the chest compressions.
14. The minimum rate of ventilation through the advanced airway to be maintained during CPR in a child.
16. Important phase of chest compression which allows flowing of blood back into the heart.