

Critical care as a career for anaesthesiologists

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ABSTRACT

Anaesthesiologists by virtue of their understanding of physiology, pharmacology and resuscitation skills are best suited to manage critical care units. Armed with this varied knowledge, the anaesthesiologist is 'physician to the surgeon and a surgeon to the physician'. Specialised training helps them to provide extended postoperative and critical care. During the past few months in the battle with coronavirus disease (COVID)-19, anaesthesiologists have stood up to the challenge of caring for critically ill patients, compromising on their operating room responsibilities. The fact from a growing body of literature suggests that an anaesthesiologist as a critical care specialist provides efficient care and better outcomes. With an increasing awareness and need for critical care, government support is going to increase with an increase in avenues for training and research leading to better professional development and earning potential.

Key words: Anaesthesiologist, career choice, critical care

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Anaesthesiology in India became an independent speciality only in 1964.^[1] In the first three to four decades, most anaesthesiologists preferred to remain behind the ether screen under the surgeons' umbrella. The first documented Critical Care Unit (CCU) in India was started at Army Hospital in Delhi in 1963.^[1] Anaesthesiologists by virtue of their better understanding of physiology, pharmacology and resuscitation skills managed most of these first CCUs.

Unfortunately, the end of the last century saw a declining role of anaesthesiologists in critical care.^[2] The situation was the same in the United States as well. Of the 25,000 board certified anaesthesiologists, only 12% had special competence certification in critical care.^[3]

WHAT MAKES AN ANAESTHESIOLOGIST IDEAL FOR A CCU?

Physicians who manage critical areas of patient care need some special abilities. These include:

- Background knowledge of all medical conditions and surgical procedures,
- Quick thinking and immediate action,
- Reasonable technical skills, and
- Compassionate but realistic approach.

Anaesthesiologists have most of these qualities imbibed into them. Their work is often compared with pilots as they follow the same practice of verifying their preparation with the help of a checklist before initiation of anaesthesia. Anaesthesiology, as a speciality has pioneered many system-based protocols to minimise human errors. Anaesthesiologists are pioneers in airway management. They are trained to administer anaesthesia to patients with a spectrum of underlying medical diseases with variable pathophysiology. Today, almost every organ function is closely monitored with the help of modern technology

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during anaesthesia. Mechanical ventilation is part of their standard curriculum and an essential part of the CCU work. Their in-depth understanding of pharmacological agents like inotropes and vasopressors make them ideal for haemodynamic management in the CCU. They are also experts in cardio-pulmonary resuscitation and the management of acute and chronic pain, all of which are essential for critical care. Additional knowledge of point of care testing gives them a separate identity. Modern anaesthesiologists are well-trained in ultrasound techniques, which they utilise for looking inside the heart, safe placement of invasive lines, diagnostic procedures of the chest and abdomen and also for deep and peripheral nerve blocks. Today, many operating rooms (OR) are under the administrative cover of anaesthesiologists, and they have proven themselves to be astute administrators. Armed with this varied knowledge, anaesthesiologist is 'physician to the surgeon and a surgeon to the physician'. Specialised training helps them to provide extended postoperative and critical care.

INTELLECTUAL STIMULATION/CHALLENGES OFFERED BY THE SPECIALITY

Critical Care is one place where knowledge, performance, skill, attitude, communication and high level of mental alertness is required all the time. A critical patient represents a continually changing paradigm; hence, constant human and machine monitoring and intervention are essential for the situation. The interplay of the physiological processes of different systems of the human body is best seen here. One often wonders how the disease of one system may affect the other system. The patients continuously stimulate the caregiver to monitor, think and act.

IMPORTANCE DURING PANDEMICS

Refer to the quote from Einstein, that 'amid every crisis, lies great opportunity'. The crisis of coronavirus disease (COVID)-19 has and will continue to bring further opportunities. The pandemic has been an opportunity for anaesthesiologists to deliver their skills.

The past few months battling coronavirus disease (COVID)-19 has been a once-in-a-lifetime event for everyone. Anaesthesiologists stood up to the challenge of caring for critically ill COVID-19 patients, compromising on their operating room responsibilities.^[3]

Anaesthesiologists have extensive knowledge of human organ systems and its physiology, and they have the training to influence them mechanically and pharmacologically both under normal and in a stressed situation. Anaesthesiologists' role in the management of COVID-19 patients has also been brought to the fore as they have expertise in airway management, vascular access and transferring sick patients in and out of the hospitals.^[4]

If anaesthesiologists wish to repair the severed track, this is the right opportunity to rewrite history. We can stand on the shoulders of iconic anaesthesiologists such as John Snow and Bjorn Ibsen with a positive response. They took responsibilities outside the operation theatre in the 20th century during cholera and polio pandemics.

Critical Care as a speciality continues to be at the cutting edge of response to the current pandemic. The speciality was developed in response to what was then an unprecedented need. It has become a highly skilled and expert workforce, well-designed to deliver advanced care and cope with new and unknown situations.

Thus, this pandemic has showcased the anaesthesiologist's skills as consultant physicians, medical managers, refined strategists and team leaders.

Ethical aspects

Critical Care clinicians should be competent in all aspects of ethical decision-making. Obvious sources of conflicts are limited resources, behavioural issues such as verbal abuse or poor communication, psychologic and physiologic stress, end-of-life care issues, caretaker and family dynamics, including a lack of respect for the patient's autonomy. Most of these issues stem from an inequitable availability of necessary or specialised resources. A bed with a ventilator does not constitute CCU care. However, these issues may be resolved by considering the patient's or family's wishes, recognising the rights of the patient and decision is to be made keeping in mind the hospital policies and the prevailing law.

Legal aspects

The CCU's dynamics exemplify a complex interplay between medicine, ethics, public policy and the law. Both money and emotions are badly taxed here. This unit functions in a tight feedback loop between (1) evaluation, (2) intervention

and (3) assessment of response to therapy. It produces multiple opportunities for lapses in monitoring, assessment, judgment or communication. The challenges, rewards and risks associated with its practice make it more vulnerable. Hence, for a quality outcome, good leadership, culture and an integrated approach are needed. Critical care is an opportunity for those young anaesthesiologists who wish to work in the frontline and do not want to be labelled as 'Experts behind the screen'.

Each new technological advance and promulgation of guidelines, protocols and pathways represents an opportunity for its use or misuse. In the court of law, deviating from guidelines may be accused of not following accepted best practices. Although the disciplines of ethics, public policy, outcomes research and the law are separate, they are interrelated. The fields of quality management, performance improvement, risk management, the severity of illness scoring and newer initiatives such as the 'culture of safety' and pay-for-performance are all related to legal risk.^[5]

PERCEPTION AND PRACTICE AS AN INDIVIDUAL/TEAM MEMBER

Unlike anaesthesia, it is challenging practising critical care as an individual. Once one is involved in the care of a patient, it is 24-hour commitment until the patient's final discharge. A critical care specialist can either lead or work with the team. Leadership role comes with seniority and expertise. Patient safety and outcome depend entirely on team dynamics, cohesiveness, commitment and individual team members' contribution. Concept of visiting consultant has its limitations in the practice of critical care.

Active interaction with other specialities

Anaesthesiologists are considered to be highly competent communicators when related to surgical disciplines. They work neck to neck with the surgeons. Before any anaesthetic, they explore the minute details about the patient from the surgical team. They communicate well with the patient, especially during pre-aesthetic check-up, informed consent taking and pain management.

This communication skill comes in handy as a critical care specialist. This is mainly due to the primary treating physician and surgeons' involvement and other super speciality consultations and interventions

for the patients such as cardiology, nephrology and neurology.

Effective communication is a fundamental skill; it is an inherent quality with some specialists, but it can be developed with teaching and training. A model teacher is the best example.

RESEARCH AVENUES IN CRITICAL CARE

It is the untiring efforts of anesthesiologists to reduce human error that has resulted in a reduction in anaesthesia related deaths from 1 in 10,000 to 1 in 300,000 today.

In the last two decades, anaesthesiologists have evaluated the concept of supranormal oxygen delivery and goal-directed fluid therapy, using a variety of non-invasive cardiac output monitors and extended this to the critical care units. Research areas of interest and expertise of anaesthesiologists include, but are not limited to sepsis, acute respiratory distress syndrome (ARDS), extracorporeal membrane oxygenation (ECMO), mechanical assist device, ventilation and early recovery after surgery (ERAS). Many of them are just an extension of their research field from the OR to the CCU.

RECOGNITION IN THE SOCIETY/MEDICAL FRATERNITY

At present critical care medicine (CCM) is a growing speciality, though not very well-acknowledged. Critical care medicine is a logical extension of the anaesthetic scope of practice, and it is the anaesthesiologists who helped create this discipline.

In India, the presence of critical care has been felt for the last 20 years. Indian Society of Critical Care Medicine (The parent society of critical care practitioners) has grown up to a large society with around 15000 members registered under this society. Many anesthesiologists are part of this society. It is a mix of anaesthesiologists, general physicians, pulmonologists, surgeons and paediatricians.

Although it has shown its presence amongst medical fraternity, societal recognition may take a longer time. The reason behind delayed recognition is a delayed accreditation by the erstwhile Medical Council of India and that too for super speciality DM Course. Recently, the DNB course in the speciality has started,

but an MD Course in the future is necessary for proper recognition and awareness in the society. Very few government medical college hospitals have a formal critical care unit in place.

Nevertheless, of late, due to onset of COVID-19 pandemic, interpersonal contact between the CCU team and the patient's families has improved. Also, the infrastructure, training, equipment availability, government funding, along with the popularity and recognition of this speciality have soared. Anaesthesiologists have performed as front liners in this COVID-19 battle for providing the vital and dangerous task to the seriously ill COVID-19 infected patients.^[6]

Economic and Financial aspects

The major factors which decide economic and financial aspects of critical care specialist are the city one chooses to practice in: metropolitan or nonmetropolitan; government or private sector; general or super-speciality critical care; seniority and expertise; visiting or full time in the private sector and some minor factors.

The choice remains with the specialist. Approximately 10% to 20% of all hospital beds are allocated to critical care. With the advent of pandemics like COVID-19, the demand vastly outnumbers the supply. The economic gains are better in the corporate sector, which increase with experience, expertise and time spent in the institution.

Family happiness

Family happiness depends upon earning and time allotted to the family. The earning part depends on one's selection. Earning is better with the corporate and private sector, but they are time taxing. On the other hand, government sector jobs are medium earning but less time taxing and leave family members' time. However, scenarios can change with pandemics like COVID-19. Many articles have been written about burnout in this pandemic with emotional and behavioural impairment, emotional exhaustion, depersonalisation and personal accomplishment.^[7] These can also be correlated with either overwork or maladjustment to the working environment.

Global appeal/as a permanent career

With an increase in the world population, the number of patients who may require critical care will increase substantially, with most of these in resource-restricted settings. Although critical care capacity is scarce in the

developing world, efforts are being made to improve the infrastructure. Old age problems, infectious diseases and trauma will continue to be the main reasons for CCU admission. Additionally, natural and human-made disasters will occasionally strain critical care services. Hence, the critical care constitution will vary continuously across the globe in terms of structure, processes and staffing. There would, however, always remain a mismatch between demand and supply.^[8]

The fact from a growing body of literature suggests that an anaesthesiologist as a critical care specialist provides more efficient care and better outcomes. However, the existing model is one in which the anaesthesiologist believes in providing supportive care to the patient in conjunction with a primary physician who may not be an intensivist.

This mindset can change with teaching and training. In the future, they will take the primary responsibility. Practice will vary with the modification of the anaesthesia curriculum and current training program for post-graduation. Hence, anaesthesiology is always an opportunity to systematically re-engage in the practice of critical care and simultaneously benefit the patients for whom they already care in the operating room.

TEACHING ASPECTS

Organised courses such as Doctorate of Medicine (DM) and Doctorate of National Board (DrNB) in Critical Care Medicine, recognised by National Medical Commission and Post Doctoral Certificate Courses (PDCC) by various medical universities are being offered in our country. Indian Society of critical care medicine also offers diplomas and fellowships of varying duration. However, there is a desperate need for MD Critical Care in our Country.

Critical care training entails taking care of the sick and the very sick. Specialised training is needed to develop expertise in the field of critical care. It is a continuous process and entails acquiring skills of invasive procedures, mechanical ventilation, bronchoscopy, advanced haemodynamic monitoring, bedside ultrasonography, dialysis and extracorporeal membrane oxygenation. Most of these basic concepts are part of anaesthesiology training as well.

Critical care training entails developing the vision to make a quick diagnosis and decision making on priority.

It requires a sound knowledge of pathophysiology, medicine and surgery.

Critical care is a combined application of knowledge to be put into perspective to treat the patient and the disease as a whole. An intensivist also needs knowledge of supportive departments for managing patients.

Prestigious universities/institutions of repute that teach/train in this super speciality

List of colleges offering DM (CCM) recognised by NMC are NRI Medical College, Guntur, St. Johns Medical College, Bangalore, Jawaharlal Nehru Medical College, Sawangi (Meghe), Wardha, Bharati Vidyapeeth University Medical College, Pune, Tata Memorial Centre, Mumbai, Institute of Medical Sciences & SUM Hospital, Bhubaneswar, Jawaharlal Institute of Postgraduate Medical Education & Research, Puducherry, Dayanand Medical College & Hospital, Ludhiana, Christian Medical College, Vellore, Sri Ramachandra Medical College & Research Institute, Chennai, Sanjay Gandhi Postgraduate Institute of Medical Sciences, Lucknow, Institute of Postgraduate Medical Education & Research, Kolkata and All India Institute of Medical Sciences (AIIMS), New Delhi, Bhopal, Jodhpur and Rishikesh.

There is a common National Eligibility Cum Entrance Test for super-specialty (NEET-SS) conducted by National Board of Examinations annually. There is a common separate entrance test for AIIMS all over the country which is held twice a year.

In the question paper, 50% of the questions are from anaesthesiology. Hence, it becomes easier for anaesthesiology residents compared to other disciplines. One can refer to the standard anaesthesia textbooks. Rest 50% of the questions are from critical care medicine, pharmacology and microbiology related to critical care.

The admission to DNB-SS is also through NEET-SS. However, one has to be careful in selecting the hospital for DNB training as additional experience in a teaching hospital may be required to be at par with DM candidates for appointment as faculty in NMC recognised medical colleges offering DM courses.

DIFFERENCES IN CLINICAL PRACTICE IN THIS SPECIALITY IN INDIA AND ABROAD

The knowledge is limited regarding differences in critical care practice across the globe. However, like most other

areas, there are variations in resources, patterns of care provided after CCU admission, discharge, reimbursement and chronic disease.^[9] These global discrepancies open up avenues for further future clinical research.

WHY ARE ANAESTHESIOLOGISTS RELUCTANT TO TAKE UP CRITICAL CARE AS A CAREER?

Critical care in India is still struggling to become a primary speciality. There is also a lack of public promotion of critical care as a speciality. Anaesthesiologists are reluctant to increase their knowledge of general medicine, which is a necessity in CCU. Remuneration in critical care may be equivalent or better than working in the OR, but usually at the cost of longer working hours. Finally, it becomes discouraging for a beginner when hierarchical systems are neither adequately defined nor in competent hands. The lack of clarity in the CCU about the final decision-makers is dampening for a newcomer's enthusiasm to take up critical care as a career.

Encouragement should come from seniors and teachers. With additional knowledge of medicine and some good leadership skills training, every anaesthesiologist can become a critical care specialist. They need encouragement for spending more time in critical care during their formative years.

Encouraging the youngsters to adopt this super speciality

The recent pandemic has increased public awareness of critical care and its importance at the world's level of policymakers. Young anaesthesiologists can join the stream with new and innovative ideas for future development in this upcoming speciality. It is an opportunity for the younger generation who wish to work in the frontline and do not want to be labelled as 'Experts behind the screen'.

FUTURE SCOPE

Training in anaesthesiology, along with additional advanced training in critical care medicine, uniquely prepares an individual to care for the critically ill by providing critical technical skills and expertise in basic sciences and perioperative medicine. The unique skills they develop concerning judgment and management are valuable to all critically ill adults and children.

Apart from the general critical care, which includes a mix of medical and surgical patients, speciality

critical care deals with specific disciplines like cardiac surgery, neurosurgery and paediatric surgery. Though, most of the setups in India are mixed, with the advent of advanced super-specialities, knowledge, skill and expertise are going to improve.

Today's critical care medicine encompasses care beyond traditional intraoperative and routine postoperative care. Anaesthesiology-trained intensivists can deliver their skills at any location, whether it is an in or out of the hospital setup.

The concept of Perioperative Surgical Home (PSH) is evolving fast and is considered as the emerging model for the future anaesthesiologist. This will be a path through which anaesthesiologists can become leaders in the multidisciplinary delivery, seamlessly and cost-effectively. For the broader acceptance of this concept, critical care training will be a must for an anaesthesiologist.

The primary involvement of anaesthesiologist in this pandemic further confirms that anaesthesiologists will continue to lead the field of critical care. Government and corporate support will further increase the awareness about the need for critical care, ventilated beds and trained staff, which will lead to an improvement in the avenues for training and research, leading to better professional development

and earning potential.

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