

The Future of Anesthesia

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Anesthesia as a field has greatly expanded in recent years. It is progressing in leaps and bounds. The spectrum of anesthesia has now sheltered not only operative patients but also patients with chronic pain, terminal illnesses, and cancer. With a brief prologue to changes in the field of anesthesiology, this article focuses on palliative care, chronic pain management, and perioperative medicine.



Changes in Anesthesiology

Medicine has matured over the last century, becoming more sophisticated and well-organized. The operating room (OR) is no exception. The modifications in the OR have altered the perspective and mutual behavior of its inhabitants, and have brought in the concept of “team spirit”, upholding the greater good of the patient at the pedestal, affecting one and all, including the **anesthesiologists**.

Changes in the team structure

There are clear changes in the behavior of the team in the operating room (OR). The surgeons, anesthesiologists and the nursing staff form the core team in the OR. All three need to maintain a harmonious balance. **Good teamwork** improved interpersonal

relations, and **communication skills culminate** in improved technical and non-technical performance and improved operative outcomes. **Non-technical skills** encompass the cognitive and social responsibility of the OR and are largely addressed by the nursing staff.

Team training, using **interdisciplinary simulation-based team training** is feasible and well acknowledged by surgical teams.

Watchful monitoring and surveillance make it feasible for hospital systems to be aware of so-called “bad” behavior that may affect patient outcomes and team interactions. The relationship between surgeons and anesthesiologists is collegial and the infrastructure is set up to support the surgeon and provide assistance during the operation, as a team.

There is also great respect between the surgeon and the scrub nurse. **Nursing personnel** are vital for the smooth execution of the operation. Some of the key elements of nursing roles, in the OR, include:

- Ensuring that equipment is brought into the OR
- Ensuring that equipment is taken out of the OR
- Provide information to the waiting areas, including families of patients
- Notify the recovery room and the holding area of the status of the case
- Support the anesthesiologist in their role.

Critical evaluation of the team as a whole is receiving considerable attention, to help reduce peri-operative adverse events. The ultimate goal is to enhance **safety in surgery** with excellent team performance.

Anesthesiologists have dared into ventures of great significance in modern times. While more than half of the population is plagued by **chronic pain, cancer** and other terminal illnesses are truncating quality of life. It is a paradox of the 20th century, that life expectancy has increased but the quality of life of the terminal years has not improved in a parallel manner. The involvement of anesthesiologists in new areas is elaborated below.

Palliative Care

The concept of “**palliative care**” was proposed by **Kristjanson et al in 2003**. They hypothesized the “palliative approach” to emphasize the need for palliative care in diseases, other than cancer. They proposed care for those patients with **terminal chronic illnesses** who may not be served with specialized palliative care services, but rather be comforted by identification of their end of life concerns, much earlier in the course of their disease progression.

Similarly, the **World Health Organization (WHO)** defined “palliative care” as an approach that is applicable early on in illness trajectories. It has been incorporated in the **WHO cancer control strategy**.

The **Worldwide Palliative Care Alliance (2014)** attested and acknowledged the WHO definition, further stressing that palliative care be affirmed by all, not just by professionals trained in palliative care.

Other terms, coined as adjuncts to palliative care, include “**early palliative care**”, “**geriatric palliative care**” and “**dementia proofing end of life care**”.

Healthcare initiatives intended to forward the mission of palliative care include

the **Australian Palliative Residential Aged Care (APRAC) Project** and, the **Program of Experience in the Palliative Approach**, funded by the Australian Government; and **Gold Standards Framework** initiated to enhance primary palliative care in the United Kingdom. These organizations have stimulated research in palliative care and have provided an impetus for the development of guidelines for enhanced end of life management.

The **iPANEL team (Initiative for a Palliative Approach in Nursing: Evidence and Leadership)** addresses multiple primary research questions pertaining to palliative care. This team emphasizes the role of **healthcare systems policy, education and practice guidelines** for enhancing palliative care.

Thus, palliative medicine entails more than just the care of patients who are dying: palliative care is the **management of pain, depression, and immobility**. Historically, palliative care has been managed by family doctors and internists – not anesthesiologists. The ability to provide **patient-controlled analgesia (PCA), epidural analgesia and interventional treatment** such as spinal cord stimulation, to improve the life experience of terminal pain, has brought anesthesiologists to the forefront of palliative medicine.

Ultrasound-guided regional blocks can also be useful for some patients and can be provided by ultrasound trained anesthesiologists. There is increasing emphasis in using non-opiate drugs in palliative care patients. Again, the experts from anesthesiology are well equipped to provide this care.

Chronic Pain Management

30% of adults suffer “chronic pain” at any given time. By definition, any pain lasting more than 3-6 months is called “chronic pain”. Of these adults with chronic pain, 2% have **disabling pain**, while 12 % have **severe pain**.

The **Multidimensional Pain Inventory (MPI)** is an inventory designed to assess chronic pain.

Pain is reported by 30-50% of **cancer patients** on treatment and by almost 70-90% of those with a **terminal disease**.

WHO has devised a “**three-step-ladder**” for cancer pain relief in adults. A two-step-ladder has been developed for the **pediatric** population.

This approach recommends administering the right drug at the right time, rather than “on demand” drug administration. It is relatively inexpensive and 80-90% effective.

The pain relief ladder can be tabulated as:

Step in the ladder	Treatment options
First step	Non-opioid analgesic (aspirin and paracetamol) with/ without adjuvant therapy (additional drugs to calm fears and anxiety)
Second step (if pain is persistent/ worsened)	Opioid for mild to moderate pain (codeine) with/ without non-opioid and adjuvant therapy
Third step (if pain is persistent/ worsened after the second tier of management)	Opioid for moderate to severe pain (morphine) with/ without non-opioid and adjuvant therapy

Surgical intervention is considered if these drugs are not completely effective.

Analgesics, opiates have long been used for management of **refractory pain**. Opiates represent the most potent and reliable analgesic agents.

Analgesics have revolutionized patient management in many ways. But, in human hands, these drugs are fraught with complications such as drug overdose, toxicity, side-effects, withdrawal, tolerance, dependence, [abuse](#) and systemic complications. Hence the latest rank in the hierarchical management of pain is **“NO” analgesics**.

Terminal cancer patients and those with advanced diseases are positively encouraged to resort to adjuvant therapies like **music therapy, yoga, and meditation**. Many patients seek solace and comfort in these modalities.

Evidence indicates that only a multi-disciplinary **“pain team”** can be successful in treating chronic pain. There is a vast need for specialized physicians for pain management. Anesthesiologists are the leaders in this process. The Australian model provides a solid model for the management of chronic pain.

Professor Michael Cousins is a world leader in developing chronic pain management programs.

The impact of comprehensive chronic pain management under the able guidance of anesthesiologists is important, given the vast number of people suffering from chronic pain.

Perioperative Medicine

Perioperative medicine is not a subset of internal medicine or family medicine, but rather a component of medical sciences that endeavors to optimize medical illness during the perioperative period, assess **operative risk-versus-benefit ratios** and manage complications emergently.

Evidence suggests that peri-operative care may be best suited for the Anesthesiologist. The American Society of Anesthesiologists society upholds that preoperative tests should be performed scrupulously to enhance preoperative management, rather than a standard order set for every patient. The guidelines urge that patient information be recorded in the medical records, patient interview, and physical examination and the anticipated nature of the planned surgical intervention should guide which tests needed.

As the “team concept” takes on in almost every walk of medicine, **cooperation between anesthesiologists and primary care physicians** is necessary to improve perioperative care. Anesthesiologists should evaluate patients routinely before surgery, particularly those with serious medical problems, including [diabetes](#), [heart failure](#) or [rheumatoid arthritis](#).

The advancements in perioperative medicine will help ensure that guidelines, protocols, and algorithms are available to objectively assure safe and individualized, perioperative care.

Changes in the Care of Patients

Technological advances have moved hand in hand with scientific research. New equipment has made surgical interventions safer and more effective. Anesthesiologists rely on several important instruments, outlined below.

Pulse oximeter



Image: "Pulse oximeter." by Rama – Own work. License: [CeCILL](#)

Pulse oximetry is used for monitoring of oxygen saturation. This allows an opportunity to identify a drop in oxygen saturation and treat it, prior to arrest. This has reduced OR deaths.

End-tidal CO₂ concentration monitor (EtCO₂)

End-tidal carbon dioxide assessment helps predict whether the **ventilation** of the patient is appropriate.

Fiberoptic bronchoscope

Use of the **fiber-optic bronchoscope** has improved opportunities for **one-lung ventilation**, necessary for numerous thoracic surgical procedures.

Better care for **acute pain** has enhanced patient comfort and satisfaction from surgical interventions.

Potential Future for Anesthesiologists

The scope of anesthesiologists' practice has increased. In the future, the anesthesiologist might be more involved in the care of surgical patients who are hospitalized, including caring for these patients prior to, during, and after the surgery.

Summary

There have been radical changes in the field of anesthesiology. Interdisciplinary cooperation between surgeons, nurses, and anesthesiologists in the OR require enhanced communication skills for the "surgical team", to ensure improved patient care and surgical outcomes.

Palliative care is an emerging subspecialty of the medical sciences, which aims to start the end of life care in an anticipated manner for patients with steep illness trajectories. Anesthesiologists play a vital role in palliative care.

Anesthesiologists also play an important role in the care of chronic pain with tools that include medication and interventional procedures.

Perioperative medicine encompasses complete comprehensive management of chronic medical illnesses of the patient in the light of the planned surgical procedure. Anesthesiologists are well positioned to care for these patients and improve patient outcomes.

The future of anesthesiology, as a profession, is exciting.

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