

Short Communication

Technical Advancements in Anesthesia: Are We Losing Human Touch?

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Dear Editor,

Scientific and technological advancements have made important changes in almost every aspect of life such as communication, traveling, shopping, banking, and food industry. Healthcare is another such field where the technology has progressed really well, with the hallmark as data recording and storage. Anesthesia Information Management System is widely used to manage and document the perioperative information of a patient. Newer anesthesia machines and infusion pumps have facilitated automated anesthesia delivery. The use of ultrasonography (USG) machine, advanced airway equipment, and the invention of high-end monitors facilitating non-invasive cardiac monitoring have proved as a boon to anesthetists and patients. Telemedicine is indeed useful for post-operative assessment of daycare patients. Simulators for the purpose of teaching and training are another marvelous technical advancement.

However, every coin has two sides. Although technology has its own advantages, it has a worrisome disadvantage of loss of skills. The aviation industry, the closest analogy of anesthesia, also reports a loss of aviation skills with technological advancements. There are numerous reports which confirm that the pilots have lost their navigation skills using landmarks, calculations based on airspeed and altitude, and the ability to fly without autopilot.^[1] The same applies to the field of anesthesia with loss of clinical skills such as procedural skills using landmarks, titrating the doses of inhalational agent and gas flows based on manual calculations (dependence on minimum alveolar concentration monitoring), and the ability to manually ventilate the patient during anesthesia without the facility of a ventilator.

The importance of eliciting a good history and meticulous physical examination is well established in the medical field

making a diagnosis in 60–80% of the patients.^[2] It also helps in establishing a positive physician-patient relationship for a favorable outcome. With pulse rate (PR) being displayed in the oxygen saturation monitor, pulse palpation during pre-anesthetic checkup (PAC) is no longer done, and thus, missed beats or arrhythmias may first be detected in the operating room (OR) after attaching monitors. Similarly, chest auscultation for lung fields and identification of murmur is hardly done as the patient already carries chest x-ray and has easy access for echocardiogram to detect any structural abnormality of the heart. Basic acts such as spine examination and looking for intravenous access in PAC have almost extinct with the use of USG.

In the OR, the reliability on monitors has increased so much that we have forgotten the skill of manual monitoring. “Hand on pulse” tells about not just the PR but also gives an idea of pulse volume and temperature, the color of the patient to appreciate the oxygenation, capillary refill time, and precordial stethoscope have all lost their charm. These monitoring skills are to be practiced regularly for expertise and are useless if done once in a while. Turning back and searching the end-tidal CO₂ trace on the monitor for confirming tracheal intubation instead of looking for the chest rise is the normal routine. A flat line in the monitor prompts the young anesthesiologist to begin cardiopulmonary resuscitation straight away without clinical confirmation, again indicating over-reliance on high-end monitors. The invention of advanced airway equipment such as supraglottic devices, fiberoptic bronchoscopes, and video laryngoscopes made us forget the skill of mask ventilation, laryngeal manipulation using little finger while doing laryngoscopy in neonates, blind nasal intubation, and retromolar intubation.^[3] The new devices may be conveniently used in the OR at most of the places but they are still unavailable in wards and in emergencies, emphasizing the need for conventional training

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in mask ventilation. Moreover, there is a high dependency on the USG machine for simple and quick procedures such as intravenous, central line, and arterial cannulation. Furthermore, blocks by eliciting paresthesias or guided by the “tissue-feel” and “pop-ups” are replaced by USG-guided blocks, which have better safety profile and low complication rates, but provide a false security, leading to poor anticipation and delayed detection of complications.

Post-operative care has definitely improved with the availability of monitors in post-anesthesia care unit. However, too much reliability on monitors, poor communication with the patient for pain assessment, and loss of empathy is a worrisome situation. Similarly, simulators for teaching procedural skills are a great technical advancement but it requires clinical judgment and knowledge to decide the appropriate procedure for a patient in a particular situation. A good clinical skill also includes detecting the deviation of anesthesia from a normal course to a critical situation, decision making and taking appropriate action during such situation as well as communication skills with patients and colleagues. The role of an appropriately trained anesthetist becomes more evident in adverse scenarios because it requires trained eyes to perceive important clinical traits, trained hands to execute necessary actions, and a trained mind to understand and analyze the situation in a holistic way, along with good communication skills for meritorious teamwork.

Technological advancements have improved safety and efficiency but the importance of a skilled and experienced anesthetist cannot be denied for ensuring patient safety during anesthesia especially in adverse situations. The latest technology should definitely be adapted but efforts should be made to preserve the best of clinical skills so that the technology acts as an assistance and not a substitute for human skills.

Ethical approval

The Institutional Review Board approval is not required.

Declaration of patient consent

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The authors confirm that there was no use of artificial intelligence (AI)-assisted technology for assisting in the writing or editing of the manuscript and no images were manipulated using AI.

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