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Editorial

Non-technical skills in the operating room: Crisis resource management principles

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The risks in anesthetic practice were recognised soon after the advent of surgical anesthesia. There has been a prevailing belief that anesthesia should carry no risk since it is not a therapeutic intervention but rather a facilitator of surgery.[1] However, anesthetic techniques involve the use of potentially dangerous drugs and techniques. On the contrary, the management of these drugs and situations is the core skill in the practice of anesthesiology. With introduction of safety standards and enhanced training, anesthesia is widely regarded as a leader in patient safety.

Cooper et al. conducted a critical-incident analysis to study the occurrence of errors and mishaps in anesthesia.[2] They found that human error in drug administration, anesthesia machine use, airway management, use of equipment and monitoring device, was a factor in the occurrence of critical incidents in 70% of cases.

There have been many advances in anaesthetic safety in the recent years. One notable development is the attention given to cognitive and social skills, collectively known as Non-Technical Skills (NTS).[3] Anaesthetist's Non-Technical Skills (ANTS) developed by the researchers at the University of Aberdeen, is a comprehensive and reliable assessment tool to assess NTS in anaesthesiologists.[4] ANTS describes the primary observable non-technical skills associated with anesthetic practice.

The adoption of non-technical skills in anesthesia drew inspiration from their use in the aviation industry. In aviation, pilots and crew members undergo training and individual assessments of non-technical skills, known as Crew Resource Management (CRM), which promote flight safety. Similarly, in other high-risk work settings, for instance, nuclear power plants and military installations demonstrating competence in non-technical skills is a critical aspect of licensing and revalidation.[5] Operating rooms, like aviation and nuclear technology are complex and dynamic settings.

Anesthetic is practice is often described as "hours of boredom with moments of terror." It's these moments of terror that determine critical patient outcome and are the focus of much of the Crisis Resorce Management training. Critical events are fortunately, very rare in modern day practice. This makes the maintenance of the requisiste skills even more important.

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Anesthesia crisis resource management (ACRM) is an approach to managing critical events in the operating room or other medical settings where anesthesia is administered. It emphasises a team-based approach to identify and handle potential crises aiming to minimize patient harm and optimize outcomes.[6] Dr Gaba and his colleagues were the first ones to implement a curriculum in ACRM at Stanford University.[7]

ACRM focuses on several key principles, including:

1. Communication

Clear, closed loop communication is essential during critical events. ACRM emphasizes clear, concise, and timely communication among team members. Early 'Call for help" is the single most critical determinant of the patient outcome in a crisis. Moreover, communication failures extend beyond the mere faulty transfer of information.[8] They are an interplay of complex individual, relational, and systemic factors. This highlights the difficulty of achieving effective communication. Breakdowns in communication have led to incidents such as retained sponges, wrong-sided nerve blocks, mis-matched blood transfusions, and medication errors.

2. Leadership/Teamwork

Strong leadership is crucial during a crisis. The ACRM approach encourages team members to take an active leadership role, regardless of their position or rank. A leader's responsibilities include clearly articulating the patient's situation to create a shared mental model, assigning roles, and fostering team cohesion. The leader should solicit inputs from the team members and remain calm.[9] It is also important that the leader delegate the appropriate tasks to the team members to offload the cognitive burden. The leader usually remains 'hands-free' and to maintain situational awareness and engages in gathering and information

3. Situational Awareness

ACRM stresses the importance of situational awareness, which involves actively monitoring the environment and anticipating potential problems.[10] Anesthesiologists should be able to assimilate and synthesize complex information in a rapidly changing, high stress situations. Anesthetists (and physicians of all other specialties) establish situational awareness in part through information available from displays, direct observation, and communication with the team. ACRM recognizes the importance of knowledge and utilizing all available resources during a crisis, including personnel, equipment, and supplies and cognitive aids.

4. Dynamic Decision-making

During a crisis, quick and informed decision-making is critical. The ACRM approach encourages a shared decision-making process, where all team members contribute their knowledge and expertise.[11]

How to effectively foster these principles in the operating room teams:

While didactic lectures have traditionally been used for education, the acquisition and application of non-technical skills require a more immersive experience. Simulation techniques have proven to be effective tools for this purpose. Simulation-based training (SBT) is an excellent format for developing the knowledge, skills, and abilities (KSAs) necessary for highly reliable team interaction.

The ACRM curriculum involves creating a life-like operating room environment with a critical event scenario. The participants manage the scenario, followed by a debriefing by a skilled educator. At our institute, these sessions are organized as a part of the anesthesia residents' curriculum. Common scenarios practiced in recent years include transfusion reactions, stat cesarean section, undifferentiated shock, laryngospasm, and myocardial infarction.

Another effective approach is conducting in-situ interdisciplinary operating room simulations. This has been shown to enhance interprofessional teamwork, patient safety, and decrease adverse clinical incidents.[12] It also boosts operators' confidence. Regular inteprofessional team simulation sessions involving critical OR events are highly recommended. The simulated scenarios could include cardiac arrest, massive transfusion like sutuations. In-situ simulations also help in creating team cohisiveness.

The learning from the simulation sessions needs to be solidified by a debriefing immediately after the scenario. It helps understand the role of the teams and helps in coordination between them.

Debriefing after a simulation session is an act of facilitated reflection and is essential to solidify the learning from the scenario. It is not meant as a critique of the participants' performance rather a facilitated reflection to engage in continuous learning. Debriefing is a bidirectional, interactive, and reflective conversation between facilitator and participant.[13] The act of debriefing itself is more important than the specific technique utilized.

Much of the traditional training has focussed on knowledge acquisition and technical skills to enable the trainees to practice anesthesia independently. Despite the demonstrated advantages of the non-technical skills, these skills are not highly valued by many medical professionals. The trainees are imparted little to no training in these skills. With an increasing focus on reducing complications and the introduction of competency-based training, this attitude is fast changing. Education using simulation modeled on ACRM-type courses with debriefing has

become widespread among many anesthesia residency training programs. The competency in these skills is also tested as a simulated scenario in the exams. Similarly, the maintenance of certification for anesthesia program incorporates simulation based critical scenarios as an essential component.[14]

Ongoing training and education are required to prepare team members for potential crises and to improve overall patient safety. It is necessary to recognise that the non-technical skills should not be considered in isolation. Appropriate knowledge of both technical and non-technical skills is essential for obtaining the best patient outcomes. By implementing these principles, the ACRM approach can help anesthesia teams manage critical events more effectively, resulting in improved patient outcomes and overall safety.

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