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Commentary

Beyond the Numbers: Redefining Patient Monitoring in Anaesthesiology: An Indian Perspective

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As anesthesiologists, our motto is eternal vigilance, and therefore, 'monitoring' is the heart of our art. However, what is meant by monitoring? Simply put, it involves keeping an eye on the physiological parameters, observing how medications affect our bodies, and so forth. To recognize the physiological perturbations in order to take appropriate action and shield our patient from any harm that may befall.

It is time we acknowledge the profound yet fundamental change that has occurred in modern medicine over the past few decades. There is a need to adopt a more comprehensive, system-oriented perspective on patient safety and move past a strictly person-centered monitoring approach. In this context, we seek to reflect on and offer some insights pertaining to monitoring that was influenced by our experiences across diverse healthcare systems.

Redefining Clinical Monitoring

In keeping with this broader view, we would like to paraphrase and emphasize that "monitoring" also means continuously evaluating the socio-technical environment of the operating room in a holistic manner in order to accomplish patient safety in the best possible way [1]. A group of people are involved in the social structure in which we function. We must keep an eye on this group's coordination and communication, as well as their nonverbal cues. Well-rounded surgeons often engage in collaborative work, inquiring about the patient's vitals, such as the blood pressure. Likewise, anesthesiologists watch over the surgical field, the nursing staff, and the associated medical personnel. Furthermore, technology is an integral part of this. Hence, a helicopter view will prove worthwhile, aiding a macro-level visual.

This transcends physics and physiology. It calls for reading and comprehending the situation, understanding not only the resources available to us but also managing our own and others' stress. It encompasses skills of team management and the most crucial aspect of taking action appropriately based on timely observations and clinical urgency. In this context, non-technical skills (NTS) are central to effective monitoring and patient safety [2-3]. Radhakrishna et al. emphasize the importance of NTS in anesthesia education and note that up to 80% of all errors in medicine can be attributed to human errors and unawareness of NTS [4]. In fact, the National Medical Commission, envisioning that the Indian medical graduate be 'globally relevant,' has revised the curriculum, emphasizing the importance of not just sound knowledge and skills but also the budding doctors' attitude, values, and responsiveness [5].

So, how can we improvise and integrate this into our clinical practice? Let's take a closer look at the age-old but seldom used, structured method—the Airway, Breathing, Circulation, Disability, Exposure (ABCDE)

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approach. It is a go-to for emergencies. The framework encapsulates continuous monitoring and evaluation of both technical and clinical aspects. It guides us in troubleshooting problems and, ultimately, achieving patient stability. Therefore, the ABCDE approach proves to be a useful clinical support tool to effectively handle problems not only when in the deep end of clinical chaos but also in routine clinical settings to ensure patient safety.

Furthermore, it is incomplete to venture into monitoring and not share our few cents' worth on Accidental Awareness on General Anesthesia (AAGA). Although it may not be a major concern at the moment in the Indian scenario, it is certainly an issue globally. To provide an overview on this matter, the Royal College of Anaesthetists conducts national audit projects (NAP) on issues highly pertinent to anesthesiologists [6]. NAP5 focused on AAGA. The reported incidence is around 1:19000 cases. Not surprisingly, with the use of neuromuscular block (NMB), it is estimated around 1:8000, and without the use of NMB, it is quoted as 136000! [7] Patients report being unable to talk or move under general anesthesia—better described as ‘awake paralysis.’

How do we address this ‘unintended’ awareness during neuromuscular blockade? With the use of depth of anesthesia monitors and quantitative neuromuscular monitors. According to the findings of clinical trials of B-Aware, B-Unaware, and BAG-RECALL, non-electroencephalogram (EEG)-based protocols with alarms to alert the anesthetist to aim for end-tidal anesthetic gases at an age-adjusted Minimum alveolar concentration >0.7 is equivalent to bispectral index (BIS)-based protocols in terms of reducing the incidence of AAGA. Hence, the key aspect lies in ensuring adequate depth of anesthesia during and until recovery from neuromuscular blockade as assessed by quantitative neuromuscular monitoring [8-10].

This issue is expected to progressively gain more attention even in places where it is underreported with the growing use of the internet and social media and, subsequently, the patient population being more ‘aware’ of the anesthetic hazards.

But then again, there is always room for further improvement and streamlining with algorithms? Paradoxically, it is not a mathematical approach, as a clinician's expertise and factual knowledge are irreplaceable. However, evidence-based clinical protocols are helpful in trying times, and these cognitive aids guide us to manage crises effectively. As lifelong learners, we have a responsibility to retrain, reflect, and refine our skills. This means unlearning habits and relearning best practices within a safe, non-threatening environment such as a skill and simulation setup. Even a low-fidelity simulator may suffice. In-situ simulation with an inclusive interprofessional team, workplace-based assessments, and mock drills could help achieve these goals.

Walking down memory lane, early patient monitoring began in the 1920s, when we switched from using "rag and bottle" to purpose-built apparatus to deliver gas. There was some improvement in the 1950s. Digital displays, like the end-tidal carbon-dioxide monitor, were available by the 1970s. It's interesting to note that simulation training and human factors were first proposed in the 1980s. Standards for monitoring were established along with this. The 1990s brought with it the depth of anesthesia monitors. The 2000s saw a shift in emphasis toward electronic health records, formal documentation, and reporting systems [1].

Summary

So, what does the future hold for us? It is beyond doubt that swift technological advancement has been the totem of our esteemed specialty. But, let’s hit pause on artificial intelligence for a moment and reflect on the basics. The value of an experienced clinician’s ‘hand on the pulse’ when in doubt cannot be overstated. Furthermore, the Association of Anaesthetists of Great Britain and Ireland (AAGBI) recommendations for minimum required monitoring are in keeping with the UK's National Health Service, which is uniform across the country [11]. Likewise, our Indian Society of Anaesthesiology (ISA) also has standardized guidelines on this topic that are highly applicable, yet stark differences in clinical practice and healthcare facilities remain in our nation. Modern health care places undue demand on anesthetists, and the ‘can-do’ culture leads to venturesome behavior. This necessitates a system akin to that used in the military and in aviation, where a "minimum equipment list" is used, and any piece that is absent is deemed "no-go" [12]. We must inculcate this mindset to ensure that patient safety is never jeopardized. We leave you with the thought that while ‘old is gold’ is imperative to our practice, we must reinforce our concepts through a socio-technical lens and balance time-honored clinical wisdom with contemporary safety frameworks to progress towards a more resilient and reflective approach to anesthesia care.

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