



Protective Ventilation in the OR

# A distracting thought on the difficulties of deploying protective ventilation

It is indisputable that general anesthesia is a safe medical intervention, as process control is quite advanced. But the complexity of procedures is steadily increasing. Here's a different approach regarding what could hinder implementation of protective ventilation in the operating room.

The current discussion on lung protective ventilation in the OR stresses the importance of this topic and the question may be raised on how implementation into daily clinical routine can be achieved. Looking at other procedures, such as the active warming of patients in the OR, the evidence is clear and even guidelines demand respective measures. But deployment into daily clinical routine appears to be hampered for various reasons. We eagerly await the results of an international, prospective, observational, multicenter cohort study intending to research the current mechanical ventilation practices during general anesthesia to get solid insights into the degree of protective ventilation deployment in the OR<sup>8</sup>. However, clinicians may need to consider a growing number of guidelines and standardized procedures in their daily clinical routine to fulfill the so-called standard of care in the future. That specifically applies to the fairly complex topic of ventilation in the OR.

### Complexity

The workplace of anesthesiologists in the OR is very complex and overloaded with information and multitasking necessities. The number of tasks anesthesiologists have to perform daily has increased substantially over the past decades, and they are required to continuously multitask under difficult conditions. In an article by Thomas M. Hemmerling, he referred to the anesthesiologist as the pilot in the physiological biosphere of modern acute care medicine<sup>7</sup>.

When combining the above with the concepts of distraction and mental workload that anesthesiologists are exposed to, the potential negative impact on patient care is imaginable.

### Distraction

Distractions are cited as contributory to healthcare-associated errors in a large portion of incidents, including or involving the anesthesiologist<sup>1</sup>. The safe administration of anesthesia requires vigilance, time-sharing among multiple tasks and the ability to rapidly make decisions and take actions<sup>6</sup>. It is well recognized in other industries, such as aviation, that distraction increases the risk of error. Within anesthesia, distraction has been implicated in the development of critical incidences<sup>2</sup>. Another aspect has the potential to make the entire mixture quite delicate.

Looking through the literature, distraction of the anesthesiologist has already been researched. One observational study has found that on average, 34 distracting events were observed in cases with a mean duration of 103 minutes. Sources of distraction included other anesthesiologists, the circulating nurse, visitors and the surgeon. But events with the highest level of distraction requiring immediate attention originated from OR equipment (alarms, noises) and other anesthesiologists. The spread of distractions across the phases of anesthesia was equal. Another study found that one distraction event happened every 4 minutes and 23 seconds, most frequently during emergence, with one event every 2 minutes<sup>2</sup>. In the first study mentioned above, approximately 8 distracting events per case were judged to be detrimental to current patient care<sup>1</sup>. The second study judged that 22% of all observed distracting events had a negative effect<sup>2</sup>.

Distracting events during key anesthetic interventions were observed relatively frequently, with about 2 events per case. The role of general background noise in the OR is controversial. General background theater noise has been associated with deterioration in mental efficiency and short-term memory. But looking into the nature of different tasks, noise does not always have a negative effect. Low demand tasks may be performed better with increasing levels of external stimulation (conversations, noise and music) up to a certain point, but higher demand tasks may suffer with the same degree of external stimulation<sup>1</sup>.

*Tip: For further technical background information, see our "technology insights" [e-book](#).*

### Our perspective and more

The administration of a general anesthesia, including protective ventilation, needs to be considered from our perspective as a high demand task that requires vigilance and close monitoring of all parameters that can be compromised by distractions, as described above. Reported incidences may underline this thought. In one German case, an anesthesiologist forgot to switch on the anesthesia device while the patient was intubated. The reported reasons were distraction and ambient noise level in the OR<sup>3</sup>. In another case, the anesthesiologist forgot to re-start the ventilation after deliberately suspending ventilation during cardiac surgery. Among the reasons reported: many distractions<sup>4</sup>.

The abovementioned events can surely not only be attributed to the anesthesiologist's inattention or other inadequate behavior. But they may be a result of the abovementioned contributing factors: Complex work environment meets information overload meets constant multitasking meets frequent distraction. Another factor that has been studied, but apparently has not yet been clearly proven to be a factor contributing to human error in anesthesiology, is the mental workload<sup>5</sup>. But methods to measure mental workload have been researched and further research is desired<sup>5</sup>. However, all this

calls for the medical device industry to come up with devices that reduce information overload, are being used intuitively and assist with tasks that can be carried out following evidence based rule sets. Maybe assistance systems that take over those tasks, while leaving the anesthesiologist in the driver's seat, easing compliance with the standard of care, freeing up the anesthesiologist's cognitive resources and reducing the potential negative effects of distractions in the OR may help reduce errors and gain importance.

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### REFERENCE:

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