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EDITORIAL

The "IKEA-effect" and modern anesthesia machines

Once upon a time in the good old days… at the end of the last century to be precise, anesthesiologists had to check the anesthesia machines themselves, every morning, before starting a busy list. When the circuit parts returned from sterilization, the puzzle re-started—our anesthesia machine needed to be gotten ready for use again. Some of the older machines required full dis-assemblance, sterilization, and then, we had to reassemble every tube, pipe, valve, bag, and bottle of the machine again. After this daily task, we were happy and proud if the check procedures while starting the machine worked without any complaint. In those days, we knew our machines well. We almost had a kind of personal connection to and appreciation of the mechanics. In our perception, even our anesthesia performance got better as a result of this deep connection to and knowledge about our machines, troubleshooting was easy—we knew how to fix nearly every part.

Part of this perception might have been attributable to a phenomenon that has been described as the "IKEA-effect" by scientists in the area of consumer psychology.[1] If people have assembled a box by themselves, they estimate the value of the box as higher and would even pay a higher price for it, than if the very same box was presented ready to use without any of their own effort needed. Additionally, it has been described, and this makes those mechanisms even more valuable, that even performance might increase by self-assembling a device before its usage. For instance, participants in a trial thought they were participating in a market research study supposedly about a new golf putter. Fewer attempts were required to land a golf ball into the hole while using a self-assembled golf putter than while using the very same object presented readily assembled.[2] In conclusion, the "IKEA-effect" means that the appreciation of an object and the experience while using it increases when effort, exertion, or cost have been invested by the person using it.

Over time as anesthesia machines morphed into anesthesia workstations, the change in terminology was paralleled by a change in the complexity of modern anesthesia machines/workstations. The performance of our workstations while in use is undoubtedly higher compared with a golf putter. Additionally, the required knowledge of the technical details of monitoring and ventilation in connection with anesthesia workstations exceed by far the demands for understanding a simple golf putter.

Similarly, a few decades ago, persons of average talent could fix some parts of their motorcycles and/or cars themselves but today this is almost impossible, even changing a simple light bulb in our vehicles requires specialized knowledge and toolkits. Our monitoring and ventilation workstations became too complex to be easily understood or fully dis- and reassembled by the average end-user. The understanding of our equipment is nevertheless as crucial as ever, most probably even more important the more complex our workstations become. While our newer workstations are a huge step forward in terms of safety and improved care, Ingvar Kamprad, the founder of IKEA, already noticed: "The most dangerous poison is the feeling of achievement. The antidote is to every evening think what can be done better tomorrow." Do we really know our novel anesthesia workstations? We "know" what they chose to show us, but we should not judge the state of our patient solely by what we see on the monitors, there is more to the real patient than numbers on a screen. As Albert Einstein put it "Any fool can know. The point is to understand." While we do not know what we do not know, let's learn more and open the black box—by appreciating the review articles on ventilation and monitoring in this special issue focusing on lung and ventilation. The complexity of routine workstations is highlighted by two excellent review articles by Spaeth et al which virtually disassemble the hardware and the underlying algorithms of modern monitoring[3] and ventilation.[4] By reading their detailed analysis, readers will be enabled to virtually reassemble their equipment with deeper understanding and gain an increased ability to interpret the measured values, as well as a greater appreciation of the required ventilator settings.

If you were to take away one message we suggest: anesthesia monitoring is not as simple as "what you see is what you get". Solely reading the derived values will not always provide the full picture of the underlying situation or condition. "It's not what you look at that matters, it's what you see" (Henry David Thoreau, American naturalist, poet and philosopher, 1817–1862). In some cases, limitations due to time delay, data processing or interpolation must be considered. But while we cannot always get the information we want, if we try, we will mostly find that we will get what we need to safely look after our patients.

When focusing on our ventilator settings, while air flows between the machine and the patient, numerous factors are influencing what may or may not eventually reach the lungs. Therefore, despite the ever more sophisticated equipment, we should not forget and not unlearn the importance of observing our patients. Clinical observation, what we can see, hear and feel, particularly in the very young or during airway interventions, will us allow to draw conclusions and detect if they are well or not. In fact, these observations may sometimes be of greater use in our clinical practice than watching the values on our screens. Especially in tiny patients, the observance of the lung's motions is the aim of our efforts and must be considered above the settings we have chosen or even the values we measure.

Another review by Karlsson et al, lets even more sunshine into our black box.[5] It offers us an insight into a possible future of

"getting even more than what you see". The interpretation of capnometry and capnography already offers us incredibly valuable information about our patient's clinical conditions. Imagine it giving us even more information not just on A and B but also C? A milestone would be reached if dynamic capnography could add valuable information to our routine anesthesia care on the cardiac output of our patients—a dream for many but one that may soon become reality. Jacob Karlsson et al.[5] provide an enlightening article about the underlying principles, the limitations and the opportunities that might be part of the future in anesthesia and intensive care medicine. Let's live in hope that this feature improves even further and soon becomes available as an additional monitor.

"Nothing lasts forever but the certainty of change" (Bruce Dickinson). As a specialty, we have to keep moving forward, we have to grow and develop, we should use what we find as a stepping-stone to achieve our biggest goal—to increase the safety for all our young patients we care for.

Clinical observations and sometimes intuition combined with experience will always contribute to good performance, we know that experience reduces the risk for adverse events.[6] However, the increasing complexity of our equipment should not prevent us from "disassembling and reassembling" our anesthesia workstations. It might require less of a physical toolbox but more of a virtual one. This virtual toolbox will allow us to gain something comparable to the "IKEA-effect" since the experience and performance while using our workstations will increase when effort, exertion, or cost have been invested.

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