

Electronic anesthesia protocol increases treatment quality and efficiency

Digitization in everyday hospital life

For some it is a sword of Damocles, for others the directive for better health care: digitization. It does not stop at the health sector either. With the implementation of an electronic anesthesia record, the Hamburg hospital Tabea shows that digital solutions can increase work efficiency and quality.

Documentation of all anesthesiological services is not only legally obligatory, but also a core medical activity: from blood pressure, medication and ECG load data to ventilation parameters and heart rate, a wide variety of values must be recorded.

Monitoring and diagnostic instruments as well as ventilators provide detailed data records, but these remain in the respective system. Communication between the devices and transfer of the data to a clear master is virtually non-existent.

"The workplace of the anesthetist in the hospital is de facto characterized by the coordination of different instruments and the permanent monitoring of the patient - especially in the surgery room. At the same time, he must document all information about the patient for diagnostic precision so that, for example, an exact data basis for further therapy adjustment is available after the surgery. This is usually done by hand on paper due to the non-convergent instruments," reports Dr. Jan-Henrich Stork, chief anesthesiologist at the Tabea Hospital in Hamburg.

The conflict becomes visible above all in complex surgeries and especially in emergency situations in which the anesthetist cannot devote himself to documentation for a longer period of time. In most cases, the vital and respiratory parameters are recorded much later and partly from memory.

Already at the first contact with the patient, the premedication consultation, the anesthetist must combine existing diagnoses and medications, existing vital data, preliminary examinations, allergies and a lot of other information in order to be able to assess the individual risk factors of the patient, plan the surgical procedure and determine the anesthesia procedure.

These data are supplemented by further examinations requested after the initial consultation.

The usual documentation process via the HIS sometimes contains system breaks and transfer work by the staff. "During the entire course of a patient's stay in hospital, there is a large flow of information. It helps to understand how much work capacity the anesthesiological documentation alone ties up - and thus causes costs - by making it clear that 90% of this work is done by doctors and nursing staff in German clinics," explains Jörg Wegner, Managing Director of app@work. "In times when economic efficiency is being discussed and at the same time a better patient care at hospitals is required, digitally supported solutions must be found, especially for such cost centers. Sandman.MD is one of them."

The digital mobile solution documents the entire anesthesia treatment process at all times. It was developed by the Berlin company app@work around the anesthesiologist Dr. Stephan-Matthias Reyle-Hahn, chief physician of the Clinic for Anesthesia and Interdisciplinary Intensive Care Medicine at the Waldkrankenhaus Berlin-Spandau.

From notes and paper to iPad

For more efficient and reliable documentation, Tabea Hospital has digitized the complete anesthesia protocol using Sandman.MD. "For us anesthesiologists, the software provides the standardization and partial automation of our documentation activities. It does not release us from this, but provides us with a uniform and comprehensive system in which we can access all relevant data quickly, mobilely and easily at any time," says Dr. Jan-Henrich Stork, explaining the practical benefits of the system. "Thanks to Sandman.MD, we anesthesiologists save around ten percent of the time that would normally have gone into the protocol. Instead, we can use the time and the better data basis to treat patients."

More than 200 anesthesiological steps, measures and activities, 200 predefined anamnesis questions including 500 possible answers as well as 250 medications are integrated in the app and help to simplify standard procedures. Moreover, in addition to manually entered data, photos, for example of patients, medical letters brought along by the patient, blood transfusion labels or specific treatment situations during the operation can also be stored in the digital patient file of the software. In addition, the system is open for individual extensions, says Jörg Wegner: "The clinics can define individual information modules which, just like the standard ones, can be linked via plausibility rules. For the future, we plan to offer additional modules specifically for mobile workspaces."

The software is operated via iPads. As with conventional apps on mobile devices, it is easy to install. "This makes the iPad the central tool and companion of the anesthetist. From here he has access to all anesthesiological treatment data of a patient at any time, even to old cases," explains Jörg Wegner.

Tabea Hospital purchased a total of 18 iPads in the course of setting up the system. Each anesthetist has their own device that they can adapt to their personal requirements. The app communicates via WLAN via the clinic's internal Sandman.MD anesthesia server SAS.MD, which is connected to the clinical information system. It is based on a virtual architecture, is therefore largely system-independent and can also be integrated as a cloud solution. The data flow between the individual devices, such as patient monitors or ventilators in the surgery room, and the Sandman.MD system can be implemented either via the hospital LAN/WLAN or independently of the hospital network using adapters. A Bluetooth or WLAN connection to the iPad can be established with an appropriate connection that is plugged into the serial interface of the device in order to transfer the measured values online to the iPad.

The app supports devices from most major international manufacturers for patient monitors and ventilators. Further connections, especially of perfusors, are planned, according to Wegner.

The system becomes a personal, individual workplace by configuring the data selection, the representation in the system and the logging frequency of the connected devices according to preferences. One example is the design of vital data symbols in the surgery room or the insertion of pre- and postmedications.

Dr. Stork and his 30-member team at Tabea Hospital have been working with the new software since January 2018.

"The installation of the SAS.MD server and the connection to the HIS took one week in the Hamburg clinic. The individual devices, for example in the surgery room, could each be connected in less than half an hour and the connection to the app was established," reports Wegner.

Dr. Stork's team was then trained and coached by the app@work staff during the first days of surgery and premedication.

"Together with Jörg Wegner and his staff, we familiarized ourselves step by step with the software. The operation of the app is intuitive and was almost self-explanatory for us," says Dr. Stork. "Together, we went through the entire process from patient admission to discharge, simulated surgical situations and tried out several configurations so that everyone in the hospital could set up the iPad personally. It took a few weeks for this new solution to become part of everyday life, but at no time we experienced a failure or serious error in the documentation."

Jörg Wegner adds: "Tabea Hospital is an excellent example of the successful integration of the app into everyday hospital life. Usually we need four to six weeks until all clinical-specific professional and technical requirements have been coordinated and optimally set up with the specialists from anesthesia and IT. During this time, we work closely with the clinics and repeatedly set up accompanying phases by our employees, who support the clinic staff on site.

Increasing treatment quality and better data basis

Tabea Hospital is the second hospital in Germany, after the University Hospital Frankfurt am Main, to work with this future-oriented tool. Today Sandman.MD is firmly anchored in the everyday life of the Artemed specialist clinic in Hamburg-Blankenese. Upon admission, each patient receives an individual barcode on his or her documents. From the surgery room to the recovery room to the discharge, the staff can scan the barcode to upload the patient data with the case number from the anesthesia server to the iPad and thus have access to all available anesthesiological data.

IT systems

For example, Dr. Stork can access premedication data from old cases and compare it with the current case. In this way, treatments can be merged, even with different case numbers. In the anamnesis, he has added his own questions and presettings to the system-integrated questionnaire. "We have adapted the entire premedication process specifically to our circumstances and requirements," he says.

In addition to the simplifications that the app brings to anesthetists and nursing staff, it also has other advantages: on the one hand, it improves the quality of documentation and, on the other hand, the data helps to optimize personnel and resource planning.

Dr. Benjamin Behar, Managing Director of the Artemed Clinic Group: "Such a modern solution is another step towards the hospital of the future. We believe in a symbiosis of technology and medicine for more efficient work processes. By reducing the administrative effort, both doctors and nurses have more time available to work directly on and with the patient. Digitalization is therefore not only a factor that can increase profitability, but also helps us to give patients even more attention."

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