

DOWNTIME SITUATIONS AND AUTOVALIDATION OF CACHED DEVICE DATA IN AN MODERN ELECTRONIC ANESTHESIA RECORD

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At the University of Iowa Hospitals, we use Epic as our hospital information system. On November 8, 2010, we brought up the intraoperative module that allowed us to dispense with the paper record for the majority of our anesthetizing locations. A primary consideration in data integrity was what to do when the flow of data from the patient monitor and the anesthesia machine was interrupted. Our data flow starts with the RS-232 stream from the monitor and machine and is converted to TCP-IP by a Capsule Neuron[®] that then sends the data over our Ethernet backbone to the Capsule server. This server translates the data to HL-7 and sends it to Epic via a Cloverleaf[®] server. The Neuron and the Capsule and Cloverleaf servers are capable of caching data indefinitely if there is a failure further down the data stream.

Perioperative data collection needs to be quick, efficient and reliable with minimal impact on the provider's clinical work. Hence, data from devices and monitors flows directly into the record without the provider having to manually validate each data set, a process known as Autovalidation of Data. In downtime situations, as long as data flows into Neuron or further, when connectivity is restored, the cached data flows automatically into the record and populates the appropriate cells with the correct data for the duration of the downtime. The feature is very useful but has drawbacks. During downtime, if there is a change of patient in the OR, autovalidation could result in wrong data going into the wrong patient. In the situation where Epic itself was down, the provider would be unable to stop data collection for the first patient who no longer is in the OR. When connectivity is restored, all the cached data from the devices so far will flow into the record of the first patient. This problem, data going into the wrong patient's record, was identified during downtime testing of each step in data flow in our simulation laboratory.

This prompted us and Epic to develop a fix that would stop autovalidation after a defined period of downtime. In deciding the duration of this period, we wanted to make sure it was not too short, so that, for every brief downtime either planned or unplanned, autovalidation would not be stopped. Similarly if it were too long, there would be a possibility of a turnover happening during downtime and a new patient coming to the OR with wrong data into the previous patient's record. Therefore, based on all these factors and historical turnover time of our ambulatory surgery operating rooms, we elected to set the duration of stop autovalidation at 10 minutes. For longer periods of downtime, we can do a manual validation of the data if the same patient is in the operating room.

This is an important consideration for all institutions planning to implement electronic anesthesia records with modern devices, which have the ability to cache device data and autovalidate.