The limitations of manually entered data in acute care environments

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To the Editor,

Avidan *et al.* have found variable accuracy in manually entered drug administration data, including prospective observation of drug omissions, drug entries in the perioperative information management systems (PIMS) where drug administration was not observed, and discrepancies in timing.¹ These findings are concerning given that the cornerstone of PIMS functionality is the creation of an accurate and timely intraoperative record.²

In their discussion, Avidan *et al.* note that most of the drug omissions represented administration of small doses of hypnotic agents or vasoactive drugs. The authors hypothesize that “the occurrence of these omissions during maintenance may suggest that they were not related to the anesthesiologist’s activity level but rather to the drug doses being perceived as non-significant or, alternatively, as self-incriminating.”¹

These findings are consistent with data we published in 2011 arising from a comparison of paper ($n = 500$) vs electronic anesthesia records ($n = 161,210$) and an evaluation of gaps in the measurement of intraoperative vital signs.³ Although 5.4% of the electronic records we evaluated from three different hospitals documented at least one ten-minute gap in blood pressure measurement during an anesthetic case, a manual review of 500 paper anesthesia records in our study did not reveal a single case (99% upper confidence limit for blood pressure gaps of 0.83%). At the time, we hypothesized that the absence of gaps in vital signs in the paper anesthesia records reflected

“interpolation” of missing values by the anesthesia provider.

“Smoothing” vital signs during the recording of manual anesthesia records is a well-described problem,⁴ and there is no question in our minds that electronically captured data are superior in quality compared with manually entered data. Nevertheless, these discrepancies raise the issue of how credible electronic records may be when they contain manually entered drug administration or vital signs data.⁵

This work by Avidan *et al.* is another reminder of the limitations of manually recorded data in acute care environments. There are emerging solutions to these shortcomings, including wireless pumps that transmit drug infusion rates directly into an electronic record and systems to record drug administration automatically.⁶ While it is unlikely that human performance will ever match that of automated systems, we must ask ourselves this question: Is the current level of accuracy adequate? If the answer is no, we must commit ourselves to developing and implementing said solutions.

Conflicts of interest None declared.

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