

Peering over the Ether Screen

The Electronic Medical Record: Garbage In, Garbage Out

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My first patient of the day was a congenial man in his 50s with a history of prostate cancer and radical prostatectomy, scheduled for replacement of a defective penile prosthesis. The history and physical in his chart was a pleasure to read because it was printed and legible, as opposed to the handwritten scrawls we often encounter. Imagine my surprise, however, at reaching the section about this patient's previous surgical history, and finding that he was supposed to have had none. I looked twice to make sure I was reading it correctly. No prior surgery. Impossible, of course—he had had both prostate surgery and the initial penile prosthesis placement. Then I realized the obvious truth: We were sabotaged once again by the fatal ease of data entry error in a computerized record.

Right now I'm not talking about computerized anesthesia records—I have a few things to say about that later, but for the moment I'm referring to the computerized documents that are starting to appear in my hospital's charts. Early problems surfaced with the "Medication Reconciliation" form. It's good to know what medications your patients are taking, and when they were taken last. Unfortunately, our nurses in preop holding, on the wards, in the emergency department, and everywhere else, are deluged with paperwork and computer documentation requirements. They can't be faulted for the occasional typographic error, and there's no proofreading process. Yet, if the patient took his beta-blocker this morning, but the nurse types in yesterday's date by mistake, we will wrongly be "dinged" as noncompliant for perioperative beta-blocker administration.

Worse still is the potential propagation of errors in the patient's medication list. The other day we had two patients in preop with the same, quite common, first and last names. Looking over the computer printout of my patient's medications and seeing Keppra listed, I asked him if he was doing well on Keppra and how long it had been since he had a seizure. He looked puzzled. He didn't take Keppra, he said, and to his knowledge had never had a seizure. We quickly figured out that the nurse had merged his med list with that of the other "John Smith." That was the easy part. The hard part was fixing the mistake. It turns out that once the nurse "closes out" and prints the record, apparently it takes an act of God to undo it. In the meantime, Keppra remains on the med list.

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I think we can all agree that we expect more of some H & Ps than we do of others. If the gynecologist or the orthopedist has done the H & P, especially if it's a "short form" for outpatient surgery, I don't pay a lot of attention to the documentation of heart sounds. I'm a bit surprised if the existence of the heart is acknowledged at all. But when a consulting internist performs the preop H & P, especially if the patient is sick, we have every reason to hope for better. Sadly, we may be disappointed.

With handwritten H & Ps, if parts of the exam were omitted, they would be left blank or "deferred." Now, what we're seeing is a lot of documentation that may or may not be true. Recently I've seen a normal cardiac auscultation documented in the case of a patient who actually had a loud, harsh, aortic stenosis murmur. If I can hear it, I assure you it wasn't subtle. The other night on call, I was evaluating a patient for a cadaver kidney transplant and was surprised to palpate a firm 3-cm. mass in the right side of her neck. The primary physician and renal consultant both recorded the neck exam as "supple, no masses or adenopathy." The surgeon had no choice but to cancel the transplant and send the kidney to another recipient. The neck mass needed proper diagnostic workup to rule out malignancy.

Such examples underscore the fact that the mere presence of legible documentation doesn't make it thorough or accurate. On a computer, it's perilously quick and easy to check off a list of negatives, especially if they're all mandatory fields. This has led me to develop the following guidelines for critical reading of the H & P:

1. If a positive history or physical finding is described, it's probably true.
2. If a negative history or normal finding is documented, one of the following is true:
 - a. The question was never asked or the exam never done.
 - b. It was done in a hurry.
 - c. It was done by someone in training who gets most clinical information from Wikipedia.
 - d. It was done properly and is really negative.
3. A long list of negatives should be viewed with suspicion unless the patient is an athlete under the age of 30.

At the ASA annual meeting in October, I looked at the newest generations of automated anesthesia record-keeping systems. There's no doubt in my mind that handwritten anesthesia records should go the way of the quill pen. I don't want to chart vital signs when there are perfectly good machines to do it for me, more accurately. However, we will have to guard against the tendency to

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document trivia *ad infinitum* just because it's easy to do. On some systems, you can add a dozen comments just about inserting an arterial line—sterile technique, local anesthesia, guide wire, Allen's test, etc. The more of these you check off, the more thorough you would appear to be. But is this information of any use, and will anyone actually believe any of it if your patient has a complication with the arterial line?

How much of a computerized anesthesia record will be trusted? Suppose that a patient's oxygen saturation deteriorates. Depending on the system's configuration, it may record the mean saturation over a given period of time, it may drop the highest and lowest values, or it may simply record the last value within the time period. None of these may represent the true critical value, which then makes the whole record suspect. If you are relying on your record to reflect your management of a critical event, it's best to know what the end product will look like and how it may represent the data to a third-party reviewer.

Back to my patient with the penile prosthesis: Once I had determined that everything in his H & P was going to require independent verification before it could be relied upon, I took a longer look at the internist's recommendations for perioperative care. I include them verbatim:

Pt is at low risk for surgery. Please avoid shifts in Blood Pressure and Volume. As is true with all surgery the anesthesiologist should mind the blood pressure as this will reduce any unknown cardiac risk the patient may have. A profound anemia would add further risk, which this patient has no evidence of. Should heavier than expected bleeding occur, please keep Hct over 30 for further cardiac risk reduction.

Although I don't know for sure, I would bet money that this internist had a check-off list on his computer with someone's idea of appropriate advice for the anesthesiologist. How would I ever have managed the case without it? Is this really the quality of information we can expect from a completely paperless system? Computers, after all, don't generate content; they only store it and make it available for retrieval. At the end of the day, if you put garbage in, you'll get garbage out, and any time we thought we saved will be spent sorting through the trash.