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When nurses make “optional” notes in a patient’s records, this may indicate that the patient is in danger of deterioration or even death.

How extra nursing notes point to deterioration

In this article...
- Definition of “optional” nursing entries in health records
- Associations between optional entries and patient deaths
- Using such notes to help identify risk of deterioration

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Optional nursing documentation in electronic health records may serve as a marker of a nurse’s concern and could be predictive of a patient’s risk of a poor outcome. A US study has found a statistically significant association between nurses recording more optional comments and vital signs, and patient death and cardiac arrest. Nurses should be aware of increased documentation as a possible predictor of patient deterioration.

Patterns of “optional” nursing documentation in electronic health records (EHRs) may serve as a marker of a nurse’s concern and could be predictive of a patient’s risk for poor outcomes.

Our study, first published in the American Journal of Critical Care (Collins et al, 2013), has shown that nurses recording documentation in the EHR beyond what is required and with increased frequency is associated with inpatient mortality and cardiac arrest. In other words, a nurse who enters vital signs for a patient every hour, when the required minimum frequency is every four hours, probably has a reason for doing this extra work, which may be concern about the patient’s worsening condition.

Nurses also make comments in records to “tell the story” of a patient’s condition. Comments are brief items that typically highlight abnormal data such as vital signs, indicating what was done for the patient, how the patient responded, that the physician was notified and the plan for continued surveillance. The presence of increased comments is also associated with poor outcomes.

Studying optional entries
Compliance with nursing documentation requirements accounts for a great deal of nurses’ time and is often said to take time away from providing hands-on care. However, nurses document optional information into the record in some situations. Intrigued by this phenomenon, we investigated whether optional documentation was associated with clinical patient states. I hypothesised, based on my experience as a critical care nurse, that optional documentation was a marker of a nurse’s concern about a patient, and the increased surveillance and of the care that resulted from this concern.

In the US, EHRs use “flowsheets” to give a tabular summary of data including vital signs and treatments given. Flowsheets are typically organised in a tabular view with rows labelled on the y axis for types of data (such as vital signs and interventions) and columns on the x axis labelled at the top of the table that indicate time.

We analysed flowsheet documentation within the first 48 hours of admission for 15,000 randomly selected acute care patients, who were admitted to hospital between September 2008 and December 2009, but had not experienced a cardiac arrest while in the hospital and were not admitted directly to the intensive care unit. This data was compared with flowsheet information for 145 acute care patients experiencing a cardiac arrest during the...
same 16-month period. Documentation from the 48 hours before their arrest was analysed for the cardiac arrest patients.

Data mining methods were used to analyse the flowsheet data for “optional documentation”; this was defined as documenting vital signs with greater frequency than required, and documenting free text comments. The investigators controlled for acuity using the Age-Adjusted Charlson’s Co-Morbidity Index (Charlson et al, 1987).

We believe this to be the first study to analyse nurses’ documentation patterns in records and to tie those patterns to patient mortality and outcomes. We found that:

- Patients who died in hospital had on average 1.5 more optional comments during a 48-hour period than those who survived until discharge;
- More vital signs were documented for patients who died in hospital than for those who survived until discharge (on average 23 versus 15 sets of vital signs during a 48-hour period per patient);
- Of the patients who had a cardiac arrest, those with more comments and vital sign documentation were more likely to die.

All reported results were statistically significant. These findings may reflect the nurse’s level of concern and the clinical accuracy of that concern.

Detecting subtle changes

Statistical methods were used to detect associations between optional documentation and the outcomes of cardiac arrest and mortality in hospital. The findings do not demonstrate causation and have not been controlled for other confounding factors. However, they do indicate some aspects of a nurse’s “gestalt”, or clinical judgement and wisdom, may be detected from analysing EHR flowsheet documentation.

This gestalt may be nurses’ detection of subtle changes in their patients’ conditions because of their consistent direct contact with patients. Past research indicates that detection of subtle changes in a patient’s condition is used by nurses more than any other health professional as the criterion to initiate a rapid response.

Rapid response systems have been implemented at many hospitals as formal processes to encourage any clinician, care-giver or patient to call a responding team to promptly address a patient’s condition. Defining specific criteria for early recognition of patients at risk of deterioration or cardiac arrest while in hospital would increase patient safety and save lives, but has proven to be a challenge. This study points to an opportunity to use nursing assessment data to better define and validate that criterion. In future, researchers could validate that a nurse’s documented concern is associated with a patient’s risk of cardiac arrest, in-hospital mortality, and other complications. That validation could translate into evidence-based guidelines for team communication and preventive measures based on documented nursing judgement long before a rapid response is required.

The results were consistent with the investigator’s hypothesis that flowsheet data contains patterns of optional documentation by nurses that may reflect their concern, and that analysis of the documentation patterns of flowsheet data could predict mortality. These results confirm the high value and great deal of contextual information and knowledge that nurses provide in flowsheet documentation.

An often-cited weakness and shortcoming of nursing documentation is the difficulty in finding important information because of the sheer amount of routine information recorded. More studies like this one could provide evidence on how to better design the display of flowsheet data to support nurses’ and physicians’ decision making and communication.

Contrasts between ICU and acute care

In a previous study, we looked at the differences in optional flowsheet documentation between the ICU and acute care floors (Collins et al, 2011). Here, we found that more optional documentation for acute care patients was associated with a greater likelihood of dying before discharge, but more optional documentation for ICU patients was associated with greater likelihood of survival.

One possible explanation is that there is a difference in the communication process and clinical care team response time to nurses’ concerns between the ICU and acute care settings. Perhaps, when an ICU nurse is concerned about a patient, other members of the care team are readily available to discuss these concerns, and the team is well positioned to quickly intervene and mitigate possible developing complications. In acute care, the nurse often needs to contact a physician who is in a different place. The response is arguably less efficient on an acute care floor than in the ICU, and the findings may have detected delays in care. Our 2013 study was intended to evaluate whether the association held true in a larger sample of acute care patients (Collins et al, 2013).

Predictive ability of risk scores

Nurses do not document randomly, and this study shows that their documentation has a pattern that reflects their clinical judgement. In this case, we believe the nurses used clinical judgement to decide to increase surveillance and monitoring for patients seen to be at risk of deterioration, and could be useful in predicting cardiac arrest and death. Many risk scores used are not good enough to predict patient outcomes. Perhaps accounting for the knowledge in a nurse’s assessment beyond the raw physiological data could increase their predictive ability. The application of electronic nursing documentation has promising results. Nurses’ knowledge of how and why they document the way they do is the key to accurately interpreting EHR nursing data and its implications. Nurses should lead and be involved as key stakeholders in this type of research. Documentation policies and workflows, and EHR system workarounds are all critical factors that influence the data entered into an EHR system – and nurses using the system understand these factors better than most.

These factors are critical to consider when analysing EHR data. I would encourage nurses to collaborate with researchers, informaticians, and statisticians to start investigations, based on their clinical hunches and knowledge of factors that influence their documentation behaviour. Until further research is done on this topic, nurses’ awareness of their documentation patterns and their level of concern may help enhance their quick recognition of a patient’s decline, and increase interventions or communication to intervene before cardiac arrest occurs. NT


References

