NCPD 2.5 ANCC CONTACT HOURS

Interdisciplinary Optimization of Admission Documentation

Reducing the Bloat

John McIlreevy, RCP, Tina L. Rylee, BA, Tiffany Shields-Tettamanti, BSN, RN, Perry M. Gee, PhD, RN

Moving toward the electronic health record increases the quality of information gathered. However, nurses argue that the electronic health record is an added burden. The aim of this study was to evaluate the removal of duplicative or unnecessary fields and reordering fields on the admission form to increase documentation that is meaningful to the patient story. A team of approximately 60 interdisciplinary clinicians engaged in document review to evaluate the importance of each field and removal or modification based on those findings. After a review of the 251 fields, the authors reduced the form to 124 fields, and the percentage of unfields by 31%. After outlier removal, the average time to complete the admission form decreased by 2.88 minutes. The new form showed a reduction of 36.71% of the use of the free text advance directive. Additionally, nurses' perceptions of the form significantly improved from pretest to posttest in terms of satisfaction with the form, time to complete, usability and usefulness, question flow, and length of the form. This study shows that an interdisciplinary team can effectively work together to optimize the Adult Admission History Form, increasing the quality of documentation while reducing the time to complete.

KEY WORDS: Admission documentation requirements, Adult Admission History Form, EHR admission optimization, Note bloat, Streamlining admission

In 2009, the Health Information Technology for Economic and Clinical Health Act went into effect, which sought to encourage the shift toward the use of electronic health records (EHRs). Research indicates that moving to an EHR has decreased the cost of care while allowing nurses to provide better care,[1] and can keep operations efficient while increasing the safety, quality, and patient-centeredness of care.[2,3] Switching from paper-based health records to EHRs has improved the quality of information gathering.[4] Nurse documentation is essential to the efficient and optimal coordination of patient care.

In addition to streamlining nurses' workflow, computerized EHRs have the power to enhance knowledge, experience, and judgment regarding patient problems.[5] However, nurses spend approximately 35% of their workday on documentation, which reduces the amount of time nurses can spend in direct patient care.[6] A qualitative study from Iran found that nurses felt that the documentation burden increased their feelings of job stress and pressure, which the authors classified as burnout.[7] Another qualitative study found that two-thirds of the participants were dissatisfied their EHRs, reporting that the EHR had reduced usability, limited functionality, and reduced interoperability.[8]

Increased or fragmented documentation is not a burden only on nurses; it also directly affects patient care. Increased nurse workload was associated with incomplete documentation of patient information.[9] Further, researchers discovered that hospitalized patients who had a cardiac arrest had incomplete vital sign records, or the records were fragmented in different locations in the EHR, making it difficult to locate for clinical decisions.[10] Ultimately, the researchers concluded that lack of vital sign representation is a threat to patient safety.[10] Colloquially, nurses have referred to overloaded or cluttered health documentation as "note bloat."[11,12] A solution might be to consolidate and reduce nursing documentation; however, there is no current literature providing guidelines on how to reorganize nurse documentation or the best practices on how to accomplish reorganization. The purpose of this study was to evaluate the removal of duplicative information and unnecessary fields and the reordering of the required fields in the Adult Admission History Form (AAHF) documentation process to increase concise, high-quality documentation that is meaningful to the patient story. The authors define meaningful documentation as that which supports patient outcomes by improving the quality and usability of data that facilitate best practice and clinical workflows.

METHODS

At the onset of the AAHF optimization project, the authors conducted a thorough literature search to assist with determining

Author Affiliations: Dignity Health Phoenix System Office (Mr McIlreevy, Ms Rylee, and Ms Shields-Tettamanti), Phoenix, Arizona; Intermountain Healthcare (Dr Gee), Salt Lake City, Utah; and College of Nursing, University of Utah (Dr Gee), Salt Lake City.

The authors have disclosed that they have no significant relationships with, or financial interest in, any commercial companies pertaining to this article.

Corresponding author: Tina L. Rylee, BA, Dignity Health Phoenix System Office 3033 N 3rd Ave. Phoenix, AZ 85013 (tina.l.rylee@gmail.com).

DOI: 10.1097/CIN.0000000000000695

what information the acute hospital admission intake form should collect. No supportive literature was found. The authors contacted Cerner (Cerner Corporation, Kansas City, MO) and other possible vendors, and found no information on how to guide the methodology. Due to the lack of information, this research was conducted in two stages. The first phase focused on outlining the procedures, engaging a team of experts to provide insight along the process. The second phase evaluated the changes made and nurses' perceptions of those changes. The initial result was used for all adult patients who were admitted to an inpatient department except Perioperative, Maternal and Child Health, and Long-Term Care. After the initial implementation, the content of the form was deployed to the remaining intake departments.

Hospital Information

Dignity Health is a 22-state network with 62 000 employees and 400 care centers, including hospitals, urgent and occupational care, imaging centers, home health, and primary care clinics. The changes to the AAHF directly affected 37 acute care facilities. Approximately 14 600 registered nurses utilize this admission form daily. More than 7000 ancillary clinicians use the data from this form in patient care.

Phase 1

Participants

A team of approximately 50 interdisciplinary clinicians was engaged in initiating the admission documentation review. The team was composed of staff nurses, nurse leaders, pharmacists, case managers, therapists, regional clinical informaticists, and system analysts. The clinicians were chosen because they were subject matter experts (SMEs), department leadership, corporate SMEs, corporate leaders, or information technology (IT) developers.

The authors met with the regional clinical informaticists, who then worked within their networks to recruit local SMEs and department leaders. The hospital system categorizes the hospitals into eight regions with three to eight hospitals in each. The authors then met with corporate leaders, who provided recommendations for SMEs and leaders for the subgroups. The authors selected representatives from one or more regions in the following departments: respiratory therapy, rehabilitation, nursing, critical care, infection prevention, health information management, care coordination, pharmacy, social services, nutrition, palliative care, laboratory, radiology, spiritual care, and providers.

This interdisciplinary team met in five subgroups of eight to 10 experts per group. An enterprise clinical informaticist led each group and the participants were clinical informaticists, SMEs, IT, or leaders. Each group had interdepartmental representatives. Each subgroup reviewed a subsection of fields on the admission form. They were responsible for answering two questions: "Who is the consumer of the data?" and "Clinically, what are they doing with the data?" The smaller subgroups reported to the larger group about their progress. The groups met both virtually and face to face to participate in the project.

Intervention Procedure

Due to the lack of previous work in this area, the authors reviewed national and state regulatory codes and legislation to determine what information should be included to maintain compliance with these different requirements. Additionally, a review of system-wide policies ensured that the optimization project would continue to support the established policy.

The first step was to analyze the 251 fields and prompts that made up the AAHF that was currently in use. An IT analyst provided data that contained the total number of times each individual field was completed within the signed forms. We were able to identify the completion percentage of each individual field by using the completed field count as the numerator and the signed form count as the denominator. Fields were separated into five groups. Therefore, each subgroup received approximately 50 fields based on the consecutive ordering in the AAHF. The subgroups were composed of interdisciplinary members who could expertly address a variety of questions, which is why the fields did not need to be separated based on content.

The second step of the analysis included collecting the usage rate, though the subgroups did not use this information to determine whether to keep or remove a field. If the interdisciplinary team found the field to be required but the field had low usage, there were further discussions to determine the reasons the utilization was low and addressed issues such as moving the field to a more appropriate location. The team determined who used the information and who needed to be aware of the data for clinical decision making and then grouped each field by area of focus. The groupings were nursing, regulatory, care coordination, ancillary care, and pharmacy-related data.

The interdisciplinary team was divided into correlating expertise to evaluate each field further. Each small meeting had five to six members consisting of SMEs, clinical informaticists, and system analysts. The teams held frequent meetings for 6 weeks to complete their review of each field that existed on the form. Analysis of each field considered the following questions:

- What are the clinical uses of the data and the impact on downstream workflows?
- Is the information also being collected elsewhere, and if not, can it be collected elsewhere?
- Is nursing the right discipline to collect the information?

- Should the information be collected on all patients, or should the system use logic to trigger the collection of relevant details when applicable?

After the interdisciplinary team considered the above points on each field, the team made one of the following decisions: to continue including the question in the form, to modify the functionality or wording of the question, to move a field from the admission intake form to a more appropriate location within the EHR, or to remove the data entry field from the AAHF. Table 1 provides an example of how the team evaluated each field. After each team analyzed the fields and made decisions, the team reassembled to ensure interdisciplinary consensus and final approval of the decisions.

Once the team approved the final decisions, a process to review the 127 fields identified for removal and/or modification was set in place to assess the impact that these fields had on existing rules, reports, and subsequent data flow throughout the EHR. All fields slated for modification or removal underwent a thorough IT review to identify any downstream impacts. The appropriate corporate leader reviewed any fields identified for regulatory, quality, or financial impacts and cited the source of impact. The team had a clinical informaticist review the data to understand whether there would be any downstream clinical workflow impact. Additionally, the authors examined the remaining 124 fields to ensure that they were grouped based on a nurse's clinical workflow during the admission process and to streamline the number of pages within the AAHF.

The following are three examples of fields that were in the original AAHF and an additional explanation of how the team analyzed the field to determine if they should remove, modify, or leave the field alone.

- **Field title: Cardiac Rehab Screening**
  Analysis: The first step was to determine usage (2.38%). The team found one department that was using these data to identify patients who might need cardiac rehabilitation. Some facilities did not have a cardiac rehabilitation department. The team worked with the department to find another field to identify this patient population. This is an example of the burden placed on the RN to capture documentation during the admission process.
- **Field title: Anticipated Discharge Plan**
  Analysis: The first step was to assess usage (100%). The team determined that this field is required. The regulatory corporate leader provided the Centers for Medicare and Medicaid Services' rules that indicate the need for this field.
- **Field title: Cultural/Religious Preference**
  Analysis: The first step was to determine usage (100%). This field is required for admission forms for patients. A similar field captured the same information on another section of the form. The team removed that field from the form.

The team took all changes to the form and layout through the change governance approval process before the replacement was built in a nonproduction domain for testing. The team used SnagIt (TechSmith, Okemos, MI) to provide a visual mockup. The IT department would create the forms using Cerner build tools in the nonproduction domain for testing. The authors presented visual mockups to the clinicians and clinical informaticists during the change governance meetings. The team worked with an IT analyst to build the new form based on the proposed modifications.

Based on the process and findings, the authors created a guiding principles document to facilitate the decision-making process. The guiding principles document contains the information we gathered on each field on the admission history form. This information provides the rationale for why we removed or kept a specific field on the form. The informaticist used this guiding principle document to help guide future modifications to the admission history form. This document is available for all future considerations for optimization projects by the organization regarding AAHF within the EHR. Similarly, the authors also created a legacy document that shows how nurses utilize each field within the EHR and developed records of all decisions identified in the project.

The project team created a testing and training plan for the implementation of the new optimized AAHF. The training plan focused on what information the AAHF would no longer collect and where the nurse could enter new information; the project team did not introduce new functionality, although it emphasized fields that healthcare professionals did not fully utilize. The clinical informatics teams created tip sheets and distributed them to each hospital to prepare the nurses and all clinicians affected by the changes.

Phase 2

Participants

The AAHF documentation completed by all nurses in Dignity Health was included in the analysis. To gather nurse perspectives on the AAHF changes, the authors provided surveys. Facility clinical informaticists and department leaders provided the survey link to nursing staff. All nurses were invited, but participation was voluntary. Leadership and clinical informaticists encouraged the nursing staff to complete the survey. A total of 349 participants responded to the preimplementation survey and 292 responded to the postimplementation survey. Only 262 of the postimplementation respondents utilized the new form and therefore were

Table 1. Example on How the Team Evaluated Each Field

	Example 1	Example 2
Description/field	Infection Control/Safety Education Topics	Previous Medical History
Assigned subgroup	5	2
Follow-up and next step	None	None
Form description	Adult Admission History (v2)	Adult Admission History (v2)
DTA decision	Remove	Include
DTA decision comments	*Rationale from subgroup:* It is the same DTA that is already in education and shift assessment	*Rationale from subgroup:* Needed for MU reporting
New section location of field	Infection Control Education	Health History (v5)
Total DTA	10 396	36 656
Total Forms	36 656	36 656
Percentage of completion	28.36%	100.00%
Consumer of the data		
Nursing	×	×
Therapies		×
Social service		×
Case management		×
Pharmacy		
Spiritual/palliative		×
Nutrition		×
Provider		×
Radiology		
Lab/or blood bank		
Infection control	×	×
Clinical use		
Regulatory—Centers for Medicare Management		?
Regulatory—Joint Commission	×	?
Regulatory—state		?
Communicate—case management		?
Communicate—social service		?
Communicate—pharmacy		?
Communicate—therapies		?
Communicate—nutrition		?
Communication—care team		
Communicate—spiritual/palliative		?
Other	Need to get specific regs. Review the ability to automate.	Required field
Field use	Assessment	Assessment
Primary user	Nursing, Pharmacy	Nursing, provider, pharmacy
Secondary user		Therapies
Alerts	None	BMI.alert Preop.alert Vitals.alert Diabetic.alert
Rule	None	BMI.rule Preop.rule Vitals.rule Diabetic.rule
Downstream workflow	None	None
What downstream workflow	None	None

Abbreviation: MU, meaningful use.

included in the analysis. The survey did not capture demographic information from the nursing staff.

Research Procedure

This study focused on the total admissions for a 2-week period in a large EHR data repository for 17 hospitals across three western states. The authors explored four overarching outcomes: time to complete admission form, usage of each field within the form, free text usage, and nurses' perceptions of and attitudes toward using the form before and after implementation. An IT analyst guided the extraction of field usage information, including time stamps for opening and signing off on forms; this information came directly from Cerner (Kansas City, MO) and was imported into Excel (Microsoft, Redmond, WA) for further analysis.

The time to complete an admission form was calculated using the timestamps extracted from the EHR. Using this information, we were able to determine the completion percentage of each specific field by using the completed field count as the numerator and the signed form count as the denominator. Data from when the nurse opened the admission form to when the nurse signed it was reviewed, and the difference between these times was used to extrapolate the total time to complete the form. The authors reviewed the total number of forms signed and the total times the fields were completed on those forms, then used the data extraction information to understand completion for each discrete task assay (DTA) or field. Cerner provides the values of how often a field is used without any calculations needed. Discrete task assays are the individual questions on the admission form, each of which links to an event code and is ultimately stored on a data table.

We utilized reports that pulled data for a 3-month period across both domains. We analyzed these data across both Cerner domains. The project team noticed that some AAHF completion times took longer than clinically appropriate, most likely due to the nurse leaving the form open and incomplete beyond the end of a shift. To ensure high-quality data usage for the analysis, completion rates were reported before and after the removal of any outliers. Outliers in this context are values more than three times the interquartile range.

The original purpose of the admission form optimization did not target the use of free text, but the team removed any applicable free text fields based on the requirements met in phase 1. Free text usage was measured as a byproduct of this optimization project based on the percentage of fields that used unstructured data. Further, free text usage rates were measured before and after the implementation of the new AAHF. The project team proceeded with the understanding that when data are captured in a discrete data field, the information is structured and standardized to the presented field. When the nurse documents the data in a free text field, it is not presented in a structured way for discovery or standardization. Additionally, the information is subjected to individual interpretation and spelling.

To measure nurse perception of the admission form, the authors worked with clinical informaticists and nurses to develop content for a short survey. An industry expert reviewed the survey for any technical errors. A group of experts familiar with the AAHF documentation process determined face validity.

There were seven questions on the preimplementation survey and eight on the postimplementation survey. The additional question on the postimplementation survey asked if the participants had the opportunity to use the new admission form, a pivotal first question since, due to vacations and nurse scheduling, some had not been exposed to the new AAHF. The survey questions focused on registered nurses' feelings and perceptions of the admission form before and after the optimization project (Table 2).

The survey questions used a 5-point Likert scale ranging from strongly disagree to strongly agree. The clinical informatics teams distributed the survey to nurses at all participating hospitals. The participants all used the EHR in their daily work. The authors used a *t* test analysis to analyze preimplementation and postimplementation survey data. The institutional review board determined the study as quality improvement, and therefore, it was excluded from a full review.

The analysis of the field usage compared 3 months of data for the preoptimization phase, March 27 to June 26, 2016, to the postoptimization phase, April 10 to July 10, 2017. Further, AAHF completion rates, how long it took nurses to complete the form, were analyzed using 2 weeks preoptimization, September 5 to September 19, 2016, and postoptimization May 1 to May 15, 2017. Finally, the authors collected the preimplementation survey from February 28 to March 6, 2017, and the postimplementation survey from March 22 to April 1, 2017. The rollout of the optimized AAHF was on March 7, 2017.

Materials

Nurses completed all admission forms in the EHR in hospital computer systems running Microsoft Windows 7, and Excel and Word (Microsoft) housed all the collected data. Statistical analyses were conducted using IBM SPSS Statistics (IBM, Armonk, NY). The authors used SurveyMonkey (SurveyMonkey, Palo Alto, CA) to collect data before and after implementation on participant perceptions of and reactions to the admission form.

RESULTS

Participants used 129 of the original 252 fields less than 20% of the time. This suggests that the participants were not using 51% of the available fields. After the optimization effort, there was a significant reduction in unused fields. Of the

Table 2. Participant Perceptions of Admission Intake Form Before and After Implementation

Question	Pre		Post		Mean Difference	t Value	95% Confidence Interval		P
	Mean	SD	Mean	SD			Lower Bound	Upper Bound	
The admission information gathered is meaningful.	3.56	1.06	3.57	1.13	−0.01	−0.11	−0.19	0.17	.91
Information that has been asked previously flows to the Adult History Form.	3.00	1.20	3.59	1.09	−0.60	−6.28	−0.78	−0.41	<.001
The Adult Admission History Form seems too lengthy.	3.91	1.07	2.80	1.20	1.11	11.90	0.93	1.30	<.001
The Adult Admission History Form does not take a lot of time to completely fill out.	2.62	1.19	3.44	1.15	−0.82	−8.39	−1.00	−0.62	<.001
The Adult Admission History Form is useable and useful.	3.31	1.06	3.69	1.11	−0.37	−4.23	−0.55	−0.20	<.001
I feel the ordering of the questions on the Adult Admission History Form flow nicely.	3.01	1.00	3.69	1.08	−0.68	−7.95	−0.85	−0.51	<.001
Overall, I am satisfied with the questions presented on the Adult Admission History Form.	3.01	1.02	3.66	1.19	−0.65	−7.06	−0.83	−0.47	<.001

remaining 127 fields, participants used only 46 for documentation less than 20% of the time. This represents 37% of the available fields. The project team analyzed more than 37 000 completed AAHF records for preimplementation data and 35 000 AAHF records for postimplementation data.

A total of 3710 patient AAHFs were completed with an average completion time of 17.05 minutes (SD, 17.78 minutes); the average completion time after removal of any extreme outliers that were higher than three times the interquartile range was 13.65 minutes (SD, 8.72 minutes; n = 3524). Analyzing the postoptimization data, there was a total of 4239 AAHFs completed with an average completion time of 18.97 minutes (SD, 32.75 minutes); after the removal of extreme outliers of greater than three times the interquartile range, the mean was 10.77 minutes (SD, 7.11; n = 3891). There was a statistically significant difference in time to complete documentation in the preimplementation time period and the postimplementation period before outliers were removed ($t_{6704} = -3.34$, $P < .001$); there was an increase in the amount of time to complete by 1.92 minutes. Additionally, there was a statistically significant difference between the before and after data after outliers were removed ($t_{6807} = 15.50$, $P < .001$); there was a decrease in the time it took to complete by 2.88 minutes. This equates to an approximate total of 1200 hours saved over a 4-week period for all the Dignity Health hospitals.

The EHR had 251 fields on the AAHF before the changed form was released. The optimization reduced the new admission form to 124 fields. This equates to a reduction of 127 fields (50.60%). Focusing on the preimplementation dataset, the authors reviewed the admission form field usage of more than 74 011 AAHF records that spanned a 3-month period across the health system. The results indicate that users of the AAHF completed 50% of the available fields less than 20% of the time.

Furthermore, analysis of the postimplementation data involved a review of the admission form field usage data on more than 86 065 AAHF records that spanned a 3-month period across the entire health system. Healthcare providers used 42 fields of the 124 fields that were available less than 20% of the time. Additionally, providers used 34% of the available fields less than 20% of the time, indicating they had a 32% reduction in the number of fields used less than 20% of the time. Further, there was an increase in infectious disease documentation by 57%, influenza documentation by 227%, and unresponsive patient documentation by 552%, capturing more data that the form missed in the past.

The data showed a reduction (−36.71%) in the use of free text advance directive information. This reduction represents an increased use of the advance directive fields. There was an increase in field use for "Patient unable to respond" (701.59%), "Contact for advanced directive info patient Unable to Respond" (626.99%), "Patient wishes to revise or update an AD" (644.15%), and "Infectious diseases" (29.05%). Eliminating unused fields and presenting the remaining fields differently increased the quality of the documentation in many cases.

The authors explored the nurse's perception of the admission intake form before and after the implementation of the updates through a short survey. A total of 349 participants completed the preimplementation survey and 292 participants completed the postimplementation survey.

Nurse Satisfaction

Data indicate that the nurses' agreement statistically improved from pretest to posttest with the following statement: "Overall, I am satisfied with the questions presented on the Adult Admission History Form" (preimplementation mean, 3.01; postimplementation mean, 3.66; $P < .001$).

Usability

Nurse-rated perception on the usability of the form improved after optimization as stated with the following statement: "The Adult Admission History Form is usable and useful" (preimplementation mean, 3.31; postimplementation mean, 3.69; $P < .001$),

Physical Structure of Form

Nurse perceptions of the physical attributes of the form were statistically different between before and after optimization: "Information that has been asked previously flows to the Adult Admission History Form" (preimplementation mean, 3.00; postimplementation mean, 3.59; $P < .001$) and "I feel the ordering of the questions on the Adult Admission History Form flow nicely" (preimplementation mean, 3.01; postimplementation mean, 3.69; $P < .001$).

Timeliness of Form

There was a statistically significant decrease in agreement with the field "The Adult Admission History Form seems too lengthy" (preimplementation mean, 3.91; postimplementation mean, 2.80; $P < .001$). There was a statistically significant improvement in the perceptions of the following statement "The Adult Admission History Form does not take a lot of time to completely fill out" (preimplementation mean, 2.62; postimplementation mean, 3.44; $P < .001$),

Meaningfulness

Finally, there was no statistical difference between pretest and posttest regarding the statement "The admission information gathered is meaningful" (preimplementation mean, 3.56; postimplementation mean, 3.57; $P = .808$) (Table 2).

DISCUSSION

Often, in hospital settings, nurses comment on how EHR admission documentation is too long and arduous to complete due to the number of fields and sections that the nurse has to navigate to document the admission history, and nurses often struggle to see the patient's story. Nurses also noted that the data did not flow from one form to another, and they felt like they had to enter the same or similar information on different sections within the same form. Furthermore, nurses made comments on the "bloatness" of the system, indicating that the forms have too many fields or are too cluttered. Unimportant fields have been added over the years, complicating the admission form and leading to more information that the nurses must sift through during documentation. The nurses were documenting information under the assumption that other departments would be utilizing this information in the care process.

The authors conclude that optimizing the AAHF documentation increased meaningful documentation and streamlined the process by removing redundant fields and identifying the essential fields needed for admission. Meaningful documentation supports patient outcomes by improving the quality and usability of data that support best practice and clinical workflows. Further, improved documentation could increase the quality of the records, reduce time to complete admission forms, improve nurse workflow, and improve nurse satisfaction with using the forms. These improvements allow nurses to collect the whole picture of a patient better when interacting with the EHR.

Previous research has shown that EHRs can increase nursing satisfaction; however, the stress and time associated with EHRs can also increase nursing burnout.[13–15] In this study, the authors found that optimizing the EHR, and therefore reducing clutter and excess fields otherwise called "note bloat," was tangible to nurses. Nurses reported that the AAHF had a better flow and was easier to complete. Further, nurses were more satisfied with the form and found it more useful.

In this study, the authors were able to decrease the number of fields by 50%, potentially streamlining documentation and improving nurse workflow. This reduction reduces nurses' burden by requiring them to scan through less documentation in the care process. Furthermore, reducing the number of fields was vital as it led to improved documentation overall. The team also discovered "required" fields in the AAHF that were no longer necessary. Additionally, the optimization brought important fields in obscure or hidden locations or fields that are numerous clicks down the form to the forefront of documentation and therefore facilitated in the completion of the necessary fields. The large number of DTAs on the admission intake form forced the nurse needs to scroll down the page to find all the fields. The use of the word "hidden" represents those fields that require the nurses to perform some additional action to see the fields.

The results indicated that more nurses completed the form in under 10 minutes, which shows that nurses are spending less time on the forms, and therefore, they have more time to focus on patient care. Research has shown that hospital healthcare teams spend less time with the patient than they do with EHR documentation.[16–18] This added burden increased stress and decreased satisfaction in the workplace.[19–21] Researchers have found that an increase in stress does reduce health outcomes.[22] Therefore, reducing this stress is essential in keeping nurses healthy and happy, improving the quality of care and health outcomes.

Furthermore, the authors were able to improve overall meaningful documentation. The authors achieved this by reducing free text advance directives. This reduction in free text entry helps to improve the discharge process by utilizing discrete data. An increase in discharge documentation also influenced meaningful documentation. Critically, this finding

enhances the quality of data that nurses and other clinicians can gather during admission that may facilitate the discharge process. Further, there was an increase in infectious disease documentation, influenza documentation, and unresponsive patient documentation. Improved documentation in these essential but previously hidden fields helps to identify patients who are at risk of adverse health outcomes.[23]

LIMITATIONS OF THE STUDY

Although the authors found statistical improvement in the amount of time it took for the nurses to fill out the AAHF, having extreme outliers reduced the effect. Reporting the time difference with and without the outliers highlights the problems often seen with clinical workflow and documentation. Nurses are supposed to sign their documentation at the time of service, but competing demands may lead to some forms not being signed until the end of shift. Accounting for these extreme time lapses is difficult. It is hard to determine whether the nurse or physician walked away due to the form taking too long or they were only 15 seconds into the form before a code appeared, and they had to change their workflow. Minute information regarding the clicks or usage within the form was not collected and therefore could not inform the problem with the outliers.

Another limitation of this study is the use of a self-developed survey to evaluate nurse perspectives on the AAHF. Although this survey had face validity, the authors did not test for external validity or reliability. Therefore, the survey findings may not hold up over time or in different populations. Thus, the survey findings should be interpreted as a possible trend in change of perspective. Further research using validated scales is needed to accurately assess the perspective of nurses in regard to AAHF optimization.

Unfortunately, the authors were not able to measure the "real estate" or physical size reduction of the admission documentation. Further, the team was not able to determine a proper method to measure the quality of the data adequately, and there was a considerable gap in the literature that supports or guides this type of EHR research. The authors did not measure mouse "miles" or clicks. While 292 nurses completed the postimplementation survey, a larger sample would have been more desirable.

CONCLUSION

The purpose of this study was to evaluate the removal of duplicative information, removal of unnecessary fields, and reordering the required fields in the AAHF to improve documentation quality and improve workflow. This study shows that an interdisciplinary team can effectively work together to optimize AAHF documentation. The improvements showed that less time was needed to document the patient's admission information and that fields previously "hidden" to nurses seemed more available and were utilized more frequently. Many of these fields were needed to facilitate the smooth transition of care by interdisciplinary team members for patient discharge or to move the patient to another care setting. Furthermore, the nurses found the changes tangible, and their satisfaction with the form increased. Nurses noted improvements in the time it took to complete, usability and usefulness, flow of the questions, and the overall length of the form. Lessons learned in improving the AAHF can be translated into the optimization process of other sections of the EHR.

References

1. Bowman S. Impact of electronic health record systems on information integrity: quality and safety implications. *Perspectives in Health Information Management*. 2013;10: 1c.
2. Harrison MI, Koppel R, Bar-Lev S. Unintended consequences of information technologies in health care—an interactive sociotechnical analysis. *Journal of the American Medical Informatics Association*. 2007;14(5): 542–549.
3. Kawamoto K, Houlihan CA, Balas EA, Lobach DF. Improving clinical practice using clinical decision support systems: a systematic review of trials to identify features critical to success. *BMJ (Clinical Research Ed)*. 2005; 330(7494): 765.
4. Wang N, Yu P, Hailey D. Description and comparison of documentation of nursing assessment between paper-based and electronic systems in Australian aged care homes. *International Journal of Medical Informatics*. 2013;82(9): 789–797.
5. Lee TT. Nurses' perceptions of their documentation experiences in a computerized nursing care planning system. *Journal of Clinical Nursing*. 2006;15(11): 1376–1382.
6. Hendrich A, Chow MP, Skierczynski BA, Lu Z. A 36-hospital time and motion study: how do medical-surgical nurses spend their time? *The Permanente Journal*. 2008;12(3): 25–34.
7. Vafaei SM, Manzari ZS, Heydari A, Froutan R, Farahani LA. Improving nursing care documentation in emergency department: a participatory action research study in Iran. *Open Access Macedonian Journal of Medical Sciences*. 2018;6(8): 1527–1532.
8. Topaz M, Ronquillo C, Peltonen L-M, et al. Nurse informaticians report low satisfaction and multi-level concerns with electronic health records: results from an international survey. *AMIA Annual Symposium Proceedings*. 2016;2016: 2016–2025.
9. Shihundla RC, Lebese RT, Maputle MS. Effects of increased nurses' workload on quality documentation of patient information at selected primary health care facilities in Vhembe District, Limpopo Province. *Curationis*. 2016;39(1): 1545.
10. Stevenson JE, Israelsson J, Nilsson GC, Petersson GI, Bath PA. Recording signs of deterioration in acute patients: the documentation of vital signs within electronic health records in patients who suffered in-hospital cardiac arrest. *Health Informatics Journal*. 2016;22(1): 21–33.
11. Kahn D, Stewart E, Duncan M, et al. A prescription for note bloat: an effective progress note template. *Journal of Hospital Medicine*. 2018; 13(6): 378–382.
12. Healthcare IT. News. 'Note bloat' putting patients at risk. 2013; https://www.healthcareitnews.com/news/note-bloat-putting-patients-risk. Accessed October, 2018.
13. Tawfik DS, Phibbs CS, Sexton JB, et al. Factors associated with provider burnout in the NICU. *Pediatrics*. 2017;139(5): e20164134.
14. DiAngi YT, Longhurst CA, Payne TH. Taming the EHR (electronic health record)—there is hope. *Journal of Family Medicine*. 2016;3(6).
15. Stock E. Exploring salutogenesis as a concept of health and wellbeing in nurses who thrive professionally. *British Journal of Nursing (Mark Allen Publishing)*. 2017;26(4): 238–241.

16. Chen L, Guo U, Illipparambil LC, et al. Racing against the clock: internal medicine residents' time spent on electronic health records. *Journal of Graduate Medical Education*. 2016;8(1): 39–44.
17. Hingle S. Electronic health records: an unfulfilled promise and a call to action. *Annals of Internal Medicine*. 2016;165(11): 818–819.
18. Sinsky C, Colligan L, Li L, et al. Allocation of physician time in ambulatory practice: a time and motion study in 4 specialties. *Annals of Internal Medicine*. 2016;165(11): 753–760.
19. Linzer M, Levine R, Meltzer D, Poplau S, Warde C, West CP. 10 bold steps to prevent burnout in general internal medicine. *Journal of General Internal Medicine*. 2014;29(1): 18–20.
20. Shanafelt TD, Dyrbye LN, Sinsky C, et al. Relationship between clerical burden and characteristics of the electronic environment with physician burnout and professional satisfaction. *Mayo Clinic Proceedings*. 2016;91(7): 836–848.
21. Babbott S, Manwell LB, Brown R, et al. Electronic medical records and physician stress in primary care: results from the MEMO study. *Journal of the American Medical Informatics Association*. 2014;21(e1): e100–e106.
22. Ohno-Machado L. Electronic health record systems: risks and benefits. *Journal of the American Medical Informatics Association*. 2014;21(e1): e1.
23. Collins SA, Cato K, Albers D, et al. Relationship between nursing documentation and patients' mortality. *American Journal of Critical Care*. 2013;22(4): 306–313.

For more than 64 additional continuing professional development articles related to Electronic Information in Nursing topics, go to NursingCenter.com/ce.

Lippincott® NursingCenter®

NCPD Nursing Continuing Professional Development

INSTRUCTIONS

Interdisciplinary Optimization of Admission Documentation: Reducing the Bloat

TEST INSTRUCTIONS

- Read the article. The test for this nursing continuing professional development (NCPD) activity is to be taken online at **www.nursingcenter.com/CE/CIN**. Tests can no longer be mailed or faxed.
- You'll need to create an account (it's free!) and log in to access My Planner before taking online tests. Your planner will keep track of all your Lippincott Professional Development online NCPD activities for you.
- There's only one correct answer for each question. A passing score for this test is 7 correct answers. If you pass, you can print your certificate of earned contact hours and access the answer key. If you fail, you have the option of taking the test again at no additional cost.
- For questions, contact Lippincott Professional Development: 1-800-787-8985.
- Registration deadline is March 3, 2023.

PROVIDER ACCREDITATION

Lippincott Professional Development will award 2.5 contact hours for this nursing continuing professional development activity.

Lippincott Professional Development is accredited as a provider of nursing continuing professional development by the American Nurses Credentialing Center's Commission on Accreditation.

This activity is also provider approved by the California Board of Registered Nursing, Provider Number CEP 11749 for 2.5 contact hours. Lippincott Professional Development is also an approved provider of continuing nursing education by the District of Columbia, Georgia, and Florida, CE Broker #50-1223. Your certificate is valid in all states.

Payment: The registration fee for this test is $24.95.