

ORIGINAL RESEARCH

Internal Medicine Progress Note Writing Attitudes and Practices in an Electronic Health Record

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BACKGROUND: The electronic health record (EHR) has been viewed with both praise and skepticism. Multiple editorials have expressed concerns that EHR implementation and “efficiency tools” such as copy forward and auto population have resulted in a decrement in note accuracy, relevance, and critical thinking.

OBJECTIVE: To evaluate the perceptions of internal medicine housestaff and attendings on inpatient progress note quality at 4 academic institutions after the implementation of an EHR.

DESIGN: Cross-sectional survey.

MEASUREMENTS: We developed surveys that assessed housestaff and attendings opinion of current progress note quality, the impact of the EHR on quality, and the purposes of a progress note.

RESULTS: We received 99 completed surveys from interns (66%), 155 from residents (49%), and 153 from attendings

(70%) across 4 institutions. The majority of housestaff responded that the quality of notes was “unchanged” or “better” following the implementation of an EHR, whereas attendings believed note quality was “unchanged” or “worse.” Attendings’ perceptions of housestaff notes were significantly lower than housestaff perceptions of their own notes across all domains. With regard to the effect of copy forward and autopopulation, the majority of housestaff viewed these to be “neutral” or “somewhat positive,” whereas attendings viewed these as “neutral” or “somewhat negative.” Housestaff and attendings had nearly perfect agreement regarding the purpose of the progress note.

CONCLUSIONS: Attendings and housestaff disagree on the current quality of progress notes and the impact of an EHR on note quality, but agree on the purpose of a progress note. *Journal of Hospital Medicine* 2015;10:525–529. © 2015 Society of Hospital Medicine

The electronic health record (EHR) has revolutionized the practice of medicine. As part of the economic stimulus package in 2009, Congress enacted the Health Information Technology for Economic and Clinical Health Act, which included incentives for physicians and hospitals to adopt an EHR by 2015. In the setting of more limited duty hours and demands for increased clinical productivity, EHRs have functions that may improve the quality and efficiency of clinical documentation.^{1–5}

The process of note writing and the use of notes for clinical care have changed substantially with EHR implementation. Use of “efficiency tools” (ie, copy forward functions and autopopulation of data) may increase the speed of documentation.⁵ Notes in an

EHR are more legible and accessible and may be able to organize data to improve clinical care.⁶

Yet, many have commented on the negative consequences of documentation in an EHR. In a *New England Journal of Medicine* Perspective article, Drs. Hartzband and Groopman wrote, “we have observed the electronic medical record become a powerful vehicle for perpetuating erroneous information, leading to diagnostic errors that gain momentum when passed on electronically.”⁷ As a result, the copy forward and autopopulation functions have come under significant scrutiny.^{8–10} A survey conducted at 2 academic institutions found that 71% of residents and attendings believed that the copy forward function led to inconsistencies and outdated information.¹¹ Autopopulation has been criticized for creating lengthy notes full of trivial or redundant data, a phenomenon termed “note bloat.” “Bloated” notes may be less effective as a communication tool.¹² Additionally, the process of composing a note often stimulates critical thinking and may lead to changes in care. The act of copying forward a previous note and autopopulating data bypasses that process and in effect may suppress critical thinking.¹³ Previous studies have raised numerous concerns regarding copy forward and autopopulation functionality in the EHR. Many have described the

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Additional Supporting Information may be found in the online version of this article.

Received: February 11, 2015; Revised: April 8, 2015; Accepted: April 26, 2015

2015 Society of Hospital Medicine DOI 10.1002/jhm.2379

Published online in Wiley Online Library (Wileyonlinelibrary.com).

duplication of outdated data and the possibility of the introduction and perpetuation of errors.^{14–16} The Veterans Affairs (VA) Puget Sound Health system evaluated 6322 “copy events” and found that 1 in 10 electronic patient charts contained an instance of high-risk copying.¹⁷ In a survey of faculty and residents at a single academic medical center, the majority of users of copy and paste functionality recognized the hazards; they responded that their notes may contain more outdated (66%) and more inconsistent information (69%). Yet, most felt copy forwarding improved the documentation of the entire hospital course (87%), overall physician documentation (69%), and should definitely be continued (91%).¹¹ Others have complained about the impact of copy forward on the expression of clinical reasoning.^{7,9,18}

Previous discussions on the topic of overall note quality following EHR implementation have been limited to perspectives or opinion pieces of individual attending providers.¹⁸ We conducted a survey across 4 academic institutions to analyze both housestaff and attendings perceptions of the quality of notes since the implementation of an EHR to better inform the discussion of the impact of an EHR on note quality.

METHODS

Participants

Surveys were administered via email to interns, residents (second-, third-, or fourth-year residents, hereafter referred to as “residents”) and attendings at 4 academic hospitals that use the Epic EHR (Epic Corp., Madison, WI). The 4 institutions each adopted the Epic EHR, with mandatory faculty and resident training, between 1 and 5 years prior to the survey. Three of the institutions previously used systems with electronic notes, whereas the fourth institution previously used a system with handwritten notes. The study participation emails included a link to an online survey in REDCap.¹⁹ We included interns and residents from the following types of residency programs: internal medicine categorical or primary care, medicine-pediatrics, or medicine-psychiatry. For housestaff (the combination of both interns and residents), exclusion criteria included preliminary or transitional year interns, or any interns or residents from other specialties who rotate on the medicine service. For attendings, participants included hospitalists, general internal medicine attendings, chief residents, and subspecialty medicine attendings, each of whom had worked for any amount of time on the inpatient medicine teaching service in the prior 12 months.

Design

We developed 3 unique surveys for interns, residents, and attendings to assess their perception of inpatient progress notes (see Supporting Information, Appendix, in the online version of this article). The surveys incorporated questions from 2 previously published

sources, the 9-item Physician Documentation Quality Instrument (PDQI-9) (see online Appendix), a validated note-scoring tool, and the Accreditation Council for Graduate Medical Education note-writing competency checklists.²⁰ Additionally, faculty at the participating institutions developed questions to address practices and attitudes toward autopopulation, copy forward, and the purposes of a progress note. Responses were based on a 5-point Likert scale. The intern and resident surveys asked for self-evaluation of their own progress notes and those of their peers, whereas the attending surveys asked for assessment of housestaff notes.

The survey was left open for a total of 55 days and participants were sent reminder emails. The study received a waiver from the institutional review board at all 4 institutions.

Data Analysis

Study data were collected and managed using REDCap electronic data capture tools hosted at the University of California, San Francisco (UCSF).¹⁹ The survey data were analyzed and the figures were created using Microsoft Excel 2008 (Microsoft Corp., Redmond, WA). Mean values for each survey question were calculated. Differences between the means among the groups were assessed using 2-sample *t* tests. *P* values <0.05 were considered statistically significant.

RESULTS

Demographics

We received 99 completed surveys from interns, 155 completed surveys from residents, and 153 completed surveys from attendings across the 4 institutions. The overall response rate for interns was 68%, ranging from 59% at the University of California, San Diego (UCSD) to 74% at the University of Iowa. The overall response rate for residents was 49%, ranging from 38% at UCSF to 66% at the University of California, Los Angeles. The overall response rate for attendings was 70%, ranging from 53% at UCSD to 74% at UCSF.

A total of 78% of interns and 72% of residents had used an EHR at a prior institution. Of the residents, 90 were second-year residents, 64 were third-year residents, and 2 were fourth-year residents. A total of 76% of attendings self-identified as hospitalists.

Overall Assessment of Note Quality

Participants were asked to rate the quality of progress notes on a 5-point scale (poor, fair, good, very good, excellent). Half of interns and residents rated their own progress notes as “very good” or “excellent.” A total of 44% percent of interns and 24% of residents rated their peers’ notes as “very good” or “excellent,” whereas only 15% of attending physicians rated housestaff notes as “very good” or “excellent.”

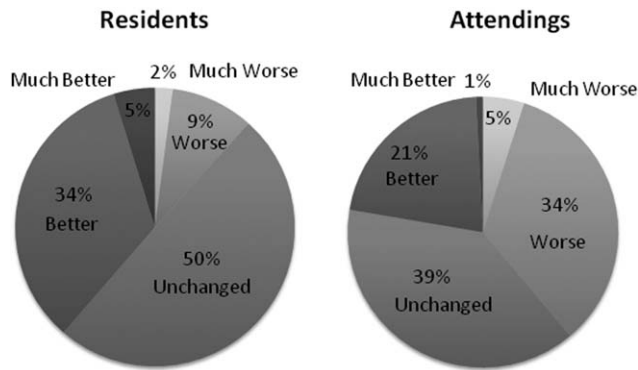


FIG. 1. Resident and attending assessment of progress note quality since adopting the Epic electronic health record.

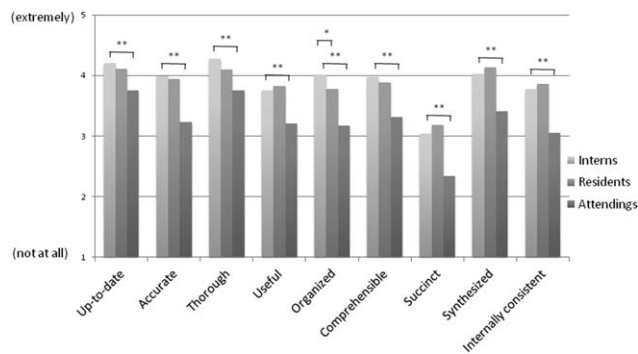


FIG. 2. Mean intern, resident, and attending perception of note characteristics based on the 9-item Physician Documentation Quality Instrument (* $P < 0.05$, ** $P < 0.001$).

When asked to rate the change in progress note quality since their hospital had adopted the EHR, the majority of residents answered “unchanged” or “better,” and the majority of attendings answered “unchanged” or “worse” (Figure 1).

PDQI-9 Framework

Participants answered each PDQI-9 question on a 5-point Likert scale ranging from “not at all” (1) to “extremely” (5). In 8 of the 9 PDQI-9 domains, there were no significant differences between interns and residents. Across each domain, attending perceptions of housestaff notes were significantly lower than housestaff perceptions of their own notes ($P < 0.001$) (Figure 2). Both housestaff and attendings gave the highest ratings to “thorough,” “up to date,” and “synthesized” and the lowest rating to “succinct.”

Copy Forward and Autopopulation

Overall, the effect of copy forward and autopopulation on critical thinking, note accuracy, and prioritizing the problem list was thought to be “neutral” or “somewhat positive” by interns, “neutral” by residents, and “neutral” or “somewhat negative” by attendings ($P < 0.001$) (Figure 3). In all, 16% of interns, 22% of residents, and 55% of attendings reported that copy forward had a “somewhat negative” or “very negative” impact on critical thinking ($P < 0.001$). In all, 16% of

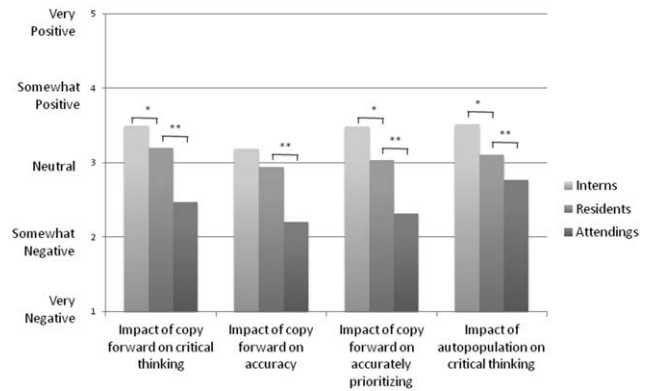


FIG. 3. Intern, resident, and attending perceptions of the mean impact of copy forward and autopopulation (* $P < 0.05$, ** $P < 0.001$).

TABLE 1. Ranked Importance of Each Purpose of a Progress Note

| | Interns | Residents | Attendings |
|---|---------|-----------|------------|
| Communication with other providers | 1 | 1 | 2 |
| Documenting important events and the plan for the day | 2 | 2 | 1 |
| Prioritizing issues going forward in the patient’s care | 3 | 3 | 3 |
| Medicolegal | 4 | 4 | 4 |
| Stimulate critical thinking | 5 | 5 | 5 |
| Billing | 6 | 6 | 6 |
| Quality improvement | 7 | 7 | 7 |

interns, 29% of residents and 39% of attendings thought that autopopulation had a “somewhat negative” or “very negative” impact on critical thinking ($P < 0.001$).

Purpose of Progress Notes

Participants were provided with 7 possible purposes of a progress note and asked to rate the importance of each stated purpose. There was nearly perfect agreement between interns, residents, and attendings in the rank order of the importance of each purpose of a progress note (Table 1). Attendings and housestaff ranked “communication with other providers” and “documenting important events and the plan for the day” as the 2 most important purposes of a progress note, and “billing” and “quality improvement” as less important.

DISCUSSION

This is the first large multicenter analysis of both attendings and housestaff perceptions of note quality in the EHR era. The findings provide insight into important differences and similarities in the perceptions of the 2 groups. Most striking is the difference in opinion of overall note quality, with only a small minority of faculty rating current housestaff notes as “very good” or “excellent,” whereas a much larger proportion of housestaff rated their own notes and those of their peers to be of high quality. Though participants were not specifically asked why note quality in general was suboptimal, housestaff and faculty rankings of specific domains from the PDQI-9 may yield an

important clue. Specifically, all groups expressed that the weakest attribute of current progress notes is “succinct.” This finding is consistent with the “note bloat” phenomenon, which has been maligned as a consequence of EHR implementation.^{7,14,18,21,22}

One interesting finding was that only 5% of interns rated the notes of other housestaff as “fair” or “poor.” One possible explanation for this may be the tendency for an individual to enhance or augment the status or performance of the group to which he or she belongs as a mechanism to increase self-image, known as the social identity theory.²³ Thus, housestaff may not criticize their peers to allow for identification with a group that is not deficient in note writing.

The more positive assessment of overall note quality among housestaff could be related to the different roles of housestaff and attendings on a teaching service. On a teaching service, housestaff are typically the “writer,” whereas attendings are almost exclusively the “reader” of progress notes. Housestaff may reap benefits, including efficiency, beyond the finished product. A perception of higher quality may reflect the process of note writing, data gathering, and critical thinking required to build an assessment and plan. The scores on the PDQI-9 support this notion, as housestaff rated all 9 domains significantly higher than attendings.

Housestaff and attendings held greater differences of opinion with respect to the EHR’s impact on note quality. Generally, housestaff perceived the EHR to have improved progress note quality, whereas attendings perceived the opposite. One explanation could be that these results reflect changing stages of development of physicians well described through the RIME framework (reporter, interpreter, manager, educator). Attendings may expect notes to reflect synthesis and analysis, whereas trainees may be satisfied with the data gathering that an EHR facilitates. In our survey, the trend of answers from intern to resident to attending suggests an evolving process of attitudes toward note quality.

The above reasons may also explain why housestaff were generally more positive than attendings about the effect of copy forward and autopopulation functions on critical thinking. Perhaps, as these functions can potentially increase efficiency and decrease time spent at the computer, although data are mixed on this finding, housestaff may have more time to spend with patients or develop a thorough plan and thus rate these functions positively.

Notably, housestaff and attendings had excellent agreement on the purposes of a progress note. They agreed that the 2 most important purposes were “communication with other providers” and “documenting important events and the plan for the day.” These are the 2 listed purposes that are most directly related to patient care. If future interventions to improve note quality require housestaff and attendings to significantly change their behavior, a focus on the impact on patient care might yield the best results.

There were several limitations in our study. Any study based on self-assessment is subject to bias. A previous meta-analysis and review described poor to moderate correlations between self-assessed and external measures of performance.^{24,25} The survey data were aggregated from 4 institutions despite somewhat different, though relatively high, response rates between the institutions. There could be a response bias; those who did not respond may have systematically different perceptions of note quality. It should be noted that the general demographics of the respondents reflected those of the housestaff and attendings at 4 academic centers. All 4 of the participating institutions adopted the Epic EHR within the last several years of the survey being administered, and perceptions of note quality may be biased depending on the prior system used (ie, change from handwritten to electronic vs electronic to other electronic system). In addition, the survey results reflect experience with only 1 EHR, and our results may not apply to other EHR vendors or institutions like the VA, which have a long-standing system in place. Last, we did not explore the impact of perceived note quality on the measured or perceived quality of care. One previous study found no direct correlation between note quality and clinical quality.²⁶

There are several future directions for research based on our findings. First, potential differences between housestaff and attending perceptions of note quality could be further teased apart by studying the perceptions of attendings on a nonteaching service who write their own daily progress notes. Second, housestaff perceptions on why copy forward and autopopulation may increase critical thinking could be explored further with more direct questioning. Finally, although our study captured only perceptions of note quality, validated tools could be used to objectively measure note quality; these measurements could then be compared to perception of note quality as well as clinical outcomes.

Given the prevalence and the apparent belief that the benefits of an EHR outweigh the hazards, institutions should embrace these innovations but take steps to mitigate the potential errors and problems associated with copy forward and autopopulation. The results of our study should help inform future interventions.

Acknowledgements

The authors acknowledge the contributions of Russell Leslie from the University of Iowa.

Disclosure: Nothing to report.

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