**Who Copies-and-Pastes in the Hospital? A Case Report Followed by Literature Review**

**Jane Zhao, MD, Olivia Plante, Jayson Schubbe, Mandip Panesar, MD**

**Background**

(The background is usually short and imparts only enough relevant information to allow the reader to dive into the study. The last paragraph of the background is a description of the study aims. You were challenged because I only asked you to write the background and discussion without a full understanding of the methods, results, and conclusion, so this is no fault of your own, more of an FYI for future writing.)

The Health Information Technology for Economic and Clinical Health (HITECH) Act, part of the American Recovery and Reinvestment Act of 2009, incentivized the use of the electronic medical record (EMR). The EMR made keeping track of patient care easier by eliminating messy handwriting and misplaced files, but the EMR unfortunately was not without consequences of its own. The EMR has created a subculture of shortcuts for healthcare professionals trying to strike the right balance between quality patient care and necessary documentation. Copy-and-paste has emerged as one such activity. At best, copy-and-paste is an effective workaround that cuts down on unnecessary documentation time, but at worst—which is only too often the case—copy-and-paste of incorrect information can perpetuate egregious errors within the system and compromise the health and wellbeing of patients.

The literature has a dearth of information on the extent of real time copy-and-paste activity that actually takes place within healthcare. This study describes the efforts at a single-site academic-affiliated hospital system that aimed to create an internal clinical decision support system to monitor and quantify copy-and-paste activity taking place by provider and specialty.

**Methods**

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The following steps are performed on a daily basis:

-          There is a job that runs and identifies all progress notes that were signed or amended the previous day. This will be the worklist of notes that will be reviewed by the algorithm. Typically this is between 1,000 and 2,000 notes daily.

-          Comparison is done on physician progress notes for a patient that were entered on consecutive days (including those that were entered by different providers). For example, a progress note entered on July 1st, 2017 will be compared to progress notes entered on June 30th, 2017 and July 2nd, 2017. The ECMC plagiarism algorithm uses a variation of Levenshtein distance (LD) to determine. Typically LD will determine the number of character differences between two strings. In the ECMC case, this was modified to determine the number of word differences as this made more sense based on the size of the progress notes being analyzed. This algorithm is applied to these two progress notes to determine the number of word differences. The results of the algorithm are stored in the ECMC data warehouse for reporting and analytics.

-          ECMC has a number of canned sections and text that are added to progress notes, including patient labs, vital signs, medications, etc. In order to more accurately check for plagiarism, these sections of the progress note are excluded from the algorithm as these would inflate the final plagiarism score.

-          From a reporting standpoint, simply indicating the number of word differences between two notes is not the best indicator for plagiarism. To make this value more user friendly, the Levenshtein distance result is converted into a score from 0 to 100, with 0 being two completely different notes, and 100 being two identical notes. The higher the score, the more similar the two notes are.

-          In reviewing the results of the algorithm, it was determined that notes with a plagiarism score of 99 or higher little to no changes, and that these would be considered plagiarized. Results between 90 and 98 were most likely plagiarism, but would require human intervention to review the progress notes to determine if the notes were truly the same. These reasons include the following:

o   Depending on the hospital service the patient was on, there may be no change in the patient’s condition, and this could lead to notes being very similar or identical. Services like behavioral health will not have much variation in patient condition from day-to-day like an acute patient would, and the scores for behavioral health notes tended to be higher on the plagiarism scale than others.

o   If the patient was ALC (alternate level of care) there may be no change in patient condition.

-          Focus of ECMC efforts were on those scores of 99 and greater as this required no human intervention to review the progress notes for plagiarism.

Brief explanation of how Levenshtein Distance works

Levenshtein distance is a measure of the similarity between two strings, which are referred to as the source string and the target string. The distance is the number of deletions, insertions, or substitutions required to transform the source string into the target string.

For example:

S = Source string

T = Target string

-          If S is "It is sunny outside." and T is " It is sunny outside.", then LD(S,T) = 0, because no transformations are needed. The strings are already identical.

-          If S is " It is sunny outside." and T is " It is cloudy outside today.", then LD(S,T) = 2, because of the following changes:

o   “sunny” is changed to “cloudy”

o   “today” is added at the end of the string

The higher the Levenshtein distance score the more different the two strings are.

**Results**

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*Stakeholders Affected by Copy-and-paste*

The premise behind the EMR is the conformity of the patient record to a national standard and thus interoperability not only between various specialties and healthcare facilities but also within a single practice. As a work-around for redundancies in this process, many physicians chose to copy-and-paste notes, use “self-populating” box checking software, “copy forwarding” in new blank notes, and “macros” or input templates that automatically input patient data from previous encounters[[1]](#footnote-9). One study has estimated that over 50% of EMR notes are actually copy-pasted[[2]](#footnote-10)[[3]](#footnote-11). Another study found that 84% of residents’ notes and 72% of attending physicians’ notes had at least 20% “cloned documentation”[[4]](#footnote-12). The practice of copy-and-pasting by providers within the EMR raises the risk of increased patient harm. For example, patients may not be getting a thorough line of questioning necessary for quality care if the provider decides to copy-and-paste medical documentation in lieu of updated status narratives.

However, beyond a simple leger for the doctor to record notes, the EMR is also a legal document as well as an insurance billing claim. The medicolegal implications of copy-and-pasting in documentation of clinical findings in patient notes have become a major area of contention. Copy-and-pasting contributes to the potential for listing a procedure that was not actually performed[[5]](#footnote-13). In fact, “patterns of over-coding” and reimbursement requests have gone up since the introduction of the EMR. Billing has consequently come under greater scrutiny by insurance companies, Medicare contractors, as well as state and federal government regulators.

*Arguments Against Copy-and-paste*

Justifiable legal and ethical concerns involved with copy-and-paste behavior include missed diagnosis, note bloat, continuation of erroneous data, pasting into the wrong patient chart, and other inconsistencies. Furthermore, the use of copy-and-paste by providers to meet documentation demands within the EMR has led to the unfortunate loss of the patient narrative[[6]](#footnote-15).

*Unsafe Patient Care*

Up to 2.6% of errors in one study were attributable to egregious copy-pasting[[7]](#footnote-16). In one example, a patient was diagnosed with atrial fibrillation by an emergency department and referred back to his primary care physician, who proceeded to copy-and-paste this emergency department visit over the next five years without ever diagnosing heart disease. The patient died of a heart attack and the physician was found liable. It was also found that copy-pasted lifestyle counseling in diabetic patients were significantly less effective in improving HgbA1c levels[[8]](#footnote-17). This type of practice can also lead to patient mistrust and ultimately less reliance on, and patient satisfaction with, the healthcare system. For example, a physician in one study began an encounter with the family of a comatose patient that had had surgery almost 6 weeks prior by stating that the surgery was very recent (2 days prior) simply because this was the note perpetuated in the EMR[[9]](#footnote-18). In another instance, an intern copy-and-pasted a note that read a patient needed an abscess drained and the OR when this had already been done. This note was copy-and-pasted several more times and almost led to a change in antibiotic regimen that was unnecessary[[10]](#footnote-19). In yet another potentially catastrophic example, a physician accidently transcribed a note copied from a different patient’s chart. His current pediatric renal failure patient thus received recommendations meant for a patient with staphylococcal cellulitis to receive vancomycin therapy rather than pulse dose. This caused a rise in creatinine and lengthy hospitalization time[[11]](#footnote-20).

*Perpetuation of False Information*

Copy-and-pasting can also lead to errors that harm the patients in other ways. In one instance a physician recalls an incident where a copy-and-paste error led a note say the patient had a history of breast cancer rather than a family history of breast cancer. This led to significant “nightmar[ish]”complications with the patient’s insurance company threatening to drop her from coverage for unreported medical issues. The ordeal finally took months to resolve[[12]](#footnote-21).

Copy-and-pasting has also perpetuated false information. For example, in the case of one chemotherapy patient with a history of pulmonary embolism, a note by one physician stated that the patient should receive heparin. However, heparin was never administered, but the note was copy-pasted by other providers over the duration of the patient’s stay for diarrhea and dehydration under the assumption that the note had been carried out. The patient had to be readmitted with an embolism after the initial discharge[[13]](#footnote-22). In another example, an infant was admitted to the ER with a fever and rash. The original physician marked TB exposure negative on the EMR which was copy-and-pasted in subsequent physician encounters despite recent travel to a TB endemic area. The infant was two weeks diagnosed with TB, suffering irreparable complications[[14]](#footnote-23).

*Note Bloat*

In many instances, copy-and-paste also leads to note bloat. Notes are virally propagated as they get copy-and-pasted over and over again in a patients record even if they are no longer relevant or were wrong to begin with. This disorganized, superfluous mess may mask important concerns and waste provider and patient time as the physicians gets lost in the text searching for pertinent historical data. This is a particular concern in the elderly population, veterans, or immunocompromised who may be on a large list of medications and have accumulated many conditions and procedures. Note bloat then perpetuates structural violence on vulnerable populations.

*Billing*

Copy-and-paste also in many instances has created significant legal trouble for physicians. In one example from 2016, an orthopedic clinic was found guilty of violating the Civil Monetary Penalties Law by the Office of the Inspector General (OIG) of fraudulent billing after a physician billed for a prior physician’s services and copy-and-pasted the initial admitting history and physician examination without ever creating his own clinical notes[[15]](#footnote-24). He was required to pay almost $50,000 in damages. In another instance, a Cardiology group was charged $423,000 by OIG for presenting cloned and fraudulent claims to Medicare and failing to generate distinct patient progress notes[[16]](#footnote-25).

*Arguments In Favor of Copy-and-Paste*

Studies have examined how mandatory EHR use has led to physicians dedicating significantly more time on documentation compared to actual patient care. According to an *Annals of Internal Medicine* study, half of physicians’ time is spent writing the EHR. Further, physicians were found to work an average of 1.5 hours after office hours in order to complete notes, contributing to an already troublesome trend of burn-out[[17]](#footnote-26). Another study found corollary results that physicians using EHR spent roughly 1/3 of their time with patients in the exam room facing a computer screen. This is in contrast to only 9% of the time not looking at patients when physicians are using paper records[[18]](#footnote-27). Certainly, this has consequences for clinical assessment as electronic documentation is distracting and takes a lot of time away from physical examination. It was found that a higher clinical gaze time at patients was correlated to higher patient satisfaction[[19]](#footnote-28). The extra workload has providers and patients frustrated, turning “provider into box checkers” and leaving little room for ingenuity[[20]](#footnote-29). The EHRs have been developed to the satisfaction of insurance companies and government regulators as opposed to practitioners. One study found that even prescription writing and lab ordering was reduced in favor of more computer chart input time for preventative care and chronic disease management[[21]](#footnote-30).

On the other hand, instances exist in which copy-and-paste is an effective tool in light of these EHR complications for maximizing the quality and time spent on clinical care. Under clear standards and provider education as well as constant monitoring, there are appropriate uses for the copy-and-paste functionality. It is beneficial to patient care in that improves the efficiency and timeliness of data input for physicians, maintains a continuity and consistency of the patient record for enhanced decision making, and makes the document more complete while still being legible[[22]](#footnote-31). That being said, a cost benefit analysis should be individually weighed by the physicians as to the extent copy-and-paste is prudently used. Education can help providers analyze how to best avoid fraudulent and dangerous use of the function. This demands cooperation between healthcare providers and regulatory bodies to come up with “best practice” standards for copy-and-paste or other solutions such as linking text that would otherwise be copy-and-paste. Some common sense solutions include editing out redundant notes after they have been copy-and-pasted and avoiding copy-forwarding from other people’s notes or in the HPI, review of systems, physical exam or assessment and plan sections[[23]](#footnote-32). Further, if functions were created that allow copied material to be easily identified then this could help stymie misuse. When copy-pasting or “selective editing” does occur, the original source (author and time) of the note text should be identified within the new note such that an accurate string of provenance is created. Additionally handwritten notes can be a good source of backup data and indeed appear to be widely used already[[24]](#footnote-33).

As some have noted, the EHR is not meant to be a “creative writing exercise”. There are standards of the report that must be adhered to even if they seem like plagiarism. An example of this type of notation with vital signs such as “heart rate was regular rate and rhythm” or “pupils equally round and reactive to light”[[25]](#footnote-34).

Despite concerns, copy-and-pasting may actually lend itself to safer, consistent patient care. The majority of copy-and-paste practicing physicians agree that the overall documentation process was enhanced in terms of liability and overall communication of a patient’s daily progress[[26]](#footnote-35). For instance, if a patient forgets a medication allergy or an old procedure, the physician can easily find that this history has followed the patient in a consistent manner through the copy-and-paste function from prior notes. Given the comorbidity of many healthcare issues, this ‘running tab’ makes patient care more comprehensive and thus safer[[27]](#footnote-36). Also, given the fact that patients are now seen by more diverse specialties in a single hospital stay, having an easily updatable and consistent patient record is of utmost importance[[28]](#footnote-37).

Further, better documentation does not necessarily translate to better patient care because in certain situations, providers know what is appropriate to document…..?

*Copy and Paste, Merely a Symptom of Underlying Barriers to Effective Workflow*

According to one study, only 19% of physicians felt that the copy-and-paste function created negative issues in healthcare, despite their awareness of common mistakes it may potentially cause[[29]](#footnote-38). In fact, 80% believed that the practice should be continued. There are several hypothesis regarding the etiology of copy-and-paste behaviors. One is that providers are unware they are plagiarizing, especially if it is a note authored by themselves or a colleague. Over half of respondents in one study believed that copy-and-pasting actually improved the process.

However, there is a noted discrepancy in the views held by physicians and offices of billing compliance and legal affairs, which deserves more attention in further studies[[30]](#footnote-39). It is crucial to gain perspective on documentation motivations of various providers who copy-and-paste. For example. attending physicians are more focused on avoiding liability and justifying billing. The residents, naïve to the pains of giving a legal deposition, may view the EHR as more of a low-level chore and are more focused on the clinical care[[31]](#footnote-40).

In fact, the excessive use of copy-and-pasting may highlight underlying workflow issues. This is especially true in the case of the training environment. The most common copy-pasters are interns, followed by residents. Residents were found to be three times more likely to copy-and-paste then faculty physicians. Most of the copying came from admissions notes, with originally declining as the hospital stay continues[[32]](#footnote-41). There are time limitations for these populations who also have, for example, their day filled with performing surgical services and academic responsibilities including conferences. Requirements of electronic documentation have actually imposed greater time constraints on already taxed physicians. This is partially due to the fact many EMR stations are not portable and thus documentation may not occur at the patient’s bedside[[33]](#footnote-42). The fact that many providers reported keeping a written backup of notes they carried with them shows inefficiencies and room for improvement in this system.

Another issue is the overload of patients such that there is not enough time to properly see patients and attend to details of filling out time consuming EHRs. Residents and physicians now have to fit more patient care into a shorter time given restrictions in residency hours.[[34]](#footnote-43) At the same time, there is a growing structural burden placed on primary care physicians and hospitalists[[35]](#footnote-44).

Alternatively, some physicians may use the function to distance themselves or take a more ‘hands-off’ approach. The physician may not want to cause distress if their finding of a physical exam is actually unchanged to a prior exam and thus copy-paste is used for consistency sake.

Ultimately, the very type of behavior that copy-represents has always existed in medicine. The EMR has simply made it more visible. In fact, when analyzing VA medical records between the years 1990-2002, it was found that up to 20% of patient notes and 3% of physical exam findings were hand copied from prior notes[[36]](#footnote-45).

**Conclusion**

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*Strengths*

*Limitations*

*Future Directions*

: now that can quantify where copy and paste activity takes place we an quantify how much of each type of copy and paste activity takes place

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