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Patient Safety Tip of the Week

August 29, 2023 The Perils of Copy and Paste

Copy and paste. Yes, we all do it. In fact, we are doing it much more frequently. A recent study looking at "bloat" in the electronic medical record (EMR) found that the size of clinicians' notes increased 8.1% from 2020 to 2023 (Bartelt 2023). Yet, they reduced their average time of 5.4 minutes spent on each note to 4.8 minutes per note during the same period. So, how did they do that? They found that organizations which increased note length saw **increased use of copy/paste functions**. Also, a previous study on over 100 million notes in the EMR from the University of Pennsylvania Medical Center (Steinkamp 2022) found that more than half of the text was duplicated. Duplicate content was prevalent in notes written by physicians at all levels of training, nurses, and therapists and was evenly divided between intra-author and inter-author duplication. The duplication fraction increased year-over-year, from 33.0% for notes written in 2015 to 54.2% for notes written in 2020. Of the text duplicated, 54.1% came from text written by the same author, whereas 45.9% was duplicated from a different author. Records with more notes had more total duplicate text, approaching 60%.

Our September 15, 2009 Patient Safety Tip of the Week "ETTO's: Efficiency-Thoroughness Trade-Offs" discussed efficiency-thoroughness trade-offs or ETTO's. That concept, best associated with Erik Hollnagel (Hollnagel 2009), is well known to everyone in the human factors and safety fields. Basically, the ETTO concept means there are certain procedures and practices that we do which make our work more efficient but at the risk we may compromise thoroughness or safety. Hollnagel, in his book, notes that such things usually go right but occasionally go wrong. A classic example of an ETTO is the "copy and paste" function that we all know well from our word processors and spread sheets. Copy and paste functionality is also widely used in electronic medical records. It allows us to easily input a large amount of text, images, etc. into one part of an EHR without having to type in all the details. This can be a huge timesaver.

But there are times when "copy and paste" can go wrong. While copy & paste may improve efficiency of clinicians, it is a patient safety issue because it increases the likelihood of erroneous information that may negatively impact a patient's care. Several of our columns have noted that copy/paste led to patients being continued or restarted on medications that had actually been discontinued.

We know of no comprehensive study on the adverse consequences of copy & paste. Most examples come from individual case studies or anecdotal reports. In a study of diagnostic errors in primary care in the VA health system, Singh et al. (Singh 2013) noted that practitioners copied and pasted previous progress notes into the index visit note in 7.4% of cases and, of these cases, copying and pasting mistakes were determined to contribute to more than one-third (35.7%) of errors.

Our February 28, 2017 Patient Safety Tip of the Week "The Copy and Paste ETTO" reminds us how the copy/paste function in today's healthcare IT systems can lead to erroneous medication lists that might result in a patient being inappropriately restarted on a medication that had actually been discontinued. In our September 24, 2019 Patient Safety Tip of the Week "EHR-related Malpractice Claims" we noted that copy & paste errors often led to medication errors, sometimes copying over a medication that had been discontinued since the prior note, and sometimes failing to include a medication that had been started since the prior note.

In a more recent column (August 15, 2023 Patient Safety Tip of the Week "Problems with Newer Diabetes Drugs") we noted that ISMP Canada (ISMP Canada 2023) found the "copy and paste" issue to be problematic because frequent adjustments of diabetes drugs are common. These may include dose modifications, addition of an agent from a different medication class, or a switch in medications. A pharmacist or a prescriber may copy a prior order, intending to alter the dose after pasting into a new order but then forgetting to make that change. ISMP Canada therefore recommends limiting the "copy" function to prescriptions that are **unchanged** from the previous prescriptions.

There are also instances where an inaccurate piece of information may get deleted (or more properly amended with appropriate attribution) from the medical record but someone copies and pastes that item from a prior part of the medical record, thus perpetuating the erroneous information. A good example is when the record says a patient is allergic to a certain antibiotic but that later gets amended when a physician realizes there was no true allergy. If the original note noting the "allergy" gets copied and pasted, the patient may be deprived of a most appropriate antibiotic in the future.

Sandeep Jauhar (Jauhar 2023) recently wrote that he took care of a patient whose medical records included multiple notes about her past open-heart surgery. The only problem was that she had never undergone open-heart surgery! He notes that would have been obvious if the authors of those notes "had taken the time to notice that she had no scars on her chest or breastbone. She was being prepared for an invasive procedure based on this misinformation when the true facts of her condition were revealed and the procedure canceled — though by then the false information had virally propagated through the chart and into multiple notes, becoming "chart lore."

Hersh (Hersh 2007) described a case of a woman with cancer and a history of pulmonary embolism following hip surgery. She was admitted for diarrhea and dehydration after completing her fifth cycle of chemotherapy for ovarian cancer and was given intravenous fluids. The intern's admitting note also stated that the patient would receive subcutaneous

heparin for venous thromboembolism (VTE) prophylaxis, although this was never actually ordered. The patient's care was transferred to a different team the following day, and the accepting intern copied and pasted the plans of the admitting intern into the new note within the electronic health record (EHR). The same note was then copied and pasted on 4 consecutive hospital days and cosigned by the resident and attending, and the patient was ultimately discharged having never received the intended VTE prophylaxis—despite each day's note stating this as part of the plan. Two days following discharge, the patient developed acute shortness of breath and hypoxia and returned to the hospital, where she was diagnosed with a pulmonary embolus. Only at this admission, and after careful review of the medication record from the previous hospitalization, was it realized that the patient never received any VTE prophylaxis.

Hersh appropriately notes that copying and pasting of patient information has probably been occurring since the beginning of recorded medical information. It's just that EHR's make copying and pasting very easy. He stresses that, when copying and pasting is done, the physician should be careful to attribute the source and to check that the information being pasted is not erroneous or out of date.

CRICO, the medical malpractice insurance carrier, notes "Overall, copy and paste as a contributing factor in a malpractice case is rare. However, when it does come up in a case, it tends to be a factor in which we close more of those cases with payment than without it." (CRICO 2023). CRICO found that, over a recent five-year period, malpractice cases with an electronic health record user issue closed with a payment to the plaintiff about 23 percent more often than cases without an EHR user issue. And the ones that feature copy and paste issues are about 18 percent more likely to close with payment than other EHR cases.

The copy & paste issue also caught the attention of the Joint Commission. The Joint Commission (TJC 2021) notes that "use of the copy-and-paste function (CPF) in health care provider's clinical documentation improves efficiencies, however CPF can promote note bloat, internal inconsistencies, error propagation, and documentation in the wrong patient chart, potentially putting patients at risk."

A workgroup convened by the Partnership for Health IT Patient Safety conducted a literature review that identified 51 publications; one study of diagnostic errors found that CPF led to 2.6% of errors in which a missed diagnosis required patients to seek additional unplanned care. The workgroup found several case reports of clinical harm related to CPF, including a patient who died from a heart attack after his primary care physician failed to diagnose cardiac disease. Two years prior, the patient was discharged from the emergency department after a new diagnosis of atrial fibrillation and potential heart disease; he was instructed to follow up with his PCP for a stress test. The PCP copied and pasted the Assessment and Plan (A/P) section of the patient's record for 12 office visits during the next two years, updating the A/P or reviewing medical entries from the ED or other department. The PCP was found liable in the death.

The Joint Commission identified several Safety Actions to consider:

All organizations that use EHRs should be aware of the potential risks of the CPF and collaborate with their health care providers to ensure this tool does not lead to unintended consequences that may result in patient harm. There are actions that health care organizations can take to help prevent copy-and-paste errors in EHRs, including the following recommendations from the Partnership for Health IT Patient Safety workgroup and the American Health Information Management Association:

- Provide a mechanism to make copy-and-paste material easily identifiable. This enables the health care provider to review, confirm and validate the copied material. Some suggested modifications to make copied material more visible include altering font color, highlighting copied text, or linking between different documents. Note: This will require new software functionality.
- Ensure that the provenance of copy-and-paste material is readily available. Having the source, context, author, time, and date of the source information facilitates the ability to verify the accuracy, applicability, reliability, and timeliness of the documentation. Information could be displayed by hover notification, a split screen, hypertext, or separate log files.
- Ensure adequate staff training and education regarding the appropriate and safe use of CPF. Outlining proper procedures for copying and pasting information can standardize the process to ensure staff is following appropriate and best practice guidelines and facilitate regulatory compliance. Encourage users to avoid workarounds to bypass policy and technological limits placed on the copy-and-paste functionality.
- Ensure that copy-and-paste practices are regularly monitored, measured, and assessed. Monitoring will help ensure that the identified solutions are appropriate and effective. Note: Such capabilities are likely to require software and potentially hardware modifications. Include a feedback loop to inform health care providers when their documentation is not accurate or is overly redundant.
- Develop policies and procedures addressing the proper use of the CPF to assure compliance with governmental, regulatory and industry standards. Also provide clarity on what is permissible to copy, when CPF should never be allowed, and consequences for violations. The Partnership for Health IT Patient Safety workgroup solicited insights from experts who agreed that information should never be copied in certain contexts, including signature lines, copying between different charts, and any information that has not been read and edited.
- Address the use of features such as copy and paste in the organization’s information governance processes.
- Provide comprehensive training and education on proper use of copy and paste to all EHR system users.
- Monitor compliance and enforce policies and procedures regarding use of copy and paste, and institute corrective action as needed.

In addition, the following recommendations from The Joint Commission can further support the safe use of the CPF in EHRs:

- Monitor compliance by beginning a focused and ongoing professional performance evaluation (OPPE) with specific triggers and measures related to the accuracy of the clinical record.

- Maintain robust quality review process(es) in which all cases of potential misuse or error due to CPF are evaluated consistently and comprehensively to identify opportunities for improvement in patient safety.

ECRI (ECRI 2015) did a nice job of trying to determine the frequency of copy and paste in the EHR. They note that reported rates vary depending upon the definitions used, the venue, and the method used to detect copy and paste, but probably 90% of physicians use copy & past in the EMR. The ECRI study also found that nearly all aspects of the medical note have been subject to copy/paste, including chief complaint, history of present illness, past medical history, review of systems, physical exam, medications, lab and radiology results, assessment, plan, etc. The ECRI study also noted that many, if not most, physicians recognize that errors might be made through copy/pasted. Physicians also agreed that frequent copy/pasting can result in notes that are less accurate, lengthier, and less organized and felt copy/paste facilitated generation of progress notes that were more likely to contain outdated or inconsistent information. However, in keeping with the concept of ETTO's, they also noted that copy/paste had important benefits like a "more trustworthy" medical note, improved documentation of the patient's hospital course, documentation for legal purposes, and documentation for billing. The ECRI study also noted the following factors that contribute to problems related to copy/paste: time constraints, documentation requirements (for billing, quality, etc.), limitations in EHR design that may incentivize poor use of copy/paste, and the movement to use the EHR to capture "structured" data that can be readily analyzed.

The ECRI study noted four problems arising from copy & paste:

- Introduction of new inaccuracies, including wrong patient/patient identification errors
- Propagation of inaccurate information
- Internal inconsistency of notes and information
- Note "bloat"

The ECRI study has numerous recommendations, including:

- Authors of notes must be able to vouch for the information's accuracy, whether they have copied their own note or someone else's
- Acknowledgement of or attribution to the original source of the information (particularly when copying from someone else)
- Strive for brevity
- Recognize that copy/paste may acceptable for certain portions of the note, but perhaps forbidden for others.

Some items that should not be copied include medical student notes or the history of present illness. Also not to be copied from another provider's notes are history of present illness, review of systems, physical examination, assessment, and plan. But some sections such as past medical history, family history, and social history might be amenable to a "copy-forward" approach with modifications after the author confirmed the accuracy with the patient.

We would even challenge the concept that copy & paste increases efficiency. Yes, it certainly saves time for the person entering the data. But, as pointed out by Steinkamp et al. (Steinkamp 2022), it "increases the time required for the reading clinician attempting to discern which information is accurate and timely vs false or irrelevant. Overworked clinicians may be disincentivized from reading such a **bloated record**, missing valuable clinical context not easily found elsewhere (eg, reasons for past diagnostic or therapeutic decisions), and leading to wasted time repeating past interventions or directly causing patient harm by missing findings requiring follow-up." They further note that rampant duplication creates viral copies of errata that can spread through a record until they are impossible to correct because of the number of copies and the inability to mark information as erroneous.

Quite frankly, the copy & paste issue is a good reason that patients should review their own electronic medical records. We don't doubt that a not insignificant portion of them may find erroneous information in their records that originated from copy & paste errors.

So, what are the **potential solutions?** Complete elimination of the copy & paste function is not a practical option, nor a desirable one. Another would be to flag any copy & paste attempt with a message telling the user to verify the content. That is also not practical, since it undoubtedly would lead to alert fatigue.

Any solution is likely to come from the artificial intelligence (AI) realm. In fact, a study from China (Cheng 2022) successfully restricted use of copy and paste in the EMR. They used electronic tools to detect word template similarities between clinical notes to identify those copied and pasted from previous visit notes. After developing an institutional policy, they set a threshold for determining whether a progress note was copied and pasted at 70% similarity to previous documents (using natural language programming and text mining) to determine the similarity. If the similarity was more than 70%, the computer would not save the progress note, similar to a plagiarism detection checker.

The prevalence of copying and pasting was significantly reduced, from 35.72±5.53% to 23.71±6.9% (P=.001), after monitoring. The prevalence of copying and pasting initially showed a decreasing trend for 11 months, followed by a short period of a significantly increasing trend and then stability after the restriction of copying and pasting.

The 14-day readmission rate, length of stay and inpatient mortality rate were evaluated to measure healthcare quality. The overall rate of readmission for the same disease within 14 days was reduced from 3.46±0.43% to 1.5±1.03% (P<.001). The rate of discharge summary note completion within 3 days decreased from 93.73±1.39% to 91.77±1.67% (P=.011) after monitoring. However, the length of stay and inpatient mortality were not significantly different. The rate of readmission for the same disease within 14 days was found to be related to the prevalence of copying and pasting in our study, with a 1-month lag.

We'd have likely chosen much different quality indicators to track (eg. number of times an incorrect medication appeared in notes), measures of "bloat" (eg. average note size), measures of efficiency (time to note completion), and some measure of clinician satisfaction.

But the key point here is that there was an effective way to restrict use of the copy & paste function. They basically found that the prevalence of copied-and-pasted text was about 40% before the restriction and decreased to less than 20% each year after the restriction policy was implemented. We'll leave it up to the IT experts to figure out ways we can use natural language programming, text mining, and artificial intelligence to reduce overall use of copy & paste in the EMR.

*The author of today's column (BTT) acknowledges that copy & paste undoubtedly contributed to "column bloat". Thank goodness this is not a note in an EMR!!!!

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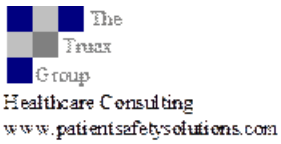

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