

EDITORIAL AND COMMENT

Clinical Thinking via Electronic Note Templates: Who Benefits?



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The origin of physicians' documentation of encounters with patients is obscure, but in 1902, Bostonian physician Richard Cabot published *Exercises in Differential Diagnosis*.¹ Cabot was the first to systematize his written diagnostic impressions of what was colloquially considered to be, "notes to self," and put them into a diagnostic framework. Seven decades later, medical educator Lawrence Weed invented the now familiar "Subjective, Objective, Assessment and Plan" (SOAP) approach to organizing information in the medical record. Another quarter of a decade would pass before electronic health records (EHRs) would become widely adopted, and clinical information would be organized primarily for billing and other administrative management. Along with this development, and as a way of streamlining record keeping, standardized templates were incorporated into the computer software, and health professionals could use note templates to build documentation in the medical record.

As useful as templates might be, they also introduced challenges in terms of workflow, accuracy, and completeness of notes. Workflows associated with documentation and review of medical records have increased workloads for physicians as well as other types of clinicians. As a result, clinicians' working at home or after hours has become a common trend.² The lack of sufficient documentation time during a clinical shift or session can adversely affect note accuracy and completion, and is contributing to physician stress and burnout.³ In addition, templates may have fields for structured data entry that are not relevant but are required for the note to be completed. This could lead to inaccuracies in documentation. When reviewing EHRs, physicians have complained about "note bloat" or too much information, accompanied by requirements

for excessive scrolling.⁴ The increasing use of templated notes has extended concerns that the templates do not always aid clinical decision-making and care delivery.⁵

In this issue, Epstein et al. reported a randomized clinical simulation process to compare the perceived note quality of notes using a new note template to notes using a "standard" template.⁶ The new template moves the assessment and plan towards the top of the note, and streamlines other sections. The investigators then created a simulated clinical encounter that was documented by PGY 1-3 internal medicine residents. The residents evaluated the template using a short questionnaire. To assess the templates' impact on note quality, faculty reviewers used the PDQI-9,⁷ a validated assessment tool. On average, residents rated the new note template as more visually appealing and less cluttered. Faculty reviewers rated the note types as equivalent in overall quality but rated the notes using the new template as inferior in accuracy and usefulness, despite improved organization. Although notes with the new template were shorter, completion time was about the same. The study exemplifies rigorous assessment in considering the most immediate impressions and effects of structural changes to clinical documentation.

While meeting administrative requirements, note templates should align with documenting clinicians' workflow and thought processes. Design decisions about templates should be based not only on administrative requirements but also on workflow dynamics, clinicians' preferences, expectations for quality of care, and information needed to support clinical decision-making. Although Epstein's randomized study starts to help us understand effects of a few design features, we will ultimately need more granular evidence. In addition, one template might not fit all: even within one medical specialty, a variety of encounter types may warrant a variety of note types that reflect different ways of processing and filtering information.

To address variations in thought, writing style, and types of encounters, more usability testing will need to be done, to determine the extent to which note templates aid effectiveness or efficiency of care. A related limitation of Epstein's study is that, although residents generated the notes, the PDQI-based quality of their notes was not assessed by any other residents.

This addition might have helped in understanding whether residents and faculty view notes differently. Nonetheless, including the residents' evaluation of the template was a step in the right direction. While PGY 1-3 residents might not have sufficient clinical experience to represent most healthcare providers, their feedback provided insight into how the new template's usability was perceived among trainees. An important item in their assessment was the note template's ability to capture participants' thoughts. A "think aloud" process could be added to complement the Likert scales, to enhance the capture of details of participants' thought throughout the documentation process.⁸ An additional methodological challenge at hand is the difference in experience using standard vs. new templates. On average, we would expect newer and less familiar procedures to require more time. As noted by the authors, this might account for some of the findings about note completion time in the study, especially because training and experience with the SOAP format begins in medical school. Investigators of new systems or processes can leverage the limited experience by studying learnability, to determine how easy it is to learn and use a tool without training.

To improve assessment of note quality, proposed methods and tools should evaluate content and content characteristics. This may require multiple methods or adapted tools. For pedagogical purposes, the creators of the PDQI-9 advised that it be used as a part of a three-phase evaluation that assesses the total score of a note, followed by a review of the item-specific scores, and a separate assessment of the amount of text pasting used to generate the note.⁷ With real encounters, the sort of "copy-forwarding" that the authors noted may profoundly affect note quality. The most rigorous studies of notes will include measures of these activities, as well as detailed attention to understanding the expectations about a note's content. Methodological innovations, such as adapting or combining tools that currently focus on different dimensions of documentation, and using natural language processing to assess thousands or millions of notes instead of dozens, may yield valid ways to add more detailed content assessments to studies of documentation.

Regarding note templates and notes, assessment of utility requires more investigation. In the 1980s and 1990s, physicians' notes became a focus for assessing and managing care quality. Peer reviewers could compare a physician's notes to known standards for diagnosis and treatment.⁹ The comparisons, however, were limited in large measure to assessing clinical decisions about biomedical diseases. Absent from literature about this was assessment for understanding significant psychological or social concerns raised by patients during their encounters. Moving forward, assessing the utility of note templates for documenting both biomedical and psychosocial concerns will be important.

Approaches to improve utility of notes should also consider advanced capabilities of information technology afforded by EHRs. Notes produced from note templates need not be a

static rendition of the information captured. Advancements in information interaction and visualizations have demonstrated potential enhancements to note utility.¹⁰ Without altering the historical document, future interfaces could be used interactively to transform the rich and important information in notes into customized information displays that support clinical and administrative decision-making by various health professionals, according to their roles and needs.

Notes have evolved, from "notes to self," to a primary source of care assessment for reimbursement, interpersonal communication among clinicians, and shared decision-making with patients. The need for understanding the relationship between building the note and making a clinical decision remains unmet. Clinicians of all experience levels continue to experience the phenomenon of making important decisions about diagnosis and treatment that occur by way of writing the note itself: as writing is a dynamic process whereby new sentences lead to new thoughts, crafting a clinical note is not just a result of decision-making, but is an integral part of decision-making itself. Organizing and documenting an array of clinical information can lead directly to a differential diagnosis and new plan of care. In asking the writer to move the assessment to the top of the note, Epstein et al. have informed us that organization and redundancy seem to benefit, but possibly at the expense of accuracy and usefulness, which are, one could argue, more important. Future research should consider integrating human factors engineering to understand how leveraging EHR capabilities during documentation and review of notes can reduce clinicians' burden and likelihood of human error. Issues that remain to be addressed are who really benefits from documentation and how, how templates and documentation can be designed to help both writers and readers while decreasing time requirements for both, and how documentation can be leveraged even more effectively to improve the lives of patients.

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Compliance with Ethical Standards:

Conflict of Interest: The authors declare that they do not have a conflict of interest.

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