Evaluating the Impact of Structured Text and Templates in Ambulatory Nursing

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This evaluation looks at the use of templates for entering structured text nursing notes that generate both a legal text note that is the chart record and an underlying coded form of the note to support analysis and research This study reflects the first phase of a prototype project of an integrated, computerized health record. Templates are notes that have been prewritten using a standard clinical vocabulary. Templates can be used as the basis of a new clinical note and can be either signed unchanged or modified to represent variations in clinical presentation. The prototype setting is a Primary Care clinic where both physicians and nurses are using the computer to enter clinical notes. In the prototype clinic team, nursing utilized the CPR for 100% of all documentation from day one. Use of templates was found to be the most frequent method of initiating a note.

BACKGROUND

The challenge of motivating clinicians to enter their observations, assessments and plans directly into a computer is one of the biggest barriers to full realization of the benefits of automated clinical information systems. Although many software systems are available to clinicians, it is difficult for software vendors to adequately address the multiple requirements for documentation in the clinical environment. The GAO[1] describes intertwined administrative, financial and clinical requirements in the areas of Quality Assurance, information for consumers and providers, cost containment, and planning and policy development. Barry and Gibbons[2] conclude that health care information systems can improve both the quality and the cost effectiveness of care and enhance the morale of those rendering that care. Dayhoff et al[3] state that clinician data capture will improve the quality of data for both clinical care and billing because it is done by the person who knows the most about it. In reality, while the benefits seem clearly established, the tools required to meet the needs are not.

Graves et al[4] discuss the need for active involvement of nurses in the design of clinical information systems if those systems are expected to meet nursing needs in the clinical setting. McCloskey and Bulechek[5] stress the need to support nursing's contribution to patient care as a key component in information system and database design, and Sorentino[6] states that it is critical that nursing be involved in the early decision stages of system implementation. Systems must provide the flexibility to support different practice models and diverse care settings. In developing a decision support system for HIV disease, Musen, Wieckert et al[7] found that " the development of even a small-scale controlled terminology requires intensive participatory design, a well-defined semantic framework, and careful attention to the clinical practice in which that terminology will be used".

As we look at designing and implementing methods that make it easier to capture information, we must ask ourselves, "will this really allow nurses to spend more time in delivering care and, more importantly, will it positively influence the quality of that care?" Ozbolt[8] states that as the burdens of documenting and communicating are streamlined, nurses will have the opportunity and the obligation to consider more and more relevant data in making judgments for patient care. Incorporated in this outlook is the proposal that nursing be able to define itself and its task in a unified language in coordination with overall efforts to develop a systematized clinical terminology. The importance of developing standardized vocabularies that would support nursing practice and retrieval of data to demonstrate the effects of nursing care on outcomes has also been identified by other authors.[9-12]

While design efforts continue to address the needs of clinicians for documentation in the automated environment, ultimately it will be the successful use of software tools by clinicians that propel us forward toward the reality of a full Computer-based Patient Record (CPR) and its benefits to both the patient and the caregiver.

Project Background and Setting

The Kaiser Permanente Southern California Region has identified the need to implement a computerized health record as a strategic imperative to effectively manage the health care of its approximately 2.1 million members. This integrated health care environment includes overall 32,000 employees, of which there are 2700 physicians, and 6300 nurses located at 10 medical centers and 90 clinics. The strategy for achieving this goal is to engage in an iterative prototype process that will provide the foundation for managing the diverse information needs of the organization. On a region wide basis the design of the CPR is ultimately combined with an extensive agenda of organizational goals.

The entry of clinical notes into the computer system through the use of a standard clinical vocabulary has been identified as a key requirement in meeting this goal. This must be achieved with a process that:
1. Supports and promotes the use of structured text in generating clinical notes.
2. Facilitates effective and efficient clinical practice.
3. Meets the organizational need to support analysis of information for outcomes measurements, development of clinical practice guidelines, decision support, and best practices implementation in carrying out the mission of providing high quality, cost effective health care.

The need to capture information on a member population with diverse health care requirements resulted in prototyping beginning in a Primary Care clinic setting. In this setting the clinical users of the system include: three Physicians, a Physician Assistant, a Registered Nurse, four Licensed Vocational Nurses, and a Trained Clinic Assistant.

In this system evaluation we address four questions:
1. Was nursing able to use the *software* in a way that supported its integration into daily practice? How could nursing practice in the clinic environment be supported through the use of *templates* as a documentation methodology ?
2. What are the implications of nursing participation in the template development process ?
3. After seven months of using template documentation, which specific areas of nursing practice within the clinic were impacted ?
4. Is there evidence that CPR templates can live up to the claims and hopes that they provide a powerful new tool to improve quality and continuity of care ?

WHAT ARE TEMPLATES AND HOW ARE THEY USED

Through a variety of software tools that support the documentation of care, users are given access to a standard clinical vocabulary. Using these tools the text of clinical notes is generated in both a legal text form that is the chart record and an underlying coded form to support analysis and research. The clinical users are offered different options in the creation of notes in order to facilitate the documentation process. One of these options involves the use of templates.

Templates can be thought of as prewritten notes that are iterative. They are developed using the same tools that would be used to create a note. Once the note is complete it can be saved as a template, stored in the system, and then can be called upon at will as the basis of a new note. When a template is selected as the beginning of a new note it can then be edited, or added to, to reflect the presenting situation. Options are available to create libraries of templated notes at either an individual user level, a departmental level or at an institutional level, making this type of template available to all users.

HOW TEMPLATES WERE DEVELOPED

In examining the implications of nursing participation in the template development process we looked at each step of template development. Prior to implementation of the computer system in the clinic, nursing staff were trained on the overall CPR software and introduced to template concepts, the use of templates, and were trained in their role in the iterative prototyping process. Then they collaboratively developed a library of templates to support documentation of their most common areas of practice.

The Prototype Lab training introduced all of the nurses to the concepts of templating and the various ways to construct and make use of templates. The nurses met informally, prior to a formal nursing template building session, to brainstorm a list of their most frequent documentation needs for nursing interventions and patient teaching. They also identified existing standards to use in template development, for example locations for injections and identification of injections by interval within the immunization series. Existing resources for template development including policy and procedure manuals, protocols and other relevant guidelines were identified and referenced.

The team for creating templates involved cross-organizational collaboration among nurses from ambulatory and inpatient clinical environments and the software developers. Participating were the lead nurse from the prototype clinic, the Department Administrator from Internal Medicine, the Associate Nursing Division Director for the Medical Centers hospital (also the co-chair of the steering committee for the prototype project), the project manager for the software company, and one of the software company's clinical content developers. All of the participants are Registered Nurses. By involving nursing principals in the conceptualization of nursing template building in the first clinical setting of the project, the team is poised for the extension of the Computer-based Patient Record into a second ambulatory clinic and, after that, into the inpatient environment.

The nursing template building session was held during the final week of prototype lab training, three weeks before the "go-live" date. The session consisted of:

- Agreeing on a conceptual approach to designing templates.
- Identification of template naming conventions.
- Template content decisions e.g. if 80% of the time injections are given in the right arm, right arm was the location used in the template.
- Identification of locations for storing templates.
- Building the templates.

The core set of templates were stored in the computer system database, and were also disseminated by hard copy to the nursing staff for review.

To evaluate the templates that were built, a template review session was conducted with the nursing staff the week before the "go-live" date. This served three purposes:
1. To evaluate the templates themselves.
2. To evaluate their usability and intuitiveness.
3. To consolidate learning before "go-live".

The review session helped to "de-bug" the initial templates. As a result, modifications were made and templates were improved. We designed the initial template library to anticipate expansion in practice. This session served as an important and purposeful update between the end of the training program and the introduction of the software into actual clinical use. Template review was a crucial step in the shift from training to new habits of working. The reviewed templates were then available for use once the transition from paper notes to computerized entry occurred.

Nursing used the software for all notes from the first day the system was implemented. The development group believes that this success can be directly attributed to the involvement of the nurses who were going to use the system in the design of their documentation tools. New templates were created as needs were identified in practice. The nurses create their own "individual" templates, try them out, and then share them through having them promoted as "institutional" templates making them available to all system users.

IMPACT OF USE

Over the seven months of system use nursing practice was supported by the use of templates in the following ways:

1. Improved consistency in documentation.
2. Improved quality of note content.
3. Increase in the efficiency with which the nursing staff completes its documentation.
4. Improvement in compliance with policies, standards of care, and clinical guidelines in practice and documentation, in that templates serve as built-in reminders.

The nursing staff identified four areas in which the use of template documentation positively impacted their practice. These areas involved: Immunizations, IM injections, Ear Lavages, and "Did Not Keep" patient appointments. Each of these areas is of significance to the nurses in that they represent either a high volume patient population or require complex documentation.

Immunizations

Immunizations represent approximately 20% of documented nursing interventions in this Primary Care clinic. While this is not a complex documentation function, it is an area of potential error in transposing numbers. The nursing staff recognized that their clinic had large lot quantities of the various immunization agents and therefore the lot numbers changed infrequently, on a controlled basis. Including the actual lot number as an element of the template meant that the nurse only had to validate the number, reducing the potential for error. Templates are easily modified, so when lot numbers change, updating the template is easy.

IM Injections

IM injections represent a large number of the interventions documented by nurses. Typically, these medication administrations involve a combination of medications in consistent dosages. The nurses' documentation of frequently administered medications has been reduced to minimal template editing that is more efficient than their paper system and provides the added benefit of helping to ensure compliance with required elements.

Ear Lavage

Of the treatments and procedures occurring within the clinic, ear lavages are representative of procedures that seldom vary in how they are carried out. These make good candidates for documentation by templating and their use improved the consistency of documentation efforts.

"Did Not Keep" Patient Appointments.

Templating has had a positive impact on the quality of nursing documentation when a patient did not keep scheduled appointments. Due to the increasing demands for statistical reporting to purchasers of health care, medical legal concerns, and increasing acuity in outpatient care, the documentation surrounding a missed appointment can be as demanding as any clinical note. Templating this documentation responsibility from a nursing perspective has become a thorough and efficient method to capture the circumstances of the "no show", communication with the patient surrounding their missed visit, how and when that communication occurred, and the need to reschedule the missed appointment.

Benefits to Practice

In looking at benefits to practice we focused on integration of the software use into daily practice and evidence of quality assurance at the point of care. The first group of nurses using CPR report a positive impact on their practice. Templates are a key component of the usability of the system to efficiently document care. They improved the level of consistency in the quality of documentation by all providers of care within the clinical team. Previously the only way to ensure consistency was after the fact through internal quality assurance processes. Because the use of templates requires that the nurse validate critical elements of data from the patient, there is more complete documentation. In this way templates act as reminders at the point of care. Clinic nurses report, "Because content is in the template you are prompted to ask all of the critical assessment questions"[13].

CPR templates support continuity of care both by acting as reminders and by providing access to the patient's last visit note(s) which cues the nurse during the intake interview to ask questions about how the patient is doing since their last visit and whether their prior concerns have been effectively resolved. The patients responses may or may not be relevant to the reason for today's visit but in the broader view of effectively managing overall health status, it provides a critical element of continuity. Referencing the last note in the example of a blood pressure visit begins to generate a longitudinal baseline for comparison of key values. The nurses feel that this "helps give today's encounter, and the data we're collecting, a context"[13].

Other Benefits Recognized By Nursing

Use of the system has also improved the handling of phone messages from patients. The nurses immediately pull up information about the patient in the computer while they are on the phone with the patient. They can review documentation from the patient's most recent encounters. "We don't always have to delay a response while we wait for the paper chart to be pulled and delivered to the clinic"[13]. While the CPR helped with short uncomplicated phone interactions, in many cases the paper chart is still required. This limitation will decrease as the organization progressively uses the CPR and retires the paper system.

Nurses believe that there is a real payoff for both the patient and themselves. There is both nursing and patient satisfaction in having information immediately at your fingertips. "Patients respond that it feels good that the people caring for you, really know you, that they don't have to wait". One of the clinic RNs says, "you can sense that it makes them (the patient) feel really good about their care and it makes us feel like what we do makes a difference"[13]

CONCLUSIONS AND FUTURE DIRECTION

In this evaluation we asked four questions in the areas of 1) use of software in support of nursing practice, 2) implications of nursing participation in the template development process, 3) areas of practice impacted, and 4) potential to improve quality and continuity of care.

Evidence from early use during this iterative prototyping project suggests the viability of templates to facilitate documentation across a range of nursing needs and that a good precedence for template identification and creation has begun. More fundamentally, our experience suggests that templates have introduced two new dynamics, that they support quality care at the point of service and that the creation of structured text notes allow flexible display to multiprofessional clinicians and eventually analysis of care.

Acknowledgments

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