Supporting CMT and User Customization in Clinical Documentation Templates

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Abstract
Clinical Documentation in the ambulatory care setting must support each clinician’s unique workflow and data collection requirements. In addition the documentation system must also be the foundation for interoperability both within and external to the organization. Linking documentation to controlled medical terminologies (CMT) provides data sharing capability and centralized management and quality reporting. Separating codified content from its presentation allows clinicians to create templates and forms that meet these requirements while still ensuring data integrity.

Introduction
Partners HealthCare System has developed the Longitudinal Medical Record (LMR), an ambulatory EHR used across the Partners Network. Some of the data collected has long been linked to unique codes which trigger decision support and is integrated with quality reporting tools. These include: allergies, problems, procedures, laboratory results, preventive health maintenance, medications, and family history. However, a significant portion of the data was un-coded and therefore could not be shared across the Partners network. Nor was the data linked to any existing CMT such as SNOMED CT, making it more difficult to share with other entities. PHS is committed to expanding decision support, data collection for pay-for-performance requirements and quality initiatives, and interoperability. In order to achieve all these goals, the Knowledge Management (KM) team is building and maintaining a library of elements that are the building blocks of templates and forms and are linking these elements to one or more CMTs.

The new initiative tightens control over how data is collected by expanding the modeling of data to include physical exams, observations, and other clinical measurements, while at the same time allowing clinicians and other users of the LMR to create and customize their own templates, forms, flow sheets, reports, etc.

Design and Methodology
Clinical Element (CE) Library: A database of clinical elements called Concepts and Attributes using SQL™ has been created and maintained by KMs. The model is designed to support mapping to HL7, SNOMED CT®, LOINC®, ICNP®, and other CMTs. Each CE has a rich set of meta-data that: assist in the maintenance process; supports extensive search capabilities; and accelerates template and form construction. Concepts are logically linked in clinically meaningful ways. The infrastructure also maintains a complete audit trail. Each Concept is composed of one to many Attributes and/or Concepts. Each Attribute is assigned a data type chosen from a subset of HL7 v3 data types. A web based application allows KMs to maintain the CE library. Changes made to any Concept are seamlessly propagated to all templates and forms which contain the Concept. The role based access also allows the clinicians and other LMR users to search and select concepts during the template construction. The KM team also has the ability to constrain the customization allowed for each CE.

Template Builder: The process of constructing a template, form, or other data capture tool has two steps. First the user can either select an existing template created by KM for use across the enterprise; or the user can create a new template, selecting the Concepts and templates that will be included in the template. Requests to KM can be made if an additional concept is required. The re-use of enterprise standard concepts and templates are promoted in the tool in order to eliminate unnecessary redundancy.

The second step is the customization process. Each template can have multiple customization tables associated with it. This enforces standardization and consistency while allowing clinicians to construct templates that closely match their workflow. Customization features include: selecting the label of the CE as it will appear in the template; setting the order of the CEs; show or hide individual CEs; setting rules for the behavior of carrying forward previously collected data; setting the rules for the behavior of inserting other patient data; adding static text that appears within the template; entering default values; entering data validation rules /ranges; specifying the GUI including font, size, color, etc. Customization does not include the ability to add or remove CEs from the template.

The content publishing process reflects a true life cycle management of clinical content to ensure that up to date content definition and best practices are released to the user community with minimal KM effort and that data integrity is maintained.

Conclusion
The past efforts at Partners supported a culture that allowed clinicians unlimited flexibility of their documentation templates which compromised data reporting and clinical decision support capabilities. It became clear that greater control and proper CMT infrastructure based content management is required. This intent is balanced with user friendly tools to allow the users to build and customize their templates and forms. Partners has now formulated a long term strategy and plan that will support clinical data capture at point of care while ensuring data integrity and clinical standards.