

# Practical Evaluation of Clinical Guideline Document Models

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## ABSTRACT

*This project evaluates existing XML document models for the representation of clinical guidelines, as part of an effort to determine the best model to encode IHC's Care Process Models. The best model will be selected on the basis of its ability to support "Infobutton" queries at the point of care.*

## INTRODUCTION

Clinical knowledge is represented by unstructured narrative text, which makes the retrieval of highly specific and context-driven information very difficult. The textual format also complicates the identification and traversal of links and relationships among different documents and knowledge resources. The Extensive Markup Language (XML) offers a standard way to explicitly describe the structure of any document, potentially enhancing the applicability and usefulness of narrative knowledge documents at the point of care.

During the past several years, Intermountain Health Care (IHC), has been developing Clinical Process Models (CPMs). CPMs are narrative documents that aim at representing state-of-the-art medical knowledge. CPMs enable medical practitioners to make appropriate decisions on patient care in various clinical scenarios. They are designed to enhance the quality and consistency in health care, while decreasing process variability. CPMs are similar to guidelines, however they are essentially "models of best care." In being models, they should not be considered "prescriptive" for patients or care providers. However, up to this point, most CPMs are still represented as unstructured narrative documents, with the same limitations just described.

The goal of this project is to select or create a highly granular XML document model for the representation of CPMs. Once this model is finalized, our intent is to convert the existing CPMs and release them as XML documents. We are currently analyzing and evaluating three document models: the "Clinical Process Guideline Reference Architecture"[1] (CPG-RA) from Newcastle University, UK, and HL7, the "Guideline Elements Models"[2] (GEM) from Yale University and ASTM, and the "XML Clinical Practice Guideline Model"[3] (xCPG) from Justus-Liebig University, Germany, and HL7 Germany. All of these models are implemented in XML.

## PROJECT DESCRIPTION

The project will be implemented in following steps:

### a) Analysis of the existing document models:

We are in the process of migrating CPMs for Diabetes, Depression, and Pneumonia from PDF format into XML instances, using the three document models. Each CPM will be represented in all three models, resulting in a total of 9 XML instances. We have been using an XML editor (ALTOVA's xml spy version 5.3) to create the instances. We will use these instances to establish the pros and cons of these three models, determining which one is more compatible with the CPMs. One of the requirements of the CPMs is the representation of process flow charts. We are also considering the adoption of the XML Process Definition Language (XPDL) to enhance the current document models.

b) *XML conversion of CPMs:* Using the results of the analysis just described, we will either select the best model, or be forced to develop a specific model for the IHC CPMs. In either case, during this phase we will convert the existing CPMs to XML, using the most appropriate document model. The major focus of this phase will be the assurance that the selected model will also support "Infobutton" queries, i.e., we will try to use the content of the CPMs to answer the questions that are more frequently asked by clinicians at the point-of-care.

### c) Deployment of the new (XML) CPMs:

After the conversion, we will attempt to deploy the CPMs in multiple IHC hospitals. We will use the current "Infobutton" infrastructure to enable the use of the CPMs at the point of care. A measure of user satisfaction with the newly structured CPM's will be obtained through electronic surveys. Impacts on clinical care by improved clinical outcomes and decreased adverse drug events will also be looked at.

## REFERENCES

1. Shiffman RN et al. GEM: A Proposal for a More Comprehensive Guideline Document Model Using XML. *J Am Med Inform Assoc.* 2000;7:488-498. Hoelzer S, R Schweiger, J Dudeck. Representation of Practice Guidelines with XML - Modeling with XML Schema. *Methods Inf Med* 2002;41:305-12.
3. Smart S. Clinical Practice Guideline Architecture (CPGA): Use Cases. HL7's Decision Support Technical Committee, 2002.