Guidelines into Decision Support

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Organization:	Yale University
Contract Number:	290-08-10011
Project Period:	March 2008 – April 2012
AHRQ Funding Amount:	$6,212,267

Summary: The Guidelines into Decision Support (GLIDES) project has supported the development, implementation, and evaluation of demonstrations that advance the understanding of how to incorporate computerized clinical decision support (CDS) into health care delivery at ambulatory care sites. A centerpiece of the GLIDES strategy has been the Guideline Elements Model (GEM), a knowledge model for guideline documents that incorporates a set of more than 100 tags to categorize guideline content.

The GLIDES project was a 5-year collaboration of guideline developers, disseminators, and implementers working to design, develop, implement, and demonstrate CDS applications using systematic and replicable processes for knowledge transformation and CDS design. CDS incorporates a broad and complex array of activities, from the development of clinical guidelines and policy statements to the design, development, and deployment of machine-executable advice. The goal of the project was to capture high-quality knowledge about appropriate care (knowledge synthesis), transform it into a standard format that facilitates computer execution (knowledge formalization), and embed the formalized knowledge in systems that actually influence care (knowledge localization).

The GLIDES project team explored the possibility of providing GEM-parsed content to the National Guidelines Clearinghouse. To date, GLIDES CDS implementation tools have been integrated at several primary and specialty clinics within the Yale New Haven collaborators systems, Children's Hospital of Philadelphia, Geisinger, and Alliance of Chicago. Tools that support improvements in guideline development are deployed at the American Academy of Pediatrics, American Academy of Otolaryngology, American Society for Clinical Oncology, and the American Urological Association.

Project Objectives:

- Implement evidence-based guideline recommendations that address prevention of pediatric obesity and chronic management of asthma. **(Achieved)**

- Apply the GEM and associated tools that facilitate the development of executable code to systematically and replicably transform the knowledge contained in these guidelines into a computable format. **(Achieved)**

- Deliver the knowledge via CDS to ambulatory sites that employ the Centricity electronic health record (EHR) at Yale and EpicCare EHR at Nemours. **(Achieved)**

- Evaluate the fulfillment of these goals and the effectiveness of the decision support tools in improving the quality of health care. **(Achieved)**

- Disseminate the findings and lessons learned via a variety of modalities. **(Achieved)**

2012 Activities: In the final year of GLIDES, focus was on supporting use of GEM and making it

compatible with complimentary GEM tools. A renewed, fully funded option year supported these activities. Throughout the course of GLIDES, the project director and key members of the team engaged in a number of methods to share and disseminate the results of the project.

Impact and Findings: GLIDES pursued opportunities to improve CDS practices, creating and demonstrating software tools, methodologies, and recommendations for future practice. A centerpiece of the GLIDES strategy was the GEM. The GEM Suite comprises a knowledge model and a collection of software tools that facilitate development, dissemination, and implementation of clinical practice guidelines and other sources of evidence-based knowledge. In addition, the Guideline Implementability Appraisal (GLIA) and its electronic format (eGLIA) are in use by a number of developers. BRIDGE-Wiz software—which leads a guideline developer through a sequence of activities to improve the transparency and implementability of guideline recommendations—has garnered considerable interest and use.

The experience of GLIDES' implementation partners demonstrates that transitioning from recommendations expressed in statement logic to functional decision support is complex and multi-faceted. Among the findings, the GLIDES team discovered the importance of ensuring that processes, methods, and tools intended to aid implementation of CDS operate within the context of an organization's existing infrastructure. Each GLIDES implementer took a slightly different approach to bridging the structured knowledge specification outputs from GEM to their own processes and tools for designing changes to EHR systems. The varied techniques reflect differences in the guidelines being implemented, the systems development practices of each organization, and the technical infrastructure being used for the EHR.

Overall, GLIDES was highly successful in involving a group of committed partners, promoting multilateral interactions among the collaborators, and advancing the science of decision support. However, at the completion of the project, the team recognized that gaps persist. Standards for development of trustworthy guidelines have not been universally adopted; criteria for judging adherence to the standards have not been developed; and standards for knowledge formalization and acceptance by academics, information technology professionals, and vendors have not occurred. Despite these gaps, GLIDES has made significant contributions to the development and dissemination of systematic and replicable processes for knowledge localization.

Artifacts developed by the collaborators are available at the Glides Web site: http://medicine.yale.edu/cmi/GLIDES/index.aspx.

Target Population: General

Strategic Goal: Develop and disseminate health IT evidence and evidence-based tools to improve health care decisionmaking through the use of integrated data and knowledge management.

Business Goal: Knowledge Creation