

Guidelines into Decision Support

Principal Investigator:	Shiffman, Richard N., M.D., M.C.I.S.
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Target Population: Chronic Care*, Obesity, Pediatric

Summary: The Guidelines into Decision Support (GLIDES) project supports the development, implementation, and evaluation of demonstrations that advance the understanding of how to best incorporate computerized clinical decision support (CDS) into health care delivery at ambulatory care sites. GLIDES is led by staff from the Yale School of Medicine’s Department of Pediatrics and the Center for Medical Informatics and is assisted by clinical and information technology (IT) staff from Nemours, a health system for children, and Yale New Haven Hospital. GLIDES CDS demonstration tools have been integrated into GE’s Centricity and Epic’s EpicCare at selected primary and specialty clinics within the Yale New Haven and Nemours health systems. These two systems are Certification Commission for Health Information Technology-certified. A combination of quantitative and qualitative evaluation methods is being used to determine the project’s results and major findings. The overall goal of the project is to recommend methods to assist clinical organizations across the country with the efficient and effective implementation of CDS.

A centerpiece of GLIDES strategy is the Guideline Elements Model (GEM). GEM is an XML-based knowledge model for guideline documents that incorporates a set of more than 100 tags to categorize guideline content. GEM provides a bridge between the process of knowledge discovery and synthesis and CDS implementation, and forms the backbone of tools that translate narrative guidelines into structured knowledge that can be implemented consistently.

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 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. **(Ongoing)**

2010 Activities: Upon achievement of many of the project objectives set forth at the beginning of the project, the GLIDES team established additional project objectives in 2010, including the following:

- Use systematic and replicable processes.
- Continue to design, develop, implement, and demonstrate guideline-based CDS.
- Focus on new guidelines and implementation partnerships.
- Enhance and improve the CDS already produced at Yale and Nemours.
- Recognize the critical importance of transparently developed and clearly stated guideline recommendations for effective implementation, work closely with guideline developers to provide tools and guidance to improve guideline development and reporting processes.
- Update the GEM and increase GEM adoption nationally and internationally.
- Continue evaluation of both existing and newly developed CDS implementations.

The GLIDES team worked with two national guideline development organizations, the American Academy of Pediatrics and American Academy of Otolaryngology-Head and Neck Surgery, to design, implement, and pilot processes and tools intended to make guidelines clearer and easier to implement. These tools are now being refined and enhanced. The team also worked with four leading hospital organizations, including Yale New Haven Hospital, Nemours, Geisinger, and Children's Hospital of Philadelphia (CHOP), to provide tools and methods for the implementation of CDS. In earlier phases of the project, four separate CDS applications for obesity and asthma were designed, built, and implemented in primary care and specialty settings. In 2010, these initial CDS applications were enhanced at Yale and Nemours. At Yale, this included a formal evaluation of usability and the piloting of an iPad-enabled data capture front-end system for their specialty CDS system. This is a major and potentially transformative change to the way CDS is delivered for Yale pulmonologists, and it will be pursued further in 2011. Both Geisinger and CHOP have designed and performed initial testing of new CDS applications that will be implemented and evaluated in future years.

An extensive literature review on experience and feedback from the various national and international organizations that have used GEM for knowledge transformation was conducted. Based on this feedback and input from GLIDES partners and other CDS contractors, GLIDES designed and implemented improvements to GEM and its related guideline implementation tools. Lastly, the project team participated in a range of dissemination activities, meetings, and presentations, and prepared, submitted, or published nine academic papers that detailed GLIDES results in various areas.

Preliminary Impact and Findings: The experience of GLIDES' four implementation partners demonstrates that transitioning from recommendations expressed in statement logic to functional decision support is a complex, multifaceted process. Several groups offered guidance for successful implementation, and an evolving set of considerations represents the current approach.

Among the preliminary findings, the GLIDES team discovered the importance of making sure that processes, methods, and tools intended to aid implementation of CDS operate within the context of an organization's in-place infrastructure when designing and implementing IT-enabled capabilities. CDS-specific processes, methods, and tools must be adaptable to an organization's in-use system. 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. These differences in bridging techniques reflect differences in the guidelines being implemented, in the systems development practices of each organization, and in the technical infrastructure being used for the EHR.

There is also tension between centrally-specified implementation considerations and the reality of local-

level capacity and necessity. A cornerstone of decision support design is to involve end-users in the development of the tools and systems they will use. Systems that do not accommodate or effectively reengineer workflow are destined to fail. Local workflow and barrier analysis is necessary to demonstrate decision support origins. Similar considerations will also dictate to whom decision support should be addressed.

GLIDES views decision support as a variety of formats, not simply alerts and reminders. More robust CDS requires a variety of modalities to solve different problems. In developing a decision support intervention, GLIDES has also found that classification of the action-type(s) is useful. Because there is a finite set of activities called for by guideline recommendations, categorization can facilitate a pattern of beneficial services associated with that action.

Effective implementation planning is key to adoption and adherence. Stand-alone guideline implementation projects do not work well, but should be part of a broader and well-supported quality-improvement effort, potentially integrated with maintenance of certification or the Centers for Medicare and Medicaid Service's meaningful use requirements. When planning for adoption, implementers should also consider incentives, feedback loops, site-based guideline "champions", and integration of performance measurements. Implementers should also include evaluation of adherence and outcomes in CDS design up-front, since ensuring access to appropriate and granular data for outcomes reporting is a key challenge.

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

* *AHRQ Priority Population*