

GLIDES Project – Lessons Learned

- **Project Organization:** GLIDES experience underlined the importance of clear and measurable clinical goals and objectives for each CDS project, and the need for committed, respected and visible “guideline champions” in each clinical location who can assist with the CDS design and leads its implementation.
- **Project Scoping:** CDS projects may tend to focus narrowly on implementation of the specific guideline for a target community of physicians. GLIDES experience suggests that a broader focus must be taken to maximize chances for a successful implementation. For example: understanding the broader clinical workflow in which the CDS will be implemented and potentially addressing inefficiencies with data capture and screen flow; understanding the level of maturity of the EMR installation itself and potentially designing different types of CDS solutions for different levels of maturity.
- **Knowledge Transformation:** GLIDES used the Guideline Elements Model (GEM) and related tools, including GEM Cutter, to mark up the targeted guidelines and transform the narrative information into structured knowledge that could be implemented in the EPIC and Centricity EMRs. This process worked effectively for the GLIDES project, and in reflection was one of the most straightforward of GLIDES’s project activities. GEM’s outputs are not intended to produce executable code, but are instead intended to facilitate the development of executable code within the site-specific EMR. With a structured data model and toolkit such as GEM, knowledge transformation and implementation is made substantially easier. We believe GEM can be of much wider utility across the US and international guideline implementation community, although we also note that adoption of the system outside of the GEM project has been minimal, despite GEM’s demonstrated efficacy and value.
- **Methodology and Documentation:** GLIDES deployed and refined a series of documentation tools and templates to assist with transformation of the guideline into implementable knowledge. However, for each local implementation, it was necessary to customize these tools and templates to integrate with system development methodology and documentation standards in use at each site.
- **Guideline Implementability:** In completing the Knowledge Transformation and implementation activities for GLIDES’ selected guidelines, the GLIDES project identified a number of recurrent themes and opportunities to improve the way guidelines are written such that they can be implemented more easily. GLIDES deployed and refined several tools to address such challenges, including Electronic Guideline Implementability Appraisal (eGLIA) and Bridge_Wiz, a prototypical guideline authoring tool. The GLIDES project believes these tools and techniques can be of value to guideline developers. In particular, if the Bridge_Wiz tool can be integrated into the process of writing guidelines themselves, it will be possible to move portions of guideline Knowledge Transformation “upstream” to the guideline development stage, which will in turn simplify the guideline implementation process substantially.
- **Central vs Local Activity:** GLIDES explored the dynamic between project activities which can efficiently be performed centrally by guideline implementation project teams (such as analysis and decomposition of the guideline) and those which must be performed locally at each clinical site to account for site-specific preferences. GLIDES experience showed that

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successful implementation emphasizes the need for strong local engagement in CDS implementation, for all but the simplest guidelines and CDS interventions. For example, clinical policies, terminology, workflow and EMR screen structures tend to work differently across clinical locations. CDS solutions, to integrate effectively with these policies, terminologies, workflows and structures, must be highly customizable to reflect these local factors.

- **Approaches For Specialists Versus Primary Care Physicians:** In implementing CDS tools for both specialists and primary care physicians, GLIDES identified design techniques that work are more appropriate for each different community. Specialists will tend to believe that they do not need CDS guidance, and will benefit from critiquing design techniques and reporting/feedback on how their decisions align with guideline recommendations. Primary care physicians will be more open to CDS tools, and may benefit more from prescriptive design techniques. In general, CDS implementations for specialists (pulmonologists) at both Yale and Nemours were less successful than for primary care physicians – usage levels were disappointing. However, efforts continue to incent and encourage adoption for all GLIDES clinical locations.
- **Technical Challenges:** GLIDES implemented CDS applications for two widely-used EMR systems – GE's Centricity and EPIC's EpiCare. Each platform presented unique technical challenges, including user interface limitations, access to data, time stamping limitations, availability of deep development skills, and challenges with invocation and usability of SmartForms. (that each required local technical expertise and knowledge to solve). Both of these EMR platforms are limited in how their presentation layer can integrate with shared services, potentially delivered via the Internet. These technical limitations, and the reliance on local technical expertise and knowledge to solve them, reinforced the GLIDES' view that implementation success requires a great degree of local site knowledge and engagement.