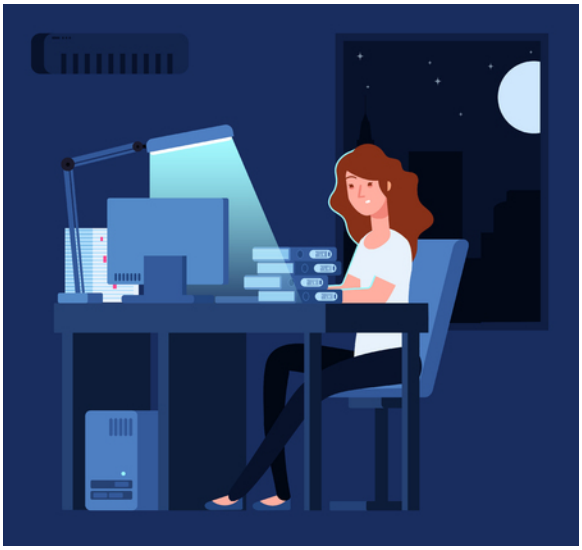
CPG Authoring Support

Initial Working DRAFT for Stakeholder Input and Refinement

Problem to be Solved - Current State



Currently, the time from evidence to implementation is too long and without standards there are disparities in the same 'guideline' as implemented at different sites (CDOs)- same expert-vetted recommendations results in disparate patient-specific guidance through various decision support and care delivery process interventions. It is also time consuming and costly to keep guidelines up-to-date and for CDOs and practitioners to implement or even identify the appropriate version. All of this leads to wasted time and effort as well as workflow disruption and lack of trust on the practitioners part.

Further, patient data including the planned care activities aren't readily, easily, or consistently captured as part of routine patient care. This has adverse consequences for reporting and research as well as quality improvement or even effectively managing local practices or large healthcare delivery systems. Evidence, Guidance, Practice, and Reporting (Evidence) need to all share common data, semantics, and knowledge (inferences) where applicable and appropriate.

Faithfully expressing computable representations of Clinical Practice Guidelines (CPGs) as shareable, standards-based formats either concurrent with guideline development of or even after the fact has been shown to address consistency as well as reduce the redundant local re-translations of guidance into actionable practice-oriented interventions. Such computable representations (as models of 'care processes) further afford faithful derivation of: interoperable CDS (alerts, reminders, documentation templates, summary views), digital Quality Measures (as well as real-time, patient-level metrics of compliance and adherence); shareable Apps (providing cognitive support); Comprehensive Shared Care Plans; and patient-level Case Reports (eCaseReports) for registries and cohort studies (including on utilization and outcomes directly related to the CPGs). Such standards-based, computable representations faithful to the intent of the guidelines and recommendations can be invaluable assets for individual participants within as well as across the Learning Health System.

Finally, there are too few individuals with the skills and knowledge needed to author (knowledge engineer) CPGs and related assets(CDS, eCQM). This requires specialized skills, deep understanding of the standards and knowledge representation formats and languages, as well as a cross-functional, integrated team working in a fairly Agile fashion using numerous specialized tools for their given activities that rarely interoperate. Examples of such approaches can be found here and here. However, "Authoring", or rather knowledge engineering and more so the knowledge lifecycle development tooling to support such activities, is not new, they just have not yet been developed for these standards, languages, and/or use case (CPGs and derivatives). Current experts in this field have estimated that such tooling could reduce their work effort by orders of magnitude while enabling numerous much less specialized individuals to perform the knowledge engineering tasks and activities. Such "Authoring Tools" have been shown to vastly improve the quality, quantity, and speed-to-development for similar initiatives (e.g. measure development, business process modeling, software development, data engineering).

What Does the Solution Look Like - Future Vision

In the future, with standards to normalize semantics and terminology as well as inter-connected, collaborative tooling for standards-based computable guideline formats, users can easily:

- Intake computable evidence on a particular topic to review and evaluate the information
- Create computable recommendations; including rationale for the recommendation and evaluation of and links to supporting evidence
- Create standards-based, executable, clinical pathways (care process models) for putting recommendation(s) together and into action in various settings, resulting in shareable, interoperable care plans
- Create (and/or derive from computable CPGs) standards-based, interoperable clinical decision support interventions of numerous types as well as apps based on (and directly derived from computable forms of) the recommendations and pathways
- Create real-time, patient-specific metrics based on (and directly derived from computable forms of) the recommendations and pathways, that can be further rolled-up to population-level digital Quality Measures
- Create electronic case reports based on the same data semantics, patient-specific inferences, patient-level metrics, and supplemental data scoped to the topic of the computable CPG (e.g. outcomes, confounders) that can be reported to public health agencies, guideline sponsors (e.g., medical specialty societies), research entities, and/or consortiums of CDOs for various registry use cases (e.g. surveillance, cohort studies for health services and outcomes research)
- (See here for work in progress toward providing this toolset)

As we progress into the future, more and more of this tooling would be oriented to true clinical domain experts and afford them the ability to develop the computable representations of the clinical best practice recommendations they wish to convey to their peers in daily practice- at the bedside, at the point of opportunity for action, and within the context of real-world data and clinical practice (workflow). To support this work there needs to be related developments in strategies and tools to produce and manage living, computable evidence, and to keep guidance living as the evidence base evolves.

Tool Users/Use Cases

- Guideline Developers
- Clinical Domain Experts
- Clinical Pathway Authors (Clinical Informaticians and SME Knowledge Engineers)
- Clinical Decision Support Authors
- Quality Measure Developers
- Local Implementation, Quality Improvement, and/or Practice Redesign/Transformation teams

Infrastructure needed to produce tools/solve problem

- standards for computable representations of Clinical Practice Guidelines (CPGs) and their Derivative and Related knowledge
- standards for definitions of recommendation-related information (e.g., strength of recommendation, risk of bias, quality of evidence, etc.)
- standards for metadata for assets needed to express computable CPGs and their derivatives including metadata for publication and sharing, interoperability for CPG and LHS lifecycle capabilities, and interoperability of lifecycle tooling (e.g., repositories, editors, validation)
- standards for application programming interfaces (APIs) for interoperability within and between authoring (knowledge lifecycle development) tooling (similar as needed for "knowledge management")
- computable/interoperable evidence
- shareable, explicit data requirements, value sets, and semantic profiles for making recommendation-related information computable and shareable across the LHS - tools to manage terminology and have robust interoperable semantics across the Learning Health System cycle

Other enablers needed to solve problem

- sustainable business models for development and disseminating these tools
- ability for expert bodies to develop computable forms of guidance on real-world data as experienced in local care delivery settings (CDOs)
- ability for local care delivery organizations to rapidly implement computable guidance and provide feedback early and often (feedback loops, iterations)
- investment in key infrastructure that amplifies the value of such tools
- means for care delivery organizations to leverage such tools and infrastructure to enable a return on investment for the human capital required to invest in implementation and care transformation
- accreditation and certification programs that can take advantage of, reinforce, and even create a value stream and market segment around the (more) rapid development, dissemination, and implementation of such clinical best practices
- regulation around open formats, semantics, content, etc. for data, knowledge, and workflow integration

Steps to address needed infrastructure / enablers - Who does what?

- mechanism for achieving consensus among stakeholders to define standards and close related gaps.

How tool(s) fit in Patient Journey

Patient Journey illustrates how guidance on specific clinical targets (e.g., Long COVID, COVID Anticoagulation, etc.) is used to support patient and care team decisions and actions; tools described here are how that guidance is expressed in computable/interoperable form so those user-facing tools can be incorporated into workflow as demonstrated in the patient journey.

Ecosystem Cycle Step(s) where tool is applicable

Produce Guidance, Create Tools