



EMR Standards: Part II - A Path Forward

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In our previous column, “EMR Standards: Part I – Drivers and Challenges”, we discussed how the trend towards ‘meaningful use’ of EMRs is driving the need for a variety of EMR standards required to support: communications between providers; advanced EMR functionality such as decision support, alerts and more sophisticated care planning; and to provide information to help clinicians and policy makers to improve primary health care delivery. However, these trends towards meaningful use require clinicians to capture ever more structured and codified data in their EMRs. Depending on the EMR design, this requirement can have a big impact on clinician sanity and perception of the value of EMRs. Finally, we discussed how EMR vendors’ ability to invest in innovating simpler ways to capture codified data was potentially compromised due to demands to implement and maintain systems that meet varying provincial, national and, for some vendors, international standards.

Looking forward, what can be done to capitalize on the trends while resolving some of the barriers we previously identified? To be frank, the complexity of the challenges and corresponding solutions would require much more than a single article. However, we will explore

three powerful standards related topics that can help us achieve meaningful use of EMRs while maintaining clinician sanity and minimizing the impact to EMR vendors.

While many standards are required to drive meaningful use, well structured clinical records combined with terminology standards are foundational for the consistent capture and exchange of information. However, asking clinicians to routinely enter “codes” for common clinical concepts into an EMR is obviously not an option that will endear IT solution providers with the clinical community. Instead, clinicians have to be able to use their preferred clinical terms in their native language to input and interpret information in an EMR; those terms then have to be mapped back to unique codes. Terminology standards such as SNOMED CT provide a robust lexicon of clinician preferred terms and synonyms, each with their own unique codes that are effectively mapped back to a single concept code which accurately represents a single clinical idea. This allows one user to enter “hypertension” and another to enter “hypertensive disorder”, both of which map to the same concept ID “38341003”. The concept ID can then be leveraged by a variety of software algorithms to find similar cases, to trigger particular care plans or simply to provide consistent statistical information.

As advanced as SNOMED CT may be, several challenges arise. Current estimates suggest that an EMR would need to support eight to ten thousand potential concepts to record items in a ‘problem list.’ Now multiply the challenge of supporting ten thousand

possible values for a single concept by the number of ways a clinician prefers to record and view information about that concept. As our colleague Dr. Ray Simkus observe, some clinicians are “lumpers”, preferring to record clinical concepts at an aggregate level (e.g. Diabetes), and some are “splitters”, preferring to record more granular concepts (e.g. Diabetes Mellitus Type 2 in nonobese). Within either of these categories, clinicians may have any range of individually preferred abbreviations (e.g. DBX, DM2, etc.).

If we accept the premise that it is the EMR vendor’s job to provide applications that are flexible to meet the broad range of clinician needs, then how can we help them simplify the standards challenge?

Shrink and Focus the problem space

Planning is underway to develop constrained subsets of SNOMED CT, called reference sets or ‘ref sets’, for key clinical concepts such as ‘reasons for visit’ and ‘problem lists’. The ref sets will reduce the burden on vendors who would otherwise have to determine which SNOMED CT hierarchies and subtype concepts to use for the structured elements in their solution. Properly designed, these ref sets will also provide vendors with an excellent starting point for clinicians’ preferred clinical terms to use in their EMRs for specific clinical settings (e.g. Emergency, General Practice, Specialties, etc.). As far as innovation goes, it will still be up to the vendors to develop intelligent user interfaces to simplify the search and entry of clinical information¹. Another key area of improvement will be to break the clinical information/billing information disconnect by either

establishing appropriate cross walks between clinical codes and the ICD codes typically used by Provincial billing plans, or we could dream big and hope for a policy solution that would see a shift in billing models to obviate this challenge altogether.

Other key areas of EMR data, such as medications, would also benefit from greater focus and consistency; particularly in addressing the need to be able to express medications at a generic level. Some EMRs provide only textual information while others force product identification through use of Health Canada's Drug Information Number (DIN). Although SNOMED CT and the pan-Canadian Electronic Drug Messaging specifications provide solutions to this challenge, common adoption appears to be lagging.

Loose in the front, tight in the back (Yup, we said it)

EMRs have to be designed to allow clinicians to enter abbreviations and any other text they chose to represent the clinical concepts they deal with on a daily basis; they also need to recognize common patterns and help streamline recurring activities. This means that the front end of the EMR, the user interface, has to be flexible to meet the varying needs of clinicians. For example, the first time a clinician enters an abbreviation or text that the EMR has not previously encountered it should consider prompting the clinician to map it to a concept from the appropriate terminology standard. This will help ensure that all information collected in the front end corresponds to a set of tightly constrained standardized codes in the back end.

Send what's seen, send what's meant

Standards have to be devised in a manner that allow systems to send whatever text the clinician saw when they initially captured the information along with the associated standard code. Consider a situation in which a family physician enters an abbreviation such as "DBX" in the problem list to record the fact that the patient has diabetes. If the family physician needs to reuse the information in the problem list to generate an electronic referral to a specialist, the HL7 V3 messaging standard would send "DBX" as well as the corresponding standard code that it was mapped to in the EMR. This allows the receiving EMR to display the family physician's original text (DBX) as well as the specialist's preferred term that is mapped to the standard code. By sending what's seen and what's meant,

the standards support, rather than hinder, the family physician and the specialist in meeting their medico-legal responsibilities.

A national approach...

As previously discussed, EMR vendors are being stretched to the limits by requirements to support multiple standards across the country. This involves not only the need to support differing functional requirements and interfacing specifications but also unique conformance processes – while trying to meet requests for support and enhancement from their paying customers.

Ideally, Canada would have a single organization – or certainly less than 14 organizations – responsible for working with all of the country's stakeholders to coordinate the development, maintenance and associated services for every information standard, content standard and messaging standard. Although the Infoway Standards Collaborative ostensibly provides a setting for these types of conversations, neither the funding model nor the political will appear to be in place to try to tackle the EMR standardization issues consistently and within a time horizon that meets the needs of the many stakeholders.

In the absence of an ideal national solution there are a few things that can be done:

1. **Reuse, reuse, reuse:** We can all do our part to be better 'standards' citizens. Between the jurisdictional and national organization there is a tremendous amount of documented information, content and messaging standards knowledge. If you are embarking on a standard or system design project it is essential that you build additional time into the project schedule to allow staff to conduct research on existing standards and to look to all key national players including Canada Health Infoway (Infoway), the Canadian Institute for Health Information (CIHI), the Canadian Partnership Against Cancer (CPAC) and any other thought leaders in key clinical domains. It is also important to keep in mind that there might not be a single standard that you can re-use completely, but there may be parts of existing standards that you can leverage (and ideally contribute your lessons learned back to the common body of knowledge).
2. **Rely on the kindness of strangers:** Reusing standards requires that you are able to find them in the first place, which is easier said than done when

they are housed by many different organizations. A great starting point is to contact the Infoway Standards Collaborative to determine which among their working groups has a scope that might encompass your standards of interest. Next you can contact the chair of the working group to arrange to present your initiative at a future meeting. Doing so will provide you with access to standards experts from across the country who are always prepared to point you in the right direction.

3. **Make it easier to self serve:** Ideally we would have a national data model that defines all the key data of interest to support our information, content and messaging standards. Expressing the data model through a tool that would link to the various standards that re-use the data definitions and code systems would be immensely helpful.

The standards challenge facing EMR vendors is only going to increase as provincial EHRs are implemented across the country and as more stakeholders turn to the EMR as an information source to assist efforts to improve the quality, accessibility and outcomes of care – particularly within the primary care sector. The challenges can be lessened through increased coordination of national and jurisdictional efforts to define and implement common standards for the broad range of 'meaningful uses' of EMRs.

¹ For a previous discussion on user interface design considerations, please see http://www.healthcareimc.com/bcovers/previous/Vol_XXIV_No_1/pdfs/Gavin_Tong.pdf