The next-generation Electronic Health Record in Norway

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In Western healthcare, there are many expectations and promises associated with the implementation of next-generation Electronic Health Records (EHRs). Such EHRs promise among other things shared care and seamless information flow, standardized patient pathways, clinical decision support and efficient medication management. There are also expectation of improved work processes and better resource management, for instance related to costly surgery planning.

However, these EHRs are typically very large (some take on a National scope) and, accordingly face many challenges because of this as well as their all-encompassing functionalities. Generally, there are also huge resources associated with their implementation. A fundamental problem then is that local and specialized needs are frequently overlooked or is a consequence of a system that cannot accommodate each and every practice. A key question then is how large-scale EHR projects can be organized to ensure that the involved practices can get a system that is useful for them and how specialised local needs play along with mainstream functionality covered by a large-scale system.

The empirical focus of this abstract is the “Health platform”, which is a regional ICT programme that aims at acquiring and implementing a new common EHR for the whole health region in Mid-Norway including the hospitals and municipalities in the region. A key goal is to improve interaction between (public and private) stakeholders, i.e. hospitals, community health service (GPs, nursing homes, home care services). the Mid-Norway health region consists of 3 counties and includes 40 000 health workers and an approximate population on 720 000. The cost amounts to 270 million EURO (2,7 milliarder kroner) (Dagens Medisin, 2016).

The Health platform also represent a pilot project (and first milestone) for the long-term national goal of establishing a common EHR for Norway across the different regions and services, "One citizen - one journal" (eHealth Directorate 2018). The second milestone is to establish a national solution for municipality healthcare service, and the third milestone is to establish the national solution "One citizen - one journal".

The timeline for the Health platform is as follows:

- 2016 - Prequalification of vendors
- 2017 - Dialog phase with selected vendors
- 2019 - Contract with a specific vendor signed
- 2021 - Starting implementation

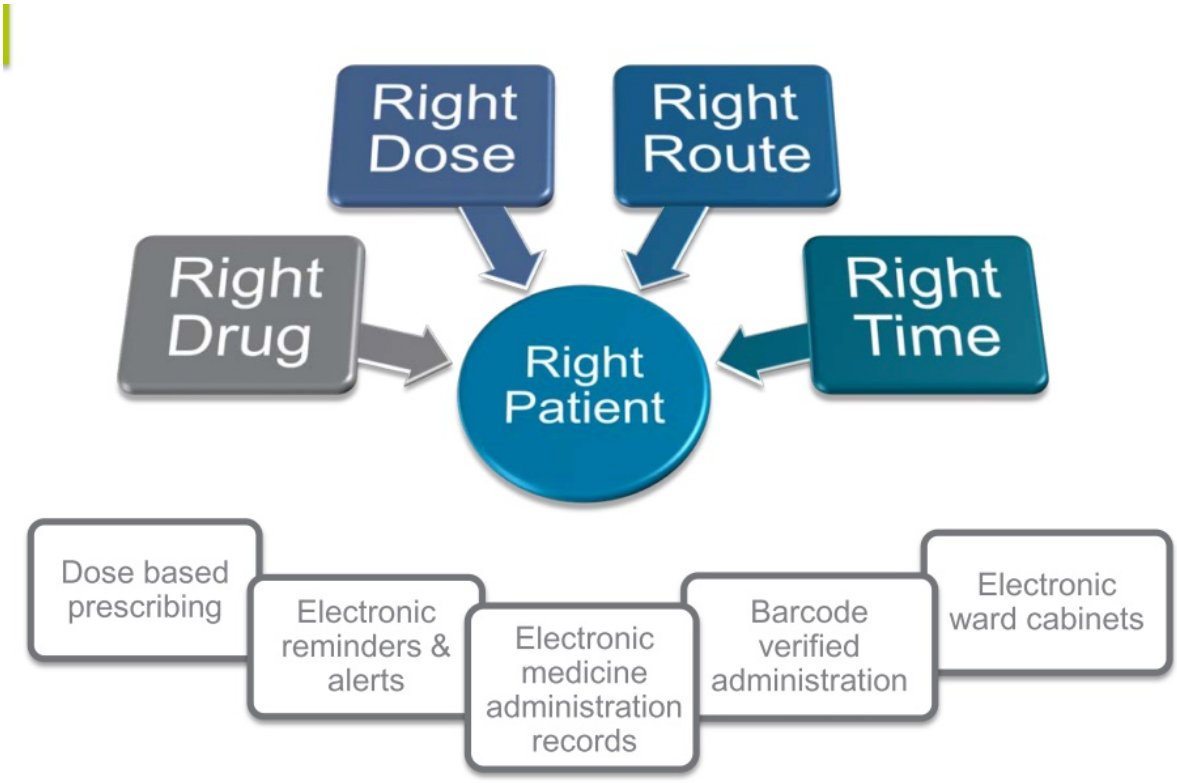
Out of 11 prequalified vendors in 2016, two are now (2018) left: Epic and Cerner. The biggest Norwegian vendor DIPS ASA never made it through the first prequalification in 2016 (Dagens Medisin, 2016)

One area of particular interest for the Health platform is Electronic Medication Management Systems (EMMS) and the connected functionality *Closed loop medication (CLM)* which is a particular functionality for prohibiting errors and

ensuring patient safety in the medication process. In the Health platform procurement specification, CLM is described as follows:

> *"CLM* is a fully electronic medication management process, supporting medication ordering, dispatching, distribution, dispensing and administration of medication. Documentation of the management process is included in CLM and knowledge and clinical decision support in the solution are vital. A CLM process (...) also includ[es] observation and evaluation of the intake of the medication and immediate effects, as well as functionality in the pharmacy systems, i.e., distribution and dispatching, in addition to dispensing of re-packed medications and compounded medications (e.g., cytostatic and antibiotic)" (Health Platform 2016):

A fully implemented CLM would mean that the medications could be identified on a unit level electronic identification of patients and health personnel in the loop.



However, successful implementations of CLM functionality is scarce.

There are several causes for this. It is some fuzziness related to what a CLM consists of. One reason is the wide range of functionality expected to be present in a CLM at each stage in the loop, for instance decision support. Another reason is the number of systems involved in such a process (EPR, EMMS, Pharmacy systems etc) which in turn requires integrations. Lastly, the scope of such systems has traditionally been associated with hospitals and extending it (as in this case) raises several new questions.

Accordingly, there are many challenges related to an operational CLM, for instance integration between the involved systems, standardisation of how to denote medications (brands/generic), a lack of barcodes as well as the need to substantial change work processes.

This motivates for studying this more closely and explore how local needs (CLM) interplays with overall mainstream needs (a common EHR). The National Center for eHealth research (NSE) has been commissioned by the eHealth Directorate to conduct evaluation research on this topic in 2018. This involves the author. We will in the course of 2018 engage in data collections at three study sites in Norway, each on involving different technologies as well as different phases of CLM implementation. Key findings will be channeled back to the Health platform organization.

References

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