# Integrating clinical data to foster a comprehensive eHealth record

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**Abstract and Objective**

*To meet the highly specialized clinical requirements in different clinical departments, best-of-breed Clinical Information Systems (CIS) provided by different healthcare solution suppliers are introduced in Hong Kong Hospital Authority (HKHA). Clinical data is captured and stored in different CIS in a scattered manner. In order to eliminate manual data input, prevent transcription error, improve operational efficiency and clinical effectiveness, bi-directional exchange of clinical data was enabled of contributing a comprehensive electronic health record that facilitates clinician to give clinical care at the point-of-care at right time.*

***Keywords:***

Clinical data integration, eHealth record, Point-of-care access, Messaging standard, Quality.

## Methods

CIS are installed in different highly secured medical networks which are tightly controlled by the HKHA's network security and management team. Bi-directional clinical data exchange is enabled in compliance to the Health Level 7 (HL7) international standard for electronic clinical data exchange.

"Channel Approach" was adopted which referred to the development of a set of standardized data uploading and downloading "channels". Major downloading channels include patient demographics and administrative data, appointment data, allergy data and laboratory results. Major uploading channels include operating and timing data, clinical reports (in PDF format) as well as other structured clinical data.

Clinical data captured by CIS is uploaded to HKHA's electronic patient record (ePR) system which is a patient-based, longitudinal medical record system. ePR is accessible by different healthcare providers across all institutions of HKHA.

Owing to the high complexity in project implementation, proper measure must be in place for project governance and prioritization. A 3-tier governance structure was established which consists of senior, middle as well as operational managers. It aims to communicate the implementation status and issues to senior management of clinical informatics. Prioritization of clinical data integration (CDI) requests is running on the first-come-first-served basis. Three "project request queues" were derived depending on the complexity and amount of development effort.

## Results

It was observed an overall increasing trend of completed CDI channels, from 3 requests in year 2001/2002 to 68 requests in year 2009/2010. The top-3 clinical departments which were implemented with CIS the most were Intensive Care Unit, Anesthesia Department and Cardiac Catheterization Laboratory.

Positive feedbacks were drawn from a post-implementation review exercise in Intensive Care Unit of one of HKHA's hospitals. CIS had effectively helped to support the clinical workflow of the department while clinicians had high reliance on CIS. They opined that an overall clinical service improvement was achieved.

## Conclusion

Acquiring vendor-supplied CIS is inevitable. Efforts are worth to facilitate and streamline CDI in order to make best use of it and to maximize the benefits. Double data-entry was eliminated such that human effort was saved. Accuracy and quality of clinical data was improved while data availability became more timely.

Adoption of standards fosters interoperability. HL7 gives the best tool to bridge different CIS to HKHA's ePR. The data generated during clinical care can form the complete clinical record and form the foundation of the future Hong Kong-wide electronic health record (eHR).

Behind the powerful side of CIS and CDI, however, smart adoption and cautious use of the system is critical to the success of the work. Moreover, clinical users may be "de-skilled" and they may not be able to "fallback" to manual operation when necessary. "Downtime training" must be made mandatory and conducted in regular basis.