Research Article

Implementation of ICD10AM: Challenges and Solutions

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Abstract

Background: It is always recommended to keep up with the latest available clinical technologies to ensure patients' safety, satisfaction, and high-quality service delivery, especially with complex healthcare systems. Such a system is adopted by the National Guard Health Affairs (NGHA) hospital in Saudi Arabia that has rapid growth and expansion pace. Considering the organization's size and many other branches around the kingdom, the ICD10AM system had to be integrated with the hospital's internal system.

Objective: This industrial experience report answers two main questions: what were the disadvantages of the legacy ICD9CM? and, what were the major key success or failure factors in the Electronic Medical Records (EMR) department?

Method: The NGHA council committee recommended the adoption of the ICD10AM clinical coding system, where it is easily interfaced with the main information system, the QCPR, at all NGHA sites and branches.

Results: As a result, The ICD10AM System had covered the shortage and defects of the legacy system. ICD10AM had benefited the NGHA in both clinical and administrative aspects.

Conclusions: The implementation and integration solution discussed in this experience report combines incorporated businesses and technical services. It helped healthcare plans define their strategy, plan for proper implementation workflow, achieve readiness and conduct end to end testing and deployment of the ICD10AM code set..

Keywords: Electronic Medical Records, Information Technology, Healthcare Information Systems, Clinical Project Implementation, ICD10AM, ICD9CM.

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Introduction & Background:

The 10th revision of the International Statistical Classification of Diseases and Related Health Problems (ICD10AM), the Australian version, has extraordinary features that none of the other medical coding systems contain [1,2]. It is also known to be a professional, effective, reliable, and a user-friendly system. ICD10AM system was selected for the National Guard Health Affairs (NGHA) hospital because it had the features capable of delivering NGHA's mission, vision, objectives, goals and values [3]. It was smoothly integrated with the existing the Quadrennial Comprehensive Policy Review System of the UN system operational activities [4,5]. This represents the hospital's core system that handles patients' information and procedures. This integration facilitated the coding workflow in the Medical Records Department (MRD) at NGHA. It also helped the coders to be oriented with the latest clinical classifications and procedures. In this industrial experience report, advantages and disadvantages of the legacy International Classification of Diseases, 9th Revision, Clinical Modification (ICD9CM) system, the American version, were reported [6]. The ICD10AM selection justification and impact on the hospital's development is also documented and clarified.

All the medical coding of the hospital's EMR were coded using the ICD9CM system. On March 2005, the hospital's medical council advised all the hospital's branches to take the necessary steps to implement the ICD10AM coding system. ICD10AM is sponsored by the World Health Organization (WHO), and also includes similar diseases common in Saudi Arabia [7].

As a first step, a team was formed by the MRD's director as the Chairman of the medical committee and the project

manager of the QuadraMed Computerized Patient Record (QCPR), the hospital's Health Information System (HIS) [8,9]. A communication was established with the Information Technology (IT) vendors and companies that would have potential solutions to an easy implementation and integration of ICD10AM. However, due to the unavailability of any local vendor supporting the ICD10AM coding system, the medical council recommended the use of the existing Virtual Address Extension (VAX) system [10]. VAX could help in integrating the HIS with the ICD10AM, starting with one of the branches as a pilot site model. This integration and implementation showed an increase in the efficiency and productivity of the MRD functionality, especially in King Abdul-Aziz Medical City (KAMC) in Jeddah, an NGHA branch [11]. **Table 1** summarizes the differences of the 2 coding systems, ICD9CM and ICD10AM, through comparison [12, 13].

Table1. ICD9CM and ICD10AM Comparison

Feature	ICD9CM	ICD10AM
Feature	ICD9CM	ICD10AM
Billable Codes	14,567 codes	69,823 codes
Chapters	19	21
Code Length	3-5 characters	3-7 characters
Allowed Character	E, V, or 0-9	A-Z (except U)
Ability to Add New Codes and Provide Detail	Limited without laterality	Unrestricted including laterality

Experiment & Methodology

In any healthcare organization, implementing a new technical solution would almost never run smoothly [14]. There are always obstacles needing to be resolved in order for an implementation process to be successfully completed in an effective and efficient manner. The journey of the ICD10AM implementation and integration with the HIS started with the coordination between the Information Systems Department (ISD) and the Committee Chairman. When the centralized QCPR medical system went live at KAMC in 2010, the QCPR System did not include ICD10AM System for EMR, while the legacy VAX system did include it. Therefore, an interface was built between the QCPR and the VAX system in order to keep the business continuity at the EMR and to reduce its diagnosis problems. Unfortunately, this was not sufficient enough as there was still a gap, and thus problems of coding and patients' abstracting remained when dealing with excessive number of patients.

Experiment Environment

KAMC, which was founded in July 1982, is one of five of its kind in Saudi Arabia; the other four are located in Riyadh, AL-Madinah, Al-Hasa, and in Dammam. Its medical services are directed mainly towards NGHA employees and their dependents. It serves both inpatients and outpatients. In addition to the hospital main building, there are other care centers which were built as expansion projects, including burns unit, cardiology, out-patient clinics, bone marrow plantation, and princess Norah bint Abdulrahman Al-Faisal oncology centers.

The medical city provides high standards of medical services. It provides anesthesia, Intensive Care Unit (ICU), cardiopulmonary services, oral and dental surgery, emergency medicine, medical imaging, obstetrics and gynecology, pediatrics, surgery and home health care program. It also provides ancillary services consisting of Dar Al-Amaan healthcare center, patient relation department, dietary and clinical nutrition, MDR, pharmaceutical, rehabilitation and social services [11].

At KAMC, the MRD is one of the most important departments, its mission is to continuously develop and maintain a comprehensive centralized EMR system which will enhance the quality of patient care. Privacy, confidentiality and security of data were taken in high consideration during all stages of information gathering and processing. It also contributed in supporting and promoting the organizations goals and activities by providing health information through educational and training sessions, facility management and decision-making research efforts.

There are some factors that emphasized the need to adopt the ICD10AM, such as:

- Disadvantages of ICD9CM.
- Joint Commission International (JCI) [15] recommendations.
- Systems' integration necessity.
- Shortage on clinical and technical staff.
- Staff training requirements.

Problem Implications

Historically, ICD9CM was developed as a clinical diagnostic classification system for medical data statistical compilation in inpatient settings [16]. Unfortunately, ICD9CM has proven to be inadequate when used in other healthcare settings, and even for reimbursement purposes, such as the Diagnosis-Related Group (DRG) and Resource Utilization Group (RUG) [17,18]. In addition, ICD9CM proved to be impractical with other Prospective Payment System (PPS) groups which considered the ICD9CM code as their cornerstone [19].

Generally speaking, most payment procedures do require complete, accurate, and detailed coding. This information is necessary to calculate correct and accurate reimbursement or coverage rates. The ICD9CM Tabular List is very short in coding numbers that sometimes it could not accommodate new code proposals [20]. Hence, ICD9CM diagnosis codes is incapable of describing the severity or complexity of many diseases' conditions due to not having enough clinical specificity. In particular, the coding for healthcare encounters for other than diseases (V codes) do not provide enough specificity [16]. Consequently, many medical organizations required additional documentation for claims' support. Many countries are presently using ICD10AM or a clinical modification of it. For example, Australia and Canada have their own modifications of ICD10AM coding system. Even in the US, mortality statistics (information on death certificates) have been collected using ICD10AM since 1999 [16,21]. Therefore, the ability of healthcare data exchange with other clinics or medical professionals is crucial for a diagnostic coding system.

Solution Implementation

MRD is responsible for providing patients with their treatments [22]. For a big healthcare organization with a large number of inpatients, caring for each and every patient in a constant and smooth manner could be challenging [23]. At KAMC, there was an increase of dissatisfaction among inpatients, repeated chaos cases, staff complaints and other similar issues. Those issues were key indicators for the KAMC higher management office to realize that the MRD has reached a level of inability to deal with the increasing numbers of inpatients. Therefore, the NGHA council committee recommended the adoption of the

ICD10AM clinical coding system, where it is easily interfaced with the main information system, the QCPR, at all NGHA sites and branches.

The process of converting the cost tables of the medical services into a classification of those services involved not only splitting the bundled items but also adding new measures and procedures [24]. Some of these procedures involved the adoption of specific technologies, yet, not all procedures attracted Medicare Benefits such as cosmetic surgeries and allied health interventions [25,26].

Besides, the items in the medical services' cost tables were in numerical order within specialty. The NGHA council committee wished to retain the core numbers with an extension for further specificity. To avoid the codes' sequential order withholding, the coding numbers extension endeavor restructured the classification system with accompanying hierarchies. To overcome this restructuring problem, and to allow codes to be rolled up into meaningful categories by sites and types of procedures, a system of sequential block numbers was introduced. This solution allowed allocating a code in the tabular list, given an index entry of code and block number.

Furthermore, the ICD10AM coding system outdistances ICD9AM by having a superior specificity and more relevant clinical data regarding managed care encounters [27]. The structure of ICD10AM allows for the possibility of greater expansion of code numbers. This classification will also extend beyond simple classification of disease and injuries to include risk factors that are frequently encountered in a primary care setting [24,28].

ICD10AM includes the most recent diseases discovered after ICD9CM last version release, including common terminology and diseases diagnostic classification. These updates are consistent with the most current clinical practices. It also allows for a greater degree of detailing to assist medical practitioners and policy makers to deliver the best healthcare service possible, while effectively monitoring both service and resource utilization (EMR Services' Manager, 2018).

Results and Discussion

The most significant findings from the experience of implementing and integrating ICD10AM at KAMC are as follows:

- *Workflow Management:* When dealing with increasing number of patients, there are always better ways to run the project implementation workflow [29]. One way is by incorporating strategic techniques and technologies to achieve better utilization of time and manpower resources.

- *Successful Implementation:* Successful implementation requires well reviewed workflows of patients' tracking that is approved by all concerned parties.

- *Staff Awareness:* Staff education and training level were very low at KAMC. Therefore, training played a major part in increasing staff awareness and eventual project success.

Conclusion

The implementation and integration solution discussed in this experience report combines incorporated businesses and technical services. It helped healthcare plans define their strategy, plan for proper implementation workflow, achieve

readiness and conduct end to end testing and deployment of the ICD10AM code set.

The integration of technology into the healthcare industry is a major challenge as health plans and provider organizations face a compliance countdown. The transition to ICD10AM classification is one good example of that.

While most healthcare organizations would likely succeed on the first few project's implementation steps, one crucial step usually remains unfulfilled, which is end-to-end testing [29]. This testing type is essential for validating critical business processes and touch points in the enterprise.

The ICD10AM System had covered the shortage and defects of the legacy system. ICD10AM had benefited the NGHA in both clinical and administrative aspects. It also improved the efficiency and effectiveness of the healthcare system by providing cost reductions for, or improvement in benefits from, electronic healthcare transactions. It also met the needs of the health data standards.

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