Advanced Information Management and the Application of Technology

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Executive Summary

This paper documents the application of health information technology (HIT) in the nursing unit and explores the background, concept, pros and cons of the system in relation to privacy, security, regulatory dynamics, cost effectiveness and ethics. The paper furthers its course by mentions areas of application of HIT and what changes - good or bad – it has brought to the nursing universe.

Health Information System is an advanced records, data, diagnosis, and treatment platform that allow nurses and other medical personnel improve service delivery to patients. The role of the federal government in checking the activities of both private and public hospitals cannot go unnoticed either. The HIPAA in collaboration with other regulatory heartbeats have made it their personal business to protect patients from hospital-induced harm as a result of HIT.

The paper is long and has been divided into various sections, each of which is discussed separately. Needless to mention, sections that appear closely related or repetitive have been combined to enhance paper quality and structure. In brief, the papers contains the following parts: analysis of technology, identification of team members, team members' roles, team members' expertize, interoperability of HIT, standardized nursing terminology, federal regulatory requirements, components of the federal regulatory requirements, security threats and potential impacts, effect of HIT on nursing process, etc.

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Introduction

The quality of health care is predominantly determined by the effect of certain health services on the patient's health status. Quality improvement in nursing is all about identifying and utilizing health services that, when appropriately done; serve to enhance operations within the hospital set, which in turn positively changes the wellbeing of patients. In this regard, information technology is the key word. Health Information Technology (HIT) enables clinicians/nurses improve the management of patient records. And in addition to diagnosis, prescription, and patient monitoring, HIT reduces the chances of errors as far as decision making is concerned.

However, HIT sounds more practical than it was fantasy. There is immeasurable controversy surrounding HIT as: (1) some patients are increasingly becoming uncomfortable with computerized services; (2) hospital management is in constant attacks by government regulations; and (3) the transition from analogue-digital information management requires sufficient resources. As difficult as it is to admit, the health care industry is at a taping point between life and death as many hospitals fail to resist the temptation to put profits ahead of patient safety. This is where the federal regulatory organs chip in. At the end of the day, the operational value of implementing information technology in clinics is worth the risk.

The associated healthcare center is called Life Center (LH), located in Milton, Massachusetts. LC recently merged with huge medical institution called the Hope Hospital (HH), Bolton, MA. HH is more resourceful than LH and it appears the company desires to open five new branches in five different states (New York, California, Mississippi, Arizona, and Oregon in the next five years), although a vision is in place to serve 20 states thirteen years from now. Hope

Hospital also has a pharmaceutical department which manufactures and distributes drugs throughout the United States. So having LC under its umbrella makes HH one of the most powerful medical institutions the state of Massachusetts has ever had. Nonetheless, this is not a business paper; meaning the details of the merged companies is of little interest here.

HIT was in moderate use of HIT, but it is its acquisition by HH that expedited the implementation of technology at all levels of operations. To name a few, technologies in healthcare include electronic patient records, structured data entry, portable computers, sophisticated human-computer interface technologies, automated capture of data from diagnostics and monitoring equipment, relational databases with internet-based query, knowledge-based computing and computer networks. To avoid deliberate ambiguity about the project, it is good to mention the exact HIT going to be implemented first. Electronic Health Records (EHRs) is the most fundamental HIT going to be incorporated into the system. Let's investigate the concept, importance, and feasibility of EHRs ("Information Management and Technology" p. 435-89).

What Are Electronic Health Records (EHRs)

Kemp (2014) define EHRs as real-time, patient-centered computerized records. They instantly make information available and put together in one place everything about patients' health status. The following is a summary of the importance of EHRs:

✓ Harbor details about a patient's medical history, diagnoses, medications, allergies, lab test results, immunization dates, and X-Ray images.

✓ Provide access to evidence-based decision making tools about a patient's care.

✓ Increase accuracy of patient and organizational information.

✓ Are responsible for the automation and streamlining of providers' workflow.

✓ They support important market changes in obligations and consumer expectations (Kemp, 2014).

Kemp (2014) suggests: "One of the key features of an HER is that it can be created, managed, and consulted by authorized providers and staff across more than one health care organization. A single EHR can bring together information from current and past doctors, emergency facilities, school and workplace clinics, pharmacies, laboratories, and medical imaging facilities."

Identification of Team Members

The project manager is responsible for assembling a competent team. A project manager (PM), in addition, acts as an intra/inter-organizational link to ensure there is effective communication within the organization and also the organization relates well with mutual organizations and regulatory structures. Here, the steering committee, better known as HER implementation team, helps to break the implementation process into department-like structures for the sake of efficiency. The HER team; thus, comprises the following, all of which are acting in a leading capacity:

✓ EHR team lead

✓ EHR implementation manger

✓ Physicians champion

✓ Nurse lead

✓ Medical assistant lead

✓ Scheduler lead

- ✓ Registration staff lead

- ✓ Laboratory staff lead

- ✓ Information technology lead

- ✓ Billing staff lead

- ✓ HER contractor

- ✓ Meaningful use lead

- ✓ Workflow redesign lead

- ✓ Training lead ("Who are Key EHR Stakeholders for Implementation?").

Team Members' Roles

EHR implementation does involve the installation of the EHR system and related activities like training, mocking practice and pilot testing. As mentioned earlier, the members of the implementation teams are top level officials. Since the titles of the EHR team are self-explanatory in terms of what they represent, this section is going to be brief ("who are Key EHR Stakeholders for Implementation")

Team Member	Team Member Role	Team Member Skills
EHR team lead	Makes final decision concerning the implementation plan	Project management, MS Project, communication, time management, general computer literacy, leadership etc.
EHR implementation manger	Keeps the project in motion, communicates updates to the rest of the team, and also assigns work to other team members.	Project management, MS Project, communication, time management, general computer literacy, leadership, knowledge about law etc.
Physicians champion	The EHR team cannot perform well without the physician champion. The physician champion acts as a link between the implementation team and	Computerized equipment automation, leadership, communication, writing, biotechnology, biomedical engineering, electrical engineering.

	the physicians. Monitors physicians' activities in a medical point of view to ensure the installation process considers the clinical needs of every stakeholder, including the patient.	
Nurse lead	The nurse lead, in conjunction with other nurses ensures smooth clinical workflows. Encourages other nurses to accept change, and effects consent within the nursing unit.	Nursing certification, team leadership, communication, psychology, computer literacy etc.
Medical assistant lead	The MA lead plays a pivotal role on the team and with medical assistants. To be fair, the MA lead assumes a similar role as the nurse lead.	This person must have medical qualifications, effective communication skills, leadership qualities, sociological implications of hospital activities on patients.
Scheduler lead	With other scheduling experts, SL is responsible for scheduling workflows and also consults other SL on certain situations.	Time management, workflow analysis, computer skills, leadership, communication etc.
Registration staff leader	He or she leads registration assistants. She also monitors registration work flows, inspire registration staff to accept change, and drives consensus among registration staff.	Procurement, registration, administrative skills, communication, leadership etc.
Laboratory staff leader	The lab lead is the team's engine and manages the laboratory department to ensure the project takes into account lab-related needs. He or she is also a source of change embracement and consensus in matters to do with lab activities.	First this individual must have laboratory studies skills. Second, leadership skills. Third, communication since he or she must disseminate information to his or her juniors in the healthcare facility.
Information technology lead	The IT lead deploys and operates the relevant software and hardware (e.g. wireless tablets, printers and scanners and workstations). In other words, he or she provides technical advice on software	This is a pure computer science (IT) expert. He is the leader of the EHR in the capacity of information technology. Without this individual eve the project manager cannot handle the entire

	and hardware operations.	implementation process. He or she must be able to review the existing technologies to expose their strengths and weaknesses as well as their costs, then come up with a perfect mix that takes into account the project's budget, completion time, adherence to regulations, operational effectiveness and patient needs. Any wrong choice of equipment or contractors may lead to the project being restarted from scratch.
Billing staff lead	He or she works with other billing staff in the capacity of a supervisor. He interprets billing workflows and inspires billing staff to embrace change and drives consent among billing staff.	Finance and auditing, moderate purchases and supplies skills, banking, communication, computer usage etc.
EHR contractor	Builds and customizes EHR application areas like templates, drop-down boxes and pick lists. As the EHR lead, the builder has the power to understand anything regarding EHR more than anyone else in the team.	Computerized automation, electrical engineering, communication, etc.
Meaningful use lead	Trains the staff how to use the EHR system in order to optimize the objectives of the project.	He or she ought to know everything about EHR and its associated equipment, accessories, usage and maintenance. Computer science skills coupled with mechanical engineering skills are inevitable.
Workflows redesign lead	Trains the staff how to evaluate present workflows and how to redesign workflows in EHR implementation.	Workflow analysis, time management, team leadership, communication etc.
Training lead	Is also known as super-user lead. He or she coordinates effort with other team leader in recruiting and training super-users. A super-user is the chief operator	Communication, leadership, computer usage etc.

	of the system who must learn how to use it before its implementation.	

Source from: http://www.healthit.gov

Interoperability

Interoperability is the capability of systems to share and utilize electronic health information from other systems without special effort on the part of the user. As far as the transformation of health care provision is concerned, advancing health IT interoperability is a mandate. The overall effect of interoperability is the improvement of quality of patient care. For instance, patient information in a hospital in Massachusetts can be shared with another healthcare center located; say in New York without having to go there in person.

The Interoperability Standards Advisory (ISA) provides guidelines for the National Coordinator for Health Information Technology (ONC) to coordinate the identification, evaluation, and determination of the most strategic interoperability standards and implementation criteria for industrial use ("Health IT Rules and Regulations: Policy Researchers & Implementers").

Regulations however recommend healthcare centers to seek permission from the patient prior to sharing patient's medical information with other hospitals. Patient privacy precedes everything here and if by any means the patient declines a request to disclose his or her information to other health institutions, the hospital has no right to use coercion (("Health IT Rules and Regulations: Policy Researchers & Implementers").

Standardized Nursing Terminology

HIT helps healthcare centers with the management of Laboratory Information System (LIS), Electronic Medical Records (EMR), Patient Record Locator (PRL), Pharmacy Information Management System (PIMS), Patient Administrative System (PAS), and Personal Health Information Technology (PHIT) etc. The capturing of nursing specific data is made possible by HIT. The basic concept here is to facilitate efficiency in clinical operations. The PAS, for example, is responsible in the hospital for reporting administrative particulars of a patient encounter in a clinic (Schwiran & Thede, 2011).

The PAS does cover modules for patient master index (PMI), inpatient management, outpatient management, emergency management, theatre management, surgery waiting list management, medical records tracking, inpatient billing and reporting. Moreover, PHIT helps with nursing staff to document a patient's full, "lifelong health and medical history into a private, secure and standardized format that he or she owns and controls, but yet is accessible to legitimate providers day or night from any location" (Schwiran & Thede, 2011).

PIMS is used by the nursing department to record activities in the department. It has various modules that include but are not limited to script registration, dispensing, clinical decision support like interaction checking, inventory control, and management reporting. Not all functionalities of HIT can be discussed as their names define what they are, but it is of essence to appreciate the importance of the LIS. The LIS utilized by clinical pathological units to record activities in the department. Thee operational modules include result reporting, management reporting, request and specimen management, blood bank and pathology request and specimen registration (Schwiran & Thede, 2011).

Federal Regulations and Components of Federal Regulations

The Federal Advisory Committees (FACAs)

The American Recovery and Reinvestment Act of 2009 (ARRA) facilitated the establishment of an HIT Policy Committee under the sponsorships of the Federal Advisory Committee Act. The Health IT Policy Committee will recommend to the National Coordinator for Health IT on a policy framework for the development and implementation of a nationwide health information infrastructure, including standards for the exchange of patient's electronic information.

Within 90 days of the penning to paper of the ARRA, the Health IT Standards Committee has to develop a schedule for the evaluation of policy recommendations. These policy recommendations have to be under annual updates. The Health IT Standards Committee also provide for the testing of the policies by the National Institute for Standards and Technology (NIST) in a bid to develop, harmonize, or recognize standards and implementation specification.

Health IT Legislation and Regulations

Legislation: The Office of the National Coordinator for Health Information Technology's (ONC) activities is authenticated by the Health Information Technology for Economic and Clinical Health (HITECH) Act. The HITECH Act instituted ONC in law and offers the United States Department of Health and Human Services the authentication to establish initiatives that would serve to improve health care quality, safety, and efficiency via the promotion of health IT, including EHRs and private and secure electronic health information exchange (HIE). In addition, legislations associated with the work of ONC do

include Health Insurance Portability and Accountability Act (HIPAA), the Affordable Care Act, and the FDA Safety and Innovation Act.

Regulations: ONC formulate regulatory policies that set the standards and certification criteria EHRs have to meet to guarantee health care professionals and hospitals that the systems they implement are able of performing specific functions.

Electronic eligibility and enrollment is also part and parcel of the regulatory framework. Section 1561 of the Affordable Care Act demands the Department of Health & Human Services (HHS), in conjunction with the Health Information Technology (HIT) Policy Committee and HIT Standards Committee, to develop "recommendations for interoperable and secure standards and protocols that facilitate electronic enrollment of individuals in Federal and State health and human services program" ("Health IT Rules and Regulations: Policy Researchers & Implementers").

Security Threats and Potential Impacts

HIT enhances convenience, provides better health care, and provides a window of opportunity for patient engagement, but at the same time security issues have always been a major concern. The security and privacy of patient health details is mandatory for patients and their families, nurses, and the government. There is federal law involvement in both private and public hospitals to give assurances for the safety of patient information. Nowadays, organizations and individual hackers work around the clock to destroy well-established companies by leaking confidential information. HIT digitizes health information, exposing it to potential cyberattacks by individuals who work alone or on behalf of organized criminal syndicates.

Now who is responsible for protecting patient health information? Well, the burden of responsibility to protect patient health information is usually shouldered by the government and the hospital; and sometimes, the patient can be involved too. The Health Insurance Portability and Accountability Act of 1996 (HIPAA), Security, and Breach Notification Rules are the paramount federal laws that provide protection for health information. The Privacy Rule safeguards the right to privacy of patient information. Moreover, the Privacy Rule is involved in setting limits on how a patient's health information can be used or exchanged. The Security Rule formulates rules for how a patient's health information should be secured in terms of administration, technicality and location.

Patient Privacy Features & Industry Standards for Safeguarding Health Information System

Ethical, legal and security issues ought to be considered when utilizing technology. Ethics is a system of conduct or behavior and involve the adherence to professional standards as described the organization and regulatory structures. The nursing profession is no exception. Health information security is defined by two major terms: privacy and confidentiality. Privacy is the ability of the patient to decide the extent of sharing personal information. The right to secrecy of information and protection against abuse, or disclosure of this information is another definition of privacy. Confidentiality is about "being entrusted with information that is held secret or secure" (Information Management and Technology" p.444-45).

The Office for Civil Rights recommends patient involvement regarding privacy and security of health information. The patient cannot just relieve their obligation to keep their health information private. Patients using online platforms to access their health information

should design strong passwords and keep them secret. Internet information management is not reliable and is subject to various breaches to privacy maneuvers with cybercrime included. Information exchange must be executed through encrypted platforms.

Industry standards for securing health information system have been engineered by the U.S Department of Health and Human Services to improve the safety of health information exchange intra/inter-organizational (HIE). The penal code regarding malicious breach of privacy indicates severe punishment including long prison sentences and this serves deterrent purposes.

Non-Clinical Emerging Technologies

Communication software and word processing & desktop publishing are important examples of non-clinical emerging technology. In the clinics, dedicated links are used to give direct access to health information via LAN (Local Area Network) connection. This is facilitated by sophisticated computer soft wares that offer a link for access between computers ("Information Management and Technology" p.440).

Word processing uses software to create documents like letters, memos, signs, books, and CVs. Desktop publishing software incorporate graphics into the text and is used for newsletters, posters and signs, books and other graphics-demanding documents ("Information Management and Technology" p.441).

Clinical Emerging Technology

Intranets and extranets networks are broadly used for remote delivery of services. They help in the transfer and distribution of health information. Intranets are for internal use while

extranets provide links between the hospital and other hospitals, pharmacies globally. Extranets embrace remote communication with patients and care givers.

Through extranets, nurses can assist heart disease patients. The patient heart is installed with a computer-interfaced microchip in the heart. When the patients is just about to have heart attack, a signal is sent to the case nurse who then quickly moderates the heartbeat; therein preventing catastrophic incidents. NB: Heart attacks are usually characterized by increased rate and force of heartbeat.

Effect on Nursing Process, Patient-Centered Care & Improving Patient Outcomes

Health Information Technology has revolutionized the field of nursing and delivery of services to patients. Health records are managed digitally to assure quick reference and worldwide availability of information. Nursing information system and clinical information system enable the patient to monitor his or her own progress even at the comfort of their home.

The patient is permitted to decide what information to share and what not to and this boosts his confidence and recovery. Patients who are worried about their information being disclosed often struggle to recover. The quality and time of recovery is a function of mental peace, so any source of emotional disharmony may hinder his or her health and the ability to get well soon as expected.

Quick access to patient health information especially in emergency situations saves lives. The ability to also share information between hospitals keeps the patient safe. When they suddenly fall sick or are involved in an emergency situation, the patient can go to the nearest hospital without having to worry about missing his medical records. They are available in his

medical database in the hospital of registration and can request information transfer to where he or she is currently being treated.

Many nursing units are beneficiaries of clinical information systems (that are not necessarily nursing information systems) in areas such as infection control, surgery, labor and delivery. Clinical information systems improve the quality of health care, at the same time bringing down operational cost and facilitating environmental protection. This section has; however, been extensively discussed, that is why there is need to make it brief.

Culture of Safety & Human Factors

HIT supports the culture of safety by keeping patient medical records private and secure. The HIPAA and other federal provisions render the patient the commander-in-chief of his or her own medical record. The patient can accept or refuse to share information on his or her health. Up on breach of privacy and confidentiality, the patient has the liberty

CCTV systems allow nurses to monitor patient program from one center. A single nurse can monitor say all the rooms be it 60 or 120 in a single observation center. This allows quicker responses to unfortunate incidents in the health care center.

These health care soft wares and hard wares are made by humans and are prone to errors, near misses, and/or severe incidents. The first concern is password forgetfulness. When a patient forgets their password to electronic medical records, he or she may face dangers of delayed treatment. Computer and equipment crash can lead to loss of vital information. For internet-based heartbeat control, someone may hack the patient's account and trigger an artificial cardiac failure resulting to death. Disasters are countless in regard to HIT, but it is our hope these life-saving equipment won't fail (Cipriano & Hamer, 2013; McHaney, N.D).

Conclusion

The quality of health care is predominantly determined by the effect of certain health services on the patient's health status. Quality improvement in nursing is all about identifying and utilizing health services that, when appropriately done; serve to enhance operations within the hospital set, which in turn positively changes the wellbeing of patients. Thousands of lives in the United States are being saved courtesy of HIT. EHRs induce efficiency and expedition of emergency care measures as well as allowing a universal medical record management system. The medical record of a patient can be shared with anyone given approval for in the world and this makes HIT irreplaceable ("Health IT Rules and Regulations: Policy Researchers & Implementers").

Care must; however, be taken to avoid the prospect of forcing the patient to give consent to activity against their favor. HIT should be optional. The law is busy protecting consumers from unforgiving exploitative maneuvers by business men and hospital owners. First, the patient, under the HIPAA, should be in control of the transfer and sharing of this or her medical records. Second, he or she can kick the matter upstairs to the corridors of justice should one act in breach of privacy and security needs. To be precise, the rights to privacy for patients are protected by the U.S. Department of Health and Human Services. The agency has a branch called the Office for Civil Rights that educates patients about their privacy rights, enforces the rules, and helps the patient take his or her case to court ("Health IT Rules and Regulations: Policy Researchers & Implementers").

HIT has its ups and downs. The ups have overwhelmed the downs though, and it is time this technology was applied international. Each and every hospital regardless of location or G.D.P; must have the capacity to introduce and sustain the use of HIT (McHaney, ND).

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