**Why are the health informatics competencies involved with managerial roles in health care?**

* *Because hospitals are businesses that need to make / save money, and “How do you measure the quality if you don’t even have the data that tells you how you’re doing?”*
  + [*https://doi.org/10.1093/jamia/ocv022*](https://doi.org/10.1093/jamia/ocv022)
* Because the healthcare system is struggling to adapt to modern technology infrastructure due to its fragmentation of medical staff and administrators—HINF specialists are tasked with bridging this gap and fulfilling opposing stakeholder objectives (health sciences vs management sciences) with information sciences. You need to be competent in understanding both sides of the canyon if you’re going to build that bridge.
  + This divide comes form Physician Autonomy: The concept of physician autonomy is a fundamental principle in medical practice. It means that physicians have the authority and independence to make medical decisions in the best interest of their patients without interference from external entities, including hospitals. This autonomy is crucial for the doctor-patient relationship and the practice of medicine.
* **What is health informatics in health care settings?**
  + <https://www.sciencedirect.com/science/article/abs/pii/S1386505605001590>
  + Burns, L. R., Bradley, E. H., & Weiner, B. J. (2018). Shortell & Kaluzny's Health Care Management: Organization Design and Behavior (7th ed.).  
    Shift from paper-based to computer-based processing and storage
  + Increase of data in HC
  + Shift from institution-centered to regional and global HIS
  + Inclusion of patients and health consumers as HIS users (besides hospital admin)
  + Use for health care planning
  + Clinical epidemiological research
  + System change management as well as strategic information management (business)
  + Sensor based technologies for health monitoring & decision support systems
* **What types of managerial roles are in health care**
  + Hospitals are two separate firms in one: medical staff, and administration
  + Each half has its own managers, objectives, pricing strategies, and constraints
    - <https://www.jstor.org/stable/3003297>
  + delivery of care is distributed across a variety of distinct and often competing entities, each with its own objectives, obligations, and capabilities. These fragmented organizational structures lead to disrupted relationships, poor information flows, and misaligned incentives that combine to degrade care quality and increase costs.
    - Hospitals have a fragmented organizational structure because physicians are
    - central to resource allocation and care processes in the hospital, yet they are largely independent of hospital management. The principle of physician autonomy is deeply embedded in the laws and regulations governing hospitals (Hall, 1988). The doctor–patient relationship and the doctor’s medical practice are usually separate and legally distinct from the rest of the hospital. Reimbursement for care that happens within hospitals is made separately to physicians and hospitals. As Harris (1977, p. 468) put it in his seminal article on the internal organization of hospitals, “The net result is one organization split into two disjoint pieces, each with its own objectives, managers, pricing strategy, and constraints.”
      * We argue below that fragmented organizational structures inhibit process improvement in hospitals, leading to waste and inefficiency. The scope for process improvements in hospitals is hard to measure, but Medicare data on geographic variation in expenditures and outcomes suggests that inefficiencies may be large.
      * Physicians, as independent contractors, have high-powered incentives for devoting time and attention to their private practice, to other hospitals where they may have admitting privileges, or to research and teaching. Getting high levels of physician cooperation for addressing hospital-specific issues like the sterilization of instruments requires that the hospital offer equally high-powered, countervailing incentives
      * Unlike the nationalized health systems of many countries, however, the U.S. health care system is deliberately composed of private, independent hospitals, ambulatory care and long term care facilities, and private individual and group provider practices. While this arrangement has stimulated competition, maximized consumer choice, and provided ongoing incentives to excel and to innovate, the free market system does not inherently generate practical mechanisms for sharing information critical to patient care
      * Past efforts to develop automated medical record systems have not been very successful because of the lack of common standards for coding data, the absence of a data network connecting the many health care organizations and clinicians involved in patient care, and a number of other factors.”
      * the absence of standards for interoperable electronic medical records creates opportunities for insurers to act as information aggregators for their policyholders. Insurers can do this because all visits and procedures that require billing are coded into the records of the insurer. If the billing information is sufficiently complete, timely, and accurate, and if it can be integrated with pharmacy and laboratory information, it is possible to assemble something approximating a comprehensive electronic medical record.
      * it takes about a year for an insurance company to collect enough information about a patient to know if they are even eligible for a disease management program.
      * Companies such as WebMD work with employers and insurers to feed billing information, as well as pharmacy and lab data, into each individual’s record. This information belongs to the individuals and stays with them. If, however, an individual’s next job does not have a contract with WebMD, the flow of information from the insurer stops. Individuals can continue to add information to their personal medical record on their own, but this approach creates a likelihood of gaps and errors.
      * <https://pubs.aeaweb.org/doi/pdfplus/10.1257/jep.22.4.93>
  + Exec VP for operations
  + Clinical Informatics Manager
  + Compliance Manager
  + eSafety Manager
  + Senior Business Analyst
  + PMO manager
  + Program Manager
  + Project Manager
  + Change Manager
  + Engagement Manager
  + Data Manager
  + Privacy Manager
  + Standards Manager
  + Database Manager
  + Risk Manager
  + Application Manager
  + Asset Manager
* **What is the intersection of health informatics with managerial roles in healthcare?**
  + They need information when deciding about investments in new treatments
    - “Finding a generic version of a drug can save millions of dollars per year”
      * <https://academic.oup.com/jamia/article/22/4/849/1746364?login=true>
  + clinical , economic, safety and organizational aspects of new treatments as the most relavant for decision-making
  + Had a narrower focus on budget impact and reimbursement
  + Needed information on the political and strategic aspects of new treatments (relationship between the treatment and strategic goals of the hospital)
  + deciding on investments in new treatments
    - <https://www.sciencedirect.com/science/article/pii/S0168851015002158>
  + EHRs Must support documentation for billing and insurance
    - <https://academic.oup.com/jamia/article/22/4/849/1746364?login=true>
    - **We’re having a hard time measuring quality because EHRs don’t always collect the kind of data we need to measure quality**
    - **The challenges of generating revenue are just not known to academics**
    - **Of all my patients, who is the one most likely to fail this therapy? Who’s the one most likely to end up in the emergency room? Whos’ most likely to have adverse effect? Whole’s most likely to not pick up their medications? Who’s most likely to fall? *So anticipaitn, and GOING TO PREDICTIVE ANALYTICS IS THE NEXT FRONTIER FOR HEALTH IT***
    - **None of the EHRs currently available really meet most clinical needs today**
    - **There is no physician charged with playing a central “gatekeeping role”, physicians therefore often found it difficult to generate comprehensive longitudinal pictures of patients’ clinical histories or the treatments they had been given**
  + What ARE the HINF competencies?
    - Health Sciences
      * Canadian Health System
        + Advanced Competencies
      * Clinical & Health Services
        + Advanced Competencies
    - Information Sciences
      * Information Technology
        + Advanced Competencies
      * Information Management
        + Advanced Competencies
    - Management sciences
      * (Reduce costs, improve outcomes)
      * Project Management
        + Advanced Competencies
      * Organizational & Behavioural Management
        + Advanced Competencies
      * Analysis & Evaluation
        + Advanced Competencies
  + What are the managerial roles?
* 3 single-spaced pages
  + (1) Introduction
  + (2) Literature Review
  + (3) Discussion
* must be clearly stated on introducing the topics (as mentioned as guiding questions) to answer the main question
  + **What is health informatics in health care settings? - and competencies**
  + **What types of managerial roles are in health care?**
  + **What is the intersection of health informatics with managerial role in health care?**
* Discussion includes logic in the difference topics and aspects involved to answer this somewhat difficult question
* 4-5 journals used in the assignment. APA reference formatting.
* Word count: 750 - 800 Words
* Assignment is easy to read, clearly states the objective, has logical flow from one idea to the next, and more detail than average to complete all the necessary requirements successfully.
* Notes on Leveraging health information technology to achieve the “triple aim” of healthcare reform

Aziz Sheikh, Harpreet S Sood, David W Bates, Leveraging health information technology to achieve the “triple aim” of healthcare reform, Journal of the American Medical Informatics Association, Volume 22, Issue 4, July 2015, Pages 849–856, <https://doi.org/10.1093/jamia/ocv022>

* HINF tech created new digital infrastructure
  + Improved quality and reduce costs
* Concerns about poor usability of EHRs
  + Limited ability to support multi-disciplinary care
  + Difficulties with HINF information exchange
    - Got in the way of patient care
  + Proposed strategy:
    - Governement forces HINF vendors to share their application interfaces and incentivize development of low-cost consumer informatics tools
    - Promote congressional review of HIPPA to optomize balance between data privacy and reuse
    - “Kick the legs from underneath the fee-for-service model” and replace with data-driven reimbursement system that rewards high quality care
* Conclusion:
  + The HITCH Act stimulated unprecedented stakeholder interest in HIT
  + HIT improves quality of care and lowers costs
    - Limited by
      * Useability
      * Limited interoperability
      * Persistent fee-for-service paradigm
* “By computerizing health records, we can avoid dangerous medical mistakes, reduce costs, and improve care.”
  + President George W. Bush, State of the Union Address, January 20, 2004
* Talked to almost everyone involved from different angles with HIT
  + Implementing and adoption of existing HIT
  + Strategies for optomozing HIT
  + Secondary uses of HIT-derived data
  + Innovation in HIT and analysis of ‘big data’
  + Recommendations and priorities for policy, practice, HIT businesses, HC orgs and researchers
  + **Key themes:**
    - Success of the HITECH Act in achieving ARRA objectives
      * The 2008 financial collapse triggered federal financial investment in HIT to improve health reform and create jobs
      * **How do you measure the quality if you don’t even have the data that tells you how you’re doing?**
        + ARRA and Comparative Effectiveness Research Institute (CERI). (R42)
    - Usability, health information exchange (HIE)/interoperability, and deriving benefits
      * Physicians expressed concerns about the usability of EHRs and computerized decision systems
        + That physicians hat to work with immature technologies written in an old code base originally developed for hospital billing
        + Believed current gen of EHRs is suboptimal for multi-disciplinary teamwork essential for delivering patient care
        + Did not make quality measurement a part of care delivery
        + **EHRs must support documentation for billing and insurance**

Freeing yourself from these restraints might make more interesting more successful systems

Physicians did not know how to use it fully

RHTs are optimized for simple transactions, not re-engineering care

**We’re having a hard time measuring quality because EHRs don’t always collect the kind of data we need to measure quality**

* + - * + Limited ability to exchange information between departments, orgs, and providers
        + **Health information Exchange is a HUGE problem and done poorly**

Globally or nationally

**Health information exchanges will cease to exist because they don’t have a sustainable business model**

*You have to make or save money somehow*

It hasn’t worked because the right incentives haven’t been in place

Not strong enough policies

Should not be left to market because it is a public good —*yeah, but at some point it comes down to money, taxes, and GDP. if improving health outcomes doesn’t improve GDP then a sustainable business model can’t be found*

**There is not a strong incentive for HC orgs to share their data (*financial*) or pressure on vendors to make systems collaborate**

**THIS IS THE PROBLEM. Orgs don’t cooperate**

Despite this, digitized infrastructure was being used to achieve cost savings

(switching patients to cheaper alternative medicines, use EHR to derive quality improvement efforts

***Make a new funding model policy that pays hospitals based on data quality and statistical proof of patient outcomes in their community***

Efforts most readily adopted were ones that aligned with business strategy of the org

Things that save doctors time

Fast patient history / data

Drug contraindications

**Knowing that generic alternatives or cheaper medications are available**

**Saves millions of dollars a year**

* + - Unintended consequences
      * HITECH disrupted market forces resulting in limiting competition in the vendor market place
        + Limited incentive to invest in tech innovation to develop next generation of EHRs
        + 2000 vendors certified for Stage 1, but less than 100 vendors for Stage 2
        + **Vendors are making the mistake of not recognizing the tremendous talent and innovation out there in the academic world**

*What’s out there?*

* + - * Challenges in working with academics
        + Much innovation is detached from the reality of the industry
        + **The challenges of generating revenue are just not known to academics**
        + The detailed MU (meaningful use) requirements were criticized bot hby vendors and the physician community as a distraction from other clinical priorities:

“We’re too busy dealing with federal regulatory burdens to do things that are not so valuable”

we ‘re so focused on MU criteria we don’t do other creative things

* + - * Concerns that consolidation of HITECH providers might inflate costs (monopoly)
        + Hospitals are consolodating to keep market share in their region

It is hard for smaller HC practices to compete against the “hospital giants” in the market due to EHR regulations, costs, and advantages

* + - * + Smaller practices have a hard time putting in an IT system
      * **What was really needed was innovation that would undercut the dominance of these historically important, but now expensive healthcare providers** - *holy shit*
        + Innovation could move the market to a more distriutibe, population-based view which would emphasize the importance of self-care and community-based initiatives focused on promoting wellness and prevention efforts
        + ***Make a personalized app that tracks your own health data and makes predictive health appointments with practitioners—have the receiving side be the EHR system for doctors***

**Make it a paid app, and include global doctors**

**Most care is delivered by nurses and others, not by physicians**

***Have the app support independent nursing practices***

* + - * + What does get built, gets built by those with the money, so academic medical centers have the money and are the ones that get to build and design the system

*But doctors have money…..*

* + - * + ***THERE is no community based resource or coordination or coordination, or communication, or collaboration, that really supports care across the community***
      * *“Finally, a few individuals said that they believed that HITECH and the current-generation of hospital-centered EHRs and related HIT was consolidating an academic medical center view of healthcare, when what was really needed was innovation that would undercut the dominance of these historically important, but now expensive healthcare providers. This group believed that innovation could help move the market to a more distributive, population-based view which would emphasize the importance of self-care and community-based initiatives focused on promoting wellness and prevention efforts.*
      * *… particularly around academic medical centers, we think we are sort of the center of the universe, but … people … spend 99.9% of their time outside of the hospital. Most care is delivered by nurses and others, not by the physicians anyway and so our IT that we have built since it’s expensive gets built out from the resources that have the money. So academic medical centers or those parts of the health system that have money are the ones that get to build and design the systems. So is it a surprise that when you are caring for your parent who is 90 years old there is no community based resource or coordination or communication or collaboration that really supports care across the community … well the dollars are where is the money, it’s where the procedures and the expensive people and the expensive drugs are so they are the ones that can afford to build the computer systems. (R25)”*
  + Strategies for leveraging HIT to maximize benefits
    - Many suggestions for improvements, major gaps remained in adoption of HIT in post-acute sector and behavioral health
    - Tools to enable population management were felt to be insufficient
      * The future is going to be based on how we can better manage population health
      * Doing poorly when it comes to population health management
        + Managing chronic conditions, managing risks
        + Expand the use of tools to support better population health management
      * Following patiens over time and space is going to improve care coordination
        + And having one large system which provides efficiencies in terms of our back office function
      * “Let me understand my population better in terms of their behavioural propensity”
        + **Of all my patients, who is the one most likely to fail this therapy? Who’s the one most likely to end up in the emergency room? Whos’ most likely to have adverse effect? Whole’s most likely to not pick up their medications? Who’s most likely to fall? *So anticipaitn, and GOING TO PREDICTIVE ANALYTICS IS THE NEXT FRONTIER FOR HEALTH IT***
      * Interviewees suggested that promoting development was the responsibility of the Office of the National Coordinator (ONC)
        + Their more interested in creating a certification process instead of new functions for EHRs
        + ONC was seen as playing a role in promoting competition in the acute sector market place—opinions were divided on how
        + Wanted steps taken to weaken the considerable power of one EHR vendor, Epic

And Medicare and Midicade (CMS) to open up their APIs to smaller vendors

But, there were no readily implementable solutions that had widespread policy or professional buy-in

* + - ***Why couldn’t you use a global app outside of Canadian jurisdiction??***
  + Discussion
    - HITECH achieved its core aim of promoting adoption of EHRs into hospitals and ambulatory sectors
    - A number of obstacles need to be overcome to fully realize the potential of HIT
      * The need to stimulate competition in the vendor marketplace
      * Need to develop a coherent national policy to promote HIE and interoperability
      * Need to align policy initiatives in relation to HIT with financial and structural reform to reward quality rather than volume of care
        + *New funding formula based on population metrics?*
        + *How do you measure it? — this is a competency of HITECH*
  + Strengths and limitations
    - *(this study is an incredible example of qualitative work)*
  + Considering the findings in light of the existing literature
    - **None of the EHRs currently available really meet most clinical needs today**
    - **There is no physician charged with playing a central “gatekeeping role”, physicians therefore often found it difficult to generate comprehensive longitudinal pictures of patients’ clinical histories or the treatments they had been given**
  + Implications for policy
    - Quality and safety can be readily improved
    - ***There are opportunities for achieving cost savings associated with investigative procedures and optimizing medication management***
      * These comprise the low hanging fruit for HIT-based reform efforts
    - MAIN ISSUES IDENTIFIED
      * Need to stimulate competition amongst vendors
      * Enhance usability
      * Promote HIE
      * Catalyze developments in population management modules
      * Impact fixed costs of healthcare through major advances in population and preventative health
        + Need new policy that rewards all aspects of avoidable usage of healthcare (not just readmissions)
        + Primary care physicians need to coordinate care
      * ***Major advances in achieving population health will depend on a closer alignment between the worlds of health care and social care as is now happening in parts of Europe***
        + <https://www.gov.uk/government/publications/health-and-care-integration-making-the-case-from-a-public-health-perspective>
* Conclusions
  + True transformation by HIT will depend on aligning HIT initiatives with wider structural and financial reform initiatives
  + Consolidation of vendors in inflating EHR costs

<https://digitalhealthcanada.com/wp-content/uploads/2019/07/Health-Informatics-Core-Competencies.pdf>

* Competencies
  + Information Sciences
    - Information management
      * Data quality
      * Information as a strategic resource
      * Finds data gaps
      * Decision support systems
      * EHRs
      * Legalities of health information
      * Applies policies
    - Information Technology
      * Networks, storage, operating systems, data warehousing, firewalls
      * Maintains tech requirements within budget
      * System interoperability, privacy, security, safety
      * Knowledge of health data, info workflow models
  + Health Sciences
    - Clinical & Health Services
      * Knowledge of basic clinical and biomedical concepts, clinical processes, and technologies
      * Clinical terminology
      * Formats and methods for recording and communicating clinical data
      * Fosters adoption and use of HINF systems in clinical settings
    - Canadian Health System
      * Knowledge of health systems in Canada: governance, funding, structures, agencies, etc
        + Determinants of health
    - Knowledge of how HI benefits are measured
    - Understands different types of healthcare delivery models (hospitals, clinics, ambulatory centers, community health agencies, etc)
    - Knowledge of how people and resources flow through the HC system
    - Knowledge of roles and relationships of HC professionals
    - Balance of HC information privacy and HC delivery
    - Promotes safe and appropriate use of HC tech
* Management Sciences
  + Organizational and Behavioural Management
    - Applies basic theories and concepts of organizational behavior and culture
    - Human resources
    - Financial and budget management
    - Risk analysis, vendor relationships
    - Contribute to organizational plans and strategies
    - Promotes appropriate use of information
    - Uses audience-appropriate communication and language for story telling
    - Quality improvement and process engineering
  + Project Management
    - Applies PM techniques, measuring, and monitoring
      * Budgets, charter, life cycle, etc
    - Works collaboratively in project planning, implementation, monitoring and evaluation
    - Mitigates risks with projects
  + Analysis and evaluation
    - Queries data to collaborate and assist stakeholders
    - Understands qualitative and quantitative methods
    - Statistical and epidemiological techniques
    - Transforming data into meaningful information
    - Data visualization and presentation
    - Knowledge and metrics for HC delivery and systems management

**Deep Dive: Why are Health Informatics Competencies Integral to Managing Health Care?**

*Parker DeBruyne, University of Victoria*

*September 26th, 2023*

This paper explores the required career competencies for health informatitians in hospital settings and how these competencies impact managerial roles. Namely, it outlines what health informatics is, the types of managing roles that exist, and how the two overlap in healthcare. To start with however, we need to understand that a hospital is a dual-organization with two halves and seemingly competing interests; in general, the medical side wants to maximize health outcomes while the administrative side wants to reduce costs, (Harris, 1977). Let us explore how the reasoning of this structure works.

Our first principle, is that all sustaining organizations require money to survive. Our second principle, is that the legal right to perform medical diagnosis and treatment—in all of its benefits and dangers—is the exclusive right of doctors; a natural consequence of the fact that we all eventually become ill, and we would like to entrust our health only to those with remarkable education. It would be inappropriate for anyone with lesser medical training to have authority over these doctors when lives are at stake. So, doctors operate as independent legal entities inside of hospitals and this creates a divide with mutual dependance; doctors need equipment and medical staff, and hospitals need good doctors and health outcomes to secure funding, (Cebul, Rebitzer, Taylor, & Votruba, 2008). Naturally, managerial roles populate both sides of the divide: medical practice, and administrative.

On the medical side, managerial roles and departments tend to reflect the most prevalent ailments of society at their respective points in time; for Canada in 2023, this includes cardiac and cancer wards because developed countries tend to struggle more with chronic illness rather than communicable diseases—but if we go back in time to the early 1900s, you would see more tuberculosis wards. Some roles include Chief of Medicine, Chief of Surgery, Chief of Psychiatry, Chief of Radiology, Director of Medical Nursing, Director of Surgical Nursing, Director of Psychiatric Nursing, Nursing Manager, Chief of Pathology, Chief of Radiology, Chief Medical Information Officer, Director of Heart Programs, and Director of Cancer Programs, (Digital Health Canada, 2019). Disease screening, patient care, and staffing of medical professionals are some of the largest priorities.

On the administrative side, much stays constant throughout time and managerial roles reflect the best practices of other organizations in the free market economy. In general, the range of roles include Chief Executive Officer, Vice President of Human Resources, Chief Financial Officer, Chief Information Officer, Program Manager, Data Manager, Privacy Manager, and Research Director, (Digital Health Canada, 2019). Priorities centre around budget, funding, sustainability, patient care process, information, research, and medical regulations. Recently, advances in data technology have improved operations for both medical and administrative sides, which brings us to health informatics.

With the intention of stimulating the economy and improving healthcare, the early 2000s saw the investment and emergence of Electronic Health Records (EHRs) in hospitals and gave rise to a new profession: health informatics, (Sheikh, Sood, & Bates, 2015). Now, information technology is an integral part of every major hospital and the effective use of health data is critical for both halves of a hospital. Comparative statistics over complete data sets allow doctors to measure the efficacy of different treatment options, while up-to-date pharmaceutical registries allow hospitals to stock up on equivalent, less expensive, generic drugs and save millions each year, (Sheikh, Sood, & Bates, 2015). Decision support systems fuelled by machine learning and projective budget analysis are only some advantages to emerge from this budding field, and it is the health informatitian's job to harmonize the needs of both doctors and administrators with modern technology.

Professionals in health informatics require competencies in health sciences, management sciences, and information sciences, (Canada's Health Informatics Association, 2012). Health Sciences include medical understanding, language, testing, and treatment options while management sciences include organization structure, project management, work process, communication skills, cost reduction, and budgeting. Information sciences include procurement, installation, change management, security, data engineering, and statistical analysis. Without knowledge of medical practices, informatitians cannot generate meaning from health data and inform managers on how reduce cost, increase access to patients, or improve quality. In particular, decision-making around new treatments require consideration of all economic, safety, and organizational aspects, none of which are effectively measured without health data, (Kidholm et al., 2015).

In summary, health informatics is the multidisciplinary blend between health, management, and information science that ties together the medical and administrative halves of healthcare with technology. Without this connection, medical advancement, organizational agility, and patient value delivery is restricted, and so it falls upon the health informatictian to maintain high standards of skill competency in each of these areas to help the entire industry move forward.