

Book Review: Nelson, R., & Stagers, N. (2016). *Health Informatics-E-Book: An Interprofessional Approach*. Elsevier Health Sciences.

Thank you to members of our informatics committee for their review of chapters!

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The Colorado chapter of HiMSS and the informatics committee know that it may have been a while since you had the chance to review the latest texts on informatics. Our informatics committee reviewed chapters that we thought you might be interested in reviewing. For the chapters reviewed, we have provided the chapter objectives, key takeaways and noted how you might be able to leverage the information in your own organizations! Please enjoy this review, and let us know if you have questions, or would like to have another book reviewed for our HiMSS members!

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Chapter 20: Downtime and Disaster Recovery for Health Information Systems.

Chapter Objectives:

The authors present factors to consider and steps to include when planning an organization's downtime processes and recovery efforts. They present tools to leverage, teams to partner with and the responsibilities of IT to mitigate and or prevent downtime.

Key Takeaways:

In this chapter, Brazelton and Lyons do a good job in highlighting the items and areas to consider for planned or unplanned downtimes. From providing an overview of the physical and IT infrastructure, to examples of common vulnerabilities and key business and clinical areas that are impacted during an outage. They detail the importance of the Downtime Risk Assessment when creating an organization's inventory of clinical systems and dependencies; as well they outline the importance of the Business Impact Analysis (BIA) in downtime and disaster recovery. They provide information on the various downtime solutions and what tools IT can implement to assess the impact of a downtime event. The dedication of a whole section to communication highlights the importance of sending the right information to the right users during a downtime.

The weakness with this chapter was that the authors were not very prescriptive in their responsibilities of the clinicians, not providing suggestions on roles that are key to contributing to the BIA, downtime planning or training. The section on Information Technology Impact and Planning focused on the change management process but offered no suggestions on increasing IT-centric staffs' appreciation/understanding of clinical/business workflows impacted.

How can you use/leverage this information in your informatics programs – Practical application:

Overall, this chapter can be useful in providing a comprehensive overview of IT downtime planning and preparation. The authors present the key components to mitigating the effects of a downtime while providing examples of processes and systems that can be put into place to provide structure for staff to manage and event successfully. Informatics is the best group to be the conduit between the organization and the Business Continuity team as they know both the workflows and the IT infrastructure environments. These professionals are vital in standardizing downtime communications, removing any IT language and ensuring context is appropriate.

Chapter 21: Improving the User Experience for Health Information Technology

Chapter Objectives:

1. Compare and contrast user experience, human factors, ergonomics, human-computer interaction, usability, and design thinking.
2. Describe the goals and benefits of incorporating usability into organizational processes and user centered design.
3. Analyze usability studies: human-computer interaction, specific purpose and types and conducting

Key Takeaways:

1. The goal of usability is Effectiveness, Efficiency and Satisfaction.
2. Do usability studies multiple times in the *design* phase. Correcting the problem later costs 10 times as much as fixing the same problem during design.
3. In all processes, consider the user experience (UX).

How can you use/leverage this information in your informatics programs – Practical application:

1. Complete a usability study during the system life cycle. And repeat.
2. One round of design is never enough, and three rounds is typical.
3. Improving UX, not the EHR, is the focus.

This is a great quote: *“Usability measurements are to user interface design what physical exams are to patient care”.*

In the design process, include a usability study early and often to improve the UX. The heuristic “rule of thumb” is an independent evaluation of 3-5 experts. The method combines the issues seen and then compares them to heuristic principles. More traditional usability analysis is Think-Aloud where users verbalize their experience and thought process. Task Analysis focuses on accuracy of actions and error recovery by observation and interviews. After the product is developed, a summative test is generally used, such as the System Usability Scale SUS which is a 10-item scale developed in 1986 by John Brooke at Digital Equipment Corporation. Other questionnaires are available for the recommended 15 users for measurable outcomes from surveys.

The author is a proponent of Think-Aloud technique. Five users performing a think-aloud can detect 60-80% of design errors in the area of value, navigation, and missing context.

For a Usability study define the “Ws”. Who is using the system, what is the task or goal, when/how often, where (context), why – what is the problem to be solved? How can the system support the user? By focusing on the user and the UX, the informatician can leverage the power of improved effectiveness (accuracy and completeness to achieve specific goals), efficiency (resources expended to be effective), and satisfaction (user comfort and acceptance of the product).

People often use the following words interchangeably, yet they differ. User experience (UX) is more “big picture” and identified by ISO 924-1 as “a person’s perceptions and responses that result from the use or anticipated use of a product, system or service”. This can be the microwave or an ATM. Human factors is the human interaction with elements of a system. Interaction with tools and systems and machines is ergonomics. HCI, human-computer interaction, is the relation of the human to computer system to complete tasks.

Chapter 25: Legal Issues, Federal Regulations, and Accreditation

This chapter provides an overview of the U.S. legal system as background for understanding healthcare and health informatics regulation. The Chapter provides information on the accreditation process of healthcare organizations and health information management practices.

Chapter Objectives:

1. Review the structure and processes of the US government specific to HIT regulation.
2. Understand the differences between laws, regulations and policy guidance.
3. Describe federal fraud and abuse regulations in relationship to HIT and EHRs.
4. Analyze how the regulation of informatics processes impacts healthcare payment reform.
5. Identify key accreditation agencies and practices.

Key Takeaways:

1. **The Legal System:** The overview provides information regarding the differences between laws, regulations and advisory opinions that help the student understand where healthcare regulation is initiated and how it is enforced. Table 25.2 Administrative Agencies provides an overview of some of the most important agencies in HIT.
2. **Fraud and Abuse:** There are three major laws that govern the purchase and implementation of EHRs.
 - a. **Stark Law:** This law prohibits self-referral to “designated health services” by physicians to organizations with whom the physician maintains a financial relationship
 - b. **Federal Anti-Kickback Statute:** This statute regulates financial relationships between healthcare providers where one party would be in the position to refer business to another party in return for goods or services.
 - c. **False Claims Act:** This act imposes monetary penalties for the submission of known incorrect claims for reimbursement by federal health programs
 - d. **Others:** The text mentions mail fraud and fraud and abuse in the EHR including the risk of error in the record with the use of the copy/paste tool.
3. **Accreditation:** The text does a short review of The Joint Commission and DNV accreditation standards.
4. **New Technology and Regulation:** This portion of the chapter reviews current regulation around medical devices, wearables and telehealth. The chapter wraps up with a look to the future and the potential need for further regulation around data ownership and the use of social media as it relates to patient privacy.

How can you use/leverage this information in your informatics programs – Practical application:

1. This chapter provides a useful summary of the legislative process as it relates to HIT and healthcare regulation
2. An instructor may choose to supplement this material with new information as it comes available in the fast-paced world of healthcare regulation and also may choose to include state-specific information.

Chapter 26: Privacy and Security

This chapter investigates the concepts of privacy and security as they relate to electronic health information including current international and federal practices, regulations, and guidelines.

Chapter Objectives:

1. Review the concepts of privacy, security, confidentiality, data integrity and availability.
2. Understand the role of federal and state legislation around privacy and security practices in healthcare.
3. Investigate common processes for implementing IT security measures

Key Takeaways:

1. **Fair Information Practice Principles:** The chapter text and Table 26.6 review the major Fair Information Practice Principles which outline the responsibilities of organizations to maintain appropriate access to data, data quality and integrity, and how organizations should be held accountable for the principles.
2. **Laws, Regulations and Principles:**
 - a. **1974 - Privacy Act:** The first Act to address the need to protect digital information. This act protects personal information in federal computerized databases
 - b. **1996 - HIPAA:** By far the most widely known legislation guarding the privacy and security of health information data. The text provides an initial brief overview and then goes more in-depth into the history of this legislation and includes a mention of the HITECH Act of 2009 and the HIPAA Omnibus Final Rule of 2013.
 - c. **2015 - GDPR:** This is the regulation enacted by the European Union to outline protections around ownership and use of personal data.
3. **Resources for Healthcare Data Privacy and Security:** This portion of the chapter reviews the resources provided by the ONC, federal and state collaborations, public health surveillance teams and HIEs around the judicious use of health information data.
4. **The Importance of Information Security and Understanding Vulnerabilities:** The reader learns about how the security of data is imperative not only from a legal standpoint but also from an ethical stance. The chapter reviews vulnerabilities including data breaches, cyber attacks aimed at medical devices, and ransomware attacks targeting personal, financial and medical information.
5. **HIMSS:** The text mentions several HIMSS toolkits for organizations looking to shore up IT security practices.

How can you use/leverage this information in your informatics programs – Practical application:

1. This chapter provides a historical summary of healthcare privacy and security legislation.
2. This is another area of constant change where information would need to be supplemented to provide the most up to date information.

Chapter 27: The Health Information Technology for Education and Clinical Health Act, Meaningful Use and Medicare Access and CHIP Reauthorization Act of 2015

This chapter reviews key legislation that set the stage for the Meaningful Use incentive program that incentivizes healthcare providers to both implement/adopt EHRs and to participate in value-based payment models.

Chapter Objectives:

1. Understand federal legislation related to the implementation and adoption of HIT
2. Describe CMS the financial incentive program to encourage the use of EHRs
3. Review Meaningful Use stages, their progression and impact
4. Analyze the impact of MACRA on value based payment models

Key Takeaways:

1. **Executive Order 13335:** This is the follow up from the 2004 State of the Union Address where George W. Bush states that every American should have an electronic medical record by 2014. This order creates the position of the Office of the National Coordinator for Health Information Technology (ONC).
2. **The American Recovery and Reinvestment Act of 2009 (ARRA):** The Health Information Technology for Education and Clinical Health (HITECH) portion of this act provides the funding source for the Meaningful Use standards and the long term goal of a National Health Information Network (NwHIN). The Health IT Policy and Standards Committees are responsible for making recommendations to the ONC.
 - a. **Financial Incentives:** The ultimate goal of NwHIN is not just to get HIT up and running in the healthcare system for the sake of technology, the goal is to improve the health of populations by improving access to care, decreasing health disparities and providing lower cost, efficient, high quality care. Financial incentives are offered to eligible entities and providers to “implement, adopt and engage in MU of certified EHR technology.” (Nelson and Stagers, 2018)
3. **Meaningful Use:** The text outlines objectives for Stages 1, 2 and 3.
4. **Medicare Access and Children’s Health Insurance Program Reauthorization Act of 2015 (MACRA):** The chapter concludes with a quick summary of MACRA and outlines the changes that incentivize providers to participate in Alternative Payment Model (APM) that focuses on value-based care.

How can you use/leverage this information in your informatics programs – Practical application:

1. This chapter provides a good overview of key legislative changes that set the stage for the push to meet the MU criteria
2. It might be worth supplementing the text with the changes to the MU program that have occurred in the past 2 years. (e.g. name change to Promoting Interoperability and updated timelines)

Chapter 28: Health Policy and Health Informatics

This chapter covers the role of the informatics professional in leveraging professional organizations to advocate for best practice in informatics by engaging in policy development and dissemination.

Chapter Objectives:

1. Identify key policy issues relevant to the practice of health informatics
2. Using informatics concepts and principles to develop health policy related to the use of technology in healthcare
3. Review of reports from the National Academy of Medicine (formerly the Institute of Medicine): “HIT and Patient Safety” and “The Future of Nursing.”

Key Takeaways:

1. **Developing and Implementing Health Information Technology Policy:** This section outlines some of the Federal Agencies responsible for developing and implementing health policy with a technology focus all of which fall under the purview of the Department of Health and Human Services. The text provides a table of informatics focused government initiatives and includes the text chapter where the initiative is described in more detail. This section wraps up with highlights of the ONC’s, “Federal Health IT Strategic Plan 2015-2025.”
2. **Driving Forces for Creating Health Information Technology Policy:** Patient Safety and Quality are the 2 main areas explored in this section of the chapter.
 - a. The text refers to reports on patient safety from the IOM (now the NAM) including the 1999 report, “To Err is Human,” “Crossing the Quality Chiasm,” and “Best Care at Lower Cost: The Path to Continuously Learning Healthcare in America” as well as those mentioned in the Chapter Objectives.
 - b. Quality of care is addressed with the work of the Agency for Healthcare Research and Quality (AHRQ) as well as through CMS’s clinical quality measures.
 - c. Both safety and quality are mentioned in the context that HIT can benefit these driving forces through better access to information for clinical decision support, error reduction, care coordination.
3. **Leadership Competencies for Developing and Implementing Health Information Technology Policies:** This section demonstrates some of the activities important to advancing the field of informatics in healthcare including ensuring that healthcare and informatics professionals are named to committees and boards of organizations that impact health policy. The authors also mention the need for health informatics professionals to stay informed on policies and regulations that impact their work by reading and responding to open calls for comments on ensuing regulations, laws and policies.
4. **Leading Policy Activities Through Organizational Work and Leadership:** This section provides information on professional organizations that are actively engaged in providing recommendations or position statements on key legislation relevant to health informatics
5. **Discipline-Specific Policies: Nursing:** The final section of this chapter narrows the focus of the previous sections to focus on nursing’s responsibility in the legislative process to advance the role of nursing in healthcare and HIT

How can you use/leverage this information in your informatics programs – Practical application:

This chapter contains information I don’t often see in similar informatics texts and does a good job of making the case for those in the health informatics field to be aware and engaged in the legislative process as an individual but also as part of a larger professional organization. I don’t think that is stressed enough in many academic programs at this time.

Chapter 29: Simulation in Healthcare Education

Chapter Objectives:

1. List and define available simulation modalities
2. Discuss challenges and opportunities of simulation
3. Discuss use cases and simulation education resources
4. Provide foundation to develop evidence-based simulation activities

Key Takeaways:

1. Standard 7 of the Informatics Nursing Scope and Practice is Education. Emerging simulation technologies and research fall within the Nursing Informatics practice domain.
2. High fidelity simulation, while often useful and impressive, is not always required. Simple simulation and scenarios work well for small portions of uncomplex learning needs.
3. The International Nursing Association for Clinical Simulation & Learning (INACSL) and the Society for Simulation in Healthcare are two of leading organizations that promote best practice and research in the simulation space. Both have several thousand members.
4. Don't judge simulation learning based on technological capability alone. Factor in summative and formative evaluation, as with design principles.
5. The chapter spends significant time on education principles and is valuable as a reference tool for concepts and practice of education.

How can you use/leverage this information in your informatics programs – Practical application:

1. Principles of simulation education can be applied to scripting your end user acceptance testing and end user training.
2. If you are asked to participate in simulation education project team, check out this chapter for some just-in-time learning!

Chapter 30: Informatics in the Curriculum for Healthcare Professionals

This chapter investigates how the introduction of digital technologies into healthcare has changed how healthcare providers care for patients and populations thus changing how the education of the current healthcare workforce and new generations of providers must adapt as well.

Chapter Objectives:

1. Identify forces that are driving the integration of informatics into healthcare education
2. Introduce pedagogic approaches for incorporating informatics competencies into healthcare education as part of both academic education and continuing professional development
3. Address the challenges of providing informatics education
4. Introduce the team approach to informatics education and practice

Key Takeaways:

1. **Introduction:** The introduction to the chapter discusses an overview of informatics and HIT and then gives a summary of some education reform initiatives that were key drivers in developing health IT competencies. This section also introduces some of the challenges in offering tech enhanced education. The challenges include faculty expertise and access to the tools that are used in the healthcare setting. The introduction offers a table of competencies and skills for informatics professionals
2. **Framework for Informatics Curriculum:** This portion of the chapter introduces a few key elements of the informatics curriculum including the use of an academic electronic health record (AEHR), web based tools and existing learning tools like TeamSTEPPS to create a comprehensive curriculum.
3. **It Takes a Village: Roles and Competencies:** This section explores the need to have a standard set of competencies for informatics as well as the need for an interdisciplinary approach to healthcare IT. There is a very quick summary of the educational needs of different IT roles, healthcare providers (both generalists and specialists) as well as health informatics specialists. The section concludes with a section addressing continuing professional development

How can you use/leverage this information in your informatics programs – Practical application:

1. The most useful section of this chapter is the outline of the IT professionals and their scope of work/educational background. I have found many informatics professionals, especially those coming from clinical backgrounds, do not have a solid grasp of how an IT department is structured in a healthcare setting.
2. Similar to the previous item, providing students and healthcare professionals with the larger picture of how clinicians, IT and analytics professionals can work together in an interdisciplinary team to leverage technology to make patient care safer, more efficient and of higher quality.
3. On a personal soapbox, I agree with the authors of this chapter around the challenges of accessing proper tools in the educational setting to really explore health IT. Having easier access to real (albeit de-identified) patient data would be a great benefit in the academic setting.