Workforce Competencies for Patient-Centered Healthcare Delivery through Health IT: A Framework for Practice Transformation

Curricula Resources: Health Information Exchange (HIE)

HIE Detailed Competency	HIE Learning Objectives	Resources/Recommendations
Definitions & Principles		
Describe what HIE includes	Describe the role of the HITECH act in the implementation of HIE	http://journal.ahima.org/2009/04/16/hitech-act-privacy-provisions%E2%80%99-impact-for-health-information-exchanges/ • A brief article from the Journal of AHIMA about the privacy provisions in the HITECH act and their impact on health information exchanges. Provisions of this act added privacy protections specifically to HIE for the first time. The article includes additional references.
	List the components of a Health Information Exchange (HIE)	http://www.ahima.org/advocacy/healthinformationexchange.aspx?tab=3 • American Health Information Management Association (AHIMA) web site, Advocacy and Public Policy tab. This tab includes an extensive list of Health Information Exchange (HIE) links, resources, and press releases. Includes a link to the AHIMA Body of Knowledge, a more extensive searchable repository of AHIMA documents.
Describe the goals of HIE	List the desired outcomes and goals of HIE	http://www.ahima.org/advocacy/healthinformationexchange.aspx?tab=3 • American Health Information Management Association (AHIMA) web site, Advocacy and Public Policy tab. This tab includes an extensive list of Health Information Exchange (HIE) links, resources, and press releases. Includes a link to the AHIMA Body of Knowledge, a more extensive searchable repository of AHIMA documents.

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	Explain why the goals of HIE are desirable	http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2995716/ • Article from the Journal of the American Medical Informatics Association (JAMIA). The article details the consistent and recurring challenges to implementing HIE and the strategies for meeting them that have been unsuccessful in the past. Different strategies are suggested for success in the latest push to implement HIE more widely. Many additional references are included. http://www.healthit.gov/providers-professionals/health-information-exchange • This is a web page that provides information about HIE, including what it is, why it's important, the benefits of HIE, NwHIN, and the State Health Information Exchange Cooperative Agreement Program.
	Describe how the components of HIE work together to accomplish the goals of HIE	http://www.clinisync.org/public/images/stories/Putting_the_Pieces_Together_07DEC2012.pdf • A white paper documenting the results the state of Ohio has had in implementing electronic health records, Meaningful Use, improved public health reporting, and HIT workforce development.
Identify information systems that	List information systems that support HIE	http://www.healthit.gov/sites/default/files/what-Is-the-nhin--2.pdf • A description of the Nationwide Health Information Network (NHIN). NHIN is a program under the Office of the National Coordinator with the goal of improving the quality and efficiency of healthcare by establishing a mechanism for nationwide health information exchange. The NHIN is a set of conventions that provide the foundation for the secure exchange of health

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support HIE and explain what they do		information that supports meaningful use.
	Describe the function of each information system that supports HIE	http://www.healthit.gov/policy-researchers-implementers/nationwide-health-information-network-nwhin • This is a web page for the Nationwide Health Information Network (NwHIN), which is a set of standards, services, and policies that enable the secure exchange of health information over the Internet. This page includes a link to the NwHIN portfolio, which is a description of various standards. http://www.google.com/url?sa=t&rct=j&q=a%20primer%20on%20health%20care%20information%20exchange%20john%20d.%20halamka&source=web&cd=3&cad=rja&ved=0CDsQFjAC&url=http%3A%2F%2Fmycourses.med.harvard.edu%2Fec_res%2Fnt%2FEEFCBDAC-A4FB-45F5-B121-7286ED75A08D%2Fhie.ppt&ei=FyM6UfPrFsOEygHhgIHAAQ&usg=AFQjCNHJ1lE5oVumKCByefutsECy5G914A • This is a link to a PowerPoint presentation entitled A Primer on Healthcare Information Exchange, by John D. Halamka MD. The presentation includes several diagrams that show the relationships between the components of a Health Information Exchange. http://www.ihs.gov/hie/index.cfm?module=dsp_hie_overview • This is an HIE web page on the Indian Health Service web site. It describes the components of a health information exchange

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		and what they do. It includes a diagram showing how the components interact. http://www.connectopensource.org/about/what-is-connect • This is a web page that describes CONNECT, an open source software solution that supports health information exchange – both locally and at the national level. CONNECT uses Nationwide Health Information Network standards and governance to make sure that health information exchanges are compatible with other exchanges being set up throughout the country. This software solution was initially developed by federal agencies to support their health-related missions, but it is now available to all organizations and can be used to help set up health information exchanges and share data using nationally-recognized interoperability standards. The web page includes many links to related information.
	Describe how HL7 regulations and other standards affect information systems that support HIE	http://www.hl7.org/ • This is the main page of the web site for Health Level Seven International (HL7), which describes itself as the "global authority on standards for interoperability of health information technology." HL7 is a not-for-profit, ANSI-accredited standards developing organization dedicated to providing a comprehensive framework and related standards for the exchange, integration, sharing, and retrieval of electronic health information that supports clinical practice and the management, delivery and evaluation of health services.

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		• This web page includes many links to related information.
	Describe how implementation of HIE varies from one state to another	http://www.healthit.gov/providers-professionals/state-health-information-exchange • This is a web page that describes the State Health Information Exchange Cooperative Agreement Program. The state HIE program promotes innovative approaches to the secure exchange of health information within and across states. It also works to ensure that health care providers and hospitals meet national standards and meaningful use requirements. The page includes a link to additional information about the state HIE program. http://www.ihs.gov/hie/ • This is a web page for the Indian Health Service (IHS), the federal health program for American Indians and Alaska Natives. The web page describes HIE from the perspective of HIS. Links on this page provide access to additional information, including information about the Master Patient Index (MPI). http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3243116/ • This is a paper from the 2011 Annual Symposium of the American Medical Informatics Association (AMIA) entitled, *Impact of Health Disclosure Laws on Health Information Exchanges*. This preliminary study explores the landscape of state-level health privacy legislation and examines the impact of variations in such privacy and confidentiality laws on the progress of HIEs. The study found that states with stronger privacy laws, limiting the disclosure of health information, had significantly more HIEs

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		exchanging data and had fewer failed HIEs. Researchers suggest that this counterintuitive finding may be explained by the more subtle benefits of such laws, such as increased confidence and trust of participants in an exchange.
	Identify how the information systems that support HIE work together	http://healthewayinc.org/index.php/exchange • This is a web page for eHealth Exchange, which is a group of federal agencies and non-federal organizations that came together under a common mission and purpose to improve patient care, streamline disability benefit claims, and improve public health reporting through secure, trusted, and interoperable health information exchange. Participating organizations mutually agree to support a common set of standards and specifications. The web page includes links to recent articles published by the group.
Identify typical information systems for patient care and what they are used for	List typical information systems used for patient care and the care settings in which they are used	http://isr.journal.informs.org/content/22/3/419.full.pdf • This is a 10-page article about the role of information systems in health care, focusing on current research and future trends. The article looks at the potential for health information systems to reduce healthcare costs and improve outcomes. It also suggests areas for future research, focusing on the implications of technology-driven advances in three areas: social media, evidence-based medicine, and personalized medicine.
	Describe how information systems for patient care function and how they are used	http://www.who.int/healthinfo/statistics/toolkit_hss/EN_PDF_Toolkit_HSS_InformationSystems.pdf • This is a web page from the World Bank about health information systems. The focus is on health information systems that can be used for public health purposes. Individual health records are used in conjunction with census or civil registration information to develop information about populations.

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Identify typical information systems for patient care and what they are used for	Describe how information systems for patient care function and how they are used	http://www.healthsystems2020.org/files/581_file_11_Chapter_11.pdf • This is a 32-page document that describes how to assess a country's health information system. The goal is to determine how to improve that system so that it provides reliable and useful information for the improvement of the country's health system as a whole. http://www.tricare.mil/tma/ocmo/download/MHSPCMHGuide.pdf • This is a 62-page pdf document, entitled *Military Health System Patient Centered Medical Home Guide*. It provides information and recommendations about the patient-centered medical home concept. Chapter 6 discussing leveraging health IT and MHS data tools. http://www.safetynetmedicalhome.org/sites/default/files/Implementation-Guide-Evidence-Based-Care.pdf • This 16-page pdf document, entitled *Organized, Evidence-Based Care Implementation Guide: Planning care for individual patients and whole populations* is a publication of the Safety Net Medical Home Initiative. It examines three areas critical to the delivery of care that is well organized and evidence-based. Introduces a comprehensive toolkit developed specifically to assist practices with implementing the Chronic Care Model (CCM).

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Describe what interoperability means in relation to HIE	List the requirements of interoperability for HIE	http://www.healthit.gov/policy-researchers-implementers/standards-interoperability • This is a web page that describes the ONC's work on standards and interoperability. Topics included are Federal Health Architecture (FHA), standards acceleration, and the interoperability portfolio. For each topic there is a link to more information. • FHA was formed to coordinate health IT activities among the more than 20 federal agencies that provide health and healthcare services to citizens.
	Identify strategies for attaining interoperability for HIE	http://www.healthit.gov/policy-researchers-implementers/standards-interoperability • This is a web page that describes the ONC's work on standards and interoperability. Topics included are Federal Health Architecture (FHA), standards acceleration, and the interoperability portfolio. For each topic there is a link to more information. • FHA was formed to coordinate health IT activities among the more than 20 federal agencies that provide health and healthcare services to citizens.
Explain why interoperability is important to HIE	List problems that result from a lack of interoperability for HIE	http://www.healthit.gov/buzz-blog/meaningful-use/interoperability-health-information-exchange-setting-record-straight/ • This HHS web page contains an article that discusses interoperability in relation to HIE. The article defines interoperability as "the ability of two or more systems or components to exchange information and to use the information that has been exchanged." So, health information exchange is necessary for interoperability, but it is not sufficient. The information

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		exchanged must also be usable.
	Describe the benefits of interoperability for HIE	http://www.healthit.gov/providers-professionals/health-information-exchange • This is a web page that provides information about HIE, including what it is, why it's important, the benefits of HIE, NwHIN, and the State Health Information Exchange Cooperative Agreement Program. http://www.healthit.gov/buzz-blog/from-the-onc-desk/interoperable-health-information-exchange-featured-conference/ • This web page is a description of presentations and demonstrations that will be presented at an upcoming conference. The web page gives examples of current uses of HIE and of the interoperability that has been attained.
	Explain why interoperability for HIE is important for meeting interoperability requirements for MU and PCMH	http://www.healthit.gov/buzz-blog/meaningful-use/interoperability-health-information-exchange-setting-record-straight/ • This HHS web page contains an article that discusses interoperability in relation to HIE. The article defines interoperability as "the ability of two or more systems or components to exchange information and to use the information that has been exchanged." So, health information exchange is necessary for interoperability, but it is not sufficient. The information exchanged must also be usable.
	Identify how interoperability affects interactions with outside entities, e.g., immunization registries	http://www.healthit.gov/policy-researchers-implementers/standards-interoperability • This is a web page that describes the ONC's work on standards and interoperability. Topics included are Federal Health Architecture (FHA), standards acceleration, and the interoperability portfolio. For each topic there is a link to more

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		information. • FHA was formed to coordinate health IT activities among the more than 20 federal agencies that provide health and healthcare services to citizens.
Describe common care guidelines	Describe common care guidelines that are established via evidence-based medicine	http://ww.guideline.gov/ • This is a web page of the U. S. Department of Health and Human Services (HHS) labeled the National Guideline Clearinghouse. Click the *Guidelines* link in the left-hand column to view a page with links to care guidelines for a wide range of conditions.
Identify when HIE can assist in adherence to care guidelines	Describe scenarios in which information can be gathered via HIE to improve care management and adherence to care guidelines	https://litigation-essentials.lexisnexis.com/webcd/app?action=DocumentDisplay&crawlid=1&doctype=cite&docid=21+Ann.+Health+L.+21&srctype=smi&srcid=3B15&key=dff62dddbe6759788b2e8ab0e0882f05 • This is an article from the *Annals of Health Law*, accessed via LexisNexis. The article is entitled, *The Role of Clinical Practice Guidelines in Healthcare Reform: An Update*. The article looks at the use of Clinical Practice Guidelines (CPGs) in the move toward evidence-based medicine. • A LexisNexis membership is required to view the full article, or you can pay a fee for access to this single article.

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Identify when HIE can assist in adherence to care guidelines	Explain which roles may use HIE in adhering to care guidelines and how those roles may use it	Recommendation: Develop a learning activity to determine which roles may use HIE to adhere to care guidelines by leveraging this resource: http://www.deloitte.com/assets/Dcom-UnitedStates/Local%20Assets/Documents/us_chs_ChronicCareManagementHIEs_w.pdf • This 11-page pdf document, produced by the Deloitte Center for Health Solutions is entitled, *Coordinating Chronic Care Management Through Health Information Exchanges*. The document discusses the economic and clinical benefits that HIEs can provide for chronic care patients and the health care industry as a whole. It describes a current state for chronic care management that it labels "Disease Management," as opposed to a desired future state of "HIE-Enabled Coordinated Care."
	Identify any special considerations (e.g., security, privacy, etc.) when using HIE to adhere to care guidelines	Recommendation: Develop a learning activity to identify any special considerations when using HIE to adhere to care guidelines by leveraging these resources: https://litigation-essentials.lexisnexis.com/webcd/app?action=DocumentDisplay&crawlid=1&doctype=cite&docid=21+Ann.+Health+L.+21&srctype=smi&srcid=3B15&key=dff62dddbe6759788b2e8ab0e0882f05 • This is an article from the *Annals of Health Law*, accessed via LexisNexis. The article is entitled, *The Role of Clinical Practice Guidelines in Healthcare Reform: An Update*. The article looks at the use of Clinical Practice Guidelines (CPGs) in the move toward evidence-based medicine.

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Identify when HIE can assist in adherence to care guidelines	Identify any special considerations (e.g., security, privacy, etc.) when using HIE to adhere to care guidelines	• A LexisNexis membership is required to view the full article, or you can pay a fee for access to this single article. http://codes.ohio.gov/orc/3798 • This document lists Ohio statutes that regulate protected health information. http://www.hhs.gov/ocr/privacy/ • This is a web page on the Department of Health and Human Services (HHS) web site. The page is entitled Health Information Privacy. This page provides links to additional topics about HIPAA and the Patient Safety and Quality Improvement Act of 2005 (PSQIA) Patient Safety Rule.
Data Quality		
Describe how data collection and data quality impact clinical interventions	Describe how data is used in clinical interventions	http://wang.ist.psu.edu/course/07/IST497/files/CH02-FINAL.pdf • This is a pdf document that appears to be a chapter (Chapter 2) from the book *Biomedical Informatics Computer Applications in Health Care and Biomedicine*, edited by E.H. Shortliffe and J.J. Cimino. The chapter was written by Edward H. Shortliffe and G. Octo Barnett.

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Describe how data collection and data quality impact clinical interventions	Describe how data is used in clinical interventions	http://www.informationweek.com/healthcare/electronic-medical-records/why-take-ehr-data-out-of-structured-form/240146191 • This is an article from the Healthcare section of Information Week. It describes a tool released by HL7 that converts patient-specific data in the HL7-sanctioned, XML-based Continuity of Care Document (CCD) format to unstructured text, to make it available and accessible to patients. This supports the idea that increasing patient access to their own medical information increases patient engagement and thereby improves health outcomes. To make the health information contained in structured data as accessible and understandable as possible for patients, converting it to unstructured data in a coherent format can be helpful.

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	List the ways that data collection methods and data quality can affect clinical interventions	http://wang.ist.psu.edu/course/07/IST497/files/CH02-FINAL.pdf
		
		• This is a pdf document that appears to be a chapter (Chapter 2) from the book *Biomedical Informatics Computer Applications in Health Care and Biomedicine*, edited by E.H. Shortliffe and J.J. Cimino. The chapter was written by Edward H. Shortliffe and G. Octo Barnett. Topics covered in this chapter include:
		
		   o What are medical data?
		   o How are medical data used?
		   o What are the drawbacks of the traditional paper medical record?
		   o What is the potential role of the computer in data storage, retrieval, and interpretation?
		   o What distinguishes a database from a knowledge base?
		   o How are data collection and hypothesis generation intimately linked in medical diagnosis?
		   o What is the meaning of the terms *prevalence*, *predictive value*, *sensitivity*, and *specificity*? How are the terms related?
		   o What are the alternatives for entry of data into a medical database?

	Define structured and unstructured data	http://www.healthit.gov/buzz-blog/electronic-health-and-medical-records/ehr-interoperability-structured-data-capture-initiative/ • This web page contains an article about a structured data capture initiative in relation to interoperability for electronic health records. Structured data capture populates a special template with data elements extracted from existing electronic health

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		records and uses those data elements for specific purposes, such as research, improving population health, and quality and safety improvement.
	Analyze situations in which collecting structured data (as opposed to collecting unstructured data) is important for making the best use of the data in clinical interventions (at least until natural language processing improves)	http://blogs.computerworld.com/18057/the_importance_of_structured_data_elements_in_ehrs • This is an article from *ComputerWorld* about the importance of structured data elements in electronic health records. The article also discusses some of the cultural issues that result in physician resistance to using structured data to record information about patient encounters and workflow issues that determine which staff members in a practice enter particular data elements. http://healthworkscollective.com/marya-zilberberg/34590/unstructured-medical-record-another-case-not-everything-counts-can-be-counted • This an article from the HealthWorks Collective, which describes itself as an editorially independent, moderated community for thought leaders in international healthcare. The article, written by a physician, argues the importance of unstructured data in electronic health records – particularly a physician's narrative about the patient's health issues. The author states that the emphasis on structured data in electronic health records better serves researchers and policymakers than clinicians (and patients). She feels that the current versions of EHR systems distract the clinician from their primary focus.
	Give examples of ways the availability of high-quality data can contribute to public health	http://www.informationweek.com/healthcare/electronic-medical-records/new-query-tool-searches-ehr-unstructured/240148634

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	Give examples of ways the availability of high-quality data can contribute to public health	• This is an article from the Healthcare section of *Information Week*. It describes a tool that has been developed to query unstructured data in electronic health records to return desired information about a patient or a population of patients. According to the article, currently up to 80% of the information in electronic health records is unstructured data. This query system is being used successfully at Massachusetts General Hospital and related facilities. http://healthworkscollective.com/marya-zilberberg/34590/unstructured-medical-record-another-case-not-everything-counts-can-be-counted • This an article from the HealthWorks Collective, which describes itself as an editorially independent, moderated community for thought leaders in international healthcare. The article, written by a physician, argues the importance of unstructured data in electronic health records – particularly a physician's narrative about the patient's health issues. The author states that the emphasis on structured data in electronic health records better serves researchers and policymakers than clinicians (and patients). She feels that the current versions of EHR systems distract the clinician from their primary focus. http://ojphi.org/htbin/cgiwrap/bin/ojs/index.php/ojphi/article/viewFile/3211/2635 • This article is entitled *Methods for Leveraging a Health Information Exchange for Public Health: Lessons Learned from the NW-PHIE Experience*. In 2007 the CDC issued a Request for Proposal (RFP) for the "Situational Awareness through Health Information Exchange" project. The project's goals are to connect public health with health information exchanges (HIEs) to improve public health's real-time understanding of communities' population health and healthcare facility status. This article

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		describes the approach and methodology used by the Northwest Public Health Information Exchange to achieve the project's goals. The experience of the NWPHIE Collaboration provides an organizational and operational roadmap for implementing a successful regional HIE that ensures secure exchange and use of electronic health information between local and state public health and health care entities.
Manage data collection and data quality for optimal use in clinical interventions	Describe data collection techniques that optimize data usage for clinical interventions	http://wang.ist.psu.edu/course/07/IST497/files/CH02-FINAL.pdf • This is a pdf document that appears to be a chapter (Chapter 2) from the book *Biomedical Informatics Computer Applications in Health Care and Biomedicine*, edited by E.H. Shortliffe and J.J. Cimino. The chapter was written by Edward H. Shortliffe and G. Octo Barnett.
	Explain how the failure to record data negatively impacts clinical interventions	http://wang.ist.psu.edu/course/07/IST497/files/CH02-FINAL.pdf • This is a pdf document that appears to be a chapter (Chapter 2) from the book *Biomedical Informatics Computer Applications in Health Care and Biomedicine*, edited by E.H. Shortliffe and J.J. Cimino. The chapter was written by Edward H. Shortliffe and G. Octo Barnett.
	Identify methods for ensuring data quality that meets the needs of clinical interventions	Recommendation: Develop a learning activity that investigates ways to ensure data quality in selecting clinical interventions by leveraging the following resource: http://wang.ist.psu.edu/course/07/IST497/files/CH02-FINAL.pdf • This is a pdf document that appears to be a chapter (Chapter 2) from the book *Biomedical Informatics Computer Applications*

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		in Health Care and Biomedicine, edited by E.H. Shortliffe and J.J. Cimino. The chapter was written by Edward H. Shortliffe and G. Octo Barnett. Topics covered in this chapter include: o What are medical data? o How are medical data used? o What are the drawbacks of the traditional paper medical record? o What is the potential role of the computer in data storage, retrieval, and interpretation? o What distinguishes a database from a knowledge base? o How are data collection and hypothesis generation intimately linked in medical diagnosis? o What is the meaning of the terms *prevalenc*e, *predictive value*, *sensitivity*, and *specificity*? How are the terms related? o What are the alternatives for entry of data into a medical database?
Ensure accurate and timely data gathering, documentation,	Describe how HIE can improve timely data gathering, documenting, reporting and interpreting	http://www.healthit.gov/providers-professionals/health-information-exchange • This is a web page that provides information about HIE, including what it is, why it's important, the benefits of HIE, NwHIN, and the State Health Information Exchange Cooperative Agreement Program.

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reporting, and interpretation	Explain how HIE patient matching can affect data quality	http://www.healthit.gov/sites/default/files/patient-matching-white-paper-final-2.pdf • This is a white paper from the Office of the National Coordinator (ONC) entitled, *Privacy and Security Solutions for Interoperable Health Information Exchange*. The majority of the paper deals with patient matching, that is, identifying the records of a desired patient in electronic health records given that patient records may use multiple identifiers for the same patient. The paper includes a literature review and summary.
Regulations		

Comply with privacy and security standards and regulations	List the privacy and security standards and regulations that apply to HIE	http://goo.gl/AyvsI (The Health Information Security and Privacy Collaboration Toolkit)
		
		• This web page provides links to tools and references that provide guidance for conducting organization-level assessments of business practices, policies, and state laws that govern the privacy and security of health information exchange (HIE).
		
		http://www.healthit.gov/providers-professionals/ehr-privacy-security/resources
		
		• This is a HealthIT.gov web page entitled Health IT Privacy and Security Resources. This page provides links to various privacy and security resources for health IT. Links are organized under the following headings:
		   o Technical Assistance
		   o Regulatory & Guidance Information
		   o Meaningful Use – Health IT Privacy and Security

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HIE Detailed Competency	HIE Learning Objectives	Resources/Recommendations
		o Tools o Education & Training Materials o Brochures, Fact Sheets, & Videos o Patient Relations & Health Information Privacy and Security o Other Federal & State-Level Privacy and Security Resources
	Identify technology requirements for compliance with privacy and security regulations	http://www.healthit.gov/providers-professionals/ehr-privacy-security/resources • This is a HealthIT.gov web page entitled Health IT Privacy and Security Resources. This page provides links to various privacy and security resources for health IT. Links are organized under the following headings: o Technical Assistance o Regulatory & Guidance Information o Meaningful Use – Health IT Privacy and Security o Tools o Education & Training Materials o Brochures, Fact Sheets, & Videos o Patient Relations & Health Information Privacy and Security o Other Federal & State-Level Privacy and Security Resources

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HIE Detailed Competency	HIE Learning Objectives	Resources/Recommendations

	Identify technology requirements for compliance with privacy and security regulations	http://library.ahima.org/xpedio/groups/public/documents/ahima/bok1_032268.hcsp?dDocName=bok1_032268
		
		• This web page on the AHIMA site is specifically about privacy and security in HIE. It describes four different models for implementing a health information exchange (e.g., Federated model with shared repositories, Nonfederated peer-to-peer network (co-op model), etc.). The web page also details guiding principles for privacy, legal privacy issues, operational privacy issues, recommendations, references, and resources.
		
		http://www.nist.gov/healthcare/security/hiesecurity.cfm
		
		• This is a web page for the National Institute of Standards and Technology (NIST), a government agency. This page is about Health Information Exchange Security Architecture. It describes a NIST document, Security Architecture Design Process for Health Information Exchanges (HIEs) (NISTIR 7497), and provides a link to this document. The operating model outlined in the publication will help organizations that are implementing HIEs to:
		  o Understand major regulations and business drivers.
		  o Identify cross-organizational enabling services.
		  o Define supporting business processes (for each service).
		  o Develop notional architectures (as a blueprint to support services, processes, and the selection of technical solutions).
		  o Select technical solutions.

HIE Detailed Competency	HIE Learning Objectives	Resources/Recommendations

	Identify steps each role must take to ensure compliance with HIE security standards and regulations	http://www.healthit.gov/policy-researchers-implementers/privacy-security-policy
		
		• This is a HealthIT.gov web page entitled *Learn About Health IT and Privacy and Security*. The page includes the following subtopics, each of which provides a link to additional information:
		  o Advancing Privacy and Security in Health Information Exchange (HIE)
		  o HIPAA and Health IT
		  o Nationwide Privacy and Security Framework for Health Information
		  o Health Information Security and Privacy Collaboration (HISPC)
		  o Personal Health Record (PHR) Model Privacy Notice
		  o Your Organization's PHR data practices
		
		https://www.privacyrights.org/fs/fs8-med.htm
		
		• This is a web page on the Privacy Rights Clearinghouse site. The page is entitled *Fact Sheet 8: Medical Records Privacy*. The web page deals specifically with medical records not covered by the *HIPAA Privacy Rule*.
		
		http://www.clinisync.org/public/images/stories/Summary_of_New_Law_on_Health_Information_Exchanges.pdf
		
		• This is a 4-page pdf document entitled, *Summary of Law on Health Information Exchanges*. It describes how a new Ohio

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HIE Detailed Competency	HIE Learning Objectives	Resources/Recommendations
	Identify steps each role must take to ensure compliance with HIE security standards and regulations	statute affects health information exchanges in Ohio. http://library.ahima.org/xpedio/groups/public/documents/ahima/bok1_049023.pdf • This is a 31-page pdf document that is a white paper from the AHIMA/HIMSS HIE Privacy & Security Joint Work Group entitled, *The Privacy and Security Gaps in Health Information Exchanges*. The intent of the document is to highlight the privacy and security issues in the various domains within the HIE environment that need to be considered when forming an HIO or implementing an HIE. http://healthcare.thomsonreuters.com/hie/assets/Insights3%20FINAL.pdf • This is a 3-page pdf document entitled, *"Break the Glass" Provider HIE Access*. The document describes a new provider access model and the benefits it brings to providers using an HIE. Several current models (census, open, and role-based) for provider access to patient data are summarized. The "Break the Glass" model is a hybrid. General access may limit provider access to records of patients the provider has previously seen. In an emergency, the provider may "break the glass" by providing the reasons for needing more access to the records of a specific patient and proceed to view those records.
Ensure the security of protected	List the security requirements for protected health information related to HIE	http://codes.ohio.gov/orc/3798 • This document lists Ohio statutes that regulate protected health information.

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HIE Detailed Competency	HIE Learning Objectives	Resources/Recommendations
health information		http://www.hhs.gov/ocr/privacy/ • This is a web page on the Department of Health and Human Services (HHS) web site. The page is entitled Health Information Privacy. This page provides links to additional topics about HIPAA and the Patient Safety and Quality Improvement Act of 2005 (PSQIA) Patient Safety Rule.
	Identify procedures that ensure the security of protected health information with HIE	http://www.hpi.georgetown.edu/privacy/stateguides/oh/oh.pdf • This is a 31-page pdf document entitled, *Your Medical Record Rights in Ohio*, and subtitled *A Guide to Consumer Rights under HIPAA*. The document was prepared by the Health Policy Institute at Georgetown University. http://www.healthit.gov/sites/default/files/290-05-0015-state-law-access-report-1.pdf • This is a 36-page pdf document entitled, *Privacy and Security Solutions for Interoperable Health Information Exchange*. It is a report on state medical record access laws. The summary of the document is this: "Most state medical record access laws are designed to address records maintained in paper format. Many of the statutes and regulations do not truly facilitate, and in fact may impede, individuals' ability to obtain their health information in electronic format. In specific, record retention requirements are relatively short in lieu of the goal to furnish individuals with a longitudinal record."

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HIE Detailed Competency	HIE Learning Objectives	Resources/Recommendations

Apply HIPAA regulations to data exchange	List the HIPAA regulations that apply to data exchange	http://www.hhs.gov/ocr/privacy/
		
		• This is a web page on the Department of Health and Human Services (HHS) web site. The page is entitled Health Information Privacy. This page provides links to additional topics about HIPAA and the Patient Safety and Quality Improvement Act of 2005 (PSQIA) Patient Safety Rule.
		
		http://www.healthit.gov/policy-researchers-implementers/privacy-security-policy
		
		• This is a HealthIT.gov web page entitled *Learn About Health IT and Privacy and Security*. The page includes the following subtopic, each of which provides a link to additional information:
		
		  o Advancing Privacy and Security in Health Information Exchange (HIE)
		  o HIPAA and Health IT
		  o Nationwide Privacy and Security Framework for Health Information
		  o Health Information Security and Privacy Collaboration (HISPC)
		  o Personal Health Record (PHR) Model Privacy Notice
		  o Your Organization's PHR data practices

	Identify procedures that ensure HIPAA regulations for data exchange are met	http://www.hhs.gov/ocr/privacy/ • This is a web page on the Department of Health and Human Services (HHS) web site. The page is entitled Health Information Privacy. This page provides links to additional topics about HIPAA and the Patient Safety and Quality Improvement Act of

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HIE Detailed Competency	HIE Learning Objectives	Resources/Recommendations

	Identify procedures that ensure HIPAA regulations for data exchange are met	2005 (PSQIA) Patient Safety Rule.
		
		http://www.healthit.gov/policy-researchers-implementers/privacy-security-policy
		
		• This is a HealthIT.gov web page entitled *Learn About Health IT and Privacy and Security*. The page includes the following subtopic, each of which provides a link to additional information:
		
		   o Advancing Privacy and Security in Health Information Exchange (HIE)
		   o HIPAA and Health IT
		   o Nationwide Privacy and Security Framework for Health Information
		   o Health Information Security and Privacy Collaboration (HISPC)
		   o Personal Health Record (PHR) Model Privacy Notice
		   o Your Organization's PHR data practices
		
		https://www.privacyrights.org/fs/fs8-med.htm
		
		• This is a web page on the Privacy Rights Clearinghouse site. The page is entitled *Fact Sheet 8: Medical Records Privacy*. The web page deals specifically with medical records not covered by the *HIPAA Privacy Rule*.

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HIE Detailed Competency	HIE Learning Objectives	Resources/Recommendations
Differentiate between structured and unstructured data in HIE	Distinguish between structured and unstructured data	http://www.healthit.gov/buzz-blog/electronic-health-and-medical-records/ehr-interoperability-structured-data-capture-initiative/ • This web page contains an article about a structured data capture initiative in relation to interoperability for electronic health records. Structured data capture populates a special template with data elements extracted from existing electronic health records and uses those data elements for specific purposes, such as research, improving population health, and quality and safety improvement.
	Explain how structured and unstructured data are handled in HIE	http://www.informationweek.com/healthcare/electronic-medical-records/new-query-tool-searches-ehr-unstructured/240148634 • This is an article from the Healthcare section of *Information Week*. It describes a tool that has been developed to query unstructured data in electronic health records to return desired information about a patient or a population of patients. According to the article, currently up to 80% of the information in electronic health records is unstructured data. This query system is being used successfully at Massachusetts General Hospital and related facilities. http://www.informationweek.com/healthcare/electronic-medical-records/why-take-ehr-data-out-of-structured-form/240146191 • This is an article from the Healthcare section of Information Week. It describes a tool released by HL7 that converts patient-specific data in the HL7-sanctioned, XML-based Continuity of Care Document (CCD) format to unstructured text, to make it available and accessible to patients. This supports the idea that increasing patient access to their own medical information

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HIE Detailed Competency	HIE Learning Objectives	Resources/Recommendations
		increases patient engagement and thereby improves health outcomes. To make the health information contained in structured data as accessible and understandable as possible for patients, converting it to unstructured data in a coherent format can be helpful.
	Identify the limitations of using unstructured data in HIE	http://blogs.computerworld.com/18057/the_importance_of_structured_data_elements_in_ehrs • This is an article from *ComputerWorld* about the importance of structured data elements in electronic health records. The article also discusses some of the cultural issues that result in physician resistance to using structured data to record information about patient encounters and workflow issues that determine which staff members in a practice enter particular data elements. http://healthworkscollective.com/marya-zilberberg/34590/unstructured-medical-record-another-case-not-everything-counts-can-be-counted • This an article from the HealthWorks Collective, which describes itself as an editorially independent, moderated community for thought leaders in international healthcare. The article, written by a physician, argues the importance of unstructured data in electronic health records – particularly a physician's narrative about the patient's health issues. The author states that the emphasis on structured data in electronic health records better serves researchers and policymakers than clinicians (and patients). She feels that the current versions of EHR systems distract the clinician from their primary focus.

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HIE Detailed Competency	HIE Learning Objectives	Resources/Recommendations

Describe technical issues of data exchange	List technical issues involved in implementing data exchange	http://www.nist.gov/healthcare/security/hiesecurity.cfm
		
		 • This is a web page for the National Institute of Standards and Technology (NIST), a government agency. This page is about Health Information Exchange Security Architecture. It describes a NIST document, *Security Architecture Design Process for Health Information Exchanges (HIEs) (NISTIR 7497)*, and provides a link to this document. The operating model outlined in the publication will help organizations that are implementing HIEs to:
		
		   o Understand major regulations and business drivers.
		   o Identify cross-organizational enabling services.
		   o Define supporting business processes (for each service).
		   o Develop notional architectures (as a blueprint to support services, processes, and the selection of technical solutions).
		   o Select technical solutions.
		
		 http://www.healthit.gov/policy-researchers-implementers/standards-interoperability
		
		 • This is a web page that describes the ONC's work on standards and interoperability. Topics included are Federal Health Architecture (FHA), standards acceleration, and the interoperability portfolio. For each topic there is a link to more information.
		
		 • FHA was formed to coordinate health IT activities among the more than 20 federal agencies that provide health and healthcare services to citizens.

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HIE Detailed Competency	HIE Learning Objectives	Resources/Recommendations
	Identify the ways technical issues complicate the implementation of HIE and how those issues may be resolved	http://www.healthit.gov/policy-researchers-implementers/nationwide-health-information-exchange-hie-resources • This HealthIT.gov web page, entitled *Nationwide Health Information Exchange (HIE) Resources*, provides links to technical resources for HIE. https://himsshie.pbworks.com/w/page/4777793/HIEModels • This HIMSS web page, entitled *Common HIE Technical Architecture Models*, describes widely-used technical models for HIE systems.
Describe financial issues related to data exchange	List financial issues involved in implementing data exchange	http://jamia.bmj.com/content/early/2011/11/03/amiajnl-2011-000394.full.html • This is an article from the Journal of the American Medical Informatics Association (JAMIA), entitled The financial impact of health information exchange on emergency department care. The article reports on a study conducted to measure the financial effects of HIE use in hospital emergency departments. Study results indicated net societal savings from the use of HIEs. http://content.healthaffairs.org/content/suppl/2005/02/07/hlthaff.w5.10.DC1 • This article in Health Affairs is entitled, The Value Of Health Care Information Exchange And Interoperability. The article assesses the value of electronic health care information exchange and

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HIE Detailed Competency	HIE Learning Objectives	Resources/Recommendations
		interoperability (HIEI) between providers (hospitals and medical group practices) and independent laboratories, radiology centers, pharmacies, payers, public health departments, and other providers. According to the article, a compelling business case exists for national implementation of fully standardized HIEI.
	Identify the ways financial issues complicate the implementation of HIE and how those issues may be resolved	http://www.nga.org/files/live/sites/NGA/files/pdf/1103SUSTAININGHIETOOLKIT.PDF • This 50-page pdf document, entitled Sustaining State Health Information Exchange: A State Toolkit, was produced by the National Governors Association Center for Best Practices. This report reviews funding for HIE development and the lack of financial incentives for the ongoing operation of HIEs.
	Describe how the ability to exchange health information can affect provider reimbursement and pay for performance	http://www.nga.org/files/live/sites/NGA/files/pdf/1103SUSTAININGHIETOOLKIT.PDF • This 50-page pdf document, entitled *Sustaining State Health Information Exchange: A State Toolkit*, was produced by the National Governors Association Center for Best Practices. This report reviews funding for HIE development and the lack of financial incentives for the ongoing operation of HIEs.
	Explain how the costs and payments for data exchange may be apportioned to vendors, providers, and patients	http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2995720/ • This is an article from the Journal of the American Medical Informatics Association (JAMIA), entitled A Framework for evaluating the costs, effort, and value of nationwide health information exchange. The article describes a framework for evaluating the costs, effort, and value of nationwide data exchange as the NHIN moves toward a production state. The paper further presents the results of an initial assessment of the framework by those engaged in HIE activities.

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HIE Detailed Competency	HIE Learning Objectives	Resources/Recommendations
		http://content.healthaffairs.org/content/suppl/2005/02/07/hlthaff.w5.10.DC1 • This article in Health Affairs is entitled, The Value Of Health Care Information Exchange And Interoperability. The article assesses the value of electronic health care information exchange and interoperability (HIEI) between providers (hospitals and medical group practices) and independent laboratories, radiology centers, pharmacies, payers, public health departments, and other providers. According to the article, a compelling business case exists for national implementation of fully standardized HIEI.
Describe legal issues related to data exchange	List legal issues involved in implementing data exchange	http://www.hhs.gov/ocr/privacy/hipaa/understanding/special/healthit/introduction.pdf • This 5-page pdf document from OCR in the Department of Health and Human Services clarifies how the HIPAA Privacy Rule applies to, and can be used to help structure the privacy policies behind, electronic health information exchange in a networked environment. http://www.healthit.gov/policy-researchers-implementers/privacy-security-policy • This is a HealthIT.gov web page entitled *Learn About Health IT and Privacy and Security*. The page includes the following subtopics, each of which provides a link to additional information: o Advancing Privacy and Security in Health Information Exchange (HIE) o HIPAA and Health IT

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HIE Detailed Competency	HIE Learning Objectives	Resources/Recommendations
	List legal issues involved in implementing data exchange	o Nationwide Privacy and Security Framework for Health Information o Health Information Security and Privacy Collaboration (HISPC) o Personal Health Record (PHR) Model Privacy Notice o Your Organization's PHR data practices http://www.legalhie.com/ • This is a web page on the Legal Health Information Exchange web site. It describes an HHS request for information seeking comment on laws and policies seeking to promote health information exchange.
	Describe how data use agreements affect the way various entities are allowed to use data that is exchanged	http://www.healthit.gov/policy-researchers-implementers/nationwide-health-information-exchange-hie-resources • This is a HealthIT.gov web page. It provides links to a variety of topics related to HIE resources. In particular, it provides a links to information about data use agreements. http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3243116/ • This is a paper from the 2011 Annual Symposium of the American Medical Informatics Association (AMIA) entitled, *Impact of Health Disclosure Laws on Health Information Exchanges*. This preliminary study explores the landscape of state-level health privacy legislation and examines the impact of variations in such privacy and confidentiality laws on the progress of HIEs. The

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	Describe how data use agreements affect the way various entities are allowed to use data that is exchanged	study found that states with stronger privacy laws, limiting the disclosure of health information, had significantly more HIEs exchanging data and had fewer failed HIEs. Researchers suggest that this counterintuitive finding may be explained by the more subtle benefits of such laws, such as increased confidence and trust of participants in an exchange.

	Analyze the chain of responsibility for exchanged data, including consent agreements and related issues	http://library.ahima.org/xpedio/groups/public/documents/ahima/bok1_049023.pdf
		
		• This is a 31-page pdf document published by AHIMA, entitled, The Privacy and Security Gaps in Health Information Exchanges. This document includes a section about the need for consistent data-sharing agreements and standards.
		
		http://www.healthit.gov/policy-researchers-implementers/privacy-security-policy
		
		• This is a HealthIT.gov web page entitled *Learn About Health IT and Privacy and Security*. The page includes the following subtopics, each of which provides a link to additional information:
		
		   o Advancing Privacy and Security in Health Information Exchange (HIE)
		   o HIPAA and Health IT
		   o Nationwide Privacy and Security Framework for Health Information
		   o Health Information Security and Privacy Collaboration (HISPC)
		   o Personal Health Record (PHR) Model Privacy Notice

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	Identify the ways legal issues complicate the implementation of HIE and how those issues may be resolved	http://library.ahima.org/xpedio/groups/public/documents/ahima/bok1_048938.hcsp?dDocName=bok1_048938
		
		 • This is a web page on the AHIMA web site that describes HIE management and operational considerations. It includes information about legal issues affecting HIE and resolution of those issues.
		
		 http://www.healthit.gov/policy-researchers-implementers/privacy-security-policy
		
		 • This is a HealthIT.gov web page entitled *Learn About Health IT and Privacy and Security*. The page includes the following subtopics, each of which provides a link to additional information:
		
		    o Advancing Privacy and Security in Health Information Exchange (HIE)
		    o HIPAA and Health IT
		    o Nationwide Privacy and Security Framework for Health Information
		    o Health Information Security and Privacy Collaboration (HISPC)
		    o Personal Health Record (PHR) Model Privacy Notice
		    o Your Organization's PHR data practices
		
		 http://www.legalhie.com/

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		• This is a web page on the Legal Health Information Exchange web site. It describes an HHS request for information seeking comment on laws and policies seeking to promote health information exchange.
Describe role-specific security requirements	Identify roles that have special security requirements for HIE	http://library.ahima.org/xpedio/groups/public/documents/ahima/bok1_049023.pdf • This is a 31-page pdf document that is a white paper from the AHIMA/HIMSS HIE Privacy & Security Joint Work Group entitled, *The Privacy and Security Gaps in Health Information Exchanges*. The intent of the document is to highlight the privacy and security issues in the various domains within the HIE environment that need to be considered when forming an HIO or implementing an HIE.
	List the specific security requirements for each role requiring special security	http://library.ahima.org/xpedio/groups/public/documents/ahima/bok1_049023.pdf • This is a 31-page pdf document that is a white paper from the AHIMA/HIMSS HIE Privacy & Security Joint Work Group entitled, *The Privacy and Security Gaps in Health Information Exchanges*. The intent of the document is to highlight the privacy and security issues in the various domains within the HIE environment that need to be considered when forming an HIO or implementing an HIE.
Implement role-specific security requirements for HIE	List ways special security requirements can be met	http://healthcare.thomsonreuters.com/hie/assets/Insights3%20FINAL.pdf • This is a 3-page pdf document entitled, *"Break the Glass" Provider HIE Access*. The document describes a new provider access model and the benefits it brings to providers using an HIE. Several current models (census, open, and role-based) for provider access to patient data are summarized. The "Break the Glass" model is a hybrid. General access may limit provider access to records of patients the provider has previously seen. In an emergency, the provider may "break the glass" by providing the

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HIE Detailed Competency	HIE Learning Objectives	Resources/Recommendations
		reasons for needing more access to the records of a specific patient and proceed to view those records.
	Create a plan for implementing role-specific security requirements	http://library.ahima.org/xpedio/groups/public/documents/ahima/bok1_049023.pdf • This is a 31-page pdf document that is a white paper from the AHIMA/HIMSS HIE Privacy & Security Joint Work Group entitled, *The Privacy and Security Gaps in Health Information Exchanges*. The intent of the document is to highlight the privacy and security issues in the various domains within the HIE environment that need to be considered when forming an HIO or implementing an HIE. http://healthcare.thomsonreuters.com/hie/assets/Insights3%20FINAL.pdf • This is a 3-page pdf document entitled, *"Break the Glass" Provider HIE Access*. The document describes a new provider access model and the benefits it brings to providers using an HIE. Several current models (census, open, and role-based) for provider access to patient data are summarized. The "Break the Glass" model is a hybrid. General access may limit provider access to records of patients the provider has previously seen. In an emergency, the provider may "break the glass" by providing the reasons for needing more access to the records of a specific patient and proceed to view those records.
Meet reporting requirements that are	Identify reporting requirements affected by HIE or the absence of HIE	http://www.nga.org/files/live/sites/NGA/files/pdf/1103HIECONSENTLAWSREPORT.PDF • This 79-page pdf document, entitled *State and Federal Consent Laws Affecting Interstate Health Information Exchange*, was produced by the National Governors Association Center for Best Practices. This report provides substantial background

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affected by HIE or the absence of HIE		information that can help states, HIOs and providers in developing patient consent strategy in electronic health information exchange; and identifies legal standards and issues that should be addressed when developing these policies. Many state laws vest greater control of health information in individuals than HIPAA does, especially with respect to sensitive health information. Individuals need to comply with both state and federal laws. Some case studies are also included.
	Determine what is needed to meet reporting requirements	http://www.health.ny.gov/technology/projects/docs/health_information_exchange_for_public_health_-_use_case.pdf • This is a 20-page pdf document entitled, *Statewide Health Information Network for New York (SHIN-NY) Health Information Exchange (HIE) for Public Health Use Case*. This document describes the use case for collecting public health information (infectious disease case investigation, monitoring hospital resources utilization/availability, and health surveillance) with the assistance of Health Information Exchange in New York state. It examines possible HIE datasets in relation to the use case. http://www.clinisync.org/public/images/stories/Summary_of_New_Law_on_Health_Information_Exchanges.pdf • This is a 4-page pdf document entitled, *Summary of Law on Health Information Exchanges*. It describes how a new Ohio statute affects health information exchanges in Ohio.
	Make a plan for ensuring reporting requirements are met	http://www.publichealthsystems.org/researchers-to-examine-impact-of-system.aspx • This is an article on the web site for the National Coordinating Center for Public Health Services and Systems Research. The article is entitled, *Researchers to Examine Impact of System Changes on Public Health*. It reports the awarding of research grants related to public health. The two grants most related to HIE include grants for studies with the following goals:

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HIE Detailed Competency	HIE Learning Objectives	Resources/Recommendations
		o Examine the impact of federal investments in health information technologies and the adoption of meaningful use criteria on the capabilities of state and local public health departments to collect, share and report data related to communicable and chronic disease surveillance. o Investigate the impact of a health information exchange innovation that will streamline provider-based notifiable condition reporting on the efficiency of public health disease investigations.
Supporting Team-based Care		
Describe how HIE solutions can facilitate team-based patient care	Give examples of team-based patient care implementations	http://www.amednews.com/article/20130121/opinion/130129989/5/ • This is a web page on the American Medical News site. It describes what team-based patient care is, how it works, and some of the challenges. http://www.odh.ohio.gov/landing/medicalhomes/pcmh.aspx • This is the main web page on the Ohio Department of Health site that talks about Patient-Centered Medical Homes and why and how they are being implemented in Ohio. There are links to other PCMH topics with relevance to Ohio. http://www.pcmh.ahrq.gov/portal/server.pt/community/pcmh__home/1483 • This is a web page for the HHS Agency for Healthcare Research and Quality, entitled *PCMH Resource Center*. This page

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HIE Detailed Competency	HIE Learning Objectives	Resources/Recommendations
		provides links to a variety of tools and resources related to PCMH.
	List ways that HIE can facilitate team-based patient care	http://www.pcpcc.net/content/health-information-exchangehit • This is a web page for the Patient-Centered Primary Care Collaborative. The Page is about now Health Information Exchange and HIT can facilitate team-based patient care in a patient-centered medical home model. There is a link to a 47-page pdf document called *Meaningful Connections* that elaborates on this topic.
Implement HIE solutions to facilitate team-based patient care	List types of applications that make use of HIE to facilitate team-based patient care	http://www.pcpcc.net/content/health-information-exchangehit • This is a web page for the Patient-Centered Primary Care Collaborative. The Page is about now Health Information Exchange and HIT can facilitate team-based patient care in a patient-centered medical home model. There is a link to a 47-page pdf document called *Meaningful Connections* that elaborates on this topic.
	Analyze best practices for leveraging HIE solutions to facilitate team-based patient care	http://www.pcpcc.net/content/health-information-exchangehit • This is a web page for the Patient-Centered Primary Care Collaborative. The Page is about now Health Information Exchange and HIT can facilitate team-based patient care in a patient-centered medical home model. There is a link to a 47-page pdf document called *Meaningful Connections* that elaborates on this topic.
Describe how HIE use and access may vary	Describe the scope of practice for each relevant healthcare role	http://www.fsmb.org/pdf/2005_grpol_scope_of_practice.pdf • This is a 21-page pdf document, published by the Federation of State Medical Boards, entitled *Assessing Scope of Practice in*

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HIE Detailed Competency	HIE Learning Objectives	Resources/Recommendations
depending on the scope of practice of an individual	Describe the scope of practice for each relevant healthcare role	*Health Care Delivery: Critical Questions in Assuring Public Access and Safety*. This document describes factors that state medical boards should consider when addressing scope of practice questions. https://www.ncsbn.org/ReformingScopesofPractice-WhitePaper.pdf • This is a 22-page pdf document that includes a white paper, entitled *Reforming Scopes of Practice*. The white paper is published by the Citizen Advocacy Center. This paper discusses scope of practice laws, which vary by state. In particular, the paper describes the difficulties encountered in attempts to revise these laws. http://www.aafp.org/online/etc/medialib/aafp_org/documents/membership/nps/primary-care-21st-century/whitepaper.Par.0001.File.dat/AAFP-PCMHWhitePaper.pdf • This is a 26-page pdf document from the American Academy of Family Physicians, entitled *Primary Care for the 21st Century*. It discusses the movement to allow nurse practitioners to direct practices independent of physicians, all in the context of the patient-centered medical home. http://www.aafp.org/fpm/2009/1100/p18.html • This is an article from the American Academy of Family Physicians, entitled *10 Steps to a Patient-Centered Medical Home*. The article describes a path to achieving a patient-centered medical home and the roles of providers and clinicians in this process.

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HIE Detailed Competency	HIE Learning Objectives	Resources/Recommendations
		.
	Give examples of use and access for specific roles, based on the scope of practice for those roles	http://healthcare.thomsonreuters.com/hie/assets/Insights3%20FINAL.pdf • This is a 3-page pdf document entitled, *"Break the Glass" Provider HIE Access*. The document describes a new provider access model and the benefits it brings to providers using an HIE. Several current models (census, open, and role-based) for provider access to patient data are summarized. The "Break the Glass" model is a hybrid. General access may limit provider access to records of patients the provider has previously seen. In an emergency, the provider may "break the glass" by providing the reasons for needing more access to the records of a specific patient and proceed to view those records.
Identify appropriate HIE use and access for individuals with specific scopes of practice	Develop a grid that lays out appropriate HIE use and access for each relevant role, based on the scope of practice for that role (for identified roles only)	Recommendation: Develop a learning activity for this learning objective by leveraging the other resources in this section.
Describe how HIE can facilitate care coordination	Describe ways that HIE can be used to improve care coordination among providers	http://www.healthit.gov/providers-professionals/care-coordination-improved-through-health-information-exchange • This is HealthIT.gov web page that contains a case study that describes how Coastal Women's Healthcare (a provider of gynecological, obstetric, and other care) attained Meaningful Use and began using a Health Information Exchange in Maine.

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HIE Detailed Competency	HIE Learning Objectives	Resources/Recommendations
	Give examples of information that could be exchanged electronically that would facilitate care coordination	http://www.deloitte.com/assets/Dcom-UnitedStates/Local%20Assets/Documents/us_chs_ChronicCareManagementHIEs_w.pdf • This 11-page pdf document, produced by the Deloitte Center for Health Solutions is entitled, *Coordinating Chronic Care Management Through Health Information Exchanges*. The document discusses the economic and clinical benefits that HIEs can provide for chronic care patients and the health care industry as a whole. It describes a current state for chronic care management that it labels "Disease Management," as opposed to a desired future state of "HIE-Enabled Coordinated Care."
	Identify potential improvements to care coordination that can be facilitated by HIE	http://spectrum.diabetesjournals.org/content/24/4/205.short • This is an article in *Diabetes Spectrum*, a publication of the American Diabetes Association. The article describes a model of how information technology can be used to support standardized workflows in medicine and dentistry to optimize care coordination for patients with diabetes. The article includes a link to an additional article about using HIE to coordinate care of diabetic patients among dentists and physicians.
Implement HIE-enabled care coordination practices	Create a plan for using HIE to facilitate care coordination in your organization	http://www.healthit.gov/providers-professionals/care-coordination-improved-through-health-information-exchange • This is HealthIT.gov web page that contains a case study that describes how Coastal Women's Healthcare (a provider of gynecological, obstetric, and other care) attained Meaningful Use and began using a Health Information Exchange in Maine. http://www.deloitte.com/assets/Dcom-UnitedStates/Local%20Assets/Documents/us_chs_ChronicCareManagementHIEs_w.pdf • This 11-page pdf document, produced by the Deloitte Center for Health Solutions is entitled, *Coordinating Chronic Care*

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HIE Detailed Competency	HIE Learning Objectives	Resources/Recommendations
		Management Through Health Information Exchanges. The document discusses the economic and clinical benefits that HIEs can provide for chronic care patients and the health care industry as a whole. It describes a current state for chronic care management that it labels "Disease Management," as opposed to a desired future state of "HIE-Enabled Coordinated Care." http://spectrum.diabetesjournals.org/content/24/4/205.short • This is an article in *Diabetes Spectrum*, a publication of the American Diabetes Association. The article describes a model of how information technology can be used to support standardized workflows in medicine and dentistry to optimize care coordination for patients with diabetes. The article includes a link to an additional article about using HIE to coordinate care of diabetic patients among dentists and physicians.
Identify terminology and shared language necessary for effective communication between health care professionals and IT	Identify potential sources of communication problems between health care professionals and IT professionals	http://www.cisco.com/web/about/ac79/docs/wp/Communication_Healthcare_WP_0724FINAL.pdf • This is a 16-page pdf document published by the Cisco Internet Business Solutions Group, entitled, *Challenges in Healthcare Communications: How technology can increase efficiency, safety, and satisfaction*. This document discusses communication problems in healthcare and the cultural differences that make it difficult for medical professionals to adapt to new technologies.
	Identify and define terminology that requires a common understanding for both health care and IT professionals and identify useful terminology resources	http://www.healthit.gov/policy-researchers-implementers/technology-standards-certification-glossary • This is a web page for the HealthIT.gov site. It is a glossary of terms used in relation to Health Information Technology (HIT).

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HIE Detailed Competency	HIE Learning Objectives	Resources/Recommendations
professionals		http://www.healthit.gov/policy-researchers-implementers/acronyms-0 • This is a web page for the HealthIT.gov site. It is a glossary of acronyms used in relation to Health Information Technology (HIT).
Communicate effectively with health care professionals and IT professionals	Identify best practices for ensuring that all stakeholders understand the required common terminology	http://www.jhpiego.org/files/EffTeach_man.pdf • This 270-page pdf document, entitled Effective Teaching: A Guide for Educating Healthcare Providers, produced USAID, The World Health Organization, and Jhpiego, an affiliate of Johns Hopkins University. This document is meant to help faculty members improve their teaching skills. The target audience is classroom and clinical instructors in schools of medicine, nursing, midwifery, as well as instructors for other medical professionals.
	Select the best mechanism for addressing and resolving communication problems in specific circumstances	http://www.medicinenet.com/script/main/art.asp?articlekey=60206 • This is a MedicineNet web page that lists communication tips for a healthy workplace. http://www.rochester.edu/ucc/help/info/comconflict.html • This is a web page on the University of Rochester web site. It provides tips for communication and conflict resolution.

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HIE Detailed Competency	HIE Learning Objectives	Resources/Recommendations
	Select the best mechanism for addressing and resolving communication problems in specific circumstances	http://www.ucdmc.ucdavis.edu/hr/hrdepts/asap/Documents/Communication_Skills.pdf • This is a 2-page pdf document from the University of California Davis. It describes how to be a better speaker and a better listener and some tips for arguing fairly. http://ezinearticles.com/?6-Powerful-Ways-to-Solve-Communication-Problems-at-Work&id=652778 • This web page article is entitled *6 Powerful Ways to Solve Communication Problems at Work*. The article lists signs that an organization may have communication problems, and then lists some ways to address those problems.
Describe the technology and practices involved in telehealth implementation	Identify the technologies used for telehealth, describe how they are used, and give specific examples of their use	http://www.nrtrc.org/documents/Crossroads%20of%20Telehealth%20White%20Paper.pdf • This is a 12-page white paper (pdf) entitled, *The Crossroads of Telehealth, Electronic Health Records & Health Information Exchange: Planning for Rural Communities*. The document addresses the opportunities for expansion of telehealth applications, the role telehealth can play in healthcare, and provides a case study of a health organization that is using telehealth and HIE. The document includes links to related references. http://www.mhimss.org/ • This is a web page for mHimss, a mobile initiative of Himss that is a platform for all stakeholders within the global mobile

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HIE Detailed Competency	HIE Learning Objectives	Resources/Recommendations
	Identify the technologies used for telehealth, describe how they are used, and give specific examples of their use	community to drive positive, transformational change in health and healthcare through the best use of IT. The page has links to articles, case studies and other items related to mobile telehealth applications. http://www.telehealth.va.gov/ • This is a web page for the U. S. Department of Veterans Affairs Office of Telehealth Services, which uses health informatics, disease management, and telehealth technologies to target care and case management to improve access to care, improving the health of veterans. According to the web page, telehealth in the VA helps ensure veteran patients get the right care in the right place at the right time and aims to make the home into the preferred place of care, whenever possible. The page includes links to videos that explain the role of telehealth at the VA.
	Identify and describe telehealth best practices	http://www.hrsa.gov/ruralhealth/about/telehealth/ • This is a web page on the HRSA web site for Rural Health. HRSA is a division of the U. S. Department of HHS with a mission to assure quality health care for underserved, vulnerable, and special needs populations. This page provides an introduction to telehealth and includes links to various grant programs for telehealth. http://www.hrsa.gov/healthit/toolbox/RuralHealthITtoolbox/Telehealth/howcantelehealth.html • This is a web page on the HRSA site entitled *How can telehealth technology benefit primary care?* The web page describes the VA's telehealth program that works with patients with chronic illnesses who prefer to remain at home. The page includes

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HIE Detailed Competency	HIE Learning Objectives	Resources/Recommendations
		links to studies related to the use of telehealth technology.
Interact effectively with patients in telehealth settings	Describe common problems encountered in implementing telehealth practices	http://onlinelibrary.wiley.com/doi/10.1111/j.1532-5415.2010.02959.x/abstract;jsessionid=A0888E5ED8ABEA2CF1C62039E5303227.d04t03?deniedAccessCustomisedMessage=&userIsAuthenticated=false • This web page includes a link to an article from the Journal of the American Geriatrics Society. The title of the article is *In Situ Monitoring of Health in Older Adults: Technologies and Issues*. This article identifies and discusses the important issues regarding the use of monitoring technologies in elderly patients. Included are emerging technologies that may improve the lives of older adults; possible applications of technology in geriatrics settings; real and perceived concerns in using monitoring technology; current reimbursement schemes for using technology; and the reliability and infrastructure needed for monitoring technology. Finally, future approaches to make monitoring technology useful and available in geriatrics are recommended. • Viewing this article requires a subscription or payment of a fee. http://europepmc.org/abstract/MED/21391447/reload=0;jsessionid=WeqVRVZuXzroORHIoNd9.2 • This web page contains the abstract of an article from the journal World Hospitals and Health Services: the Official Journal of the International Hospital Federation. The title of the article is *At the crossroads: NRTRC white paper examines trends driving the convergence of telehealth, EHRs and HIE*. The article explores emerging trends and recent disruptors impacting the healthcare delivery system and examines the opportunities they present for the advancement of telecommunications-based

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		health solutions and the broadband infrastructure available through telehealth networks.
		• The full text of the article is not available from this web page.
	Identify ways to monitor and improve telehealth skills	http://www.nrtrc.org/documents/Crossroads%20of%20Telehealth%20White%20Paper.pdf
		• This is a 12-page white paper (pdf) entitled, *The Crossroads of Telehealth, Electronic Health Records & Health Information Exchange: Planning for Rural Communities*. The document addresses the opportunities for expansion of telehealth applications, the role telehealth can play in healthcare, and provides a case study of a health organization that is using telehealth and HIE. The document includes links to related references.
		http://online.liebertpub.com/doi/abs/10.1089/tmj.2012.0295
		• This web page provides a link to an article entitled *Center for Telehealth and Cybermedicine Research, University of New Mexico Health Sciences Center: A Model of a Telehealth Program Within an Academic Medical Center*. The article describes the Center, its business plan, and a view to the future. The web page also includes links to several other articles related to telemedicine. All the articles linked on the page require a paid subscription or single view payment to access.
E-prescribe	Identify situations in which e-prescriptions are and are not appropriate	https://himsseprescribingwiki.pbworks.com/w/page/18288936/FrontPage
		• This HIMSS web page is labeled as a wiki about e-prescribing, but it does not currently function as a wiki. The page includes links to a variety of sources of information about e-prescribing, including regulatory updates and industry resources.

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		http://himss.files.cms-plus.com/HIMSSorg/content/files/SureScripts.pdf • This is a 22-page pdf document entitled *National Progress Report on e-Prescribing – 2008*, published by SureScripts, the country's largest electronic prescribing network. The document provides a timeline for e-prescribing as well as summaries of e-prescribing use, adoption, key drivers of e-prescribing in 2008, and next steps.
	Identify the roles involved in e-prescribing and describe the scope of practice for each role	http://www.hrsa.gov/healthit/toolbox/HealthITadoptiontoolbox/ElectronicPrescribing/epreswork.html • This is a web page on the HRSA web site. It's a thorough overview of e-prescribing (with a flow diagram) called *How Does e-Prescribing Work?* There is also a link to additional information about e-prescribing developed by the American College of Rheumatology.
	List the common technologies and tools used to e-prescribe	http://www.ama-assn.org/ama/pub/eprescribing/home.shtml • This is a web page on the American Medical Association (AMA) web site. It is billed as an e-prescribing learning center. There is general information about e-prescribing, information about the impact of e-prescribing on a practice, and help to find an e-prescribing system. Some information from the web page is available only to AMA members.
	Describe how HIE is used in e-prescription	http://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/ERxIncentive/Eligible-Professionals.html • This is a web page on the Centers for Medicare and Medicaid Services web site that describes the electronic prescribing incentive program. The Electronic Prescribing (eRx) Incentive Program is a reporting program that uses a combination of

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		incentive payments and payment adjustments to encourage electronic prescribing by eligible professionals. The page includes links to related information.
	Identify and describe e-prescription best practices	http://www.ama-assn.org/resources/doc/hit/ehi-ama-mgma-webinar-slides.pdf • This is a 43-page pdf document published by the AME, entitled, *A Clinician's Guide to e-Prescribing Understanding the Regulations & Making the Transition*. The document takes the form of PowerPoint slides of a presentation that provides an overview of e-prescribing and a review of incentives for e-prescribing.