Domain 4: Health Information Systems

RHIT Exam Review Prep

Rasmussen College 2013

Disclaimer

Please note that these presentations are designed to serve as a valuable supplement to your overall study plan to prepare for the RHIT certification examination.

Participation in these presentations does not guarantee a passing score on RHIT the examination. For more information on the testing dates and the RHIT credential go to www.ahima.org.

It is suggested that you follow the AHIMA Candidate Guide, Appendix H as a study guide for preparing for your certification exam.

Information Systems - 12% Knowledge Clusters

1. Train users on software

2. Maintain database

3. Set up secure access

4. Evaluate the functionality of applications

5. Create user accounts

6. Trouble-shoot HIM software or support systems

7. Create database

8. Perform end user audits

9. Participate in vendor selection

10. Perform end user needs analysis

11. Design data archive and backup policies

12. Perform system maintenance

Database Management

Create database
Maintain database
Evaluate the functionality of applications

Basic Components of an Information systems (IS)

- Information systems are all the elements of business process coming together for a specific outcome.
  - Takes in data and provides output (reports, labs results, etc.)
  - Quality of data is critical
  - "GIGO"

Basic Components of an Information systems (IS)

- Information Systems is data, people and work processes including:
  - Hardware- computers, routers, cabling
  - Software- applications
    - Applications and work processes (examples)
      - RADT
      - Financial & Billing
      - HIM
      - Pharmacy
      - Nursing
      - CPOE
  - Communication technology-computer networks
    - DSL
    - What type of communication will be needed to handle the about of data you'll be moving across the internet
      - Speed

IS Activities

- IS performs 5 specific activities
  - Input
    - Patient's identification, temperature, blood pressure, heart rate
  - Processing
    - Can include performing calculation, making comparisons between the patient's blood pressure values against normal blood pressure, selecting alternative actions
  - Output
    - Providing reports on the patient's vital signs, output of IS is usually information to be used in making decisions (clinical or administrative)

IS Activities – continued

- IS performs 5 specific activities
  - Storage
    - Store patient data such as the patient's H&P, lab results, other testing results
      - Data Warehousing
      - Data Repository
  - Controlling
    - Controls its own performance
    - Example – a hospital administrator might discover that the daily census output does not add up to the correct monthly census. This may indicate that data entry or data processing procedures need to be corrected. The system can only process what is given as input based on the programming it's been given.

IS categories

- Enterprise-wide system (aka Enterprise Resource Planning System)
  - Large IS that manages data for an entire healthcare system (i.e.. HCA)
  - Intended to solve enterprise-wide rather than a specific department problem
  - Handles HR, Financial
- Operation support system-transactions
  - Transaction systems
    - Coding, billing functions, registration (R-ADT), dictation monitoring system
    - Functions support MIS and DSS
- Customer Relationship, supply chain planning and sales and logistics
- Management support IS
  - Management information systems
    - Incomplete records, productivity, admissions data, budgets, create work schedules, performance employee evaluations
  - Decision support systems
    - Administrative support systems
      - Assist middle managers with functions
    - Clinical Decision Support System
      - Assist physicians with reminders, clinical knowledge databases

IS Categories- continued

- Executive information systems
  - Upper management; trends of the organization
- Expert System – a type of knowledge management system that is built with specific set of rules to be used to solve a specific problem
- Knowledge management system – recent type of system
  - Supports the creation, organization and dissemination of business and clinical knowledge and expertise to providers, employees, managers throughout a healthcare enterprise
  - Composed of electronic libraries, clinical databases and repository of best practices accessible by the internet or extranet

Development of IS

- IS must be created in a logical manner
- System Development Life Cycle (SDLC)
  - A model used to represent the ongoing process of developing (or purchasing) information systems.
  - Everything has a life cycle
    - Equipment becomes antiquated
    - Software need upgrades
      - Examples: How often do they update and upgrade IPhone? Gaming software?

Database

- …Collection of organized data in a binary file. Purpose is to store and retrieve data.

- Three main types:
  - 1. Relational database
    - Predefined tables of rows and columns
    - Stores data such as currency, real numbers, strings of data
  - 2. Object oriented database
    - Stores objects of advanced data (i.e.. Graphs, movies and audio)
    - An object is a discrete or abstract thing such as a car or a line at the grocery store
  - 3. Object relational database
    - Combines the best of relational and objected oriented

Creating a database

- What is the purpose?
- How will it be used?
- What is it replacing?
- Who will be using it?
- How will it be updated?
- Who will support it?
- What type of information will be collected?
- How will you maintain ***integrity, validity, reliability, privacy*** *and* ***security*** of the data?

Data Warehouses – another type of database

- A special type of database used to consolidate and store data from various databases found throughout an enterprise system
- Designed to perform data analysis rather than support routine operations
- Principle purpose is to provide data to support and improve decision making
- Some typical functions performed with DW:
  - Decision population analysis
  - Physician analysis and benchmarking
  - Clinical protocol development
  - Reimbursement/cost analysis

Data Quality

- Data quality important for all data management whether manually or electronically – must be monitored to ensure that it is the highest quality possible
- Data quality characteristics
  - Data has **integrity** if accurate, complete, consistent, up-to-date & same no matter where it's found in the system
  - Data is **reliable** if it's consistent throughout all systems where it's stored, processed and/or retrieved
  - Data is **valid** if it conforms to an expected range of values.

Data Dictionary - provide consistency

- Defines terms and data elements
- Data dictionary content depends on the use
  - Name of field
  - Type of data field
  - Length of data field
  - Edits placed on the data field
  - Values allowed to be placed on the data field
  - A clear definition of each value

- One source of data dictionaries may be from predetermined data sets such as DEEDS, UDHHS or MDS

- Improves data validity and reliability within, across and outside the organization
- Improves communication in clinical treatment, research and business processes

System Administration

Create user accounts

Set up secure access

Train users on software

Trouble-shoot HIM software or support systems

Users, Rights & Privileges

- Users
  - Unique username and password
  - Time limited
  - Security training
- Hierarchy for rights and privileges
  - Based on "need to know"
- System Administrator controls
- Policies and procedures
  - Access protocols
    - Password changes
  - Terminated employees

Data Security

- Defined as the means of ensuring that data are kept safe from corruption and access is effectively controlled.
- Data security plan is the basis for all actions
  - Policy and procedures
  - Access procedures
  - Physical and technology controls
  - Disaster recovery – continuity planning

Access Control

- Access control mechanisms are based on identification, authentication and authorization
  - Username
  - Password
  - Smart cards
  - Biometrics
  - User rights and privileges
  - Intrusion detection

Physical security

- Physical protection of information resources from loss, theft, physical damage and natural or other disasters
  - Equipment
  - Environment hazards
  - Backup systems

- Risk Assessment
  - Identify and minimize security threats
  - Security Audits trails

Training Users

- Training plan
  - Train based on job requirements
  - Scheduling no more than 2 weeks out from go live
    - Must be able to apply what is learned or it's lost
  - Group training
    - Admissions
    - Nurses
    - Doctors
  - Practical application

IS Management

Participate in vendor selection

Perform end user needs analysis

Perform end user audits

Design data archive and backup policies

Perform system maintenance

Development of IS

- Major phases of the SDLC are
  - Planning
    - The process of identifying and assigning priorities to the needs of upgrading or changes of an IS
    - Match to the organization's strategic plan
    - Asking what do we need the "new system" to do
    - What's lacking in the legacy system
  - Analysis
    - Starts with the submission of a project requisition or request for a system development – includes an overview of the system purpose

Development of IS - continued

- Major phases of the SDLC are
  - Design
    - After the analysis phases identifies the functions needed, it's time to design the system
    - Identifies the "hows" the system will need to work
    - What are the system requirements – will use in the ROI evaluation
    - Screen prototypes can be used
    - In-house design or purchase
      - What type of system build will you use?

Vendor selection process

- Vendor selection process
  - Identify vendors
  - Request for Proposal
  - Evaluation Vendor
  - Contract Negotiation
  - Implementation
- RFP – request for proposal
  - Set up the specifications needed
  - Discovery and investigation of vendors' background
- View systems in operation not just demo

What's the best strategy to use to build a system?

- Best of Breed (Various Vendors)
  - Strategy used when purchasing HIT that refers to acquiring applications that are considered the top performing in their class, even when each is from a different vendor.

- Best of Fit (Single Source)
  - Strategy used when purchasing HIT in which all applications are required by the facility are all available from one vendor.

- Best of Suite or Dual Core
  - Acquisition strategy in which one vendor primarily supplies the financial and administrative applications and another vendor primarily supplies the clinical applications.
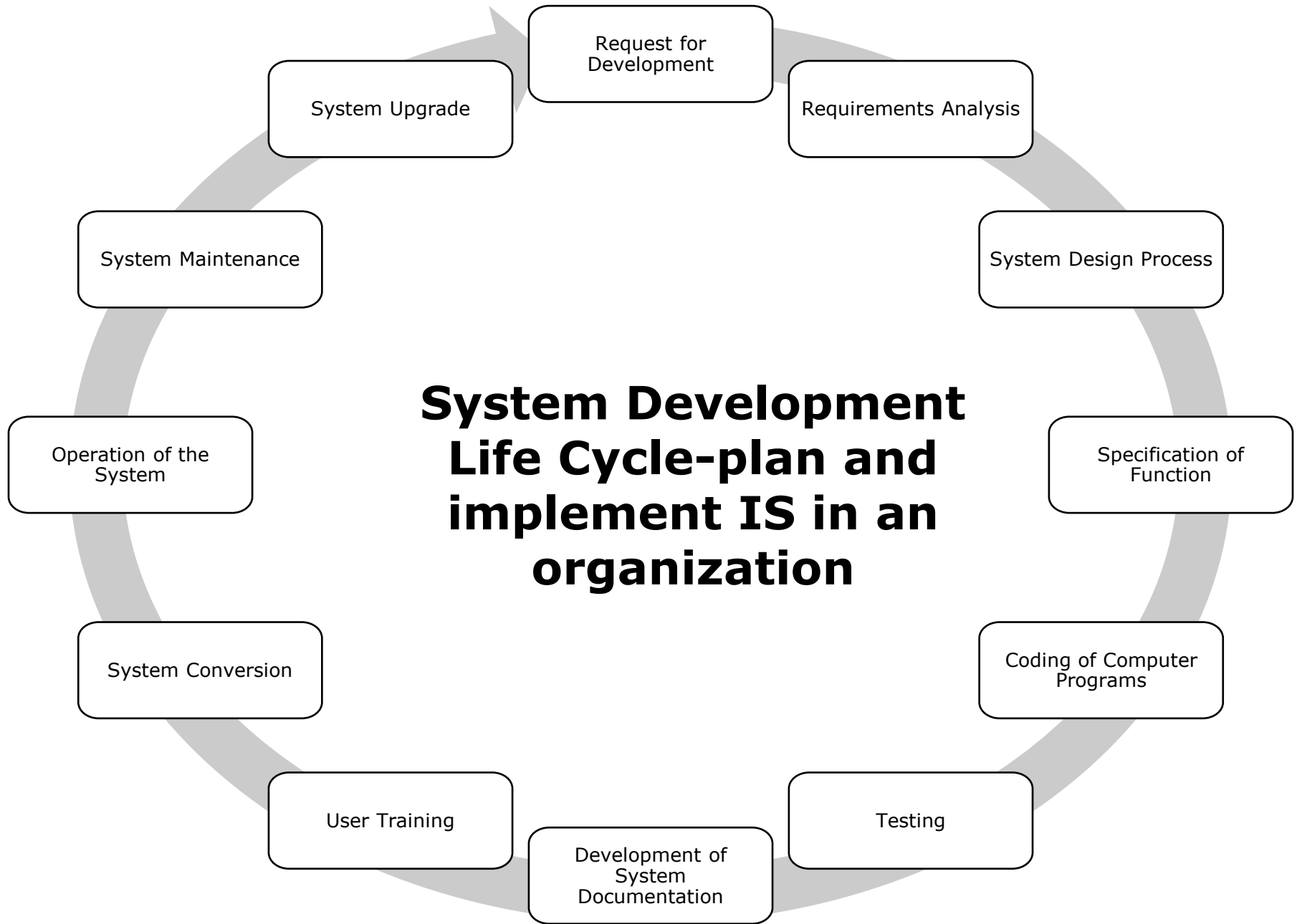
Development of IS-continued

- Implementation
  - Includes development of system documentation, testing of the system, development of the system, end user training and system conversion
  - Conversion
    - Parallel approach – running old and new
    - Phased approach – implements parts of the organizations at different times
    - Direct cutover approach – "flip the switch" old system turned off and new system turned on
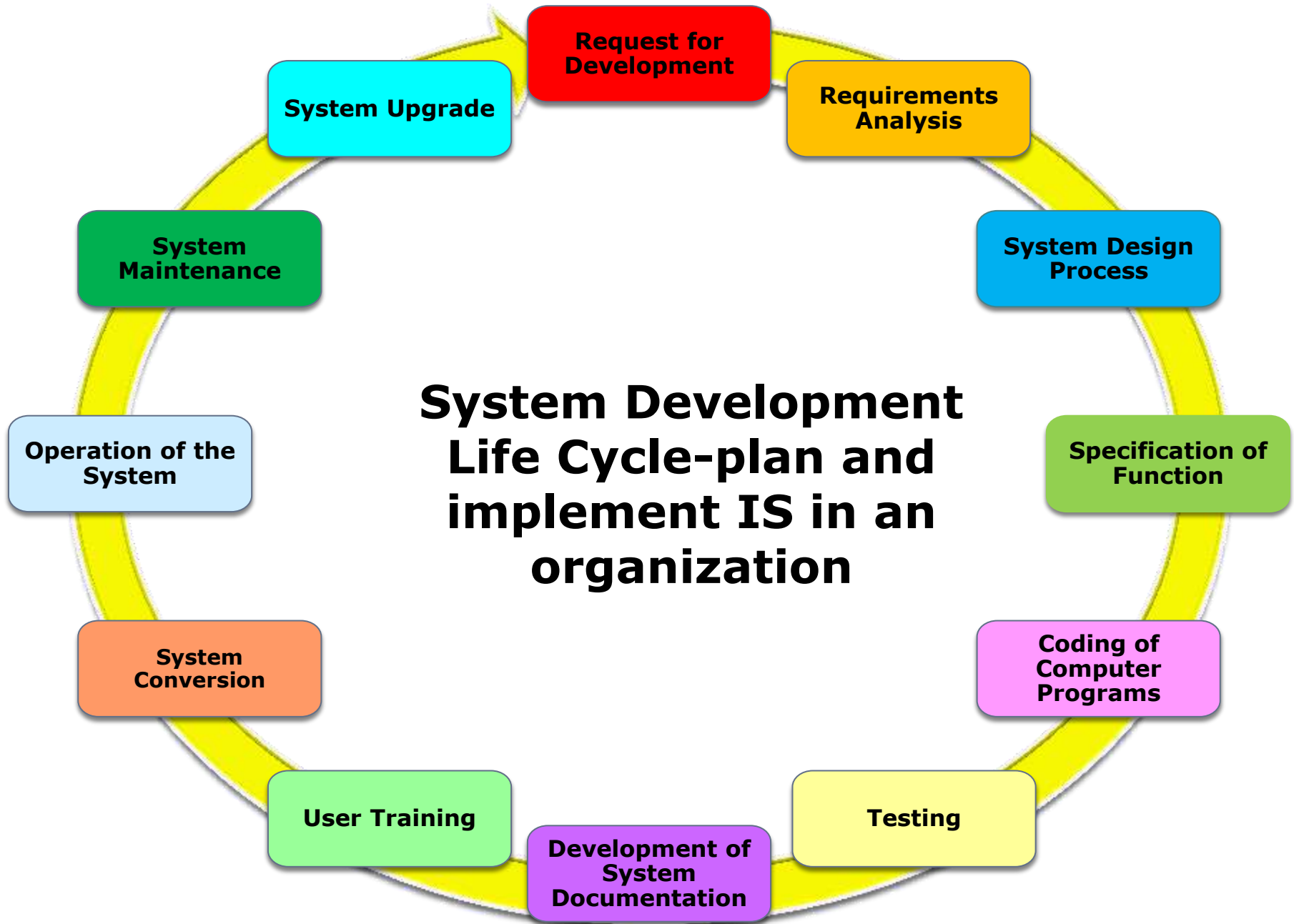
Development of IS-continued

- Maintenance and Evaluation
  - Last phase of the SDLC
  - Technical support
    - System backups
    - Software upgrades
    - Equipment maintenance and replacement
    - Ongoing user training and assistance
    - Disaster recovery
  - Return on Investment
    - Did the system do what you needed?
    - Go back to the original Design process

System Development Life Cycle-plan and implement IS in an organization

- Request for Development
- Requirements Analysis
- System Design Process
- Specification of Function
- Coding of Computer Programs
- Testing
- Development of System Documentation
- User Training
- System Conversion
- Operation of the System
- System Maintenance
- System Upgrade

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Real World Application

Remote Coding Case

Your facility has completed it's 2 year implementation plan for an EHR. All physicians are now documenting on the electronic system and your coders have been paper-less for 12 months. As the HIM Manager, it's now time to move your coders to remote/off site coding from their homes. This has always been part of the plan of the EHRs implementation plan.

- What would you need to do to make this happen?
- Who would you need to involve in getting this process to work?
- What would be the impact to your coding program? Your coders?
- What type of system changes would need to be considered?
- What type of security would be needed?
- How will coders access their charts?

Remote Coding Case Response

- **What would you need to do to make this happen?**
  - Build a team and prepare a plan of action
  - What systems would be needed?
  - Does your current system support remote application?
  - Determine cost and benefits
- **Who would you need to involve in getting this process to work?**
  - IS, coders, finance, billing, risk management
- **What would be the impact to your coding program? Your coders?**
  - Computer literacy coders
  - System support by IT
  - Productions standards by coding management
  - Quality control monitoring by coding management
    - Part of the RCM program at the facility
  - Deadlines for billing
- **What type of system changes would need to be considered?**
  - Remote access to patient records
  - Remote access to encoder and other coding resources
  - Multiple user access
- **What type of security would be needed?**
  - Encrypted systems for PHI security
  - Speed and reliability of internet
  - Home site inspection for security
- **How will coders access their charts?**
  - VPN set up and supported by IS

Example Questions

Question

- The number that has been proposed as a unique patient identification number but is controversial due to confidentiality and privacy concerns:

- 1. Social security number
- 2. Physician identification number
- 3. Health record number
- 4. National provider identifier

Answer

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- **1**. **Social security number**
- 2. Physician identification number
- 3. Health record number
- 4. National provider identifier

Why?

- The health record number uniquely identifies the patient and also the patient record

- Patient care is linked

- SSS# have been proposed to be used as the patient identifier but risk of privacy and security issues

Question

- What ensures each term used in an EHR has a common meaning to all users?

- 1. Encoded vocabulary
- 2. Controlled vocabulary
- 3. Data exchange standards
- 4. Proprietary standards

Answer

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- **2. Controlled vocabulary**
- 3. Data exchange standards
- 4. Proprietary standards

Why?

- A controlled vocabulary means a specific set of terms in the electronic health record's data dictionary is being used.

- Also there is someone/group overseeing any changes or additions to maintain consistency

Question

- What uses standard order sets and other clinical decision to support physician order entry into the computer?

- 1. CPOE
- 2. EHR
- 3. PDA
- 4. PHIO

Answer

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- **1. CPOE**
- 2. EHR
- 3. PDA
- 4. PHIO

Why?

- When orders are entered, the physician gets immediate feedback as to whether there are drug contraindications, appropriate protocol for diagnostic studies.

- Once the physician signs off on the order, they are automatically routed to the appropriate department

Question

- The ability to electronically send data from one electronic system to another and still retain its meaning is called:

- 1. Data comparability
- 2. National data exchange
- 3. Interoperability
- 4. Data architecture

Answer

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Question

- Which of the following best describes the function of kiosks?

- 1. A computer station that physicians use to order medication
- 2. A computer station that unlocks workstations
- 3. A computer station that facilitates integration communication within the organization
- 4. A computer station that promotes the organization's services

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Why?

- Patient portals or kiosks support the patient to log in to schedule an appointment, pay bills, obtain patient educational material, request ROI or even engage in an e-visit (which is now reimbursable by some insurance companies

Question

- Which of the following is not a true statement about hybrid health record systems?

a. Development of processes for both manual and computer processes is a challenge
b. Creation a health record in manual in electronic format must be developed
c. Version control is easy to implement
d. Security safeguards must be developed for both paper and electronic processes

Answer

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Why?

As the electronic system develops, different versions of documents may exist in these also must be monitored and logged for both legal and practice purposes. Additionally, the AHIMA e-HIM Task Force (2004) describes in detail changes in health information processes and procedures that are required as a record transitions from paper to hybrid to fully electronic format.

Question

- Which of the following would be the best course of action to take to ensure continuous availability of electronic data?

a. Acquire storage management software
b. Send data to a remote site via the Internet
c. Store data on RAID
d. Use mirrored processing on redundant servers

Answer

- Which of the following would be the best course of action to take to ensure continuous availability of electronic data?

a. Acquire storage management software
b. Send data to a remote site via the Internet
c. Store data on RAID
d. **Use mirrored processing on redundant servers**

Why?

Data must be available continuously. When paper as a backup no longer exists in a paperless electronic health record environment, users must be assured that the computer system is available to them at all times. To achieve such availability, and EHRs should have server redundancy accomplished through mirrored processing. This means that as data are entered and processed by one server, they are entered and processed simultaneously by a second server. Should the primary server crash, the system should be designed to "fail over" to the second server and can continue processing as if, at least from the user's point of view, nothing had happened.

Question

- Which of the following technologies would allow a hospital to get as much medical record information online as quickly as possible?

a. Clinical data repository
b. Picture archiving system
c. Electronic document management system
d. Speech recognition system

Answer

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Why?

- In an effort to get as much medical record information online as possible many hospitals turn to document imaging and computer output to laser disk systems. Document imaging systems involve scanning documents created on paper and making your images available on a computer monitor.

Question

- to ensure that a computerized provider order entry system supports patient safety, what other system must also be in place?

a. Digital dictation
b. Electronic nursing notes
c. Pharmacy information system
d. Point of care charting

Answer

- to ensure that a computerized provider order entry system supports patient safety, what other system must also be in place?

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b. Electronic nursing notes
c. **Pharmacy information system**
d. Point of care charting

Why?

Computerized provider order entry is an application that uses standard order sets and other clinical decision support systems that support physician order entry into the computer. As you orders are entered, physicians get immediate feedback from CDS systems as to whether there are drug contraindications, Wendy provide preventive care services were screaming, and so on. Once the physician signs off on the order they are automatically routed to their respective destinations (for example; lab orders to the laboratory information system, drug orders to the pharmacy information system, died orders to food and nutrition service and cremation systems).

Question

- As part of an EHRsystem selection, due diligence should be done:

a. After installing electronic health record systems to test for acceptance
b. Before contracting for electronic health records system product
c. During system build to check interface quality
d. Prior to any user authorization for access

Answer

- As part of an EHRsystem selection, due diligence should be done:

a. After installing electronic health record systems to test for acceptance

b. **Before contracting for electronic health records system product**

c. During system build to check interface quality

d. Prior to any user authorization for access

Why?

- Due diligence involves thoroughly reviewing the vendor's proposal, conducting product demonstrations, visiting sites where the product is already installed, calling references, and investigating the vendor's business practices. The organization must be assured that not only will the electronic health record function as expected, but that the vendor will do a good job implementing it, provide appropriate support when there are problems, keep it current, and remain in business.

Question

- Which of the following is the unique identifier in the relational database Patient Table?
a. Patient last name
b. Patient last name and first name
c. Patient data per
d. Patient number

Patient Table			
Patient #	Patient Lane Name	Patient First Name	DOB
021234	Smith	Mary	02/02/1926
022256	Rogers	Donna	07/05/1960
023444	Smith	Mariann	04/06/1965
032099	Jones	Donna	10/19/1951

Answer

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032099	Jones	Donna	10/19/1951

Why?

- The unique identifier in the patient table is the patient number, IT is unique to each patient. Patient last name, first name and date of birth can be shared with other patients with the identifier will not.

Question

- As a health information professional, you've become involved in developing the health information exchange (HIE) in your region. The agency that would provide the best resources for health information exchange development is?

a. NCVHS
b. HI7
c. ONC
d. ASTM

Answer

- As a health information professional, you've become involved in developing the health information exchange (HIE) in your region. The agency that would provide the best resources for health information exchange development is?

a. NCVHS
b. HI7
c. **ONC**
d. ASTM

Why?

- The ONC's charge is to help develop a national health IT infrastructure to improve quality and efficiency of healthcare and the ability of consumers to manage their care and safety. Through ARRA the ONC has received funds for use in supporting regional or subnational efforts towards health information exchange (HIE) as well as other uses.

Question

- When a hospital develops its electronic health record system by selecting one vendor to provide financial and administrative applications and another vendor to supply the clinical applications, this is commonly referred to as what type of strategy?

a. Best of fit
b. Best-of-breed
c. Dual core
d. Single source

Answer

- When a hospital develops its electronic health record system by selecting one vendor to provide financial and administrative applications and another vendor to supply the clinical applications, this is commonly referred to as what type of strategy?

a. Best of fit
b. Best-of-breed
c. **Dual core (aka Best of Suite)**
d. Single source

Why?

- Many organizations find that their HIS vendor does not provide the level of EHRs sophistication they desire and are looking to interface their HIS applications with clinical applications from another vendor. Sometimes call ***"dual core or Best of Suite"***, in this vendor strategy one vendor primarily supplies the financial and administrative applications and another vendor primarily supplies the clinical applications.

Resources

- Amatayakul, M: Electronic Health Records: A Practical Guide for Professionals and Organizations

- Green, M: Essentials of Health Information Management: Principles and Practices