Healthcare Technology and Information Management

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As a healthcare executive, why should I be concerned about information technology?
Key Areas to Review for Exam

Knowledge of …

- Technology role & function
- Planning & implementation
- Security, confidentiality, & continuity
- Trends & applications

Information & Knowledge Management
Health Information

98K+ patients die annually due to medical errors!!

Why?

Lack of Relevant Information
Health Information

Automate to optimize decision making

Pressuring / Overload

Medical Knowledge
Health Information

Information technology can help make healthcare ...
Health Information
American Recovery and Reinvestment Act of 2009 (ARRA)

What is ARRA? What is Meaningful Use?

One Hundred Eleventh Congress of the United States of America

At the First Session

Begun and held at the City of Washington on Tuesday, the sixth day of January, two thousand and nine

An Act

Making supplemental appropriations for job preservation and creation, infrastructure investment, energy efficiency and science, assistance to the unemployed, and State and local fiscal stabilization, for the fiscal year ending September 30, 2009, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE.

This Act may be cited as the “American Recovery and Reinvestment Act of 2009”.

SEC. 2. TABLE OF CONTENTS.

The table of contents for this Act is as follows:

Federal Register

Wednesday, July 28, 2010

Part II

Department of Health and Human Services

Centers for Medicare & Medicaid Services

42 CFR Parts 412, 413, 422 et al.
Medicare and Medicaid Programs: Electronic Health Record Incentive Program; Final Rule
ROLE AND FUNCTION OF IT IN OPERATIONS
IT in Operations

IT strategy must align with organization’s goals and objectives

Synergy of Purpose
Leadership starts at the top

**Chief Information Officer (CIO) = Senior IT Executive**

Responsible for IT …

- Planning and leadership
- Management oversight
- HR & Financial management
IT in Operations

Role of the CIO

- Member of executive management team
- Understand strategic planning & management
- Advisor on effective use of information
- **STRATEGIC** alignment of IM/IT across enterprise
- Oversee IT organizational units
IT department structure depends on …

- Degree of centralization / decentralization
- Use of in-house developed systems
- Canned software or application service providers
- Outsourcing strategy

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IT in Operations

Information Technology Infrastructure Library (ITIL)

- IT Service Desk
- Incident Management
- Problem Management
- Change Management
- Release Management
- Configuration Management
IT in Operations

Summary

• Healthcare is information intensive
• IT enables the healthcare business
• IT Develops and supports communication technologies throughout the organization
• IT can help automate / optimize decision making by improving access to relevant information … STEEEP
• IT strategy must be aligned with business strategy
• IT leadership provided by Chief Information Officer (CIO)
• CIO must possess same skills as other senior executives
• CIO organizes IT dept based on organization’s strategy
• IT Dept uses ITIL best practices for IT service management
Role and Function of IT in Operations

Practice Questions

Q1  Why is it important for the IT strategy to align with the organization’s goals and objectives?

a) To increase Medicare payments
b) To improve access to data for management, providers, and consumers
c) To allow the CEO to control IT spending
d) To give the CIO a seat on the Executive Committee
Role and Function of IT in Operations

Practice Questions

Q2 What competencies do not matter in selecting a CIO?

a) Prior management experience

b) Knowledge of healthcare organization and delivery

c) Personal relationship with Board Member

d) Finance and Budgeting skills
Role and Function of IT in Operations

Practice Questions

Q3  How do CIO and CEO job responsibilities differ?

a)  Financial Management

b)  Human Resource Management

c)  Strategic Planning

d)  Fundraising and Development

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INFORMATION SYSTEMS
PLANNING & IMPLEMENTATION

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Planning & Implementation

Strategic information systems planning is …

“The process of identifying & assigning priorities to a portfolio of computer-based systems that will assist an organization in achieving strategic goals and executing business plans”
Planning & Implementation

General approach

Information Systems Steering Committee
Chaired by the CIO

- Oversee information systems planning
- Link information systems planning to organization’s strategic plans
- Establish priorities for systems development

Subcommittees

- New / Replacement Systems
- Specifications for IT Infrastructure
- Capital and Operating Budgets

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Planning & Implementation

Elements of a **STRATEGIC** plan …

- Corporate and IT goals and objectives
- Applications priority list
- Systems architecture and infrastructure
- Software development plan
- IT management & staffing plan
- Statement of resources requirements
Planning & Implementation

Elements of an **IMPLEMENTATION** plan …

- Tasks, schedule, responsibilities, & budget
- Examination of data, network, information, & telecommunications needs
- Process redesigns
- Project manager identified
- Project team identified
- Quality control plan
Planning & Implementation

Success characteristics …

▪ Documented goals for vendor & organization
▪ Achieving end-user buy-in
▪ Strong organizational sponsorship
▪ Adequate systems acceptance testing
▪ Well-planned end-user training
▪ Minimal business and service disruptions
▪ Plenty of data conversion time
Planning & Implementation  

Summary

- Strategic IS planning is key to org’s strategic goals
- Direction provided by Board via CEO
- IS planning typically led by CIO as chair of …
- Information Systems Steering Committee
  - Oversees information systems planning
  - Link information systems plan to org’s strategic plans
  - Establish priorities for systems development
- Elements of a **STRATEGIC** plan
- Elements of an **IMPLEMENTATION** plan
- Characteristics of a successful IS implementation
Role and Function of IT in Operations

Practice Questions

Q4 Membership of the IT Steering Committee should comprise …

a) The CEO, CIO, CFO, Chief of the Medical Staff, and chair of the governing board

b) Representatives of administration, physician leadership, information systems management, and major user departments

c) The CIO and senior systems analysts

d) The CIO and outside technical consultants
Q5 One of the major elements of a strategic IT plan is

a) A request for proposals (RFP) from vendors

b) A list of detailed specifications for computer programs

c) Priorities for individual computer applications to be aligned with the strategic objectives of the organization

d) Specification for computer hardware installation and maintenance
Q6 Selection of an information system in a healthcare organization should begin with …

a) Meeting with several information systems vendors to determine the scope of available technology

b) Hiring an information systems consultant to determine the organization’s strategic needs

c) Development of an information systems plan that supports the organization’s existing strategic objectives

d) Evaluation of available hardware and software to best determine what meets the organization’s needs
Security & Confidentiality

Why is IT security & confidentiality important?

Health IT systems contain sensitive information
Security & Confidentiality

Focus is usually on the technology, but …

Need to address it from **ALL** angles

- People
- Facilities
- Policies (including education and awareness)
- Technology
Role of Government?  
To protect health & welfare of the population

Justification for Intervention

- Privacy Act
  - HIPAA
  - ARRA
  - HITECH Act
Security & Confidentiality

HIPAA

- Portability and Simplification
- Establish technology transaction standards
- Improve admin efficiency and effectiveness
Effective March 26, 2013

Comply by September 23, 2013

ARRA (HIPAA updates)

- Breach notification requirements
- Expanded definition of “Business Associate”
- Accounting of disclosures
## Security & Confidentiality

### Essential Elements of ...

| Data Security       | 1. Protect against system failures or external catastrophic events (e.g., fires, storms, deliberate sabotage, and other acts of Nature, etc.)  
|                     | 2. Control access to computer files (prevent access by unauthorized personnel) |
|                     |  
| Information Security Policy | 1. Physical security  
|                            | 2. Technical controls over access  
|                            | 3. Management policies that are well known / enforced  
| Information Confidentiality Policy | 1. Access rights  
|                                  | 2. Release of information  
|                                  | 3. Special handling (e.g., HIV results, VIPs, staff)  
|                                  | 4. Approved methods for communication  

Security & Confidentiality

Management Policies

Written security policy
Employee training
Disciplinary actions for violations

Technical Safeguards

Passwords
Encryption
Audit logs

Physical Security

Hardware & Facilities
Data files

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Information Systems Continuity

How important is IT to your business?

What percentage of my business is NOT enabled, touched, or impacted by IT?

Lessons from history?
Information Systems Continuity

- Prepare
- Mitigate
- Respond
- Recover
- Educate
Information Systems Continuity

“A risk accepted by one is a risk shared by many”

Agree or Disagree?
Technology Security, Confidentiality & Continuity

Summary

• Health IT systems contain sensitive information
• Address from all directions … People, Facilities, Policies, & Technology
• Justification for intervention – Government’s role
• Essential elements of data security and information security & confidentiality policies
• Layered approach … Management policies, technical safeguards, & physical security
• Risk Analysis: Threats & vulnerabilities determine risk
• Prepare, mitigate, respond, recover, & educate
Q7 Which of the following is NOT an important component of an information security program?

a) Maintenance of user audit logs to record who has accessed data files

b) Encryption of critical information

c) Policies that require all employees to be aware of security procedures and include training programs and disciplinary action for violations

d) Use of computer software that is HL7 compliant for data compatibility.
Q8  The goal of HIPAA in terms of security and privacy was to …

a) Improve the efficiency and effectiveness of the healthcare system via electronic data interchange

b) Expand the privacy and security requirements of the American Recovery and Reinvestment Act

c) Provide financial incentives for implementing secure electronic health records

d) Establish privacy standards for federal government organizations only
Q9  What types of potential situations do not call for healthcare organization disaster planning related to information systems?

a) Hurricanes, tornados or other natural disasters

b) Terrorist, disgruntled employee, or cyber attacks

c) Unscheduled information systems downtime

d) Stock market downturn
Q10 The best location to store a backup copy of the organization’s data and information is …

a) In a building nearby the primary data center

b) In the basement of the hospital for quick access in an emergency

c) Preferably in another city in a different region of the country

d) No need to create a backup copy if your data center is hardened against attacks
Healthcare Technology and Information Management

TECHNOLOGY TRENDS AND CLINICAL APPLICATIONS
Technology Trends and Clinical Applications

- Information security
- Clinical decision support
- Interoperability
- Web-based (e-health) applications
- Wireless technologies
- Consumer support systems
Technology Trends and Clinical Applications

Knowledge Enablement

Build, renew, and apply intellectual assets to maximize effectiveness

How can we best reuse information to make decisions?
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Intelligence Continuum

Embrace technology techniques & knowledge management strategies to ... 

... knowledge-enable workflows
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Clinical Decision Support (CDS)

• Knowledge enablement for patient care

• 2014 Primary Clinical Focus
  - Physician systems
  - Fully functional EHR
Technology Trends and Clinical Applications

Meaningful Use (MU) Stage 1

“Implement 1 clinical decision support rule relevant to specialty or high clinical priority along with the ability to track compliance with that rule”

- Implement Rules
- Alerts
- Alert Statistics
Implement 5 clinical decision support interventions related to 4 or more clinical quality measures, if applicable, at a relevant point in patient care for the entire EHR reporting period.

Enable the functionality for drug-drug and drug-allergy interaction checks for the entire EHR reporting period.
Technology Trends and Clinical Applications

Interoperability

EMR
EHR
PHR

Health Information Exchange
Technology Trends and Clinical Applications

HIE Adoption

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<th>Year</th>
<th>N</th>
<th>Participating</th>
<th>Planning to Participate</th>
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Technology Trends and Clinical Applications

e-Health (Telemedicine)

- Specialist referral
- Patient consultations
- Remote monitoring
- Medical tele-education
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Mobile computing & Wireless communications

- Wellness programs
- Medication compliance
- Patient scheduling
- Diabetes management
- Pain management
- Smoking Cessation
- Mental health support
- Prenatal care programs
## Technology Trends and Clinical Applications

### Top 10 applications planned for purchase

#### 2009

<table>
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<th>Application</th>
<th>Number of Hospitals</th>
<th>% of 5237 Total Hospitals</th>
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<tbody>
<tr>
<td>CPOE</td>
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<tr>
<td>eMAR</td>
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<tr>
<td>RPACS</td>
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<tr>
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#### 2013

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<td>CPOE</td>
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<td>Patient Portal</td>
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<td>Physician Documentation</td>
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<td>Physician Portal</td>
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<td>HIE</td>
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<td>Nursing Documentation</td>
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Technology Trends and Clinical Applications

Summary

- Today’s healthcare IT priorities
  - Security, decision support, interoperability, e-health, wireless & consumer support systems
- Ultimate goal: Knowledge enablement
- Clinical decision support
  - Assist in diagnosis & treatment planning
  - Meaningful Use defined
- EMR vs EHR vs PHR
- Telemedicine: remote patient care
- Wireless: no strings attached
Technology Trends and Clinical Applications

Practice Questions

Q11 What type of system assists physicians in diagnosis and treatment planning?

a) Financial information systems
b) Clinical decision support systems
c) Office automation systems
d) Physician’s Assistant information systems
Practice Questions

Q12 Which technology trend is the combination of computer technologies and communications technologies to support healthcare provided to patients at remote locations?

a) Picture Archiving and Communications Systems (PACS)
b) Electronic Health Records (EHR)
c) Telemedicine
d) Second Life Virtual Worlds
Q13 Knowledge management is defined as …

a) The practice of explicitly and deliberately building, renewing, and applying relevant intellectual assets to maximize organizational effectiveness

b) The transfer of structured information between two computer systems

c) A movement to explicitly use the current, best-available scientific evidence for managerial decision making

d) The planning, organizing, directing, and controlling of resources to accomplish goals and objectives related to a distinct initiative
Key Areas to Review for Exam

Knowledge of …

- Technology role & function
- Planning & implementation
- Security, confidentiality, & continuity
- Trends & applications

Information & Knowledge Management
Suggestions for Exam Preparation

1. Review notes, handouts, and references

2. Focus on managerial (STRATEGIC) issues related to the planning & use of IT

3. In reviewing technology, focus on how technology is used in providing patient care and managerial support rather than details of the technology itself

4. Use managerial common sense in considering your answers -- Don’t overcomplicate things

5. Get a good night’s sleep before the exam