





Unit Objectives

- Define the concepts of business process, business process design and business process redesign
- Explain the business process redesign cycle in health IT/eHealth
- Describe how data, information, and knowledge flow within the health system
- Relate how clinical/health IT systems support healthcare business processes
- Identify common healthcare organizational structures, operational/business processes and workflows
- Describe decision making tools within EHRs



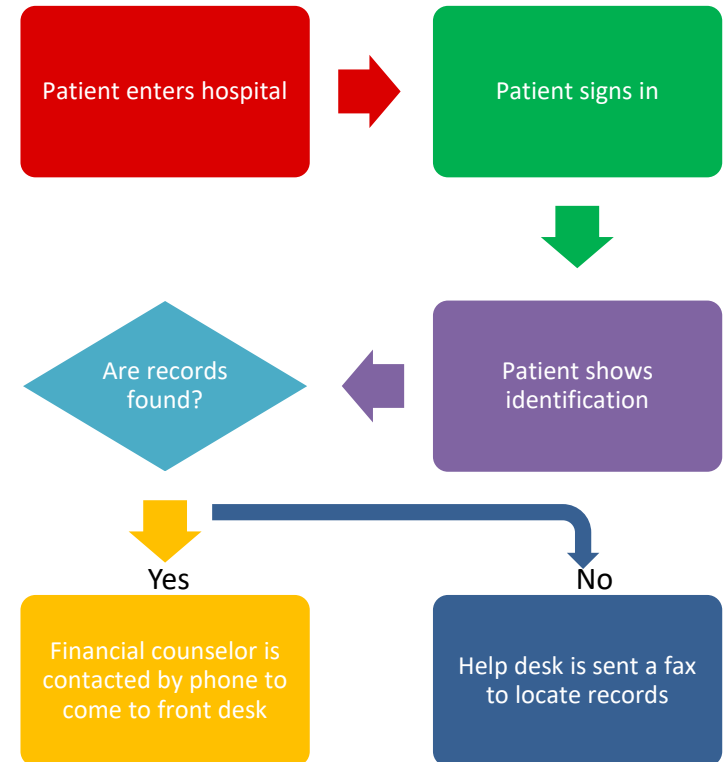
Business Process

- What is the **business process** of healthcare?
 - The healthcare business process is the mostly nonclinical activities or tasks related to the provision of healthcare provided to patients and their families. This includes services such as registration and admission, financial services, data collection, research, and other services performed primarily by non-clinician eHealth workers.
 - Business processes, however, may also include clinical components. An example of this would be an emergency room registration, which includes triage.



Business Process Design

- **Business Process Design:**
Business process design involves taking a business process and mapping that process
- Like clinical processes, the business processes in healthcare are often visualized as a flowchart of sequences of activities with interweaving decision points, or as a process matrix of a sequence of activities with relevant rules based on data in the process
 - Decision points are indicated with a diamond shape
- This flowchart mapping becomes the business process design





Business Process Redesign



- **Business process redesign (BPR)**, or re-engineering, focuses on the analysis and redesign of workflows and business processes within an organization, typically utilizing information systems and technology to transform the workflows and business processes
- In healthcare, the term is used to describe both clinical and non-clinical business processes that are being redesigned
- Both business process design and redesign are very important in that BPR cannot occur without first having BPD with mapping of the clinical and/or business workflows
- BPR usually involves some steps of **process improvement (PI)**, which is identifying, analyzing and improving upon existing business processes within an organization for optimization and to meet new requirements or standards of quality



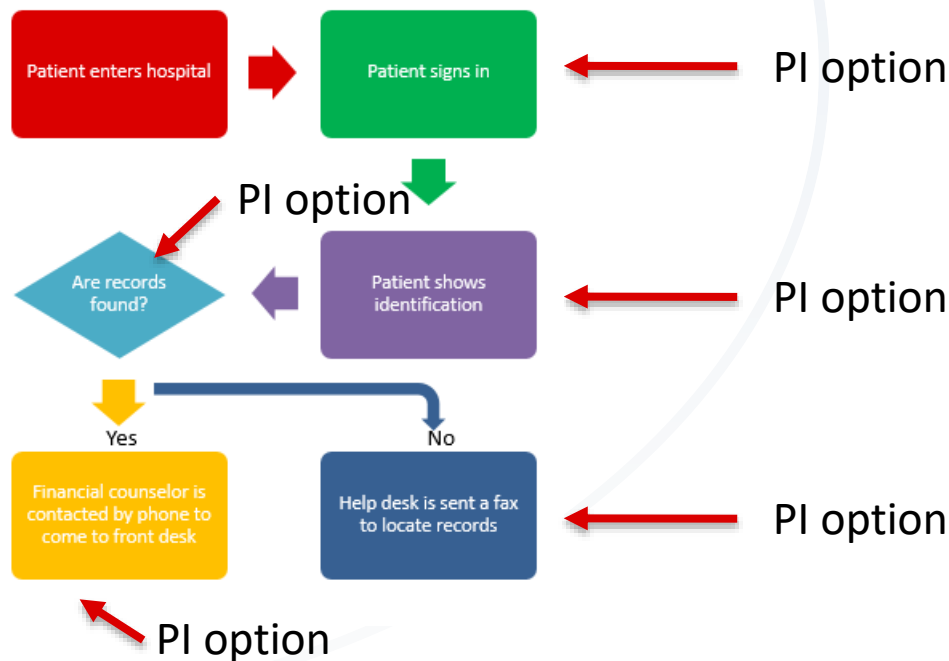
Business Process Redesign (cont'd)

- BPR analysis generally involves the following steps:
 1. Map the current function, operations and workflow of the structural organization of the process within functional units, and then within cross-functional units
 2. Re-structure and streamline activities to heighten efficiency, improve quality, reduce errors and achieve maximum throughput (process improvement), including:
 - a. reducing handoffs
 - b. centralizing data
 - c. minimizing or eliminating unnecessary redundancies
 - d. reducing delays
 - e. freeing resources faster
 - f. combining similar activities
 3. Remove non-value adding tasks
 4. Introduce new information systems and technology to the cross-functional process



Business Process Redesign (cont'd)

- This is how a BPR analysis might look when performed on the example we previously used



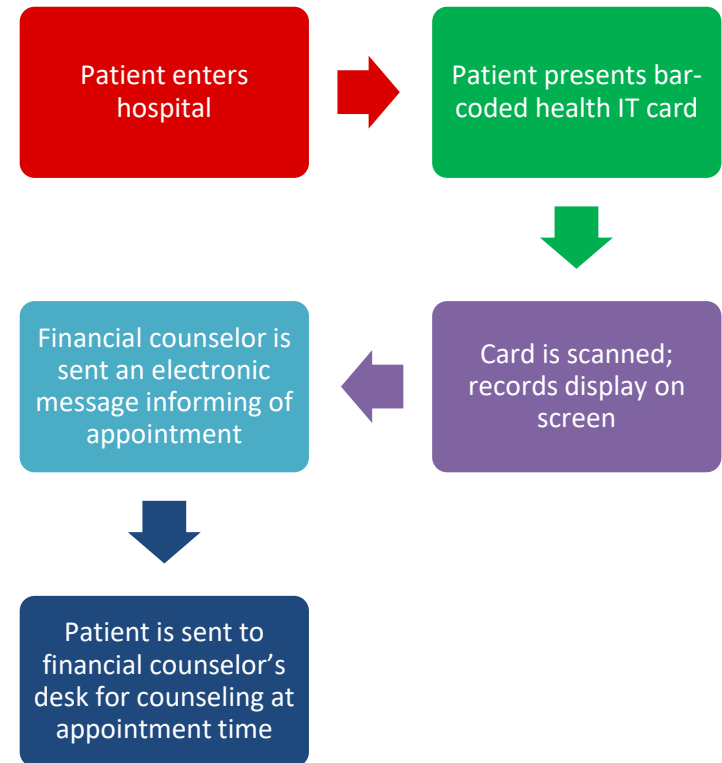
BPR Analysis:

- There are opportunities for heightening efficiency and optimizing workflow (process improvement options – **PI option**) in five of the six operations of the financial office registration process
- In the current state, paper, telephone processes are used exclusively
- Staff are routinely dissatisfied due to time-consuming processes
- Technology can be integrated at all steps to make these processes more efficient and optimized in future state



Business Process Redesign (cont'd)

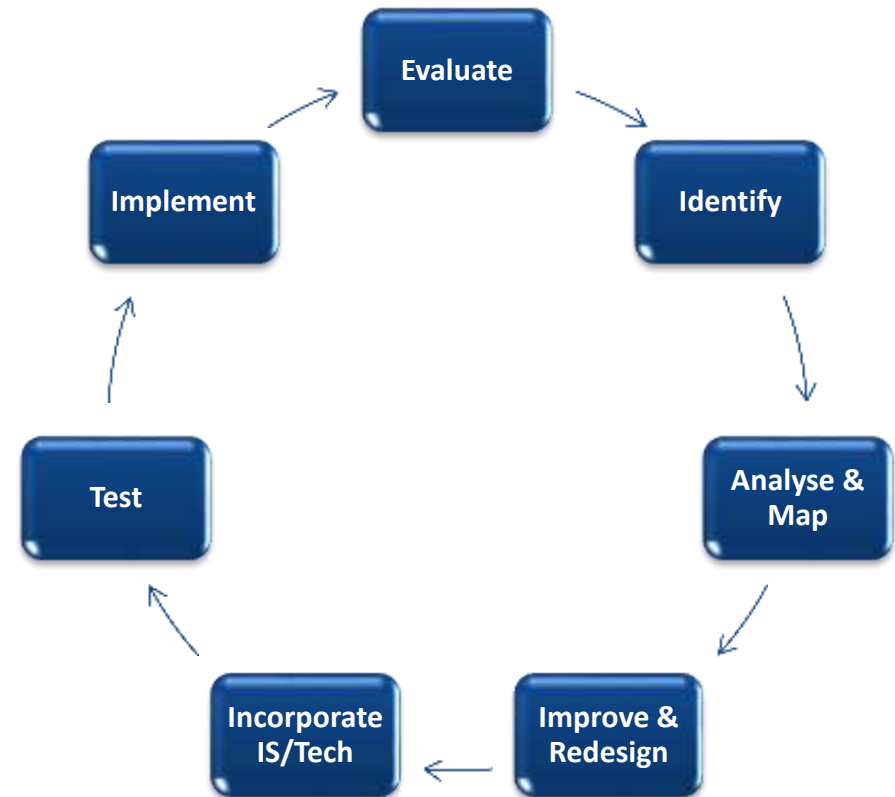
- The redesigned process is displayed here. Compare with the previous Business Process
- Although this BPR has been significantly condensed for purposes of presentation, it demonstrates how the key components of how technology and information systems can be applied to transform processes once the operations have been optimized





Business Process Redesign (cont'd)

- Once a business process has been redesigned, it is a cycle that can be completed again as necessary for re-optimization.
- The BPR cycle includes:
 1. Evaluate status (current state)
 2. Identify processes (current state)
 3. Analyze and map processes (current state)
 4. Improve and redesign processes (future state)
 5. Incorporate information systems and technology (future state)
 6. Test processes (future state)
 7. Implement (future state)



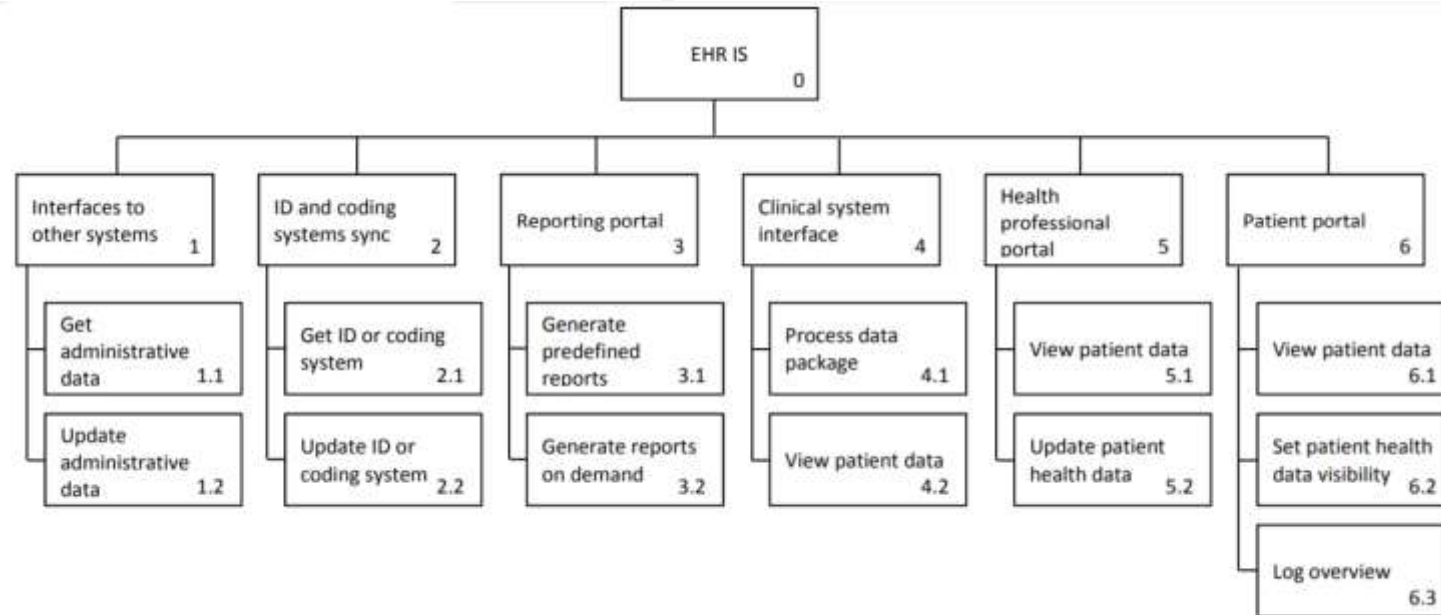


- Following are several examples of how data, information and knowledge flow within various health systems. They all show examples of current or future states of BPR:





How Data, Information, and Knowledge Flow Within the Health System (cont'd)



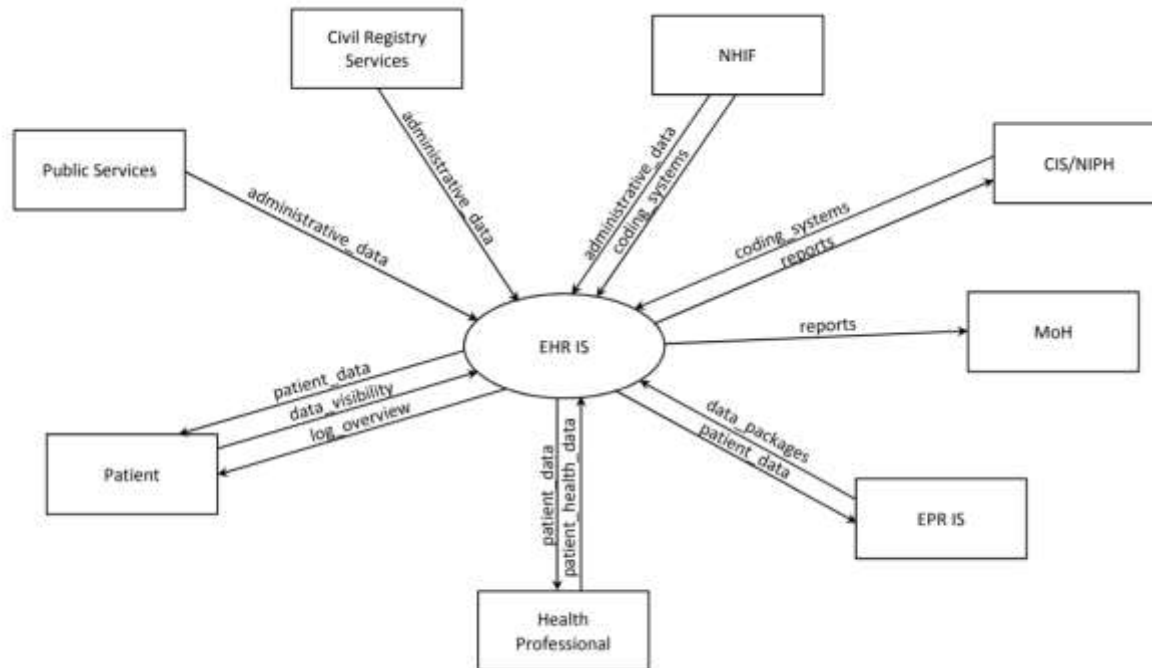
Decomposition Diagram
EHR Data Flow Diagrams

EU-IHIS – European Union – Integrated Health Information System Project

http://www.eu-ihis.rs/docs/Docs/TechDocs/EU-IHIS_EHR%20Data%20Flow%20Diagram_Final_EN.pdf



How Data, Information, and Knowledge Flow Within the Health System (cont'd)



Context Level Data Flow Diagram

EHR Data Flow Diagrams

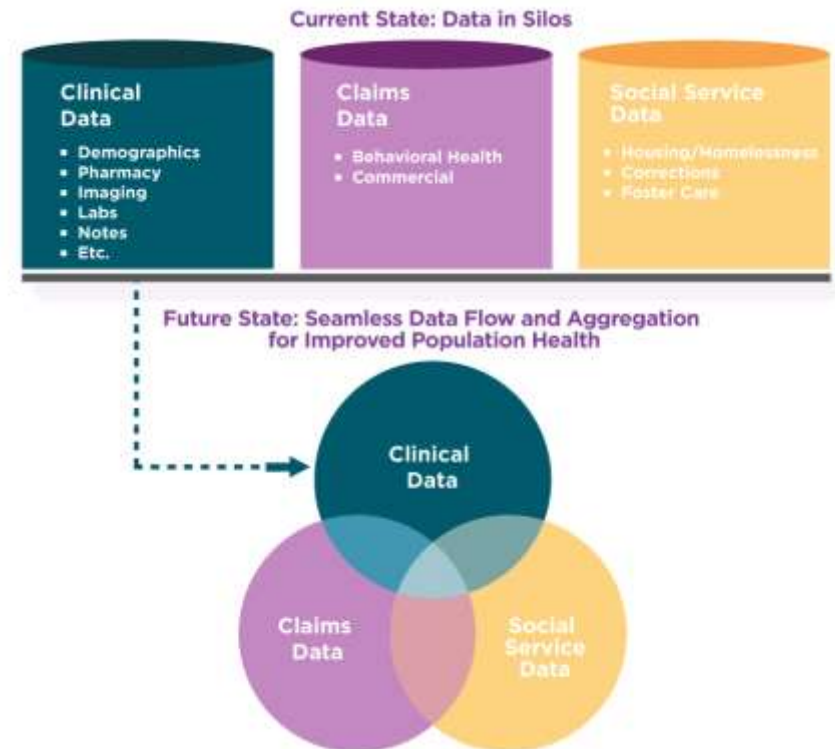
EU-IHIS – European Union – Integrated Health Information System Project

http://www.eu-ihis.rs/docs/Docs/TechDocs/EU-IHIS_EHR%20Data%20Flow%20Diagram_Final_EN.pdf



How Data, Information, and Knowledge Flow Within the Health System (cont'd)

This chart illustrates the seamless data flow and aggregation from individual **silos**—isolated systems, processes, or departments—into collaborative data that functions together

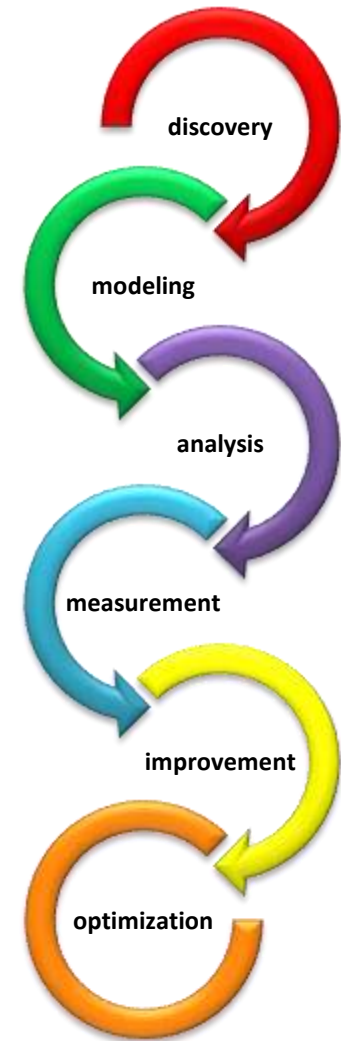


From National Governor's Association's publication: "A Road Map for States to Improve Health Information Flow between Providers", December 2016



How Clinical/Health IT Systems Support Healthcare Business Processes

- Gartner defines Business Process Management (BPM) as: a discipline that uses various methods to discover, model, analyze, measure, improve, and optimize business processes
 - A business process coordinates the behavior of people, systems, information, and things to produce business outcomes in support of a business strategy
- This definition can be applied to clinical processes, and can be used to show how clinical systems support the business process



Retrieved : <https://www.gartner.com/it-glossary/business-process-management-bpm>



How Clinical/Health IT Systems Support Healthcare Business Processes (cont'd)



- Clinical systems and technology can support healthcare business processes by enabling change using the following six change mechanisms:
 - discovery: mapping of the clinical/business process through research, interviews and questionnaires
 - modeling: depicting the clinical/business process via workflow diagrams
 - analysis*: performing current and future state analysis of the clinical/business workflows, including analysis of gaps with proposals for changes with integration of the clinical system or technology
 - measurement: measuring the impact of the proposed changes in clinical/business workflow or process with the implementation of the clinical system or technology
 - improvement*: presenting suggestions and proposals for process improvement in the future state of the clinical/business workflow with the clinical system or technology
 - optimization: demonstrating how the clinical system and/or technology can optimize the clinical/business process for maximum effectiveness, output, safety, quality, etc.

**Elements overlap with the BPR cycle*

This work is produced by the EU*US eHealth Work Project. This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement No. 727552
EUUSEHEALTHWORK



Common healthcare organizational structures, operational/business processes and workflows

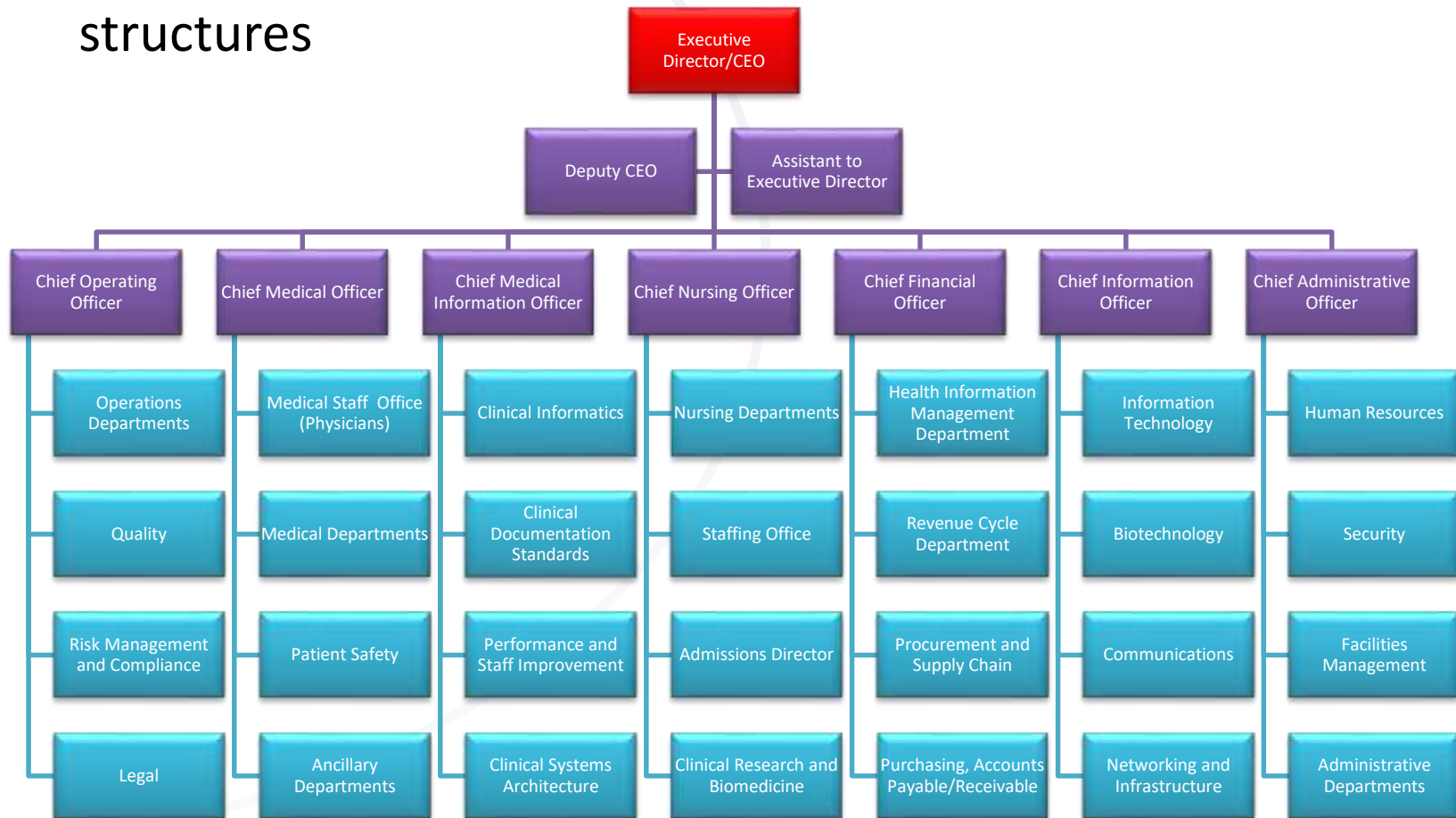


- EHR systems and health technology affect clinical processes, both direct and indirect
 - Direct care processes are those that occur as a result of patient care activities (e.g., taking a history, composing a prescription, ordering laboratory procedures and radiology examinations, etc.)
 - Indirect care processes make direct care processes possible and are often administrative in context (e.g., registration, appointment scheduling, billing, coding, etc.)
- Because direct and indirect care processes must interact at some point, understanding how care delivery organizations are organized helps define the operational, clinical and business processes and workflows



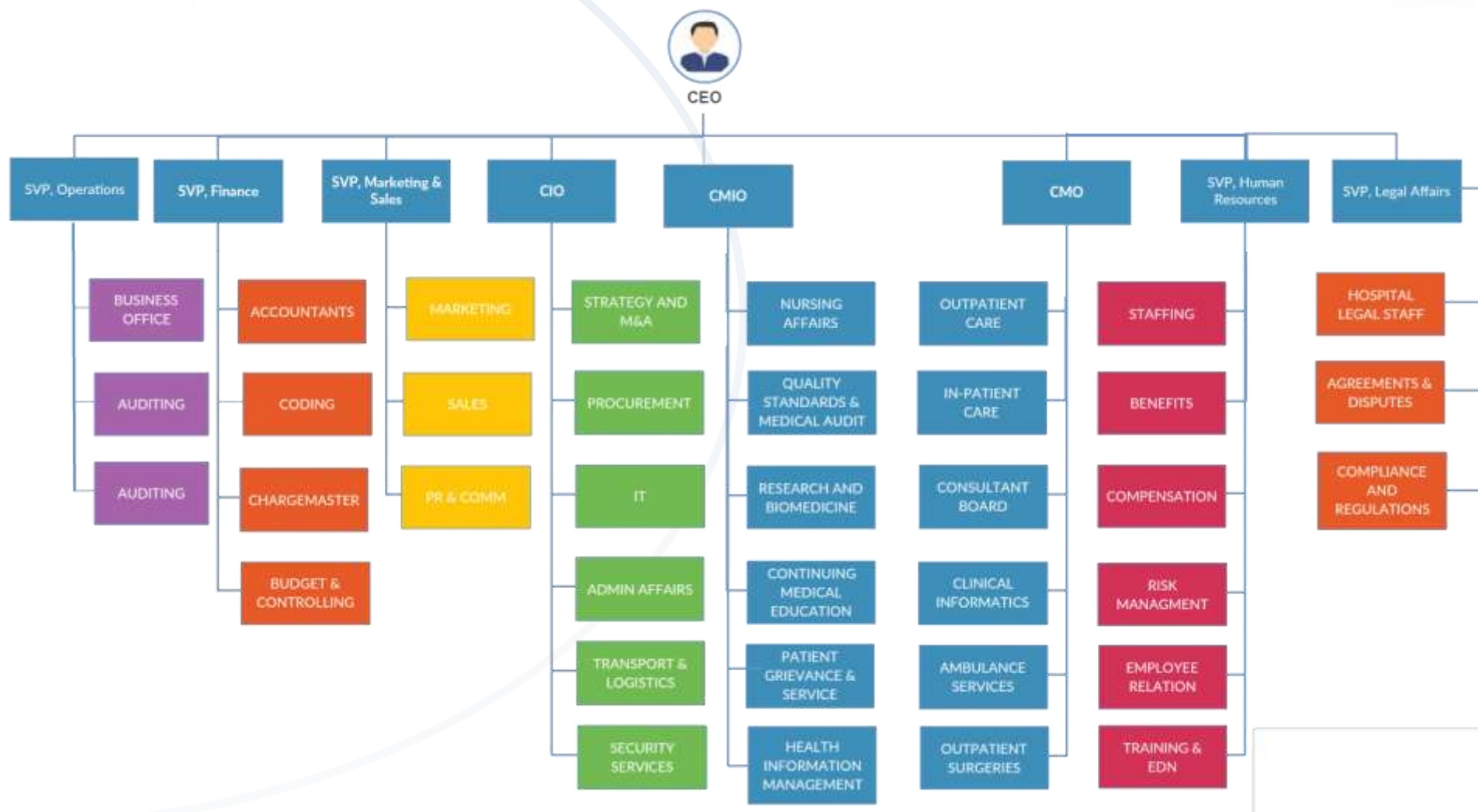
Common healthcare organizational structures, operational/business processes and workflows (cont'd)

- Following are some common healthcare organizational structures



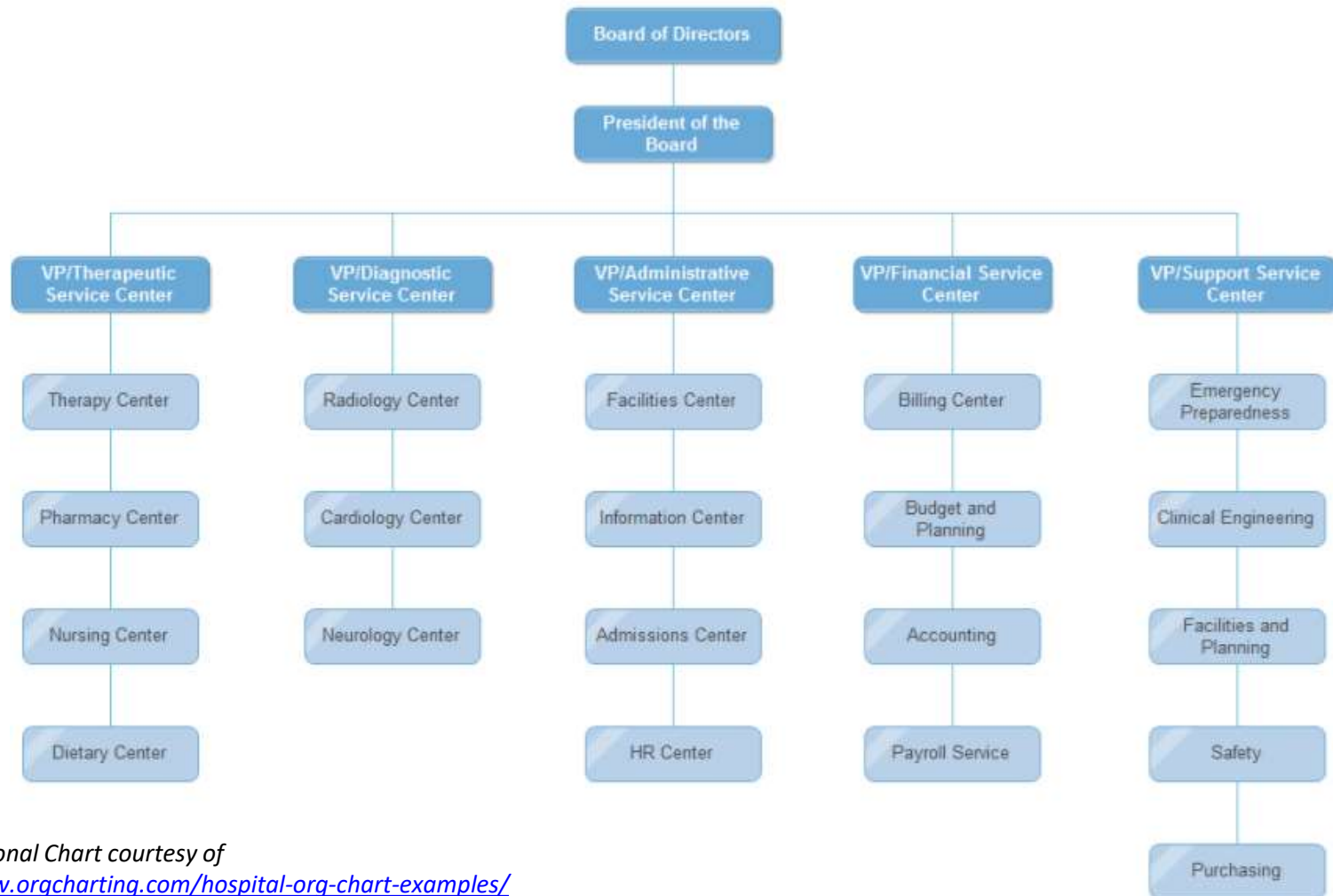


Common healthcare organizational structures, operational/business processes and workflows (cont'd)





Common healthcare organizational structures, operational/business processes and workflows (cont'd)



Organizational Chart courtesy of
<http://www.orgcharting.com/hospital-org-chart-examples/>



Business Process and Decision Making Tools Within EHRs



- Health information systems and technology design can enhance communication and care coordination
- The design of health information technology (HIT) has the potential to support the diagnostic process
 - By supporting clinicians involved in the diagnostic process and the tasks they perform, HIT has the potential to improve diagnostic performance and reduce the occurrence of diagnostic errors
- One way of accomplishing this is through careful integration of the clinical/business process into decision making tools within EHRs



Business Process and Decision Making Tools Within EHRs (cont'd)



- Decision making tools in EHRs include the following:
 - **computerized alerts and reminders:** these include laboratory and other data results at critical levels, allergies, drug precautions and interactions, etc.
 - **clinical practice guidelines:** statements that include recommendations intended to optimize patient care that are informed by a systematic review of evidence and an assessment of the benefits and harms of alternative care options
 - **clinical protocols:** Clinical protocols are more specific than guidelines, defined in greater detail. Protocols provide a comprehensive set of rigid criteria outlining the management steps for a clinical diagnosis, condition or syndrome
 - **evidence-based health resources:** the conscientious, explicit, judicious and reasonable use of modern, best evidence in making decisions about the care of individual patients; evidence-based health integrates clinical experience and patient values with the best available research information
 - **condition-specific order sets:** a prepackaged group of related orders which a provider can place with a few keystrokes or mouse clicks that apply to a specified condition, diagnosis or particular period of time



Business Process and Decision Making Tools Within EHRs (cont'd)



- **focused patient data reports, summaries, and communications:** these reports, summaries or communications can apply to a subset of patients based on a problem, condition or diagnostic criteria, or age, gender or other demographic or population-based benchmarks
- **documentation templates:** these computerized forms are standardized formats for commonly used documents, such as review of systems and physical examination. They typically include blocks of text with frequently used section titles, headers and categories.
- **diagnostic support and contextually relevant reference information:** this includes online reference tools that can aid health practitioners in making diagnoses and researching health and medical information from a variety of evidence-based and other sources
- **clinical pathway reports:** A clinical pathway is a multidisciplinary management tool based on evidence-based practice for a specific group of patients with a predictable clinical course, in which the different tasks (interventions) by the professionals involved in the patient care are defined, optimized and sequenced. Outcomes are tied to specific interventions. The reports allow providers to assess and discuss significant variations from the clinical pathway.
- **graphic displays:** these aid the multidisciplinary team to visualize and assess laboratory findings on tablets and mobile devices



Unit Review Checklist

- ☐ Defined the concepts of business process, business process design and business process redesign
- ☐ Explained the business process redesign cycle in health IT/eHealth
- ☐ Described how data, information, and knowledge flow within the health system (WB01)
- ☐ Related how clinical/health IT systems support healthcare business processes (WL01)
- ☐ Identified common healthcare organizational structures, operational/business processes and workflows (WB02)
- ☐ Described decision making tools within EHRs (CL01)



Unit Review Exercise/Activity

1. Explain the difference between business process design and redesign. Why are both terms important?
2. What are the seven steps of the BPR cycle?
3. What are the six BPM change mechanisms?
4. Which BPM change mechanisms overlap with steps of the BRP cycle?



Unit Exam



1. Which of the following activities is the best example of a business process within healthcare?
 - a. ordering a medication in the EHR
 - b. assessing and diagnosing a patient
 - c. monitoring vital signs and entering them into the record
 - d. scheduling and registering a patient for a chest x-ray
2. Which of the following would be a decision point in a business process design diagram?
 - a. Patient is scheduled for a chest x-ray
 - b. Patient arrives to the radiology department
 - c. Is the patient pregnant?
 - d. Patient is sent to primary care provider for pregnancy test



Unit Exam (cont'd)



3. The current state components of the business process redesign cycle include which of the following:
 - a. analyze and map processes
 - b. improve and redesign processes
 - c. incorporate information systems and technology
 - d. implement
4. A discipline that uses various methods to discover, model, analyze, measure, improve and optimize business process describes what concept:
 - a. clinical pathways
 - b. business process management
 - c. evidence-based medicine
 - d. clinical protocols



Unit Exam (cont'd)



5. In a healthcare organizational structure, the information and communications technology department typically reports to which executive:
 - a. chief nursing officer (CNO)
 - b. chief information officer (CIO)
 - c. chief medical officer (CMO)
 - d. chief financial officer (CFO)
6. Statements that are informed by a systematic review of evidence, an assessment of the benefits and harms of alternative care options, and include recommendations that are intended to optimize patient care, best describe which of the following decision making tools:
 - a. computerized alerts
 - b. condition-specific order sets
 - c. clinical practice guidelines
 - d. clinical protocols