This is a sample of the instructor materials for *Health Informatics: A Systems Perspective*, second edition, by Gordon D. Brown, Kalyan S. Pasupathy, and Timothy B. Patrick.

The complete instructor materials include the following:
- Responses to the end-of-chapter discussion questions
- Guidance for the case study discussions
- PowerPoint slides
- Teaching notes to accompany the PowerPoint slides

This sample includes the discussion questions, case study discussion, PowerPoint slides, and teaching notes for chapter 3, "Health Professions, Patients, and Decisions."

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Chapter 3: Responses to Discussion Questions

1. How has the role of health professionals changed but not been diminished in an information-driven health system?

The role of professionals has changed, as it should, based on changes in values and in characteristics of society (e.g., aging). The role of the professions is a social role. Probably the greatest change in the role is due to information technology and the dependence of the health professions. There is dependence based on access and use of the latest scientific clinical evidence to inform and guide clinical decision making. This reduces the individual autonomy of decision making but not the professional autonomy, if done correctly. The rapid increase in science to support clinical decision making is an important factor to consider in this discussion.

The second application of IT is the ability to move clinical information across time, space, organizations, etc. This use of technology is related to and contributes to the increased patient orientation and the expectations that clinical information can be accessed wherever the patient seeks care and increasingly that professionals will engage in collaborative practice, across time, space, organization boundaries, etc., to provide the best clinical quality in a seamless, coordinated manner.

A third change that can be discussed is the increasing practice in teams of professionals, particularly across professional domains. To do this effectively, changes must be made in training programs, licensure statutes, financial reimbursement, etc.— which takes us back to the systems perspective of transformational change.

2. How does the assumption of evidence-based clinical decision making change the role of the health professions?

This question takes the general discussion from question 1 to an individual clinician basis. The professional must be supported by a network of information technology, including many primary care professionals who will be linked to community and social services, as discussed in the chapter 1 case. This will change the traditional clinical role. In addition, the health professions will be linked to a clinical decision support system that accesses and presents the best clinical evidence for decision making. Generally, the professions become more dependent on organizations to enable them to practice evidence-based medicine. In doing so, traditional organization structures and processes must change, built to inform and support the clinical process. Organizations will be explored in detail in chapter 4, but this is a good opportunity to set up this discussion and address the need to fundamentally transform organizations around a clinical and professional logic.

3. Give examples of the difference between a clinical decision and the decision process.

This topic is a subtle but important perspective, in that much of clinical decision making historically emphasized the importance of the individual professional. This is reflected in the oaths that were taken, the licensure laws, etc. Much of the literature on clinical decision making was focused on the "doctor and his patient." Information technology has enabled clinicians to increase emphasis on the continuity of care and focus on the clinical process. Such focus is inherent in an information-based system and is achieved through EHRs, and increasingly through shared financing and patient involvement.

4. Should intuitive decisions include evidence from a clinical trial?

This question can lead to an interesting discussion to review the types of clinical decision-making processes. Intuitive decision making can never be justified as a substitute for considering and applying evidence-based decision support. However, the evidence-based decision support should not be "institutionalized" to the degree that professionals cannot use intuition and make effective decisions for a given patient. Here, organizations must be careful not to apply negative sanctions for not following the clinical guideline. However, the outcomes of clinical decisions should be used as a basis for evaluating clinical quality and effectiveness. It is the outcome that is important, and the process can be justified based on a superior outcome. This is a careful balance with the increased importance of the role of organizations in the clinical process. Old structures and cultures must be changed.

5. Make a case for and against public advertising of prescription drugs as a patient information strategy.

The case made by pharmaceutical companies is that this strategy is preferred as a basis for informing patients about the benefits of prescription medications. The students might be asked to record the names, number, medical conditions, etc. included in these ads. When are they aired (e.g., prime-time news hours)? What is the total accumulated expenditure for these adds? Do other countries allow this practice? Is this the most effective means of informing patients? What alternatives might be considered that are more targeted and guided by health professionals? Who benefits from these "health messages"? How do the cost, unit price, and total cost of pharmaceuticals in the US health system compare to those in other countries? How might pharmaceutical companies be

aligned with patients and health professionals in seeking the highest quality of care at

lowest cost?

Chapter 3: Case Study Discussion Questions

Redesigning Futures: The First-Ever Engineering-Driven College of Medicine

1. Research the Flexner Report. How did this report transform medical school in the early 1900s, and how did existing medical schools respond? How did the change in curriculum requirements affect the profession of medicine?

   This report in many respects transformed the practice of medicine by establishing the basic sciences as core requirements for the MD degree. Prior to that, the selection and education process was based more on an apprentice model, where novices were selected and mentored by recognized practitioners. There was a strong paternalistic culture that developed, where sons of other physicians were accepted into apprenticeship. One of the main threats posed to the training model by the Flexner Report was that schools must have a recognized basic science core, which many training institutions did not possess.

   The change in curriculum requirements had a couple of effects—first, a scientific one, which based clinical diagnoses and treatments on the basic sciences in medical education and continuing education. This recognition had the effect of moving medical education into major universities. Johns Hopkins was an early advocate and leader for this change. This transformation was the early development of evidence-based clinical decision making.

   A second effect involved the politics of who would teach the basic science courses and whether they could be taken in a college of science by PhDs, who were not located in a medical school. The general pattern that has been followed is having basic scientists with appointments in medical schools, most of whom have their primary appointment there. This structure is in part based on the evolving interest of MDs in doing clinical

research and doing so with research-trained PhDs. In part, this arrangement allowed

medical schools to retain considerable control over admissions, curriculum, promotion

and tenure, and salary levels of faculty.

2. Why did the American Medical Association not call for a new type of medical school and curriculum in 2006, instead of just a 20 percent increase in numbers?

   The AMA, like any professional association, is not characterized as being in the business of disruptive innovation or system transformation. They are in the business of representing the interests of their members and the profession. Calling for an increase in medical doctors is a considered response to the shortage of physicians in certain medical specialties (primary care) and in underserved areas (rural). It does not directly consider changes to the profession due to information technology or to new bases of science in medical education.

3. Discuss the conflicts that might arise if a change in curriculum design were proposed in an existing and well-established medical school.

   This is a good question to explore the dimensions of science and the professions. Medical schools, like the AMA, do not have a strong tradition of disruptive innovation, and the change made by the University of Illinois is transformational in many respects. It is highly unlikely that an existing medical school, particularly the well-established and highly regarded medical schools, would desire or be able to make this transformation. One also has to consider that the proposed change is a high-risk venture and might fail. That is a characteristic of transformational change. One can make a strong case for

medical schools to become more innovative in curriculum content, teaching models, and team education involving other health professionals. Part of the change deals with curriculum content and part with socialization into new professional roles. Some traditions might be justified, such as the "white coat ceremony" in medical schools, and some might be to maintain the traditional social role in a rapidly changing system. Students might be encouraged to review some of the Pew Commission reports on changes in health professions education.

4. Consider a range of existing medical schools, and assess their relative strategic positions if engineering is added as a new translational science.

   There are a number of topics within this broad question, and students can brainstorm as an opening activity. Similar to the Flexner Report, medical schools that are not located within universities with a strong engineering college might have greater opposition to a new curriculum model. Illinois is one of the top engineering schools in the country, and world, so it is a good strategic move for them, assuming the new curriculum timely for the field. Medical schools that are not keeping pace within the medical education market might be more willing to take risks and to develop a relative strength or uniqueness that would revitalize their identity and enrollment. Maybe the model will result in different strengths and core competencies in medical education, while still keeping a common core of basic and clinical sciences. This model would be a challenge to the profession, moving away from a recognized and reinforced (accreditation and licensure) model of medical education.

5. What arguments can be made for preparing physicians with competencies in engineering? Against?

Is the college training practicing physicians or scientists to engage in innovative technology for physicians? It is easy to assume that the focus of the new college will be on hi-tech engineering applications for highly specialized clinical care. However, an equal case can be made for a college devoted to system innovation and change. The college states that its focus will be on "Innovation, Design, Engineering and Analysis (IDEA)," with a focus on patient-centered care and systems-based delivery of care. It seems to be staking its claim on preparing physicians with the systems and engineering skills to not only delivery evidence-based clinical care but to create evidence-based systems within which teams of health professionals will delivery care that is evidence-based, efficient, and patient-centered. One of the themes of the new college is to create healthcare systems to reduce disparities. The college has as part of its mission to apply advanced engineering and behavioral science to create new systems and not just advanced medical technology. Of course, it also has within its research agenda to create molecular prosthetics to replace missing proteins to treat a range of complex diseases.

6. The curriculum at Carle-Illinois College of Medicine is designed around "interdisciplinary, team-based innovative approaches to achieving improved healthcare outcomes." How are nurses and other health professionals engaged in this new model?

The area of team learning and practice will be interesting to follow as the School of Nursing of the University of Illinois is at the Chicago campus, including all of the health

professions. The team learning developed on the Urbana-Champaign campus focuses on teams of clinical, basic, and engineering scientists as a learning model, which is really a teaching model. The campus's strengths in engineering also bring weaknesses in nursing and the health professions. Neither does Carle Foundation Hospital or the Care Physician Group, although they have a range of health professions doing their clinical training. How might this new medical school create a team learning environment for the medical students? Maybe its structure presents a limitation in achieving its innovative mission? Could the Chicago campus support a training program in Urbana-Champaign? Cooperation among university campuses? Now there is real innovation.

Evidence-Based Clinical Decision Making

The Professions in Society

Sources and Levels of Evidence

Reporting Evidence

Effects on the Clinical Process

Slide 3.1

The Professions in Society

Define the core body of knowledge (competencies)

1. Select who will study and be trained

2. Determine who will enter the profession

3. Establish a code of conduct

4. Discipline members

5. Structure of behavior and relationships

How will the professions change in the information age?

Professions and Organizations

- The market for their skills is global rather then organizational. They have a global set of peers.

- Inherent conflict between requirements of the profession and allegiance to the corporation.

- They obey a different set of rules and are affected by a different set of influences.

Historic Hippocratic Oath

I swear by Apollo Physician and Asclepios and Hygeia and Panacea and all the gods and goddesses, making them my witnesses, that I will fulfill according to my ability and judgment this oath and this covenant:

To hold him who has taught me this art as equal to my parents and to live my life in partnership with him, and if he is in need of money to give him a share of mine, and to regard his offspring as equal to my brothers in male lineage and to teach them this art—if they desire to learn it.

# Historic Hippocratic Oath (cont.)

I will neither give a deadly drug to anybody who asked for it, nor will I make a suggestion to this effect. Similarly I will not give to a woman an abortive remedy. In purity and holiness I will guard my life and my art.

I will not use the knife, not even on sufferers from stone, but will withdraw in favor of such men as are engaged in this work.   (Guilds of Barbers-Surgeons)

Doctor–Patient Relationship
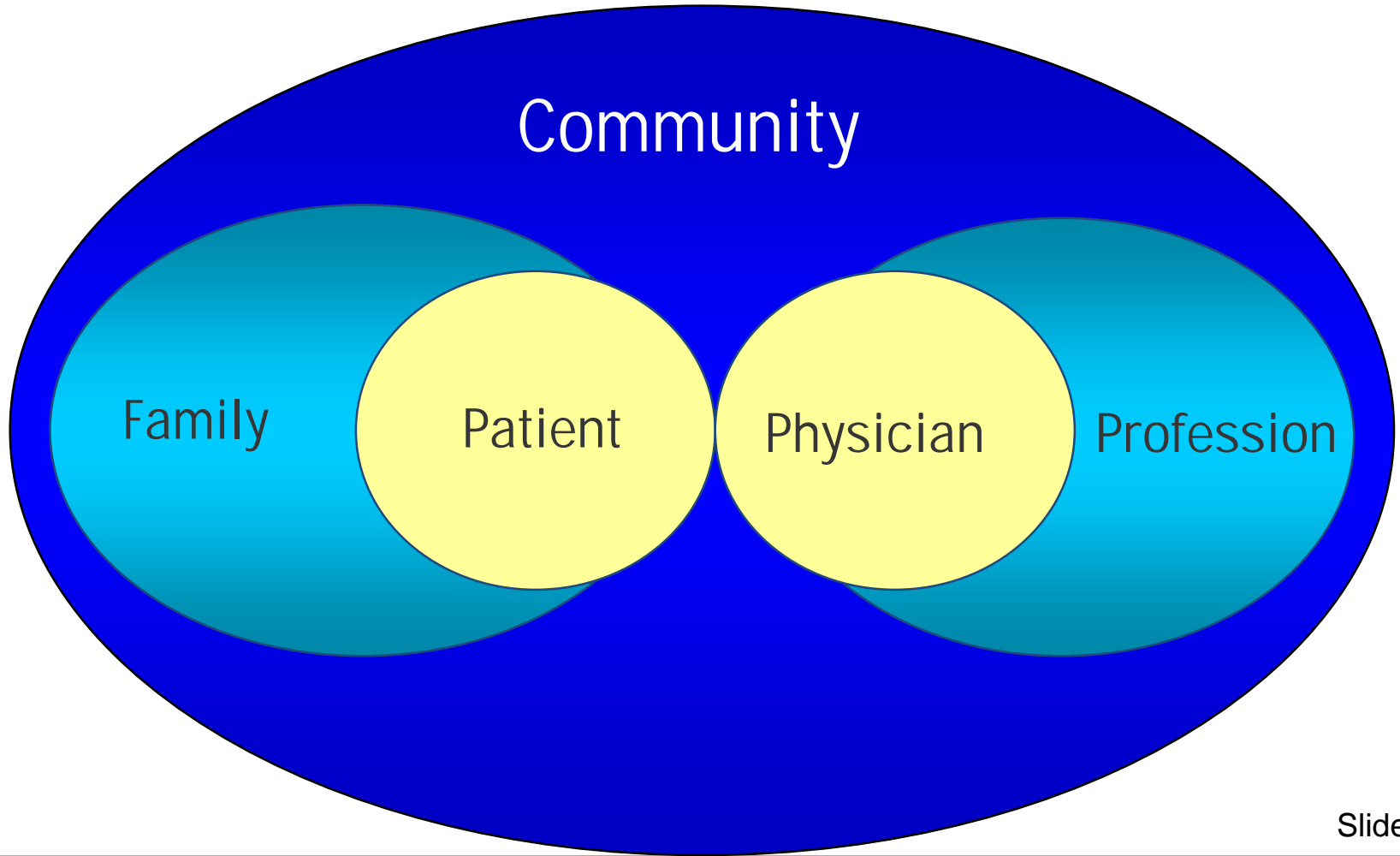
Role of the Health Professions

How does a society value and delegate responsibility to the professions? What might cause values and practices to change?

Are the values, standards and conventions that serve as the foundation for the medical profession universal?

When Was This Observation Made?

"It has become increasingly difficult to keep abreast of and to assimilate the investigative reports which accumulate day after day. . . . [My colleague] was ill at ease because he felt unable to control even the area of his own discipline; one suffocates, he once told me, through exposure to the massive body of rapidly growing information."

Published in 1872

- **Bernhard R. K. von Langenbeck** (1818-1887) German surgeon

Flexner Report 1910

- Transformed the nature and process of medical education in America

- Established the biomedical model and embraced scientific knowledge, adopting a required basic science curriculum

- Elimination of proprietary and apprenticeship schools

- This model of medical education combining basic and clinical sciences exists today

www.ncbi.nlm.nih.gov/pmc/articles/PMC3178858/

The Third Pillar of Medical Sciences

Innovations in medicine occurring at the interface of engineering

Basic sciences
- Biochemistry
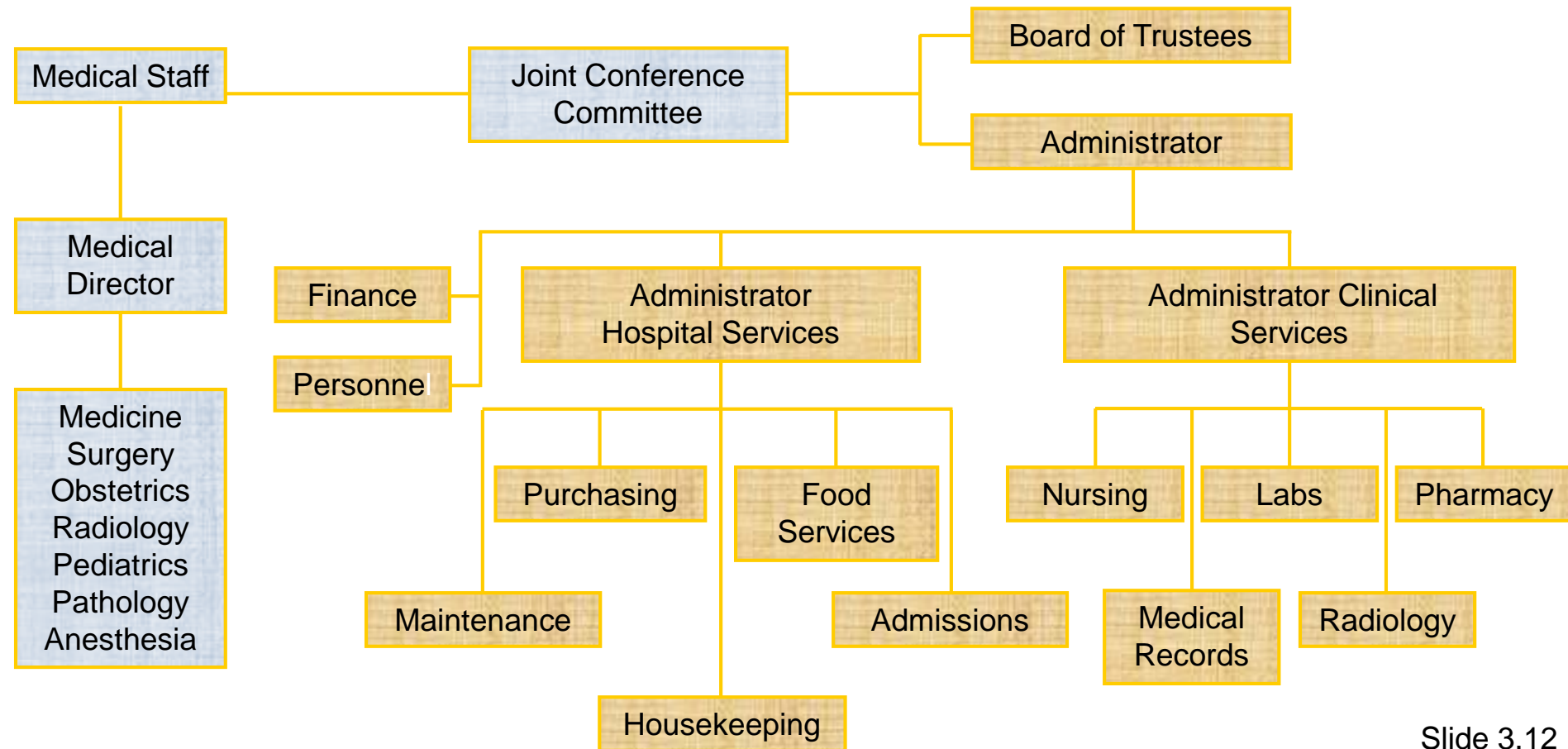- Anatomy
- Physiology
- Pathology
- Pharmacology

Clinical sciences
- General medicine
- Surgery
- Dermatology
- Pediatrics
- Neurosciences
- Psychiatry

Engineering sciences (Carle Illinois College of Medicine)
- ER medical management systems (medical GPS)
- Nano bubble delivering pro-drugs
- Biophotonics
- Optical coherence technology (OCT)
- Molecular prosthesis (cystic fibrosis)
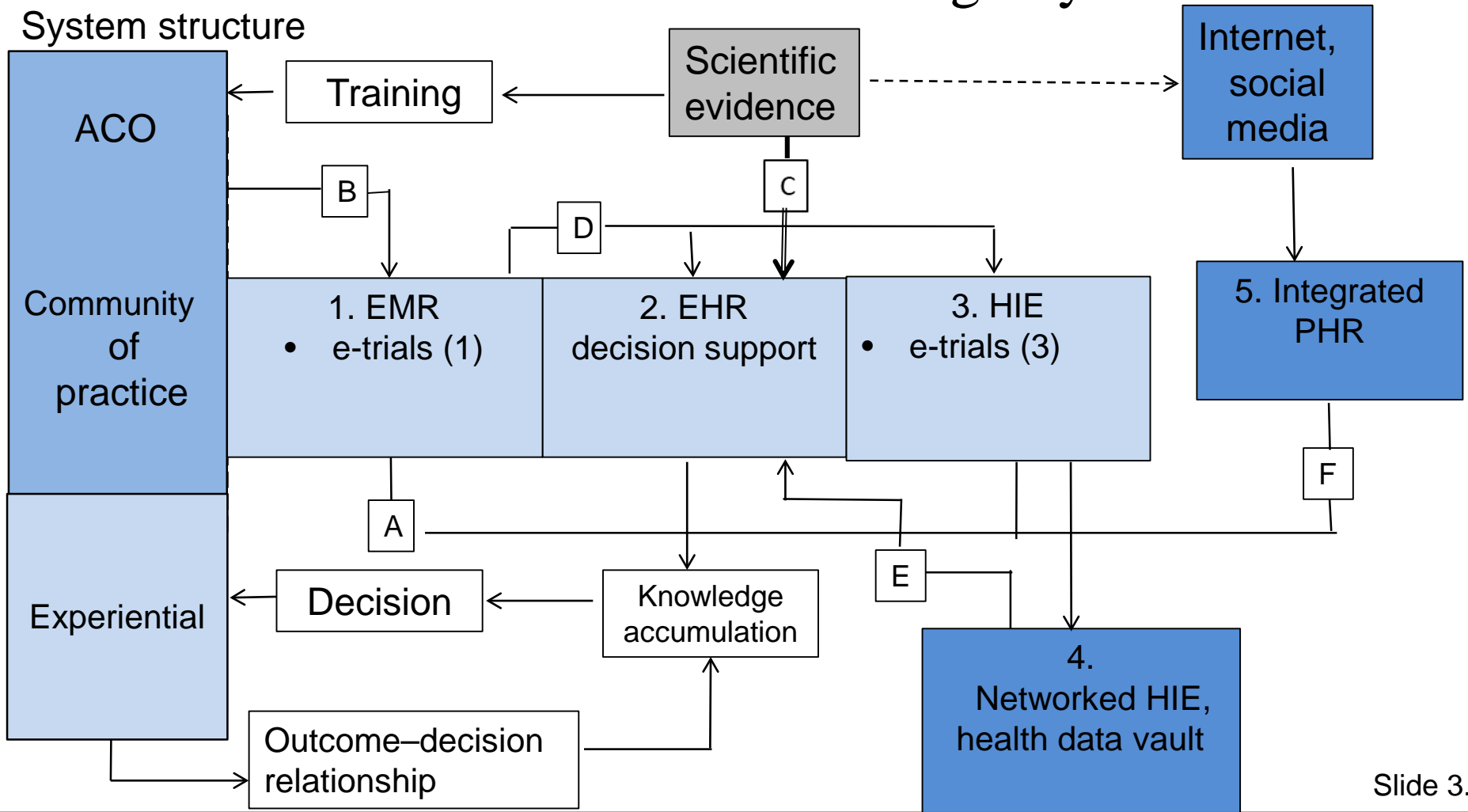- Bio materials

Slide 3.11

Classic Hospital Functional Structure: Clinical and Administrative

Medical Staff

Joint Conference Committee

Board of Trustees

Administrator

Medical Director

Finance

Personnel

Administrator Hospital Services

Administrator Clinical Services

Medicine
Surgery
Obstetrics
Radiology
Pediatrics
Pathology
Anesthesia

Purchasing

Food Services

Nursing

Labs

Pharmacy

Maintenance

Admissions

Medical Records

Radiology

Housekeeping

Slide 3.12

Patient-Oriented Knowledge System

Evidence-Informed Decision Making

Best available research evidence

Environment and organizational context

Decision making

Population characteristic, needs, values, preferences

Resources, practitioner expertise
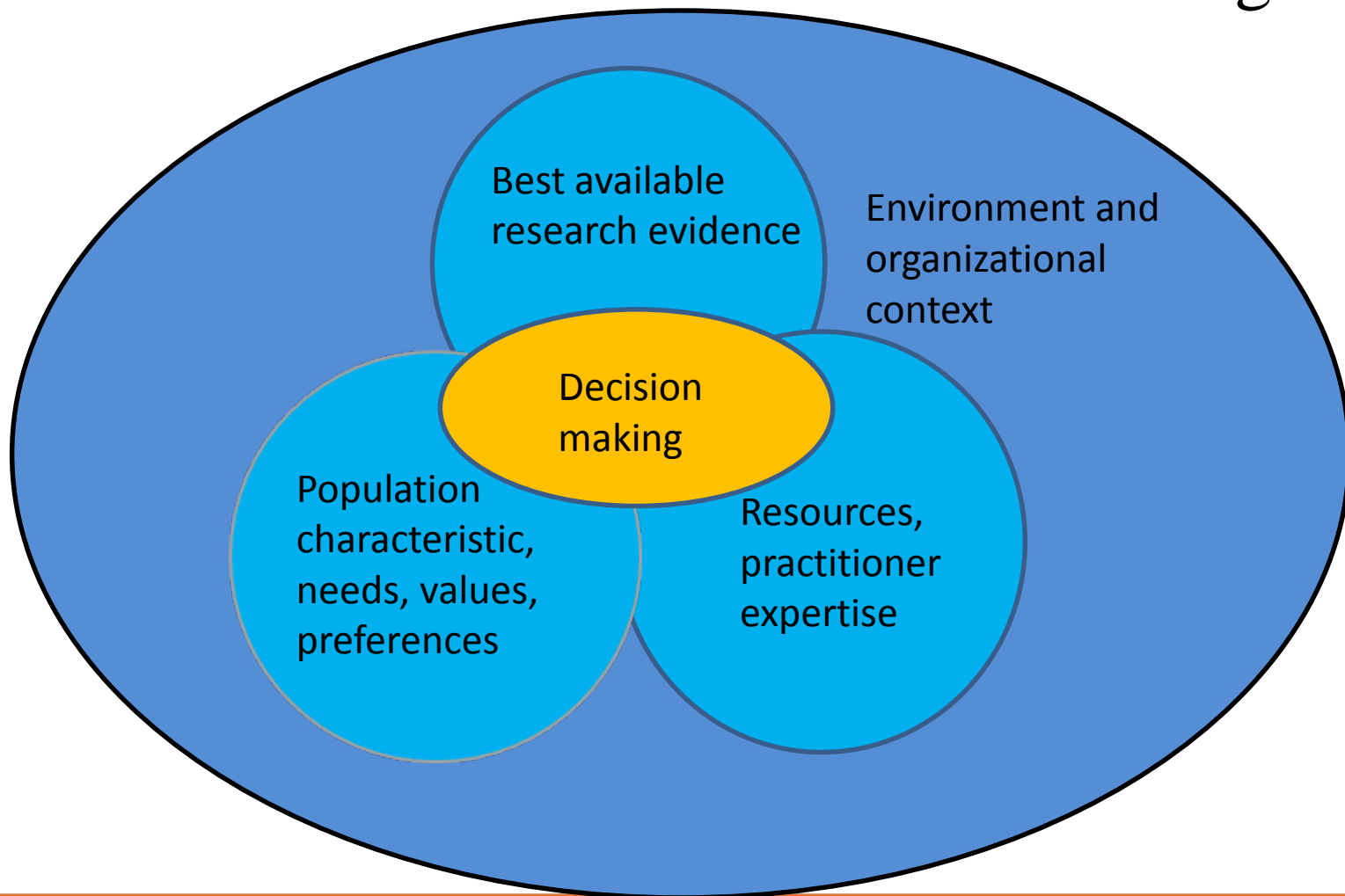
Decision Science: Decision Types and Logic

Type	Logic	Based on
Evidence-based *Biological* *Genomic* *Engineering*	Descriptive	Facts
	Normative	Judgment or expert reasoning
Intuitive	Subconscious	Holistic thought
Affective	Emotion	Values

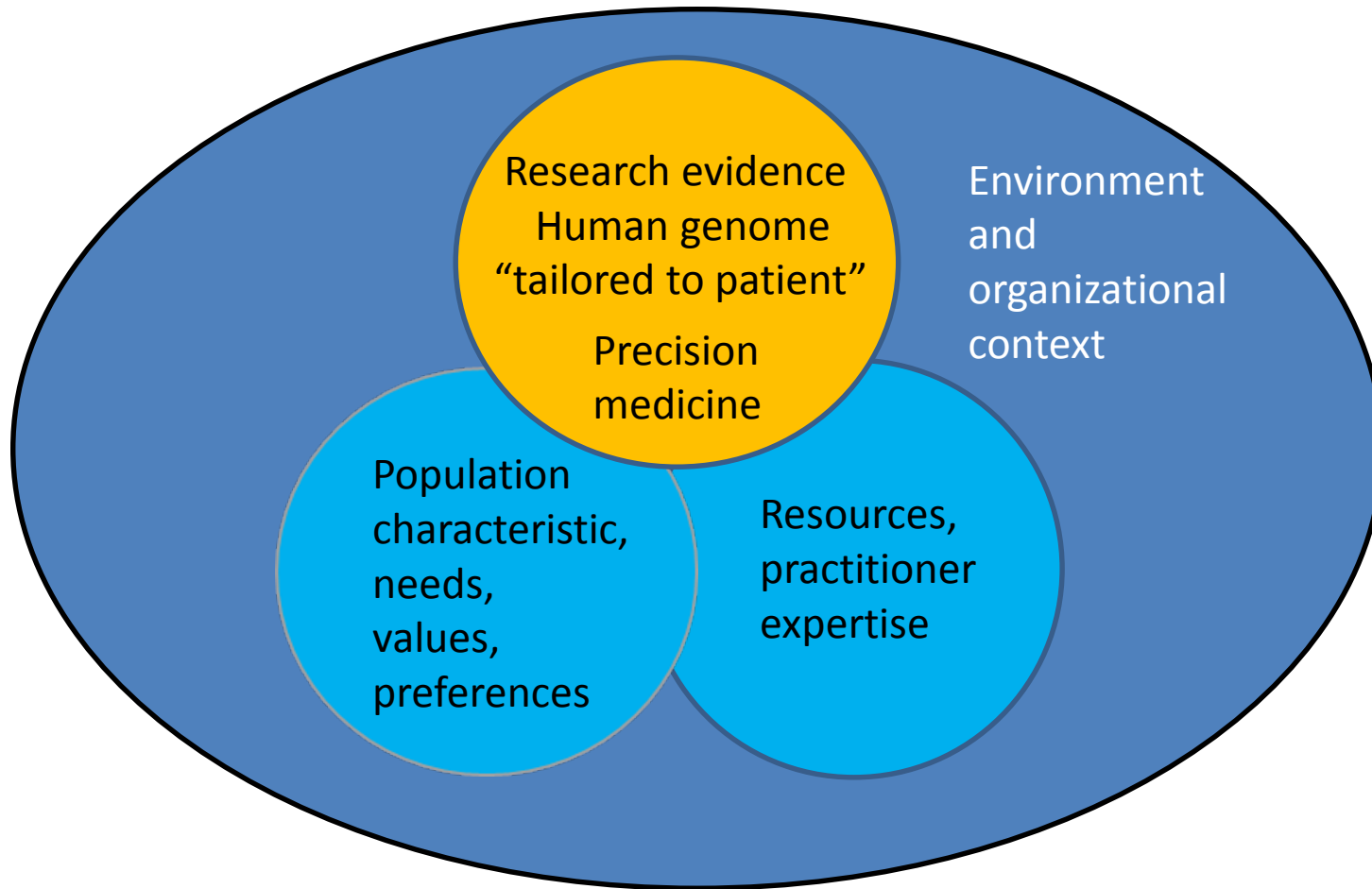Slide 3.15

Developing a Rapid Response Team

Knowledge capture from existing systems to inform clinical processes?

Are these decisions based on facts or judgment, or both?

Sources of knowledge:
- Medical records
- Charge and ER nurses
- Respiratory therapist
- Attending doctors and hospitalists
- Networked medical centers
- Accreditation agencies
- Insurance/financing

"Mechanistic" Decisions in Clinical Practice

Research evidence
Human genome
"tailored to patient"

Precision medicine

Environment and organizational context

Population characteristic, needs, values, preferences

Resources, practitioner expertise

Factors Typically Not Included in EHR

Patient values and preferences—not routinely considered in practice

- Schooling
- Religion
- Culture
- Alternative health practices
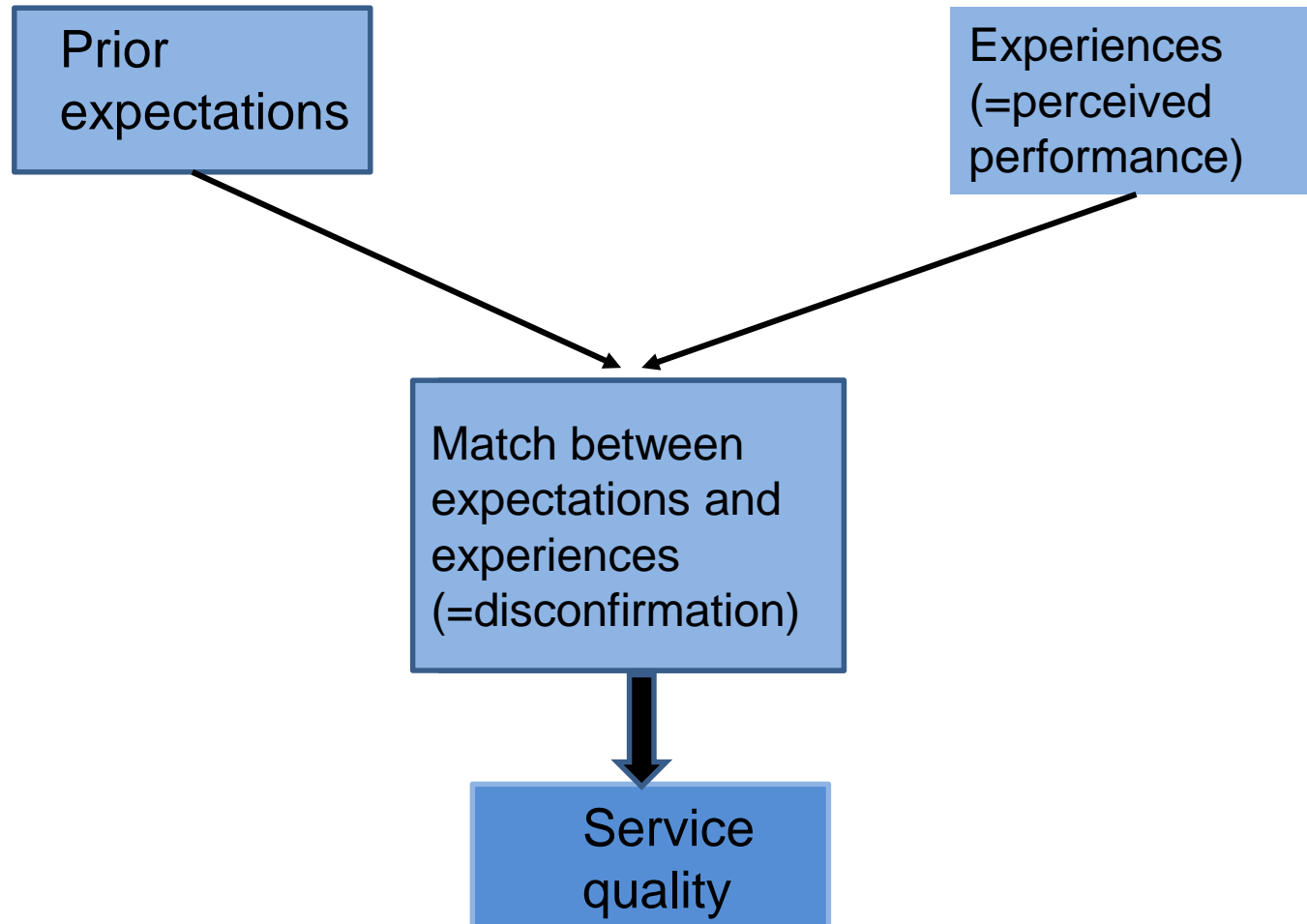- Stressors

Slide 3.18

Family and Social Information in EHRs

Promoted thinking and discussion about contextual information (e.g., immigration, income sources, legacy of family violence, housing arrangements)

- Highlighted some challenging life transitions
- Supported team-based care plans
- Organized data clearly for continuity of care

Customer-Perceived Service Quality

Prior expectations

Experiences (=perceived performance)

Match between expectations and experiences (=disconfirmation)

Service quality

Defining Palliative Care

1. Palliative care is specialized medical care for people living with serious illness.

2. It focuses on providing relief from the symptoms and stress of serious illness.

3. The goal is to improve quality of life for both the patient and the family.

4. Palliative care is provided by a team of palliative care doctors, nurses, social workers, and others who work together with a patient's other doctors to provide an extra layer of support.

5. It is appropriate at any age and at any stage in a serious illness and can be provided along with curative treatment.

SOURCE: Center to Advance Palliative Care. https://www.capc.org/about/palliative-care/ (accessed April 11, 2017).

Change in Role of the Health Professions

1. How has the EHR changed the decision-making process of medical doctors? Nurses?

2. As the clinical process changes, is there a loss of professional autonomy? Individual autonomy?

3. What are examples of decisions that represent each type of decision context in exhibit 3.1?

4. What changes in the selection, training, and reward of medical professionals would you suggest given the changing role of the society and information technology?

Chapter 3: Discussion Points for PowerPoint Slides

Slide 3.1. Evidence-Based Clinical Decision Making. This chapter deals with the clinical decision-making process and what informs clinical decisions. This discussion must be grounded in a knowledge of the health professions and their important social role. Clinical decisions are discussed by type of decisions and supportive decision processes. Decision science is introduced to explore the nature of clinical decisions.

Slide 3.2. The Professions in Society. Provide an overview of the social role of the professions in society and how that role changes as the culture and technology of a society changes. The changing role of the medical profession can be discussed. Sociologists study the professions and offer courses on the topic, emphasizing that professions are social roles. Discuss what causes them to change, including basic science and information technology. Professions will continue to play an important social role in the future because clinical decision making involves judgment and expert reasoning as well as the application of clinical evidence. Clinical decision making is also a process that includes patient values and beliefs.

Slide 3.3. Professions and Organizations. You might review the role of the professions with regard to organizations and why they have maintained a clear separation from them. The history of clinics such as the Ross-Loos Medical group can be reviewed, where the Medical Association tried to have their medical licenses revoked for starting and practicing within a corporation. Their early concept of prevention and wellness could have changed practice in the US but the profession prevailed and an organization was prohibited from influencing medical decisions.

Slide 3.4. Historic Hippocratic Oath. The oath can be reviewed, noting how personal it is intended by pledging, historically, that those who teach you are regarded as your parents. Why were these values important given the historic nature of the practice of medicine?

Do any of these values continue to exist? Are professional and family ties still considered in admission? What might be the effect if medical education were available at no cost to the student but paid for by society? It would change enrollment, but would it also change the culture and reward structure? Would it enhance or diminish the professions?

Slide 3.5. Historic Hippocratic Oath (continued). Note the fact that, historically, surgery was not considered as a medical science and specialty; it was with the Guild of Barber-Surgeons in Europe. It was a natural integration because they were experts in the use of razors. The Barber Surgeons Guild still exists, selling products such as hair serum, etc. This discussion puts into perspective that the professions and professional oaths reflect a strong set of social values during a period and reflect a level of science, economics, demography, etc. that enables the social role of professionals. These values, although they change, are important in a society. How might the professional role change in the future with information technology and patient access to information? The change process would have to start with the student population and the socialization process for training professionals. This is a good area for discussion and further exploration. There are some good studies of the sociology of medical education.

Slide 3.6. Doctor-Patient Relationship. This slide graphically presents discussion from a 1960s-era textbook describing what was referred to as the "sacred trust." This is an important relationship, but it changes as technology and knowledge change. Note that the organization is not included in the conceptual model. What new dimensions might be added to this model to reflect changes in technology and society?

Slide 3.7. Role of the Health Professions. It is clear that the role of the professions changes as society changes. Information technology might transform the role of the health professions into an integrated collegial or even a corporate role. This does not suggest that it will follow the business model that has characterized corporations in the past. These discussions can start students thinking about designing systems, systems change, and, at the core, the role of the health professions. The professions are important, but they will change. Change will start with recruitment of students and the socialization process they encounter while in school. This will be a hard change for senior faculty trained in a different era.

Slide 3.8. When Was This Observation Made? Have students read the slide and discuss when this statement become a reality in medicine.

Slide 3.9. Published in 1872. Discuss the rate of advancement in basic, clinical, and engineering sciences today and how professionals can be trained and possibly stay current in their fields. When does learning start and stop?

Slide 3.10. Flexner Report 1910. Discuss the Flexner Report and its impact. The report was widely criticized in medicine but ended up changing the model of medical education *and the profession*. The profession changed from being a trade union to having a scientific base and requiring university education, integrating basic sciences with clinical science. The Hopkins Circle was instrumental in the transformation, enabled by philanthropist Johns Hopkins.

This would be an interesting topic for a student paper. The issue is not the mechanics of the change but the dramatic change in education, the profession, and the culture. It is an example of the professions being accountable to the society that grants them rights and responsibilities, but that changes. It continues to change, in part by the application of advanced information technology.

Slide 3.11. The Third Pillar of Medical Sciences. This slide introduces what might be another transformation in medical education and the profession. It relates to the case study and can generate considerable discussion. The University of Illinois has introduced engineering science as a core requirement in the medical curriculum. How might engineering science change the practice of medicine? Is this another Flexner moment in medical education?

Engineering has been involved with medicine for decades, in bioengineering programs, but this proposal is different. Engineering knowledge is now prosed as a core competency in clinical practice. Some have contended that adding engineering science will overwhelm the curriculum and ability of students to master the content (an argument that was raised against Flexner as well). However, the focus for students is not primarily on engineering research and knowledge generation (they are trained in that environment by faculty who are so engaged) but on

incorporating knowledge into clinical practice. Save in-depth discussion of this topic for the case study.

Slide 3.12. Classic Hospital Structure: Clinical and Administrative. This slide introduces the historic relationship between the clinical and business, including IT, functions in hospitals. The business function is explored in depth in chapter 4. Note the fundamental separation of the clinical from administrative functions. This structure continues to be part of the DNA of health systems and is inconsistent with the information world.

Historically, there has been a separation between the clinical and managerial functions, although early graduate programs in health administration were in schools of medicine. Few have survived, and none were successful in integrating organization and system design into medical studies. This slide presents the separation of these functions. Throughout the book we discuss the integration of the clinical and organizational functions, structure, and strategy. This chapter focuses on the clinical function.

Slide 3.13. Patient-Oriented Knowledge System. Review this slide from chapter 2 on knowledge generation and application. You might review the types of knowledge being generated and how they affect clinical decisions and the profession. For example, the EHRs bring in a scientific base of knowledge that needs to be interpreted and applied. Information and knowledge is generated from the EMR and from a tailored network of EMRs. Patient information and decisions become part of the clinical decision process. How can the role of the professional not change?

Recall the discussion from chapter 2 of the effect of the change in information exchange on the structure of the health system and organizations. This topic sets up discussion in chapter 4. The integration of these chapters should be emphasized.

Slide 3.14. Evidence-Informed Decision Making. This model draws on Smithfield's work, who refers to the clinical decision not as evidence-based but rather *evidence-informed* clinical decision making. Note the shared responsibility with the practitioner, available resources, and patient characteristics and preferences.

Slide 3.15. Decision Science: Decision Types and Logic. Exhibit 3.1 from the text introduces a large and complex science that can only be summarized here. The concepts can be developed, but the details and the science supporting them will not be covered in depth. The model delineates the types of clinical decisions that are made and the bases for making them.

Note that the health literature seldom draws on the rich area of decision science to better understand the nature of the decision and the logic/evidence to support it. The literature frequently cites terms like "intuition" and "judgment" as abstractions without identifying the basis for making the decision, and thus does not add to the knowledge of the appropriate decision support. We will refer to this figure in subsequent slides.

Students might be interested in exploring in greater depth the area of decision science as a basis for examining the literature on clinical decision making and decision support. Medicine and research into clinical decision making tend to identify types of decisions according to clinical

specialty instead of decision type and structure. This topic can be a rich source for papers and discussion.

Slide 3.16. Developing a Rapid Response Team. This slide provides an example of *mechanistic decision making*, using AI in a traditional hospital/clinical setting. It draws on an example from the text about activating a rapid response team in a hospital, and it is a good opportunity to talk about AI and its potential in clinical decision making. In this example, the traditional method of calling out the RRT was based on collective, expert judgments of charge nurses, ER nurses, and others to assess the patient risk and activate the team. This is a critical decision context because, if not called, a patient might die, but false-positive calls are expensive, disruptive, and have negative social/professional sanctions.

In this case, AI is able to process and store scores of variables and thousands of patients and to identify risk, considering factors such as patient age, diagnosis, current treatment protocols, etc. It might be interesting to consider the potential of using networked HIEs (i2b2), discussed in chapter 2, to increase the volume of information collected and knowledge generated. Debate the position that the networked institutions might not be similar in terms of patient population and risk, and that additional data might not improve the predictive powers of the Smart system. It is more than just about mechanics and processing speed. The advantage is that there is much greater patient volume, and for AI, the larger the number of patients and variables to consider, the better.

Slide 3.17. "Mechanistic" Decisions in Clinical Practice. This graphic draws again on Smithfield's work, focusing on mechanistic decision making. The model is correct in differentiating between evidence-informed and evidence-based, in that the former draws on population-based clinical trials and the latter is based on genomics and precision medicine, tailored to the individual patient—thus the term *mechanistic*. In this regard, the decision does not require, nor is it possible to improve the decision based on, expert judgment. The authors focus on the clinical decision per se and not the values and preferences of the patient, which would broaden the decision context but not alter the point of the clinical decision being mechanistic.

Slide 3.18. Factors Typically Not Included in EHR. This slide expands on the previous one, bringing in population characteristics, needs, values, and preferences. Should these factors be included in the EHR to prompt health professionals and better inform the decision? Might these factors provide increased context for attending physicians? It is a good opportunity to discuss the complexity of clinical decision making, in that precision medicine is considered as a mechanistic decision process for clinicians but, in its broader context, involves "affective decision processes" based on patient values (exhibit 3.1).

The patient can draw on the PHR to become better informed of the consequences of the process and participate in the decision. No matter the level of certainty of precision medicine, patients have drawn, and will increasingly draw, on their own values, beliefs, and desires in making the final decision.

Slide 3.19. Family and Social Information Template in EHRs. This slide extends the discussion of the previous slide by considering characteristics of patients as a social group and

then as individuals. The social and cultural background can help inform the decision context. The research by Kotay et al. also introduces the importance of teams within the decision and treatment context. Students might be assigned to work in teams to explore other research that uses as a base high levels of clinical knowledge (certainty), tailored to individual patients, but considered within the context of patient values and preferences.

Slide 3.20. Customer-Perceived Service Quality. This is an interesting slide on patient perception of quality, based on a match of patient expectations and experiences. Many institutional assessments focus on what the institution or what health professionals value without considering patient expectations. One option to consider might be to assess patient expectations as a basis for tailoring services. Is there a risk that evidence-based medicine might socialize clinicians into a mind-set of mechanistic decision making and abandon their important professional role? Might EHRs with input from PHRs enable greater sensitivity to patient values and expectations? What information would be included?

Slide 3.21. Defining Palliative Care. This slide focuses on palliative care, which presents a good model for considering the range of clinical services, from acute to chronic. Included in the answer to the questions posed in the previous slide is to practice in teams, including social workers and palliative care specialists, that consider family values and the broader social services dimension.

Slide 3.22. Change in Role of the Health Professions. This slide poses some discussion questions. One assignment for students might be to survey the clinical decision literature and assess the decision types (exhibit 3.1) and context. Is the description of the decision (e.g. intuitive) based on an understanding of the concept, or just a label for everything other than factual decion types included in the exhibit?

Are there similar decision structures across clinical specialties that could serve as a basis for better understanding clinical decision making and decision processes? Is decision science compatible with professional decision making?