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SCHOOL OF RURAL PUBLIC HEALTH

TEXAS A&M UNIVERSITY

PHPM 680: HEALTH SYSTEM LEADERSHIP

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**PETER SENGE & EHR:
BEYOND ELECTRONIC PATIENT
RECORDS...ELECTRONIC PATIENT
MANAGEMENT AND EHR DESIGN**

Metanoia

- ◆ Several years ago I was browsing in a bookstore and came across the word *metanoia* in a book about business.
- ◆ I was absolutely confident that *metanoia* had nothing to do with American business.
- ◆ In order to "debunk" what the author said, I read Peter Senge's *The Fifth Discipline*. Needless to say, "I had a change of mind."

Metanoia

- ◆ I found in Dr. Senge's book a structural and philosophical foundation for what we were already doing at SETMA.
- ◆ I also found another illustration of a principle a friend had taught me years before:
 - “the person who helps you the most is not one who teaches you something new, it is the person who teaches you how to say that which you already know or suspect.”

Learning

- ◆ Dr. Senge said:
 - ◆ "To grasp the meaning of '*metanoia*' is to grasp the deeper meaning of 'learning,' for learning also involves a fundamental shift or movement of mind...Learning has come to be synonymous with 'taking in information'...Yet, taking in information is only distantly related to real learning."

Change of Mind

- ◆ If there is one thing which is needed in the medical informatics, or medical information technology world, it is a **“change of mind.”**
- ◆ There needs to be a fundamental change of mind such that we are not talking about "electronic health records (EHR)," but about "electronic patient management (EPM)."

Change of Mind

- ◆ Transitioning from an EHR mentality to an EPM goal is to apply Dr. Senge's concept of "generative learning" to the field of medicine.

Change of Mind

- ◆ Addressing the concept of a “learning organization,” Senge says:

"This then is the basic meaning of a learning organization... continually expanding its capacity to create its future. For such an organization, it is not enough merely to survive. 'Survival learning' or what is more often termed 'adaptive learning' is important – indeed it is necessary. **But for a learning organization, 'adaptive learning' must be joined by 'generative learning,' learning that enhances our capacity to create.**" (emphasis added)

Change of Mind

- ◆ If we continue simply to talk about electronic health records, we may create a future in which we discover that we have only created a very expensive and very complex substitute for a relatively inexpensive transcription service.

Change of Mind

- ◆ If we are going to impact the future of health care, we -- vendors, managers, providers, payers, institutions, every member of the health care team -- are going to have to begin thinking differently.
- ◆ This will involve at least three major shifts in our thinking. This will involve “**medical *metanoia*.**”

Shifts in Thinking

1. Those who are naturally competitors are going to have to work collaboratively.
2. Those who are naturally idealists are going to have to produce work which is practical.
3. Those who are naturally resistant to new ideas are going to have to become innovative and receptive to change.

1. Collaboration

- ◆ The reality is that whatever role we play in healthcare and whatever type of organization we represent, we are all part of a larger, community, healthcare team, which often consists of those we would call our “competitors.”

1. Collaboration

- ◆ It is a much larger team than those who are simply on our payrolls. This team consists of participants previously seen by health care providers as peripheral to the healthcare equation, such as pharmaceutical representatives, unit clerks, DME companies, home health agencies, hospital administrators, etc.

1. Collaboration

- ◆ If our only goal is to survive and to "triumph," we will not have changed our way of thinking and even if we succeed corporately, we probably will have failed in any thing which is ultimately valuable.

1. Collaboration

- ◆ By “taking charge” of our own healthcare future, we can dictate what it will look like and how it will operate.
- ◆ The only way we “lose control,” is by refusing to participate.

1. Collaboration

- ◆ In this “new world,” our focus must no longer only be on “winning,” because the reality is, if “he wins,” if “she wins,” and if “they win;” “we all win.”
- ◆ This does not mean that we cease to compete, but it means that we now collaborate at some level with our competitors to make both of us better.

1. Collaboration

- ◆ Recreationally, Americans are drawn to zero-sum games -- football, basketball, car races, horse races, track and field, soccer -- in which there is a clear and decisive winner, by however narrow a margin, and where there is a clear and decisive loser, no matter how excellent a performance they turned in.

1. Collaboration

- ◆ In our "health care information" race:
 - ◆ all finishers will be winners and
 - ◆ because they drive the process, all participants will be winners, if they pursue the right goal.
- ◆ The best medical-business model is not an "I win/you lose" scenario.

2. Produce Practical Work

- ◆ Those who are naturally idealists are going to have to produce work which is practical.
- ◆ Americans are enamored with the fastest, the best, the biggest, the....you fill in the blank. None of these terms will apply to the successful electronic patient management tools which you will produce and use.

2. Produce Practical Work

- ◆ Other words, such as “interactive,” “connectivity,” “interoperability,” “stability,” “efficient,” etc, will define the parameters of our new pursuits.
- ◆ Our systems will have to be fast enough; they will have to be easy enough to use; they will have to be good enough, but superlatives will not apply.

2. Produce Practical Work

- ◆ Once our systems are “fast enough,” and “easy enough” to use, we can begin to focus on what is really important : **How do they help us increase the quality and safety of care and decrease the cost of care which we deliver every day, and how do they up us prove that we are doing all three?**

2. Produce Practical Work

- ◆ The problem is that it is possible to design an elegant solution to healthcare's problems and yet not impact healthcare at all, **because it is not possible to use it within present day realities.**
- ◆ One enterprising full-page ad in the *New York Times* heralded that **"it is not how many good ideas you have that matters, but how many good ideas you can implement."**

Forward Thinkers versus Day Dreamers

- ◆ In this context, Dr. Senge addresses the difference between a **forward thinker** and a **day dreamer**. He said:
 - ◆ “The juxtaposition of vision (what we want) and a clear picture of current reality (where we are relative to what we want) generates what we call ‘creative tension’: a force to bring them together, caused by the natural tendency of tension to seek resolution.”

Forward Thinkers and Day Dreamers

- ◆ Forward thinkers are able to create and sustain “creative tension. “ They are persistent and sometimes can be described as “**relentless**” in the pursuit of the future they have envisioned. Sometimes, they are not fun people to be around as they will constantly be declaring, “**Do it right and do it right now!**”

Forward Thinkers and Day Dreams

- ◆ “Creative Tension will occur in an organization when **“process becomes passion.”** When the goal is internalized and becomes a product of “generative” thinking and “creative tension” **both of which exist independent of external pressures and obstacles.**

Forward Thinkers and Day Dreamers

- ◆ **Health reform** employs external pressure to reshape healthcare delivery into a desired pattern. It functions only as long as rules, regulations, requirements and restrains squeeze the system into a desire form. Unfortunately, it is not creative and is not self-sustaining.

Forward Thinkers and Day Dreamers

- ◆ **Healthcare transformation** will result from the internalized ideals which create vision and passion, both of which produce and sustain “creative tension” and “generative thinking.”
- ◆ **Transformation** is not the result of pressure and it is not frustrated by obstacles. In fact, the more difficult a problem is, the more power is created by transformation in order to overcome the problem.

Forward Thinkers Have Personal Mastery

- ◆ Senge goes on to discuss “personal mastery” which in its essence, he says, “is learning how to generate and sustain creative tension in our lives.”
- ◆ “Personal Mastery” is the “intelligence” which is the foundation of transformation.

Forward Thinkers have Personal Mastery

- ◆ **Personal Mastery** – the discipline of continually clarifying and deepening our personal vision, of focusing our energies, of developing patience, and of seeing reality objectively – the learning organization’s spiritual foundation. (Peter Senge)
- ◆ **“The essence of personal mastery is learning how to generate and sustain creative tension in our lives.”**

Personal Mastery: Characteristics

People with a high level of personal mastery share several basic characteristics:

1. They have a special sense of purpose that lies behind their vision and goals. *For such a person, a vision is a calling rather than simply a good idea.*
2. They see current reality as an ally, not an enemy. They have learned how to perceive and work with forces of change rather than resist those forces.

Personal Mastery: Characteristics

3. They are deeply inquisitive, committed to continually seeing reality more and more accurately.
4. They feel connected to others and to life itself.
5. Yet, they sacrifice none of their uniqueness.
6. They feel as if they are part of a larger creative process, which they can influence but cannot unilaterally control. (p. 142)

Personal Mastery: Characteristics

7. Live in a continual learning mode.
8. They never ARRIVE!
9. (They) are acutely aware of their ignorance, their incompetence, their growth areas.
10. And they are deeply self-confident! (p. 142)

2. Produce Practical Work

- ◆ “Creative tension” can only produce results, however, when it finds a place from which to leverage change.
- ◆ Senge wisely comments that **“Cynicism...often comes from frustrated idealism – someone who made the mistake of converting his ideals into expectations.”**

2. Produce Practical Work

- ◆ It is not enough to want things to change; you have to make things change. And, as IBM learned, when they encouraged “change agents” within their organization, **“if you are going to change things, the change better make a difference.”**

2. Produce Practical Work

- ◆ Furthermore, medical informatics technology must provide us with **tools** not with **toys**.
- ◆ A tool makes your job more efficient and your product more excellent, while a toy only makes your job more amusing.

2. Produce Practical Work

- ◆ Thirty years ago, a physician in our community was using computers. He had one of the very first portable computers. He would visit his medical school and attend grand rounds, plugging into a medical database. When the question and answer time came, he would ask questions based on obscure publications which were online but not available in the medical library.

2. Produce Practical Work

- ◆ He was computer savvy and knowledgeable, but he used the computer as a toy.
- ◆ He never changed the process of healthcare and he never improved the care of his patients with technology.

3. Embrace Change

- ◆ Those who are naturally resistant to new ideas are going to have to become innovative and receptive to change.
- ◆ Change is suspect because it upsets the equilibrium. In order to succeed, we must all surrender some level of comfort and some level of control.

3. Embrace Change

- ◆ The innovation required to design a future which meets everyone's needs is a future fraught with discomfort, difficulties and uncertainty.

3. Embrace Change

- ◆ None of these characteristics are pleasant to participants in healthcare, though they so well and so often describe the nature of our enterprise.
- ◆ Yet, change is the very nature of healthcare and if changing how medicine is practiced and/or how health care is delivered in America is not our goal, then we need to rethink what we are doing.

3. Embrace Change

- ◆ **Innovators** are going to have to lead the process of change by helping make those successful who are reluctant to change.
- ◆ **Leadership** is more often defined in dedication and demonstration than it is in dictation.
- ◆ **Rather than dictating change, we are going to have to demonstrate the benefits of and the possibility of change with our dedication to change.**

Learning Disabilities Which Impede Electronic Patient Management

- ◆ We must actively and willingly participate in this "learning organization" which has no walls.
- ◆ Yet, the development of a "learning organization" is resisted, Dr. Senge suggests, by seven learning disabilities. These disabilities, which encumber our organization and team mobility, are applicable to medicine as well as to other enterprises.

Learning Disabilities Which Impede Electronic Patient Management

1. I Am My Position
2. The Enemy Is Out There
3. The Illusion of Taking Charge
4. The Fixation of Events
5. The Parable of the Boiled Frog
6. The Delusion of Learning From Experience
7. The Myth of the Management Team

1. I Am My Position

- ◆ Dr. Senge comments: "When people in organizations focus only on their position, they have little sense of responsibility for the results produced when all positions interact. Moreover, when results are disappointing, it can be very difficult to know why. All you can do is assume that 'someone screwed up.'"

1. I Am My Position

- ◆ This disability principally addresses vendors.
- ◆ When all a vendor does is focus on his/her product and its functionalities, the vendor may accomplish something which has virtually no value, if it is not dynamically related to other members of the "medical information technology learning organization."

1. I Am My Position

- ◆ Progressively, vendors are going to hear from end users, "You have a good product, if it worked with our other systems, but it doesn't."
- ◆ This means that while you have a great idea, we will not benefit from it."

1. I Am My Position

- ◆ Here is the counterintuitive decision vendors are going to have to make if they are going to contribute to solutions in healthcare rather than simply continue to aggravate the problem.
- ◆ **Vendors must create products which can either interact with other proprietary products or they create products with an architecture which is easily adaptable to interaction with the products of their competitors.**

2. The Enemy Is Out There

- ◆ Senge says, "There is in each of us a propensity to find someone or something outside ourselves to blame when things go wrong."
- ◆ This disability is found in providers and very often in patients.
- ◆ **This disability is at the root of one of the system archetypes, "Shifting the Burden."**

2. The Enemy Is Out There

- ◆ The idea that someone is responsible for my difficulties is a common ploy with which to avoid responsibility for being a change agent yourself.
- ◆ Charging someone else with negligence or mistakes is an unproductive substitute for being willing to change.
- ◆ The reality in health care is that, like Pogo, "We have met the enemy and he are us!"

2. The Enemy Is Out There

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- ◆ Charging someone else with negligence or mistakes is an unproductive substitute for being willing to change.
- ◆ The reality in health care is that, like Pogo, "We have met the enemy and he are us!"

2. The Enemy Is Out There

- ◆ Several years ago, I had the opportunity to consult with a University, community-based residency program.
- ◆ They were struggling with the implementation of an EHR software product. After a day of analysis, I met with the faculty, administration and residents. I said, “You only have three problems...”

2. The Enemy Is Out There

- ◆ One, you have no faculty leadership.
- ◆ Two, you have inadequate technical, hardware support for your project.
- ◆ Three, you have residents with unacceptably bad attitudes.

“Quite frankly, I would fire all of you and start over.”

2. The Enemy Is Out There

- ◆ I concluded with the following two statements:
 - a) “Either you are practicing better medicine than you are documenting or you are committing malpractice every time you see a patient.
 - b) You do not have a software or a vendor problem.”**

2. The Enemy Is Out There

- ◆ The head of the program stood to respond to my conclusions. He courageously and humbly said, "You are right."
- ◆ Within less than a year, they had solved their problems and today are doing a great job.

2. The Enemy Is Out There

- ◆ The only hindrance to our success with medical informatics is our propensity and often our willingness to provide ourselves with an excuse for not succeeding.

2. The Enemy Is Out There

- ◆ When a physician recently told me that he gets discouraged when things don't work in a week or so, I told him that I was going to give him a list of 100 excuses.
- ◆ In the future, he would not have to tell me why he didn't succeed, he could simply send me a note saying, "I was not able to succeed because of 16, 44 and 73."

2. The Enemy Is Out There

- ◆ Anyone who wants an excuse can find one, but successful people refuse to accept an excuse, particularly for themselves.

3. The Illusion of Taking Charge

- ◆ Senge argues that
 - ◆ "All too often, 'proactiveness' is reactivity in disguise. If we simply become more aggressive fighting the 'enemy out there,' we are reacting – regardless of what we call it. True proactiveness comes from seeing how we contribute to our own problems. It is a product of our way of thinking, not our emotional state."

3. The Illusion of Taking Charge

- ◆ Often we think action is good and inaction is bad, but we fail to recognize that disorganized activity, while fatiguing and sometimes fulfilling, rarely produces a positive result.

3. The Illusion of Taking Charge

- ◆ Remember the recent coal-mining accident; the success was won, not by furious action, but by careful planning and correct assumptions, however improbable that they were. **Here's where vendors and providers often collaborate in ineffectiveness.**

3. The Illusion of Taking Charge

- ◆ It is generally better to do something than it is to do nothing. And, there is no premium on timidity born of the fear of failure.
- ◆ It is our nature that we try, but we must try with both insight and correct analysis. We must not tilt at windmills, yet we must continue to build wind turbines.

4. The Fixation on Events

- ◆ Senge explains:
 - ◆ "The primary threats to our survival, both of our organizations and of our societies, come not from sudden events but from slow gradual processes; the arms race, environmental decay, the erosion of a society's public education system..."

4. The Fixation of Events

- ◆ This learning disability addresses the possibility and even the probability that our “vision” may be obscured by our experience and by the subtle changes taking place in our world.
- ◆ In healthcare, this learning disability warns us not to devise solutions which are tied so closely to current phenomenon that they cannot adapt to changing realities.

4. The Fixation of Events

- ◆ Technological innovation has been one of the driving forces in human progress.
- ◆ Adaptability to new technological trends will be critical to successful healthcare innovation in the future.

5. The Parable of the Boiled Frog

- ◆ Senge illustrates:
 - ◆ "Learning to see slow, gradual processes requires slowing down our frenetic pace and paying attention to the subtle as well as the dramatic."

5. The Parable of the Boiled Frog

- ◆ As long as the frog swims around in the slowly heating water, he can't focus on what is really bothering him -- the rising temperature -- and what he needs to do about it -- get out of the water.

5. The Parable of the Boiled Frog

- ◆ How often have we seen those who are constantly busy but equally ineffective?
- ◆ They vigorously work but rarely solve the problem they are intent on addressing. I have known people who were very busy about their task, but who never did their job. They were “busy as bees” but without the bees purposed efforts and design.

5. The Parable of the Boiled Frog

- ◆ This applies to all participants in the healthcare industry.
- ◆ Very often, we are so fatigued from our frenetic swimming about that we don't take the time to do that which initially doesn't make sense, but which ultimately leads us to the solution we desired in the first place.

5. The Parable of the Boiled Frog

- ◆ Repeatedly, Senge addresses “counterintuitive” behavior – doing that which initially does not seem to make sense, but which ultimately accomplishes your goal.
- ◆ Senge gives an illustration...

5. The Parable of the Boiled Frog

- ◆ On a winter canoeing trip, his party faced a waterfall. Porting around the fall, they noticed a man going over the water fall. The canoe capsized and the man furiously tried to swim away from the water fall. The freezing water overcame him. His body then sank below the water and was pushed by the current to the side of the river. The man's dead body ended up exactly where he was trying to go, but too late to save his life.

5. The Parable of the Boiled Frog

- ◆ Success in this instance, involved doing that which was counterintuitive, holding your breath, going under water, and allowing the current to carry you to safety.
- ◆ Business solutions and particularly medical informatics solutions are often like this.

6. The Delusion of Learning From Experience

- ◆ Senge cautions:
 - ◆ "When our actions have consequences beyond our learning horizon (a breadth of vision in time and space within which we assess our effectiveness), it becomes impossible to learn from direct experience."
- ◆ Evidence-based medicine is built on the premise that personal observations and personal experience often lead to the wrong treatment plan.

6. The Delusion of Learning From Experience

- ◆ If learning is more than “taking in information” and if learning is the managing of “creative tension” to create a future of our choosing, then we will need to move beyond *a posteriori* knowledge – experienced-based learning -- to an *apriori* comprehension – an intuitive apprehension both of reality and of creativity -- of the future and of its demands.

7. The Myth of the Management Team

- ◆ Senge declares:
 - ◆ "All too often, teams in business tend to spend their time fighting for turf, avoiding anything that will make them look bad personally, and pretending that everyone is behind the team's collective strategy – maintaining the appearance of a cohesive team."

7. The Myth of the Management Team

- ◆ The deception employed here is the illusion of competence. It is never popular to say, “I don’t know,” but sometimes it is the most creative approach to solving a problem.
- ◆ The admission that you don’t know, or that the “management team” does not know, often makes the team aware of possibilities which otherwise would be excluded.

7. The Myth of the Management Team

- ◆ This is the foundation of the last three characteristics of “personal mastery” which Senge addresses in *The Fifth Discipline*. People who have a high degree of personal mastery:
 1. Never arrive!
 2. Are acutely aware of their ignorance, their incompetence, and their growth areas.
 3. Are deeply self-confident!

Part II: Designing an EHR with Systems Thinking: EHR vs. EPM

- ◆ Remember, Dr. Senge said, "...taking in information is only distantly related to real learning." It is the same with our health care world. The ability to accurately, efficiently and quickly document a patient encounter in a physician's office is "only distantly related to 'real' electronic patient management."

EMR versus EPM

- ◆ If all we generally talk about is Electronic Patient Records or Computerized Patient Records or Electronic Medical Records, or ...then everyone is going to get the idea that when they create the ability to produce an electronically generated document of a patient encounter, they have arrived.

EMR versus EPM

- ◆ The problem with this is that many health care providers, who are very interested in joining the 21st-Century methodology of health care (EPM), are going to buy a product which they suddenly find is wholly inadequate for the tasks at hand.

EMR versus EPM

- ◆ To accomplish *metanoia* in medical informatics, I would immediately hold up the standard of Electronic Patient Management (EPM). I would describe it at least, if not define it. I would detail and illustrate its every aspect. I would model it where it exists, and I would dream about it where it does not.

EMR versus EPM

- ◆ And I would herald the truth that the ability to document a patient encounter only "gets you on to the playing field" in EPM. That ability is not the end point; and, the vendor who can only do that is not holding the winning hand.

SAFIR Records

- ◆ The characteristics of an electronic-management system, which would be a "winner," in ascending order as to importance, but in descending order as to how people judge a product, are:
 1. Speed
 2. Appearance
 3. Functionalities
 4. Interaction
 5. Research

SAFIR Records - Speed

- ◆ SAFIR records will be fast enough to be functional, both from the standpoint of reaction time and from the standpoint of time and attention required to document a record in the presence of a patient.

SAFIR Records - Appearance

- ◆ SAFIR records will be attractive enough so that providers less inclined to embrace the more important functions of electronic patient management will be drawn to EMR.

SAFIR Records - Functionality

- ◆ SAFIR records will have the functionalities, which define a robust EHR. The functions move beyond a “transcription service,” beyond the documentation of a patient encounter to the ability to assess a patient’s cardiovascular risk profile, to bringing what is known about a condition to bear upon the encounter.

SAFIR Records - Interaction

- ◆ Interaction with other clinical functions is critical to electronic patient management. The system which is the fastest may not be the best if its speed is achieved at the expense of doing nothing but being a substitute for dictation and transcription of records.

SAFIR Records - Interaction

- ◆ A system which allows in-patient and out-patient care from the same database is superior.
- ◆ A system which allows "real time" ICU patient management which is useable from the provider's office, home, hotel room, etc, would have tremendous value.
- ◆ A system which promotes and supports care coordination and effective transitions of care.

SAFIR Records - Interaction

- ◆ A system where the specialist and the generalist are using the same data base in the clinic, in the hospital, in the ER, in the physical therapy, in the home health, in the hospice, in the home would be the ideal. A system which is not “locked up” in the provider’s office after hours but is available every where and every time a patient is seen.

SAFIR Records - Research

- ◆ Research -- ultimately, the superior record must demonstrate its ability to allow data to become information to become decision making for improving the quality of care and for controlling cost. This will require auditing, analyzing and publicly reporting quality metrics.

SAFIR Records - Research

- ◆ "Expensive" and "excellence" are not synonyms -- this aspect of the electronic patient management can prove once and for all that it is possible to decrease cost while increasing quality of care.
- ◆ In addition, the research aspect also can be used for clinical trials of medications, for managing the business side of medicine and for influencing provider and patient behavior in overcoming clinical inertia.

SAFIR Records

- ◆ Recently, I went with a family member to see a world-renowned specialist for a life-threatening problem.

SAFIR Records

- ◆ I sat and watched as this specialist hand wrote a History and Physical.
- ◆ I then sat and watched while a Chief Resident repeated the same exercise, independent of the data collected by the specialist.
- ◆ I then sat and watched while the Junior Resident and Nurse do the same thing.

SAFIR Records

- ◆ I then listened as each one of them collected slightly different and, at significant, but not critical points, incorrect data. I thought, "Wow, these are the best we've got and they're using 19th-Century methodologies, while practicing 21st-Century, 'cutting age,' technological medicine."
- ◆ This is inefficient, expensive and at times, it can be dangerous medicine.

Two Requirements

- ◆ Perhaps the first thing which has to happen is the acceptance of the fact that excellence of care requires standardization of care based on "best practices," "national standards of care," "guidelines," "treatment pathways, or what ever other phrase you wish to use to define quality of care.

Changing Behavior

- ◆ There is only ONE way, to my knowledge, to effectively standardize care and to eliminate variations and that is with a systems approach to healthcare...changing behavior.

Changing Behavior

- ◆ First, there is no effective way to change behavior other than with systems which challenge the provider to either "do it the right way," or to document why another way is better.
- ◆ Second, there is no effective way to make a change in behavior habitual without the ability to audit performance and to give "real time" feedback on standards and variances.

Changing Behavior

- ◆ Third, using my illustration, I suspect that we might not get this world-renowned specialist to document his data in an electronic format, but we can get him to review the patient's data which has already been electronically documented by others, and we can make that data available to each member of the healthcare team.

Changing Behavior

- ◆ Then, as the specialist sees the benefit of a common patient database, I believe he/she could be personally motivated to begin documenting electronically.

Changing Processes

- ◆ **First**, the goal must be correct.
- ◆ "Paperlessness" in a medical office is a by-product, not the end point for electronic patient management. It might be possible to eliminate all of the paper in an office without improving the process of healthcare delivery.
- ◆ The goal must be **ELECTRONIC PATIENT MANAGEMENT!**

Changing Processes

- ◆ **Second**, there are different audiences.
- ◆ The complexity of the "process issue" is that the process changes from venue to venue.
- ◆ The small medical office needs electronic patient management as much, if not more, than the large metropolitan integrated-delivery hospital network, but the issues are so different as to make a common discussion almost unintelligible.

Changing Processes

- ◆ **Third**, pictures are powerful motivators. In this case, it is pictures of those who are "doing it."
- ◆ A powerful illustration of this concept is the Nike corporation.

Changing Processes

- ◆ Nike Corporation achieved great success doing what they are very good at. But, there is one thing they have never done. They have never made a pair of shoes.
- ◆ They are good at design, marketing and distribution, but they are not good at manufacturing shoes.

Changing Processes

- ◆ Nike took its corporate name from the transliteration of the Greek word for "overcoming," which is *nike*.
- ◆ There are major obstacles to "overcoming" our inefficient, expensive and disconnected health care delivery. One way to "NIKE" this process is to model, celebrate, and publicize those who have "done it" and/or who are "doing it."

Changing Processes

- ◆ **Fourth**, to change the process is going to require a degree of honesty which is painful. In *The Fifth Discipline*, Peter Senge says the following about "truth telling..."

Changing Processes

- ◆ "We begin with a disarmingly simple yet profound strategy for dealing with structural conflict: **telling the truth...** (which) means a relentless willingness to root out the way we limit or deceive ourselves from seeing what is, and to continually challenge our theories of why things are the way they are..."

Changing Processes

- ◆ “...Telling the truth means continually broadening our awareness, just as the great athlete with extraordinary peripheral vision keeps trying to 'see more of the playing field.'... 'telling the truth' means continually deepening our understanding of the structures underlying current events.”

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January 27, 2011

**DESIGNING AN EMR GUIDED BY
THE FIFTH DISCIPLINE BY PETER
SENGE, PHD**

The Problem

- ◆ It is possible for healthcare providers to be overwhelmed by the volume of valuable information available for medical decision making.
- ◆ The organization and storage of that information is particularly ill suited for easy access and application in clinical settings.

The Solution

- ◆ Electronic health records have the potential for making current and future information available for use in improving the quality of treatment outcomes.

Systems Thinking

- ◆ In his book, *The Fifth Discipline*, Dr. Peter Senge identifies “systems thinking” as the solution to the management of complex data issues in business.
- ◆ While the term does not refer to computer systems, the principles apply to health care delivery via an electronic format as legitimately as to other business enterprises.

Systems Thinking

- ◆ Senge states:
 - ◆ “Learning has come to be synonymous with ‘taking in information.’...Yet, taking in information is only distantly related to real learning.”

Systems Thinking

- ◆ Classically, healthcare has focused upon “taking in information” in the form of facts.
- ◆ The hurdle required to enter medicine as a physician is the proven ability to absorb and retain tens of thousands of isolated pieces of information and then to be able to repeat that information in a test format.

Systems Thinking

- ◆ Clinical training attempts to take the static database created by these facts and transform it into a dynamic tool which can provide answers to complex disease-process questions.
- ◆ This is where the complexity comes into healthcare: *How do you take a linear database and transform it into a circular, global, decision-making tool?*

Systems Thinking

- ◆ Senge also identified the problem with which healthcare is faced today. He stated: “System thinking is needed more than ever because for the first time in history, humankind has the capacity:
 - ◆ To create far more information than anyone can absorb,
 - ◆ To foster far greater interdependency than anyone can manage
 - ◆ To accelerate change far faster than anyone’s ability to keep pace.”

Undermining Confidence

- ◆ Senge concludes, “Complexity can easily undermine confidence and responsibility.”
- ◆ Confidence is undermined when the vastness of available, valuable and applicable information is such that it appears futile to the individual to try and “keep up.”

Undermining Confidence

- ◆ In healthcare, once confidence is undermined, responsibility is surrendered as providers tacitly ignore best practices, substituting experience as a decision-making guide.
- ◆ While experience is not without merit in medical decision making, it is not the best guide.

Undermining Confidence

- ◆ Any sense of healthcare provider helplessness has a solution, but it is not based on attempting to take in more and more information.
- ◆ Senge states, "Systems thinking is the antidote to this sense of helplessness that many feel as we enter the 'age of interdependence.'"

Undermining Confidence

- ◆ The solution is not only to “see” the interrelatedness of disease-processes, one disease aggravating or precipitating another, but also to see the dynamic interaction between the treatments of two or more simultaneously occurring pathological processes.
- ◆ The solution also allows the healthcare provider to “see” how the treatment of one disease processes is required in order to augment and/or to facilitate the treatment of another.

Medical Knowledge Overload

- ◆ No intellectual discipline is more illustrative of Senge's principle of undermining confidence /responsibility than is the knowledge base required to perform excellently in the delivery of healthcare.
- ◆ Depending upon how you count, there are between 4,000 and 7,000 medically-related journals presently being published. There are over 1,000 medically-related journal articles published each day.

Medical Knowledge Overload

- ◆ In 2004, the *Journal of the Medical Library Association* published an article entitled, “How Much Effort is needed to keep up with the literature relevant to primary care?” Here are the authors’ conclusions:
 - ◆ There are 341 currently active journals which are relevant to primary care.
 - ◆ These journals publish approximately 7,287 articles monthly.

Medical Knowledge Overload

- ◆ It would take physicians trained in epidemiology an estimated 627.5 hours per month to read and evaluate these articles. That translates into 21 hours a day, seven days a week, every month.

Medical Knowledge Overload

- ◆ In 1997, *The British Medical Journal* stated that there are over 10,000,000 medically-related articles on library shelves of which about $1/3^{\text{rd}}$ are indexed in the Medline database compiled by the National Library of Medicine. If a healthcare provider receives only an average of 8 journals, including those which are free, it can be seen how overwhelming the problem of information is.

Medical Knowledge Overload

- ◆ This is the level of the problem for individual physicians, but what about collaborative efforts to organize medical data?
- ◆ The Cochrane Collaboration was started in 1992 following Dr. Archie Cochrane's 1979 statement in which he opined
 - ◆ "It is surely a great criticism of our profession that we have not organized a critical summary, by specialty or subspecialty, adapted periodically, of all relevant randomized controlled trials."

Medical Knowledge Overload

- ◆ There are now fifteen Cochrane Centers around the world with 1,098 complete reviews and 866 protocols (reviews in progress).
- ◆ It is estimated that it will take 30 years to complete reviews on random-controlled studies (RCTs) in all fields of medicine which presently exist. At the end of those 30 years, nothing would have been done on the RCTs which will have been completed in the intervening 30 years.

Medical Knowledge Overload

- ◆ Without medical knowledge, quality-of-care initiatives will falter, but the volume of medical knowledge is so vast that it can overwhelm healthcare providers.
- ◆ Stated a different way, the good news about healthcare today is the state of our current knowledge; it is excellent. The bad news is the form in which that knowledge is stored and/or accessed. The solution is “a shift of mind.”

Metanoia - A Shift of Mind

- ◆ To sustain the learning process created by this “shift of mind” healthcare providers need tools which facilitate change rather than processes which support the status quo.

Patterns of Change Rather Than Static Snapshots

- ◆ In summarizing systems thinking, Senge almost seems to have healthcare in mind.
- ◆ He describes systems thinking as, “A discipline of seeing wholes...a framework for seeing interrelationships rather than things and patterns of change rather than static ‘snapshots.’”

Patterns of Change Rather Than Static Snapshots

- ◆ Historically, medical records have been snapshots of a patient's condition without any connection between the past and the future. EHR has changed that, or at least EMR has the potential of making that changing.
- ◆ With the cumulative data capacity of EHR, which provides a longitudinal portrait of the patient, patterns of change can be viewed seasonally and progressively.

Patterns of Change Rather Than Static Snapshots

- ◆ The application of these concepts to medicine provides an elegant framework with which to study the design of the tools used to effect change in behavior of patients and physicians, and to shift the focus from information and experience to evidenced-based outcomes and data analysis over time.
- ◆ The shift of mind requires that the patient be seen as a whole.

Patterns of Change Rather Than Static Snapshots

- ◆ If the patient's surgery is a success, it makes no difference if the patient dies; it makes no difference if the patient's kidneys are in great condition but the patient dies of a heart attack.

Patterns of Change Rather Than Static Snapshots

- ◆ Health initiatives must be global for the preservation of the life and well-being of the person. The “interrelations” of disease processes and disease causation and the patterns of change required to regain or retain health are pivotal concepts in healthcare.

Designing The Tools

- ◆ The final systems-thinking concept which will help design an EHR which will facilitate active learning, avoid learning disabilities and result in dynamic data management and which will change physician and patient behavior is the concept of “complexity.”

Designing The Tools

- ◆ Remember, *The Fifth Discipline* was written to effect change in corporations and business, but the principles apply eloquently to healthcare delivery and even to the behavior of biological systems.

Designing The Tools

- ◆ Systems thinking requires the analysis of complex problems. Most analysis focuses upon multiple variables and a plethora of data. This is “detail complexity.” However, the greatest opportunity for effecting change in an organization or an organism is in what Senge calls “dynamic complexity.”

Designing The Tools

- ◆ “Dynamic Complexity” occurs when “cause and effect are subtle, and where the effects over time of interventions are not obvious.”
- ◆ The applications to medical research design are intriguing but beyond this discussion, but whether in corporations or medicine, “the real leverage in most management situations lies in understanding dynamic complexity.”

Designing The Tools

- ◆ To design a healthcare delivery tool which facilitates excellence will require a system which approaches healthcare from this vantage point.

Designing The Tools

- ◆ Display of data can obscure effective management if all it does is present more detail while ignoring, or further obscuring, the dynamic interaction of one part of a biological system with another.
- ◆ The circle describes a biological system much more effectively than a straight line. Yet, most medical data is displayed in a linear fashion. The difference is critical.

Seeing Circles of Causality

- ◆ “Reality is made up of circles, but we see straight lines...Western languages...are biased toward a linear view. If we want to see system-wide interrelationships, we need a language of interrelationships, a language of circles.”

(The Fifth Disciple)

Seeing Circles of Causality

- ◆ It is here that we see the application of *The Fifth Discipline* to medical information technology most clearly. The following concepts derive from Senge's systems principles:
 1. Healthcare delivery is **not improved** simply by the providing of more information to the healthcare provider at the point of care.

Seeing Circles of Causality

2. Healthcare delivery is improved when the organization of that information is such that there is a dynamic interaction between the provider, the patient, the consultant and all other members of the healthcare equation, as well as the simultaneous integration of that data across disease processes and across provider perspectives, i.e., specialties.

Seeing Circles of Causality

3. Healthcare delivery is **not necessarily improved** when an algorithm for every disease process is produced and made available on a handheld, pocket-computer device but it is improved when the data and decision-making tools are structured and displayed in a fashion which dynamically change as the patient's situation and need change.

Seeing Circles of Causality

4. Healthcare delivery **also improves** when data and information processed in one clinical setting is simultaneously available in all settings. This improvement does not only result from efficiency but from the impact the elements contained in that data set exert upon multiple aspects of a patient's health. In this way, the data reflects the dynamic within the system under analysis, which in the case of healthcare is a living organism which is constantly changing.

Seeing Circles of Causality

5. Healthcare is **improved** when there is simultaneous evaluation of the quality of care as measured by evidenced based criteria is automatically determined at the point of and at the time of care. Healthcare is improved when the data display makes it simple for the provider to comply with the standards of care, if the evaluation demonstrates a failure to do so.

Seeing Circles of Causality

6. Healthcare is also improved when data can be displayed longitudinally, demonstrating to the patient over time how their efforts have affected their global well-being. This is circular rather than linear thinking. A person begins at health. Aging and habits result in the relative lack of health. Preventive care and positive steps preserve, or restore health.

Seeing Circles of Causality

7. Healthcare improvement via systems **will require** dynamic auditing tools which give the provider and the patient immediate feedback on the effectiveness of the care being provided and received.

Seeing Circles of Causality

If then, excellent healthcare requires healthcare Organizations to:

- ♦ be “learning organizations”
- ♦ avoid “learning disabilities”
- ♦ think in a circular rather than a linear fashion
- ♦ look at dynamic complexity rather than detail complexity

How would data need to be displayed to support these functions?

Seeing Circles of Causality

- ◆ If health science has the capacity:
 - ◆ To create far more information than anyone can absorb,
 - ◆ To foster far greater interdependency than anyone can manage
 - ◆ To accelerate change far faster than anyone's ability to keep pace.

Seeing Circles of Causality

- ◆ How can electronic patient records and/or electronic patient management help solve these problems and make it possible for healthcare providers to remain current and fulfill their responsibility of caring for patients with the best treatments available?

Data Display

- ◆ First, the data organization must see the patient:
 - ◆ As a whole rather than as a summary of many different parts; this requires a circular perspective of a patient's life.
 - ◆ As a living organism rather than as a disease process; this requires a circular perspective of a patient's life.

Data Display

- ◆ Second, the data organization and management must:
 - ◆ Encourage and provoke change in patient behavior.
 - ◆ Encourage and provoke change in provider behavior.
 - ◆ Provide feedback to the provider at the point and time of service whereby the excellence of care can be measured.

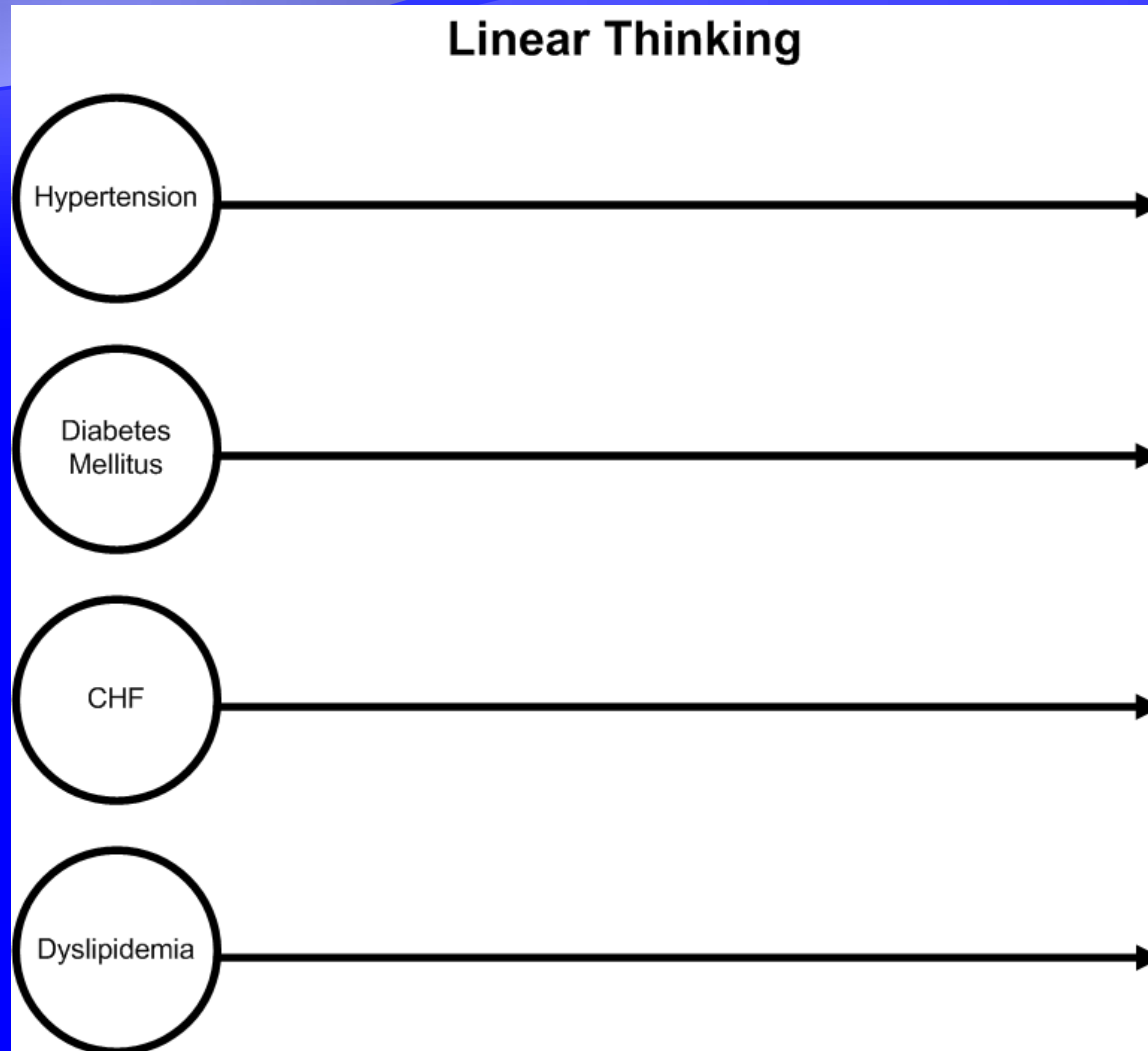
Data Display

- ◆ Third, the data manipulation must have:
 - ◆ Multiple points of entry.
 - ◆ Easy and dynamic interaction between the various elements of the database.
 - ◆ Automatic summarizing of the patient's care as measured against evidenced-based criteria.

Linear Thinking

- ◆ Thinking linearly, a healthcare provider would begin with a disease or problem and focus exclusively on that problem until it was resolved and then go to another problem.
- ◆ Each problem would be dealt with in isolation and without interaction between the two.
- ◆ In biological systems, as in business, nothing occurs in isolation.

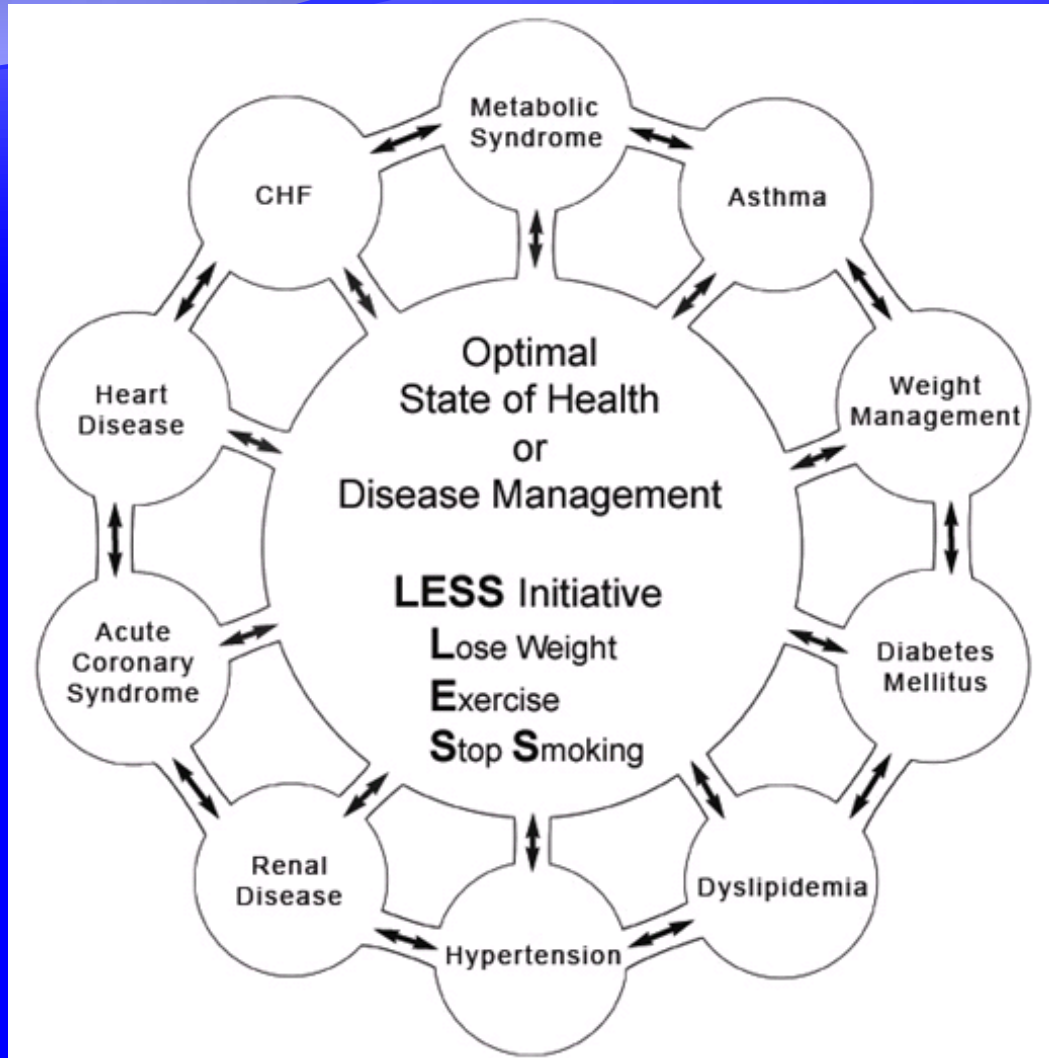
Linear Thinking



Circular Causality

- ◆ On the other hand, reality in a biological system can only be effectively approached from a circular- causality platform which is designed to encourage and facilitate the dealing with complex, interrelated problem solving for maximal effectiveness.

Circular Causality



EHR Design Principles

SETMA's development EHR design principles are:

1. Pursue Electronic Patient Management rather than Electronic Patient Records
2. Bring to bear upon every patient encounter what is known rather than what a particular provider knows.
3. Make it easier to do it right than not to do it at all.

EHR Design Principles

4. Continually challenge providers to improve their performance.
5. Infuse new knowledge and decision-making tools throughout an organization instantly.
6. Establish and promote continuity of care with patient education, information and plans of care.

EHR Design Principles

7. Enlist patients as partners and collaborators in their own health improvement.
8. Evaluate the care of patients and populations of patients longitudinally.
9. Audit provider performance based on the Consortium for Physician Performance Improvement Data Sets and other quality metric measurement sets.

EHR Design Principles

10. Create multiple disease-management tools which are integrated in an intuitive and interchangeable fashion giving patients the benefit of expert knowledge about specific conditions while they get the benefit of a global approach to their total health.