Reshaping the System of Survival for SCA

Friday June 13, 2008  
5:15 pm  
Bally’s Room Platinum/Gold/Silver
Reshaping the System of Survival for SCA

Presentation by

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Frank Poliafico, RN
1. Background and History
   - Our Questions
2. How We Think … About Sudden Cardiac Emergencies
3. Another Way to Think
4. Next Steps
1. Background and History

Special Task Force
Benjamin Abella, Allan Braslow, Robert Brennan, Raina Merchant, Vinay M. Nadkarni, Frank Poliafico, John Pourdehnad, and Larry M. Starr
1. Background and History
University of Pennsylvania

- Problem solving and decision making (emergency-related)
- Systems planning, research, design, and change
- Large, complex organizational problems
Our Questions

We Are Very Concerned

Why after 40 years of enormous energy and resources is the Sudden Cardiac Arrest (SCA) survival rate low, very low — too low? Are we doing the “right” things?
I am Stepping Out-of-the-Box: It May Cause Discomfort

And while you’re thinking outside the box, have the box cleaned out by the end of the day. You’re fired.
My Approach

I will be discussing **Sudden Cardiac Arrest** as a problem of management and organization science.
People Think in Models and Metaphors
Thinking Models/Metaphors: There’s a Lot of Politics Where I Work
Thinking Models/Metaphors:
I Feel Like I’m in a Game of Dodge Ball
Common Models/Metaphors: Mechanical and Biological

We use “analysis” which means we believe “the whole is equal to the sum of the parts.”
Whole = Sum of the Parts

If there is a problem with the whole, we search for the cause in the parts which when added together create the whole.
Analysis: Think in Steps

► Define a problem then reduce it into small parts

► Repair, replace, improve or “optimize” one or more parts

► Reassemble the parts and expect the whole problem to be solved
Analysis: Small Parts
Example 1. Mechanical

If there is a mechanical problem:
Focus on Parts
Example 2. Biological Problem

If there is a biological problem: Focus on parts

CORPUS CALLOSUM
The bridge joining the two halves of the brain, called the corpus callosum, is larger in Marge than in Homer. Marge can integrate information from the two halves of her brain, meaning that she can simultaneously make Homer’s lunch, listen to Lisa’s saxophone playing and insist that Bart doesn’t burn anything, while Homer has trouble combining singing and driving without crashing into a chestnut tree.

HEART AND CIRCULATORY SYSTEM
While Marge is young, Bart’s Shih Tzu is less likely to give her high blood pressure than Homer’s. Her higher levels of estrogen prevent cholesterol deposits from forming on artery walls. But the time Lisa graduates from Yale, however, Marge’s risk for heart disease will begin to match his.

LYMPHATIC SYSTEM
If Marge gets a cold, her immune system will respond more forcefully than Homer’s immune system. But she is also more likely to suffer from diseases like rheumatoid arthritis and lupus erythematosus, linked to a highly active immune system that malfunctions.

LIVER
Homer metabolizes beer faster and more efficiently than Marge does, so he is less likely to get a hangover. But that immunity may partly explain why more men are alcoholics.

STOMACH
No one can dispute that Homer is the gourmand of the Simpsons. He is unable to resist pork chops, chocolate and Vaseline. But in the unlikely event that he decided to lose weight, he could diet. For Marge, however, losing weight would require not only giving up Jell-O desserts, but exercising.

SKELETAL SYSTEM
Homer’s body will always produce testosterone, but estrogen production virtually halts when a woman goes through menopause. Because these hormones rejuvenile bones, this means that while Homer will always survive cliff falls on Bart’s skateboard unscathed, Marge’s bones could become more brittle.
Example 3. CPR Problem: Focus on Parts

CPR Training Devices

CPR Performance
Example 3. CPR Training Device Problem: Focus on Parts
Example 4: **CPR Performance**

Problem: Focus on Parts

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**AHA Science Advisory**

**Hands-Only (Compression-Only) Cardiopulmonary Resuscitation: A Call to Action for Bystander Response to Adults Who Experience Out-of-Hospital Sudden Cardiac Arrest**

A Science Advisory for the Public From the American Heart Association Emergency Cardiovascular Care Committee

Michael R. Sayre, MD; Robert A. Berg, MD, FAHA; Diana M. Cave, RN, MSN; Richard L. Page, MD, FAHA; Jerald Potts, PhD, FAHA; Roger D. White, MD
Example 5: SCA Survival Problem: Focus on Parts
Why after 40 years of enormous energy and resources is the Sudden Cardiac Arrest (SCA) survival rate low, very low —too low?

Are we doing the “right” things?

Consider the following:
Example 6: Car Crash Problem

In the 1970s there were many head-on car crashes resulting in injuries and deaths on the George Washington Bridge (NY-NJ)
George Washington Bridge
Head-on Car Crash Problem: Reduce into Parts

Port Authority

Columbia-Presbyterian Medical Center

Police and EMS
Port Authority

Focused on the road markings so they regularly repainted the solid yellow lines. They measured their effectiveness by the degree of visibility of the lines by the drivers.

But, there was little overall improvement.
Focused on driving behavior so they attentively issued fines to drivers who crossed the solid yellow lines or drove over the speed limit. They measured their effectiveness by the number of fines levied.

But, there was little overall improvement.
Focused on responding to emergencies so they kept themselves and their resources up to date. They measured their effectiveness by response time to the scene, quality of care, and response time to the medical center. **But, there was little overall improvement.**
Columbia-Presbyterian Medical Center

Focused on advanced medical care so they improved emergency facilities and treatment. They measured their effectiveness by quality of care feedback and survival rate. But, there was little overall improvement.
3. Until...A Different Model Was Applied
3. Thinking Models/Metaphors: Social Systems

Think Systemically
Social System Thinking Model

The performance of the whole is **NOT** the sum of the performances of its parts.
Social System Thinking

In a system problem the performance of the whole is derived from the interactions of the parts. A system problem cannot be solved by focusing on independent parts.
Parts are Inter-Connected
Social System Thinking Model

The parts do **NOT** always perform in ways that are expected.
Social System Thinking

In a social system the “parts” include

► people and groups

► who are purposeful, have their own interests, intentions, and generate their own goals

Goals are not always shared
Social System Thinking

Different methods are required to diagnose, describe, and understand a systemic problem
Head-on Car Crash Problem: 
System Diagnosis

When these methods were applied a different question emerged:

On the George Washington Bridge, under what conditions would a head-on collision be impossible?
Head-on Car Crash Problem: 
System Diagnosis

And THIS produced a 
Systemic Solution:

Replace the solid yellow painted lines with a solid concrete barrier
George Washington Bridge

3. Systemic Thinking is Not New

“Systemic thinking has permeated virtually every functional area of business, and is taught, in one form or another, at most of the top-ranked schools.”

Are We Doing the “Right” Things?

We propose approaching the problem of SCA low survival rate from a systemic perspective.
4. Next Steps

Step 1. System Diagnosis (Full Systems Understanding)

Step 2. System Change (Design Science)
Global Problem
Pilot Project in US
System Diagnosis Will Answer

How and why does the SCA survival system including *all stakeholders* *engaging in all interactions* currently operate as it does?
System Diagnosis Will Answer

What are the systemic obstructions, conflicts, and barriers to SCA survival? How, why, and where do they occur?
System Diagnosis Will Answer

What systemic characteristics improve SCA survival?

How, why and where do they occur?
Step 2. **System Change:**
**Design Science**

Most successful system changes rely heavily on the participation of persons who are likely to be involved with or are current users of whatever is changed.

Design is with and by the users.
System Change: Example

System Change: Example

Using a Design Approach to Change the National Health Service in England

“This article is about a very large public sector organization – or rather system – that is said to be undertaking the most ambitious, comprehensive and intentionally funded national initiative to improve healthcare quality in the world… the transformation of the English National Health Service (NHS).”
System Change: Example

Using a Design Approach to Change the National Health Service in England

“Design Science (was selected because it) is about the broader creative approach to defining the problem itself then developing a process to solve it...At a practical level, design offers a range of proven tools and techniques for transformation that connect organizations with their users, encourages collective participation and reveals insights in a variety of contexts.”
What Can YOU Do?
Community Dialogue

“Reshaping the System of Survival for Sudden Cardiac Arrest”
Website
and
Community Message Board
Reshaping the System of Survival for Sudden Cardiac Arrest

Special Task Force
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ECCU 2008
Invitation: Link to Invitation
Slides: Link to slides

Message Board
Post your questions, comments, observations here

Academic Resources
- Penn Organizational Dynamics Graduate Studies
- Penn Center for Resuscitation Science
- Children's Hospital of Philadelphia Center for Simulation, Advanced Education and Innovation
Message Board
http://forum2.aimoo.com/RSSforSCA
To Discuss Funding and Governance

Project Funding
Allan Braslow, Vinay M. Nadkarni, Frank Poliafico, and Larry M. Starr

Project Coordination
John Pourdehnad and Russell Ackoff
Panel Discussion

Sign Me Up
SCA Survival as a Non-Linear Model

Figure 5. System of Survival From SCA