Reshaping the System of Survival for SCA

Friday June 13, 2008

5:15 pm

Bally's Room Platinum/Gold/Silver

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Reshaping the System of Survival for SCA

Presentation by

Larry M. Starr, Ph.D.

Allan Braslow, PhD

Vinay Nadkarni, MD

Frank Poliafico, RN

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Agenda

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

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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

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1. Background and History
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- 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?

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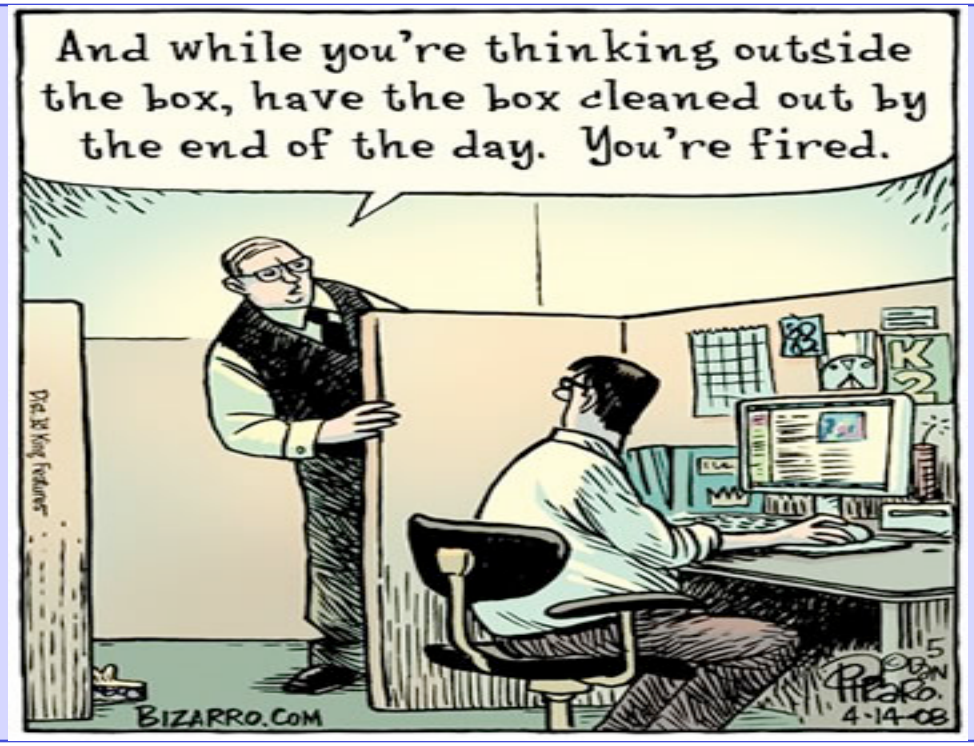
I am Stepping Out-of-the-Box: It May Cause Discomfort



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My Approach

I will be discussing

Sudden Cardiac Arrest

as a problem of

management and

organization science

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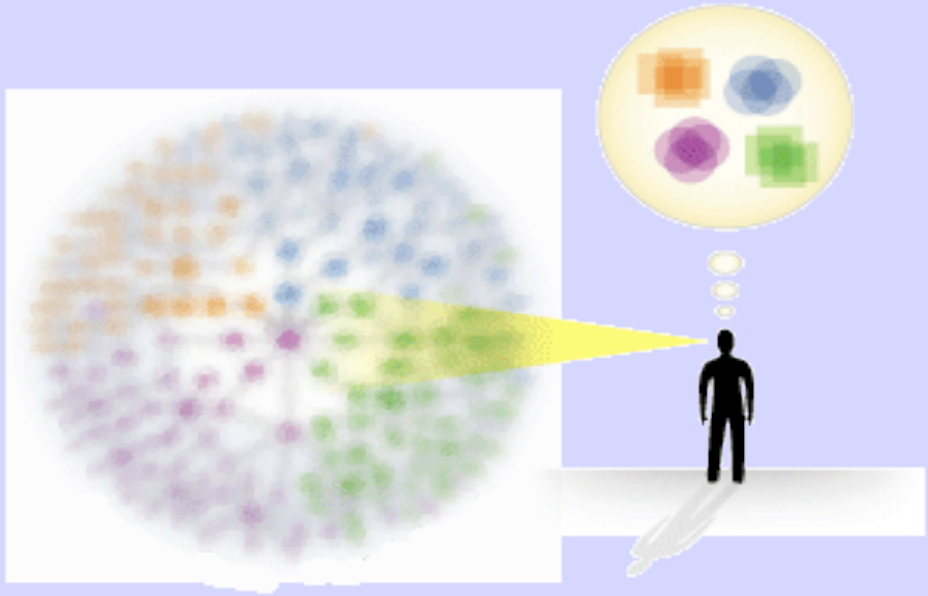
People Think in Models and Metaphors



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Thinking Models/Metaphors:
There's a Lot of Politics Where I Work

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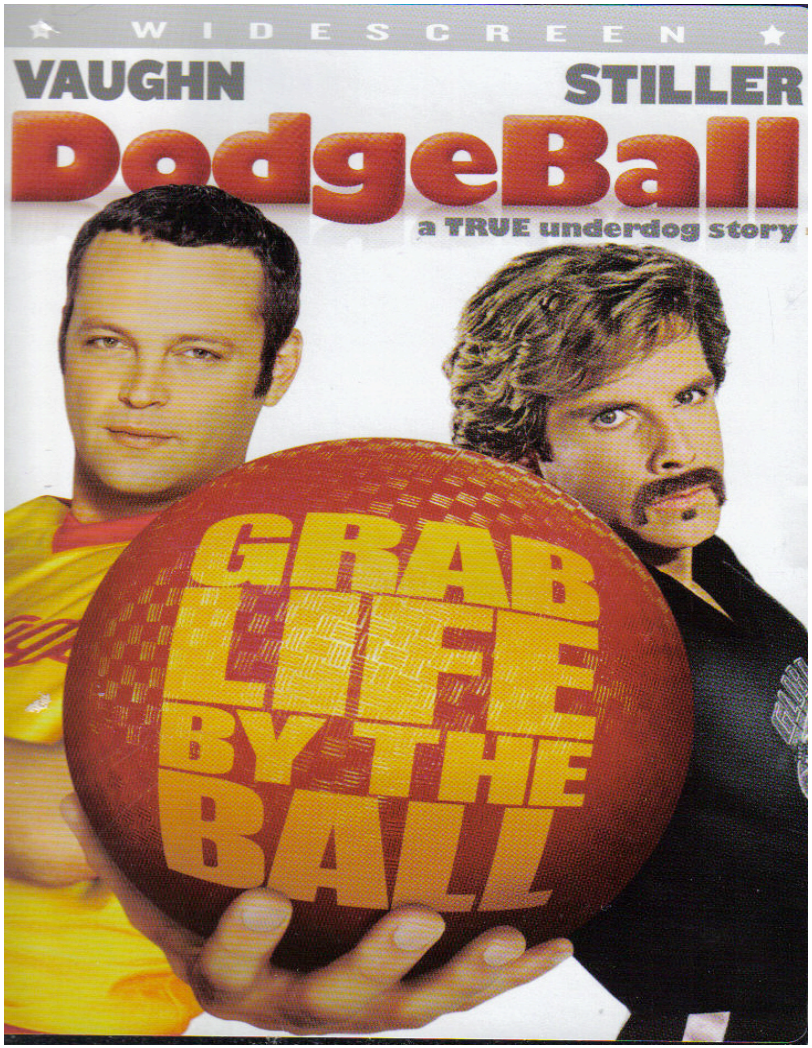
Thinking Models/Metaphors:
I Feel Like I'm in a Game of Dodge Ball



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Common Models/Metaphors:
Mechanical and Biological

We use

"analysis"

which means we believe

"the whole is equal to the sum of the parts."

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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.

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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

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Analysis: Small Parts

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Example 1. Mechanical

If there is a *mechanical* problem:

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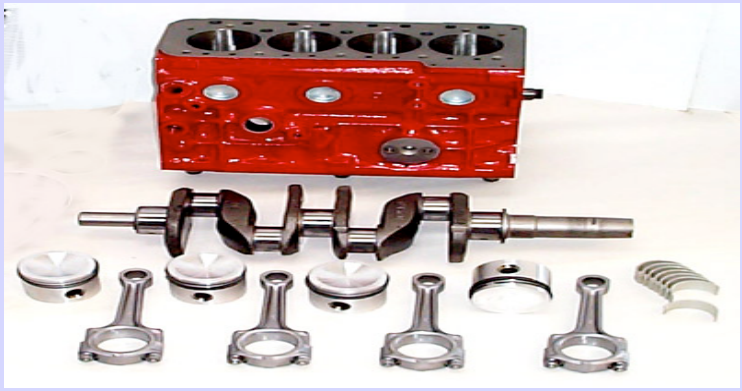
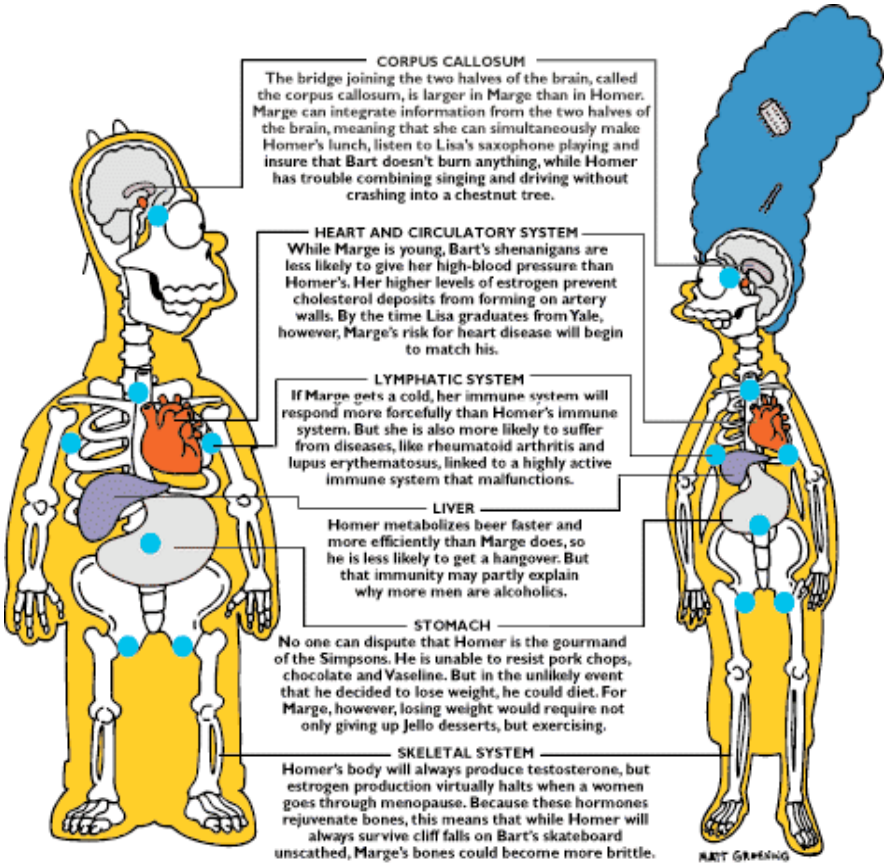
Focus on Parts



Example 2. Biological Problem

If there is a *biological* problem:

Focus on parts



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

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

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Example 5: *SCA Survival* Problem: Focus on Parts

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Back to the Questions

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:

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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)

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George Washington Bridge

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Head-on Car Crash Problem: Reduce into Parts

Port Authority

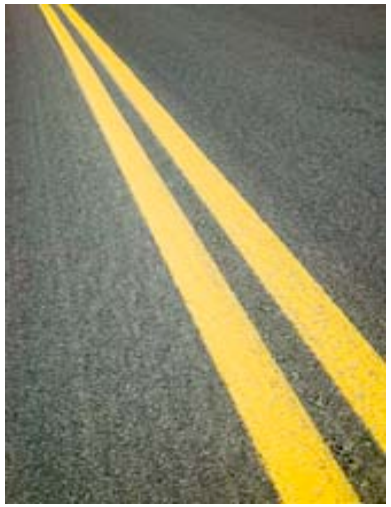
Columbia-Presbyterian Medical Center

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.



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Police

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.

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EMS

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.

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Columbia-Presbyterian Medical Center

Focused on advanced medical care so they improved emergency facilities and treatment. They measured their effectiveness by quality of care feed-back and survival rate.

But, there was little overall improvement.

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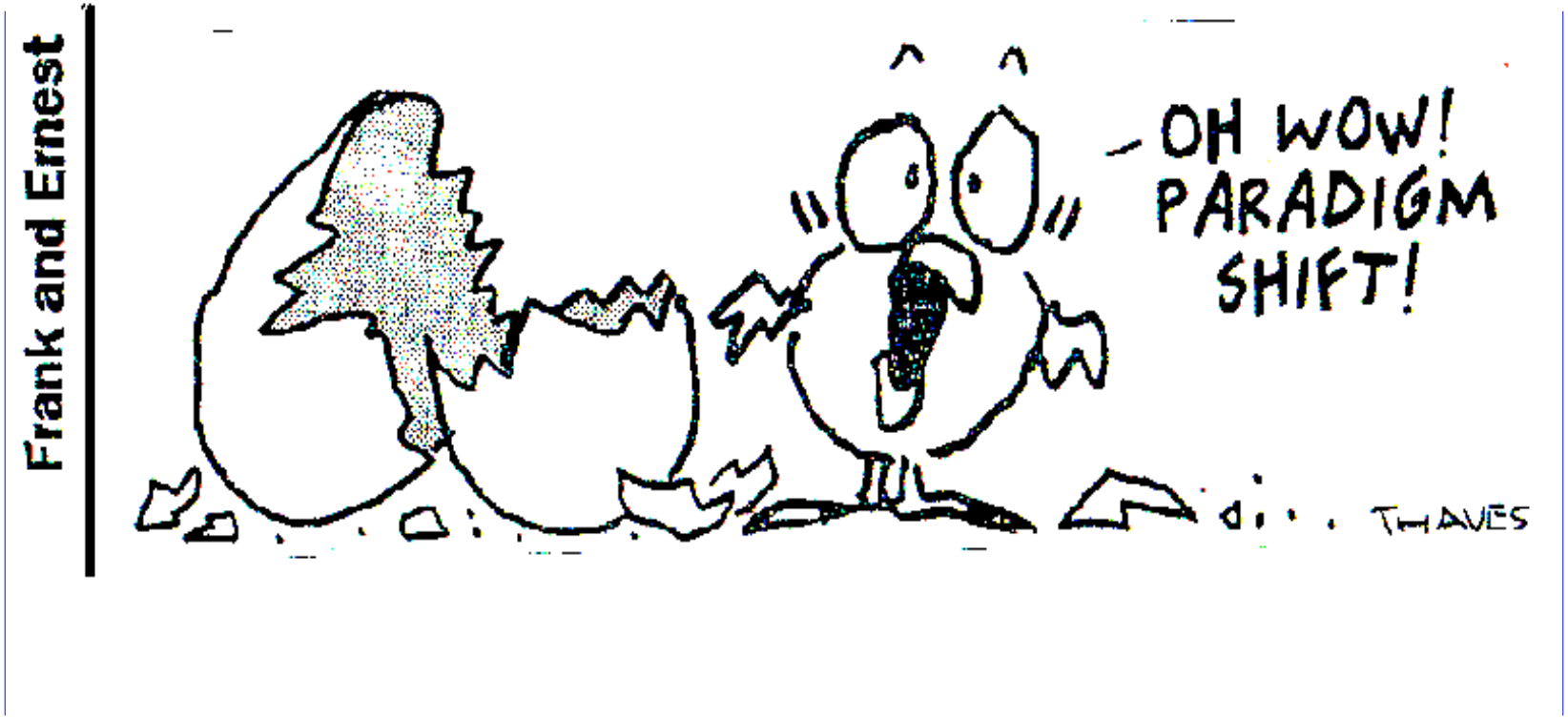
3. Until…A Different Model Was Applied



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3. Thinking Models/Metaphors:
Social Systems

Think Systemically

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Social System Thinking Model

The performance of the whole is NOT the sum of the performances of its parts.

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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.

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Parts are Inter-Connected

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Social System Thinking Model

The parts do NOT always perform in ways that are expected.

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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

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Social System Thinking

Different methods are required to diagnose, describe, and understand a systemic problem

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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?

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Head-on Car Crash Problem:
System Diagnosis

And THIS produced a
Systemic Solution:

Replace the solid yellow painted lines with a solid concrete barrier

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George Washington Bridge

Gambino, Raymond. Beyond Quality Control. Lab Report, 1990, Vol. 12, No. 5.

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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."

Atwater, JB, Kannan, VR, & Stephens, AA. Cultivating Systemic Thinking in the Next Generation of Business Leaders. Academy of Management Learning & Education, 2008, Vol. 7, No. 1, 9-25.

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Are We Doing the "Right" Things?

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

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4. Next Steps

Step 1. System Diagnosis
(Full Systems Understanding)

Step 2. System Change
(Design Science)

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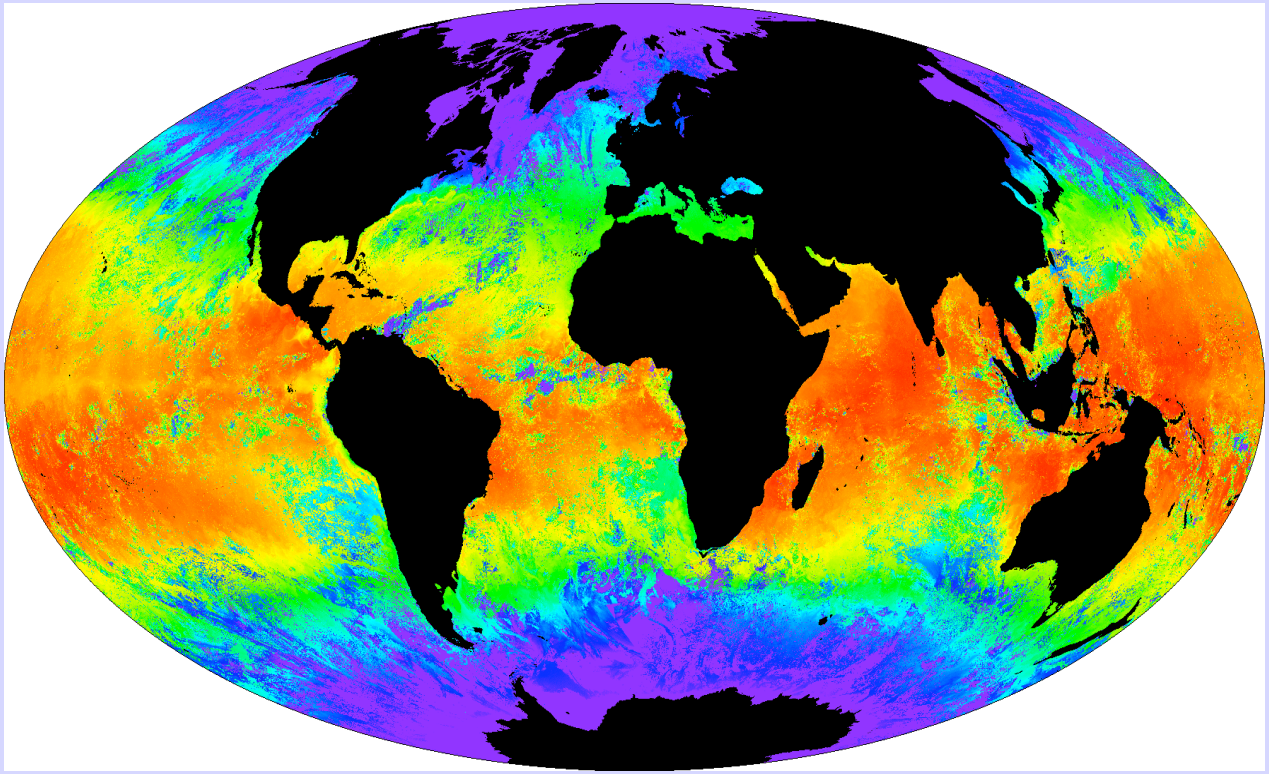
Global Problem



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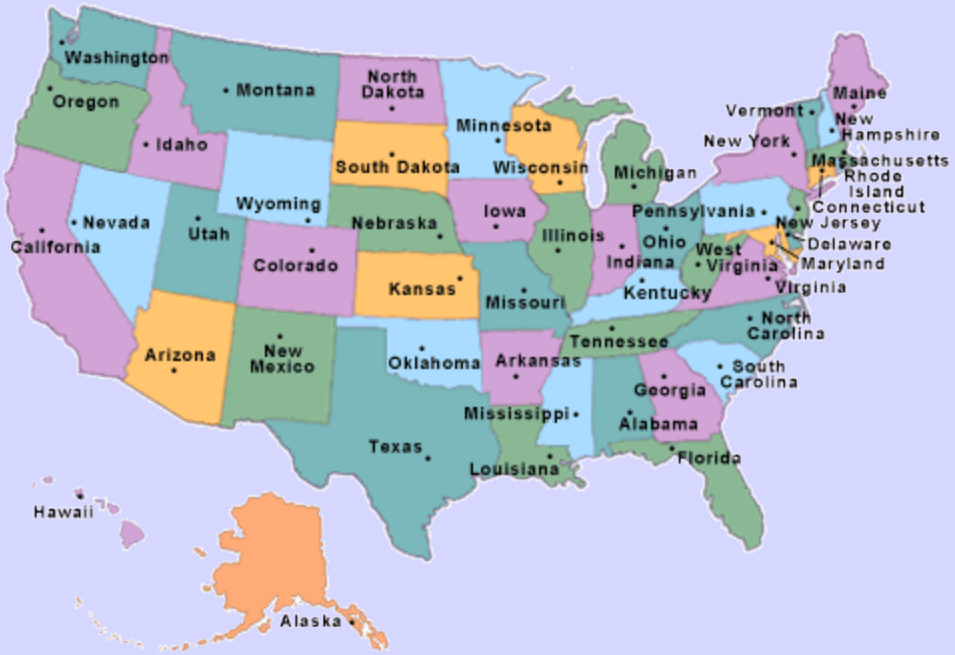
Pilot Project in US



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System Diagnosis Will Answer

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

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System Diagnosis Will Answer

What are the systemic obstructions, conflicts, and barriers to SCA survival?

How, why, and where do they occur?

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System Diagnosis Will Answer

What systemic characteristics improve SCA survival?

How, why and where do they occur?

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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.

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System Change: Example

Bevan, H., Glenn, R., Bate, P. Maher, L., & Wells, J. Using a Design Approach to Assist Large-Scale Organizational Change: "10 High Impact Changes" to Improve the National Health Service in England, 2007, The Journal of Applied Behavioral Science, Vol. 43, No. 1, pp. 135-152.

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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)."

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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."

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What Can YOU Do?
Community Dialogue

"Reshaping the System of Survival for Sudden Cardiac Arrest"

Website

and

Community Message Board

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http://www.sas.upenn.edu/scasurvival

Organizational Dynamics

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The ART and SCIENCE of the ORGANIZATION

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Special Task Force

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- Frank Poliafico
- John Pourdehnad
- Larry M. Starr

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

Programs for Working Professionals at Penn
SAS: School of Arts and Sciences
University of Pennsylvania

Penn Arts & Sciences

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Campus Map • MapQuest

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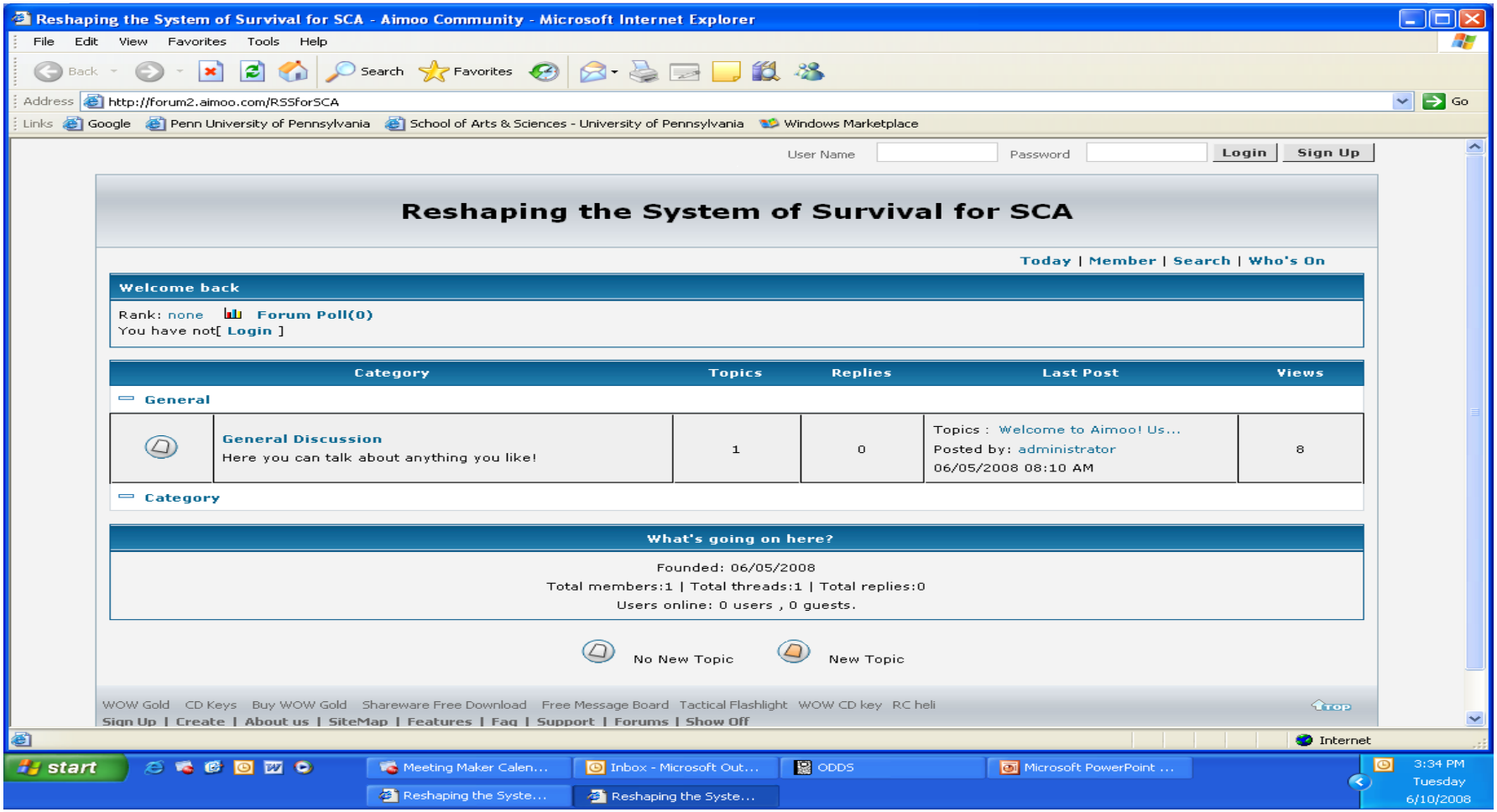
F: 215-898-8934

dynamics@sas.upenn.edu

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

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Panel Discussion

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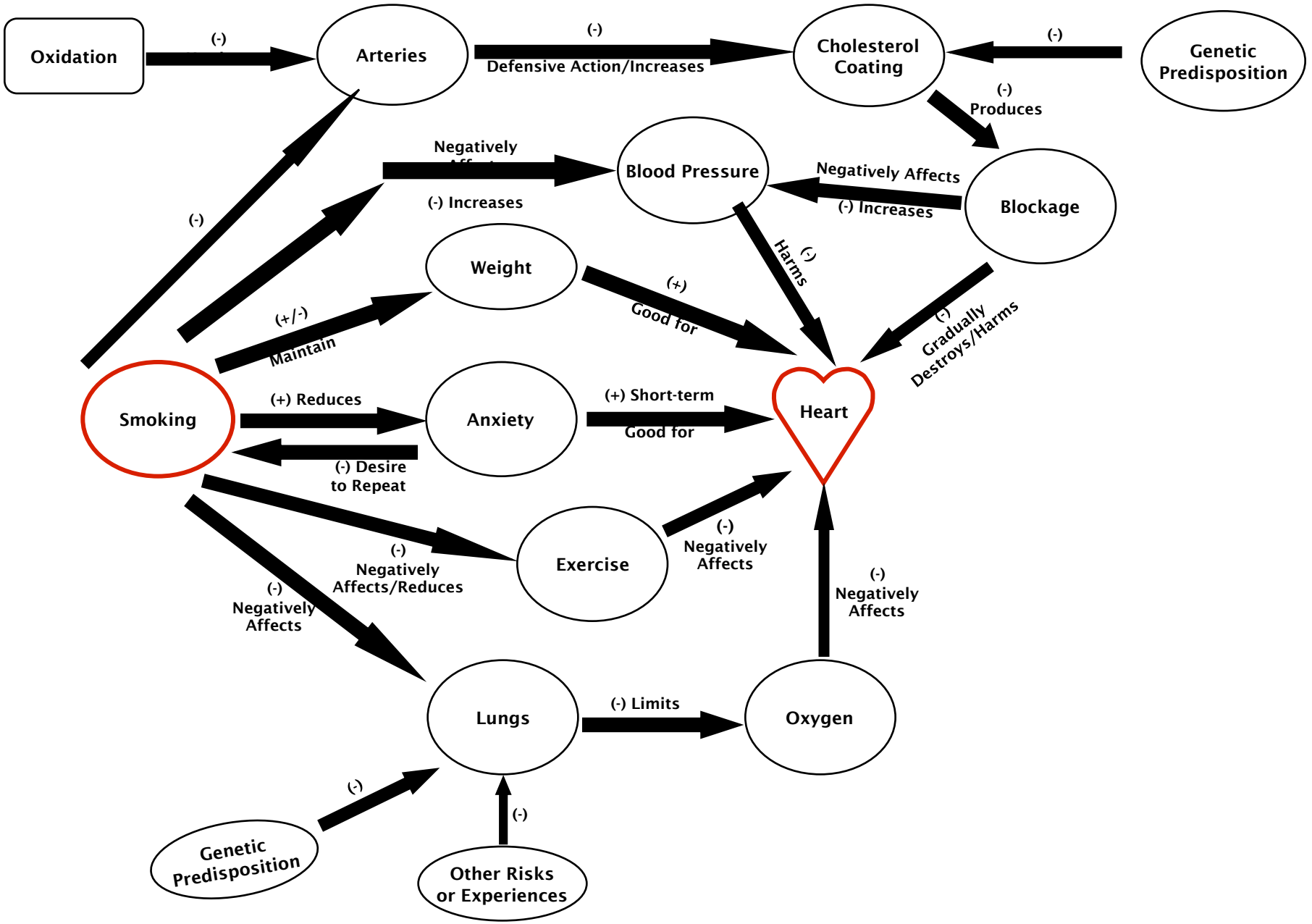
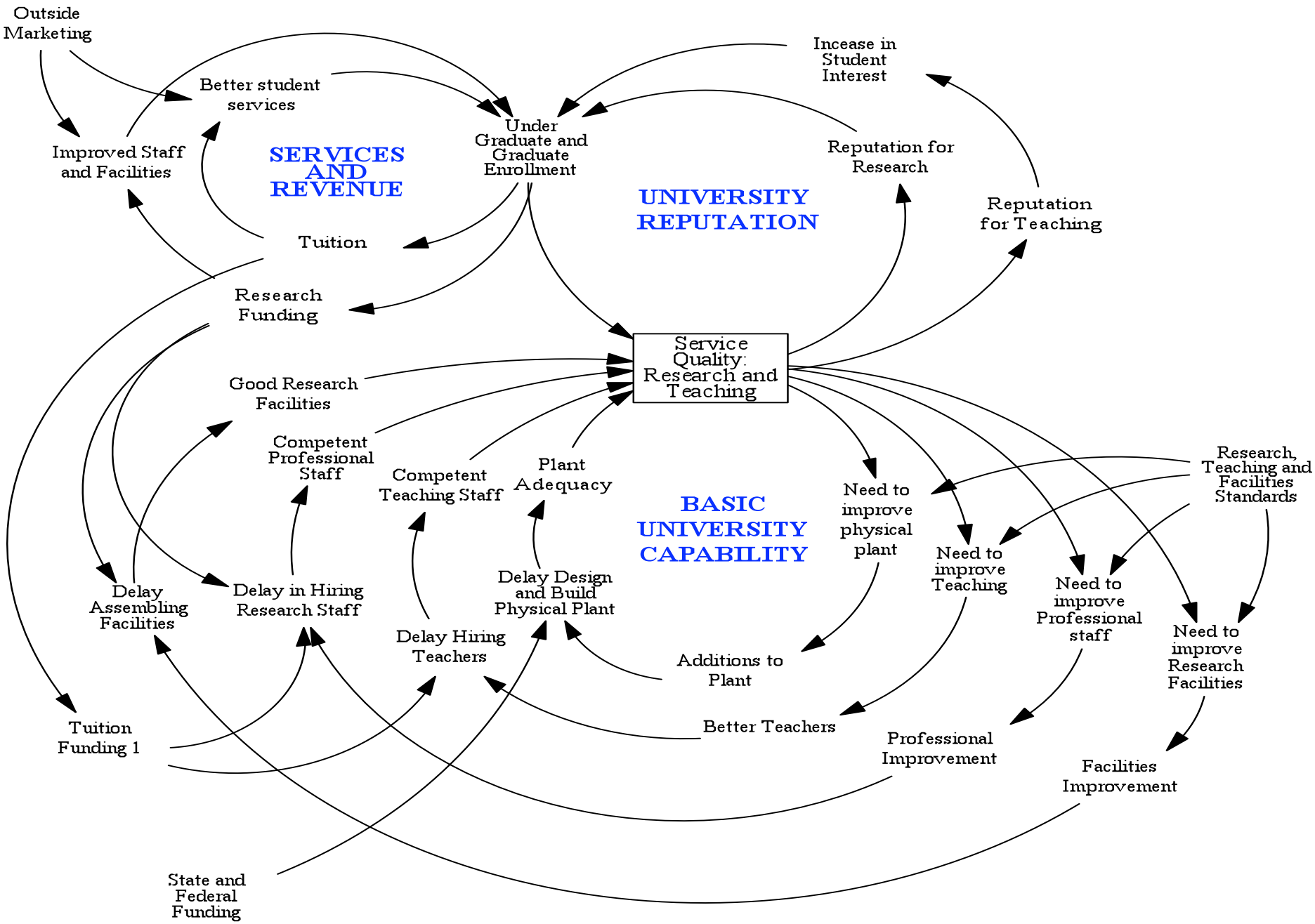
Systemic Relationship Between Smoking and the Heart

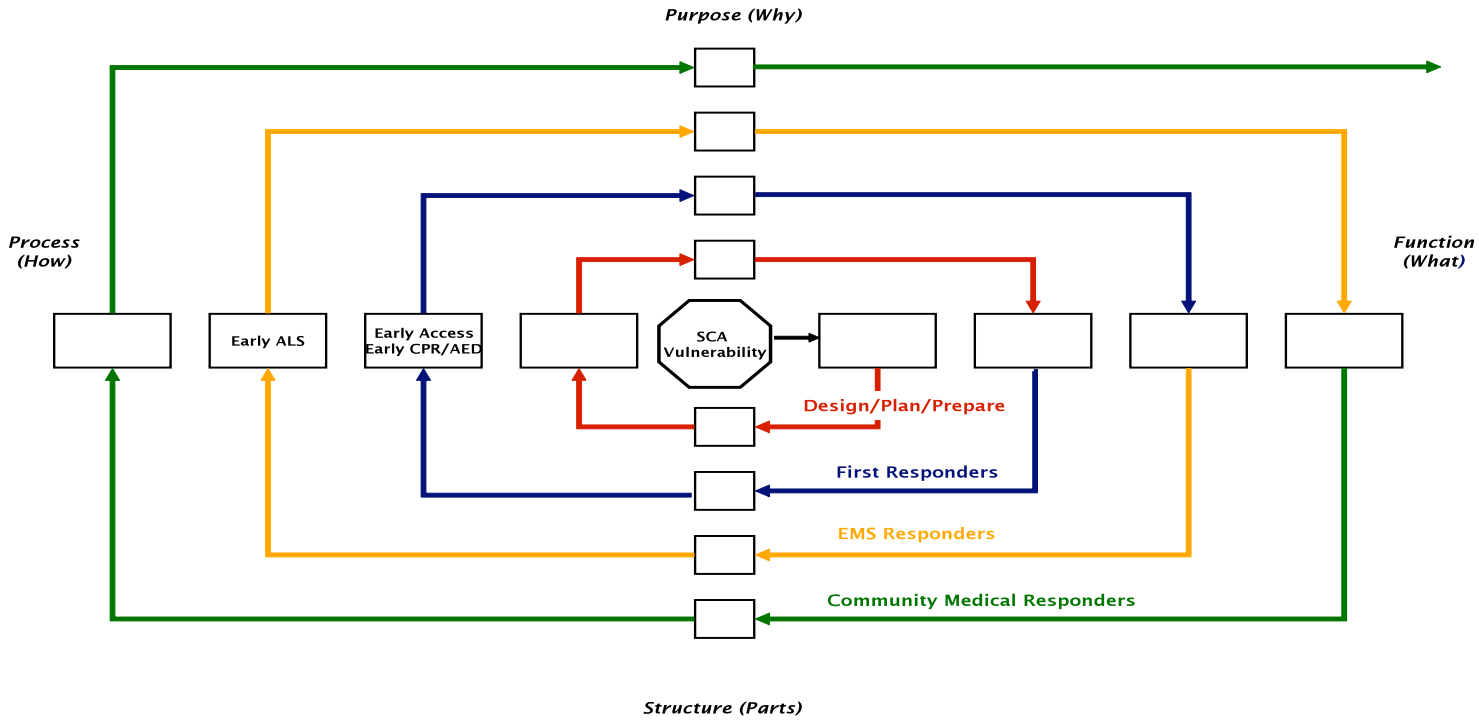


UAA University Functions and Resources: Teaching, Research, Public Service, Feb 25, 2003, Cole



SCA Survival as a Non-Linear Model

Figure 5. System of Survival From SCA



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