

Rethinking the System of Survival for Sudden Cardiac Arrest



November 3, 2011

Rethinking the System of Survival for Sudden Cardiac Arrest

Welcome!

Technology Notes

**Introductions:
Please provide your
name and affiliation(s)**



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Writing Workshops

Because the discipline of writing for academic purposes is based on skills that are not common to business writing and because the writing process is central to learning in this program, Organizational Dynamics offers a series of free workshops

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Sudden Cardiac Arrest is a Wicked Problem. It's a Mess.

[Read More >> Project Website.](#)

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DYNAM 771: Micro Finance in India - the Past, Present, and Future

Categories: F, A
Concentrations: LM, GL, PR

What's New

CALENDAR OF IMPORTANT ACADEMIC DATES

For a list of important events see the new [Bulletin Page](#).

GRADUATE STUDIES JOURNAL OF ORGANIZATIONAL DYNAMICS

[Graduate Studies Journal of Organizational Dynamics \(GSJOD\)](#) 2011, Vol 1, No. 1 is available through the University of Pennsylvania's Digital Library, [Scholarly Commons](#). We are now reviewing papers for Vol. 1, No. 2 which will be published in fall, 2011. Please review the [submission requirements](#) before submitting a manuscript.

60 SECOND LECTURES

 By Jeanne Leong (MSOD 2007): In the amount of time it takes to watch two television commercials or wait for the traffic light to turn green to cross Walnut Street, you could hear an entertaining and informative lecture from a School of Arts and Sciences (SAS) professor. [SAS's 60-Second Lecture Series](#) features faculty from many disciplines discussing a variety of thought-provoking topics from

35 Years, 50 faculty and scholars, 500 adult students, 17 domains of **Organizational Dynamics**



Anthropology, Design and Planning, Economics, Education, Engineering, English, Government and Politics, Health Care, Humanities and Languages, Human Resources, Law, Management, Organizational Science, Philosophy, Political Science, Psychology, and Sociology

If you are participating via the web

**There is a chat/comment box
being monitored.**

AGENDA

November 3, 2011

Rethinking SCA Survival: Design and Research

Welcome and introductions ✓

➔ Approach and language

Proposed "Penn Mess Formulation" project

Lunch

**Resources, operations, roles of Special Task Force,
discussion**

Imagine the following



The New York Times
Expect the World®



PRESIDENT DESPITE “GOOD HEALTH” DIES OF SCA!

CONGRESS CALLS MEETING OF THE NATION’S LEADING GROUPS TO “EXPLAIN LOW SCA SURVIVAL RATE”

Why is SCA survival so low?

Experts Gather to Explain the Problem

Epidemiology, Statistics
Finance, Budget
Marketing, Sales
Engineering, Technology
Information, Education
Medical Research
Public Health, Informatics
Community Medical Leadership

Why is SCA survival so low?

Experts Explain the Problem

Epidemiology and Statistics

The problem is analytic with 4 root elements.

We have known for more than 25 years that the predictors of SCA survival can be deconstructed into a linear chain.



Survival rate = 67% at collapse – 2.3% per minute to CPR – 1.1% per minute to defibrillation – 2.1% per minute to ACLS.

Survival will improve if we optimize each independent link. The problem requires more improvement in the additive components of the chain of survival.

Why is SCA survival so low?

Experts Explain the Problem

Finance and Budget

This is a funding problem.

£ \$
¥ €

Not so fast. The problem is more complex than that.

Compared to other illnesses, funding for SCA is low, perhaps inadequate. We need more grants from NIH and other federal sponsoring agencies; more financial support from donors and institutions; more support from private and corporate funding agencies; and overall better allocation of financial resources toward this problem.

Why is SCA survival so low?

Experts Explain the Problem

Marketing, Sales

This is a marketing/sales problem.



This is not solely about finances. We need better visibility, competitive promotion, and public relations. We need to get our message to the people and we need it to stick. We need to sell more AEDs and CPR classes, and present more promotion aimed at customer understanding of how SCA survival can be improved by lay citizens.

Why is SCA survival so low?

Experts Explain the Problem

Engineering, Technology



This is an engineering, technology problem.

We cannot sell ourselves out of this problem. AEDs need to be better and of higher quality; we need to integrate and apply smart social technology and devices; we need more and sophisticated medical assessment and resuscitation facilities using advanced engineering and technology.

Why is SCA survival so low?

Experts Explain the Problem

Information, Education

This is an information, education problem.



Everything described has merit but the solution lies in information technology and improved education. Both will reduce marketing costs, improve responder performance, and increase automation. IT and simulation will facilitate easier and more accurate skills training for all levels of responders.

Why is SCA survival so low?

Experts Explain the Problem

Medical Research

This is a medical research problem.



All that is fine, but we are still dealing with a medical event.

More and better research can make SCA survival better understood and better treated. We need more and better basic, ongoing and advanced research, and more researchers working on this problem.

Why is SCA survival so low?

Experts Explain the Problem

Public Health, Informatics



This is a public health, informatics problem.

You are all missing the essential point about SCA survival. We must remember that “if we cannot measure it, we cannot improve it” so we must get better and more evidence-based data about actions and outcomes. We need more and better reporting, collecting, measurement, and integration of data.

Why is SCA survival so low?

Experts Explain the Problem

Community Medical Leadership

This is a medical leadership problem.



Of course we need data, so if you are seeking evidence, look at the leadership in communities where SCA survival is highest. King County, WA and Rochester, MN, for example, have outcomes far greater than Philadelphia and New York. To improve SCA survival we need more coordinated and better community medical leadership.

Why is SCA survival so low?

What kind of problem is SCA survival?

Epidemiology, statistics problem?

Finance and budget problem?

Marketing, sales problem?

Engineering, technology problem?

Information, education problem?

Medical research problem?

Public Health, informatics problem?

Community medical leadership problem?

Why is SCA survival so low?

**SCA survival is a
mess. It is a
wicked problem.**

Mess ... Wicked Problem

It is all of those problems and more.

“Mess” or “wicked” is an **organizational term** that describes a **type of problem** that is difficult or impossible to solve because of incomplete, contradictory, and changing requirements that are often difficult to recognize.

Moreover, because of **complex interdependencies**, the effort to solve (or optimize) one aspect of a wicked problem may reveal or create other problems.

Problem Epistemology: How Do We Think about and Know our World?

- **Narrative** – Present stories, personal experiences and anecdotes. Appropriate for persuasion, some training, in conversation, film and literature.
- **Research/Analytic** – Conduct controlled studies where knowledge is reality/use evidence-based criteria. Appropriate for **complicated** problems that are additive and can be deconstructed.
- **Design/Systemic** – Produce what does not yet exist/create something new based on what is desired. Appropriate for **complex** problems that are interactive.

Shift from Research/Analytic to Design/Systemic

- **Research/Analytic thinking is essential, must continue, and must be supported.**
- **Design/Systemic should also be used even though it challenges the status quo.**
- **When the analytic and systemic are integrated, new thinking, innovation, and creative outcomes emerge.**

Shift from Research/Analytic to Design/Systemic

Mindset:

Pattern of thinking; premises and assumptions; cognitive bias.

Mindsets are the products of historical circumstances. In general, they are based on assumptions that evolved from the industrial era and the “**mechanistic mindset**” that prevailed from the Renaissance until about the time of WWII.

Those who have benefitted the most from a current pattern of thought (mindset) are comfortable with it and have a high tolerance of the problems it has created and leaves unsolved.

Research Mindset: **Analysis**

“Analyze” means to **“break into parts”** so this type of thinking seeks to deconstruct a problem and to search for and determine (root) causes, states and effects. Appropriate in **complicated** problems.



Steps of Analytic Thinking

1. Take the thing or event or problem to be understood apart, preferably down to its indivisible parts, elements.
2. Explain the behavior or properties of each part taken separately.
3. Aggregate the explanations of the parts into an explanation of the whole.

Procedure Outcome of Research/Analytic Mindset



The diagram illustrates the three components of CPR:

- A AIRWAY:** Shows a person's head tilted back. The left side is labeled "OBSTRUCTED" and the right side is labeled "OPENED".
- B BREATHING:** Shows a person lying on their back with a rescuer performing rescue breathing into their mouth.
- C CIRCULATION:** Shows a rescuer performing chest compressions on a person lying on their back.

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

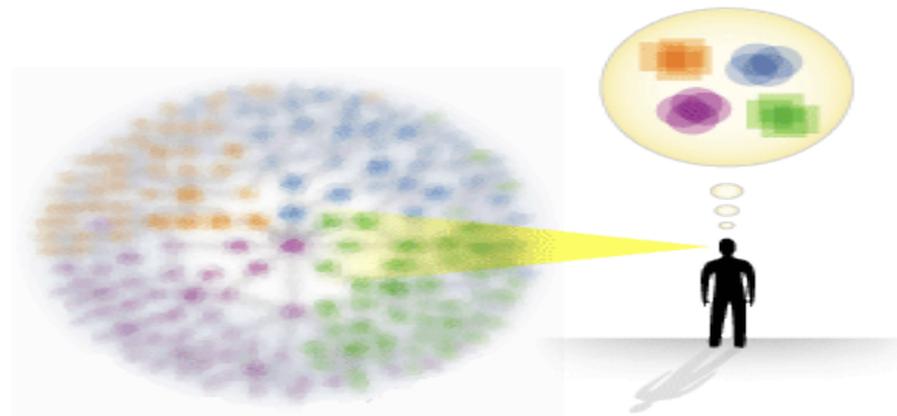
Product Outcome of Research/Analytic Mindset



Another Way to Think

The overall change that is taking place in society is a **shift in the thinking paradigm.**

Emergence of a new world view (mindset) is stimulated to a large extent by a growing awareness of the nature of **systems.**



Systems Thinking

When we shift from a “**mechanistic view of the world**” to a “**systemic view of the world,**” we change our method of inquiry and thought processes.

The essence of systems thinking lies in a shift of mind to:

- Seeing interrelationships rather than linear cause-effect chains, and
- Seeing processes of change rather than snapshots.

The Fifth Discipline, Peter Senge

Systems Thinking



Systems Thinking and Language

To understand a system is to be able to explain its **properties and behaviors** and be able to explain “why it is what it is” and “why it behaves the way it does.”

With understanding, one can control causes rather than treat symptoms and therefore **design** and **create** the future.

Mechanisms, Organisms and Social Systems, Russell Ackoff

Systems Thinking and Language

Because the properties of a system derive from the interactions of the parts rather than their actions taken separately, the improvement of the parts separately does not guarantee that the performance of the whole is improved.

Systems Thinking and Language

Systems thinking does not break down or deconstruct a problem into parts either to understand or to intervene.

Systems thinking focuses on forces in the environment including those outside the problem (in the “**containing system**”) and on **relationships, interests and purposes** among the parts rather than on the parts themselves.

AGENDA

November 3, 2011

Rethinking SCA Survival: Design and Research

Welcome and introductions ✓

Approach and language ✓

Questions and Comments

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➔ **Summary of April 23 meeting**

Proposed "Penn Mess Formulation" project

Lunch

**Resources, operations, roles of Special Task Force,
discussion**

Summary of April 23, 2011 Meeting

Systems Methodology

1. Define and diagnose the current system's design: conduct the **“mess formulation.”**
2. Define and design the ideal system: apply **idealized design, interactive planning,** and other design methods.
3. Design – including the implementation and resource requirements – the workable improved system then move into its operation.

April 23, 2011 Group Activity

Systems Methodology

2. Define and design the ideal system: apply idealized design and interactive planning.

Suppose the Gates Foundation offered unlimited resources to the best design for the ideal system that would enable survival from out-of- hospital sudden cardiac arrest in a community of 1 million people.

- What elements or characteristics would be needed?
- What would you like – your wishes – to be in place for this to occur today?

Design Rules

- You are designing from “nothing”
- There is nothing in place at present and so nothing to improve
- Focus on what you want – your ideal
- Do not focus on what is not needed
- If you disagree offer an alternative
- One conversation at a time
- Stay focused on the task
- Encourage wild ideas
- Go for quantity
- Be visual
- Defer judgment
- Build on the ideas of others
- Do not worry about resources
- Do not worry about implementation

April 23, 2011
76 Ideal Elements (see project website)

<u>Type</u>	<u>Total</u>
Technology	22
Process	13
Values	10
Advocacy	10
Network	9
Access	5
Medical	2
Financing	3
Education	1
Other	<u>1</u>
Total	76

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Proposed "Penn Mess Formulation" Project

Overview

Partner/Sponsor:	Penn Division of Public Safety
Geography:	University City/University of PA
Stakeholders:	"All Relevant Groups"
Timeline:	Spring 2012
Leadership Team:	DYNM + Public Safety + Penn Med + ...
Advisory Team:	Special Task Force on Reframing the System of Survival for Sudden Cardiac Arrest

Proposed "Penn Mess Formulation" Project

Division of Public Safety » Penn Public Safety - Windows Internet Explorer

http://www.publicsafety.upenn.edu/

File Edit View Favorites Tools Help

Division of Public Safety » Penn Public Safety

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DIVISION OF PUBLIC SAFETY

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Emergency Team Members consist of Penn Faculty, Staff and students just like you. Team Members become critical in supporting emergency personnel in the event of a crisis or emergency. Consider volunteering today! [Read More »](#)

Message from the Vice President

Penn is an urban college campus, well-integrated into a vibrant University City community, which offers students, staff and faculty access to a wonderfully diverse cultural, arts and restaurant scene...

[Read More »](#)

Maureen S. Rush, M.S., CPP
Vice President for Public Safety

Campus Safety Notices

- There are currently no active Safety Notices

[Click Here to Sign Up For Traffic & Safety Notices](#)

Quick Links

24x7 Walking Escort Service

RAD: Self Defense Courses

News, Events & Announcements

[Vice President Biden discusses public safety and the economy](#)

On Tuesday, October 18, 2011, Vice President Joseph R. Biden visited Penn's campus to discuss community safety and the economy with first responders from around the Delaware Valley. Below are two videos covering the event, courtesy of Penn University Communications. Read University Communications Article View Additional...

[New Photo Album: DPS Open House](#)

start | Inbox - Mozilla Thund... | SCA Workshop Nov 3... | Microsoft PowerPoint... | Penn: Search - Windo... | Division of Public Safe... | 11:05 AM

Current Penn System

Characteristics/Assumptions

A large number of elements

Many interactions among the elements

Attributes of the elements are not predetermined

Interaction among elements is loosely organized

Interactions and people are probabilistic in their behavior

System and subsystems (groups within) evolve over time

Sub-systems are purposeful and generate their own goals

System is largely open to environment

Mess Formulation

Preparation and Activities

- 1. Systems Analysis** – A detailed description of how the system currently operates
- 2. Obstruction Analysis** – Identification of those characteristics and properties of the organization that obstruct its progress
- 3. Reference Projections** – projections of aspects of the organization's future assuming: (a) no change in its current plans, policies, programs, etc. and, (b) the future environment that it currently expects
- 4. Reference Scenario** – a description of how and why the organization would continue to fail to improve or become worse if the assumptions made were true [synthesis of what is learned in (1), (2), and (3).]

Mess Formulation

Systems Analysis

This has never been performed on any community

1. How is the overall system to be defined?
2. What is the “business or businesses” of the “organization and its members”?
3. How is the “organization” organized?
4. How does the “organization” actually operate?
5. What policies, practices, strategies, and tactics are currently in force that affect operations?
6. What are the principal stylistic preferences of leadership and management?
7. How has the “organization” performed in the past and how is it performing now?
8. Who are the “organization’s” stakeholders?
9. Who are the “organization’s” competitors?
10. What laws and governmental regulations affect the “organization” and how?

Mess Formulation

Obstruction Analysis: Conflicts of all Categories

1. Conflicts within (administrative, ethical, etc.) individuals who are part of the “organization”
2. Conflicts between individuals
3. Conflicts between individuals and the “organization” or parts of it
4. Conflicts between units at the same level of the “organization”
5. Conflicts between units at different levels or between units and the “organization”
6. Conflicts within the “organization” as a whole
7. Conflicts between the “organization” and external groups

Mess Formulation

Mess formulation team performs 6 activities:

**Detects
Focuses
Searches
Represents
Diagnoses
and
Presents**

the complex problems of an organization

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Discussion

Resources

Operations and Procedures

Roles of Special Task Force

Follow-up Correspondence:

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Next Meeting

November 3, 2011

Rethinking SCA Survival: Design and Research

<http://www.organizationaldynamics.upenn.edu/survival>

THANK YOU