
Managing System Safety in Healthcare

A Status Report

System Safety Society of Canada

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Ottawa, ON

Three Questions

Managing system safety in healthcare:

1. What kind of a system is healthcare?
2. What is safety, in general, and in healthcare?
3. Can safety be managed?

Three Questions: (1) Healthcare as a System

“Innovation in health care is not a complicated issue.

It is a complex issue.

- Paul Plsek

Examples:

1. Simple: baking a cake
2. Complicated: moon mission
3. Complex: raising a child; improving quality in healthcare

Three Questions: (1) Healthcare as a System

Mirror, mirror, on the wall, who is the most complex of all?

Answer: Hands down, healthcare wins

Do we really understand the specific nature of healthcare as a complex socio-technical system?

Do we integrate this understanding in promoting system safety in healthcare?

Three Questions: (1) Healthcare as a System

Hold your horses!!

What kind of widgets does healthcare make?

Whose system is it anyway?

Is patient safety equivalent to system safety?

Three Questions: (1) Healthcare as a System

Elements or levels of a system: [Perrow]

1. Parts or components (could be human operators)
2. Unit (could include human units – teams)
3. Sub-system (an array of units)
4. Whole system

Three Questions: (1) Healthcare as a System

Dimensions:

Perrow:

Interactivity: complex versus linear

Coupling: tight versus loose

Snook:

Logic of action: rule-based versus task-based

Thompson:

Interdependence and coordination mechanisms

Three Questions: (1) Healthcare as a System

Complex interactivity:

1. Proximity
2. Common-mode connections
3. Interconnected subsystems
4. Limited substitutions
5. Feedback loops
6. Multiple and interacting controls
7. Indirect information
8. Limited understanding

Transformation processes

Surprises and non-linearity

Linear interactivity:

1. Spatial segregation
2. Dedicated connections
3. Segregated subsystems
4. Easy substitutions
5. Few feedback loops
6. Single purpose segregated controls
7. Direct information
8. Extensive understanding

Few surprises

Three Questions: (1) Healthcare as a System

Tight coupling:

1. Delays in processing not possible
2. Invariant sequences
3. Only one method to achieve goal
4. Little slack possible in supplies, equipment, personnel
5. Buffers and redundancies are designed-in, deliberate
6. Substitutions are limited

Loose coupling:

1. Processing delays possible
2. Order of sequences can be changed
3. Alternative methods available
4. Slack in resources possible
5. Buffers and redundancies fortuitously available
6. Substitutions fortuitously available

Three Questions: (1) Healthcare as a System

What about the logic of action dimensions in healthcare? [with thanks to Scott Snook]

- We love rules, guidelines, algorithms, policies, processes – the dreaded “forms committees” (rule-based logic)
- We also cherish professional autonomy and the exercise of judgment on a case by case basis (task-based logic)

The dialectic between these dimensions is fertile ground for healthcare “drift into failure”.

Three Questions: (1) Healthcare as a System

<u>Type of Interdependence</u>	<u>Coordination Mechanism</u>
Pooled	Standardization
Sequential	Plan
Reciprocal	Mutual adjustment

Three Questions: (1) Healthcare as a System

Healthcare is likely a **hybrid** complex socio-technical system, especially when viewed from the patient journey perspective

Systems are in constant evolution and movement through several dimensions on different continua

- Interactivity
- Coupling
- Logic of action
- Types of interdependence

Solutions are not always appropriate for all stages in the life span of a complex system

Three Questions: (1) Healthcare as a System

Hypothesis: The failure to recognize the specific nature of healthcare as a complex socio-technical system and the hybrid nature of that system creates barriers to the promotion of patient safety

- Application of inappropriate tools and techniques
- Inappropriate focus on components rather than the relations between elements of a system
- Search for reliability instead of understanding and nurturing variability

Three Questions: (2) Contrasting safety and quality

*“Safety is a core value,
not a commodity that can be counted.*

*Safety shows itself only
by the events that
do not happen.”*

- Erik Hollnagel

Three Questions: (2) Contrasting safety and quality

Safety is more than the avoidance of error, reduction of risk, or absence of accident

Social construct that is easier to judge than to define

Emergent property of complex system

“A story that an organization or group tells about itself and its relation to the task environment” (Rochlin)

Three Questions: (2) Contrasting safety and quality

Safety is to error and risk, as health is to illness

Health (wellness) is not simply the absence of illness

Safety is not simply the lack of error or reduction of risk

“Safety as a holistic social construct, a property of the interactions, rituals, myths , and beliefs of the entire organization” (Rochlin)

Three Questions: (2) Contrasting safety and quality

“Managing quality is about single components, about seeing how they meet particular specifications, about removing or repairing defective components. Managing safety has little to do anymore with single components.”

“Safety is an emergent property and its erosion is not about the breakage or lack of quality of single component.”

- Sidney Dekker

Three Questions: (2) Contrasting **safety** and quality

Elements or levels of a system: [Perrow]

1. **Parts or components (could be human operators)**
2. **Unit (could include human units – teams)**
3. **Sub-system (an array of units)**
4. **Whole system**

Three Questions: (2) Contrasting safety and quality

Elements or levels of a system: [Perrow]

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Three Questions: (2) Contrasting safety and quality

Can quality be counted or measured?

“You can only measure 3% of what matters”

- W.E. Deming

“The important question is not “how many?”

The important question is what happened?”

- Don Berwick

Three Questions: (2) Contrasting safety and quality

	Quality	Safety
Concise Oxford Dictionary	“degree of excellence”	“freedom from danger or risks”
Operational Definition	“definition of quality may be almost anything anyone wants it to be – it is ordinarily a reflection of values and goals current in the medical care system” - Donabedian	“reduction of preventable harm to patients” - WRHA RIPSS
Paradigm	Structure, process, and outcome - Donabedian	Structure, process, and patterns - Plsek

Three Questions: (2) Contrasting safety and quality

Donabedian's "conceptual and operationalized definition of quality of medical care.."

What to measure, or assess, to determine quality:

- Structure
- Processes
- Outcomes

Three Questions: (2) Contrasting safety and quality

A different paradigm:

The key to understanding and transforming whole systems:

- Structure
- Processes
- Patterns

See Capra, Bohm, Plsek

Three Questions: (2) Contrasting safety and quality

Key patterns in healthcare (Plsek):

1. Relationships
2. Decision-making
3. Power
4. Conflict
5. Learning

It is intrinsically difficult to count or measure these patterns.

Three Questions: (2) Contrasting safety and quality

Which paradigm do we choose?

Both

Quantitative and qualitative methodologies are both necessary to understand and improve healthcare – we must learn to integrate these in a mutually interdependent manner

Healthcare tends to remain stuck on counting bed pans and toilet seats

Three Questions: (3) Can safety be managed in healthcare?

It all depends on whether we want to count or to understand

Can you manage what you can't count?

More to the point, do you need to count in order to manage?

Three Questions: (3) Can safety be managed in healthcare?

Yes, if we...

1. Shift our paradigm from **S**tructure, **P**rocess, and **O**utcomes (S/P/O) to one of **S**tructure, **P**rocess and **P**atterns
2. Abandon our love affair with quantitative methods and learn to integrate qualitative approaches as we search for innovative solutions
3. Shift the emphasis in QI activities from only promoting reliability to one of also understanding variability of performance
4. Integrate Perrow's second- and third-party victims in all our safety and quality activities

Three Questions: (3) Can safety be managed in healthcare?

*“ We must recognize that
most patients
do not wish to be regarded
as a problem
requiring eradication”*

- Hugo Letiche

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