Making the Form fit the Fuss

Complexity Science and Critical Incident Investigations

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Making the Form Fit the Fuss

What are the characteristics of an effective critical incident (CI) review training process in healthcare?

The answer will come, in part, from understanding healthcare as a complex adaptive system (CAS) and, in part, from exploring underlying CAS theory.

Where did the funny title come from?
Conflict resolution literature: *"Make the Forum Fit the Fuss"*

Making the Form Fit the Fuss

The issue of an effective critical incident review process in healthcare raises the question of why we are bothering to review critical incidents. [aside from social justice]

Bold assumption: we are doing this to learn

Confessions of a CAS maniac: [psst – don't tell Erik] this is pure Safety I (or is it?)

Assumption: we still need an effective CI review process

Making the Form Fit the Fuss

Re-frame the original question:

How do systems thinking, complex adaptive systems theory and complexity science help us to design an effective CI review process?

Where does such a process fit in the range of accident investigation models:

1. Simple linear
2. Complex/complicated linear
3. Systemic non-linear

Holistic perspectives

“ Wholeness is revealed only as shapes, not facts.

Systems reveal themselves as patterns, not as isolated incidents or data.

It’s not easy to give up the role of master creator and move into the dance of life.”

- Meg Wheatley

Systems thinking

Some basic elements:

- Seeing the whole instead of the parts [holistic approach]
- Seeing that the whole is more than the sum of the parts [emergence]
- Seeing inter-relationships rather than linear cause-and-effect chains [listening to and hearing the story]
- Seeing processes of change rather than snapshots [self-organization]
- Understanding dynamic complexity (vs. static/detail complexity)

Some properties of systems

What is a system?

"System" denotes deliberate arrangement of parts (components, people, functions, subsystems) that is instrumental in achieving specified and required goals (Hollnagel)

Properties of a system:

- Closed versus open
- Mechanical versus living
- Static versus dynamic
- Defined boundaries versus mobile [semi-permeable] boundaries
- Simple/complicated (non-complex) versus complex

Nature of Systems

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

Nature of Systems

Dimensions:

Perrow:

Interactivity: complex versus linear

Coupling: tight versus loose

Snook:

Logic of action: rule-based versus task-based

Thompson:

Interdependence and coordination mechanisms

Nature of Systems

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

Examples from healthcare…

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

More examples please.
Can you see overlap?

Nature of Systems

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

Examples from healthcare?

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

More examples from healthcare…
Are they happening concurrently?

Nature of Systems

The logic of action dimensions (with healthcare as a typical example:

- 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 to “drift into failure”.

Nature of Complex Systems [from Cilliers]

Some general characteristics:

1. Composed of large number of elements (some intractable)
2. Elements interact dynamically – the effects propagate throughout the system
3. The interactions are non-linear
4. Many direct and indirect feedback loops
5. Complex systems are open systems – interacting with their environment – exchanging information/energy
6. Complex systems have memory – distributed
7. Behaviour of the system emerges from interactions of the components
8. Complex systems are adaptive

Nature of Complex Systems [from Cilliers]

Characteristics of complexity in *organizations:*

Relationships are vital (interactions between agents)

Context is important – open systems interacts with its environment and boundaries are not fixed

History co-determines nature of complex organization

Unpredictability is common feature of emergence

Non-linearity leads to surprising outcomes – not always in proportion to size or strength of a pattern or interaction

Self-organization tends to evolve so that the system is most sensitive to events that are critical to its survival

Central control is non-optimal – distributed control is optimal

Structure is rich, not absent – distinction complex vs. chaotic

Healthcare as a CAS

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

Healthcare as a CAS

Hypothesis: The failure to recognize the specific nature of healthcare as a complex adaptive 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 accepting and nurturing variability)

CI Review Training Process

Implications of healthcare as a hybrid CAS for a CI review training process?

1. Be systemic/holistic in approach
2. Promote understanding of the relational elements
3. ***Let the Stories Breathe***
4. Make emergence, self-organization and non-linearity easily understandable with concrete examples
5. Promote understanding of the history of the system
6. Promote gathering all forms of data

[Would these be helpful to promote learning in Safety II?]

Letting the stories breathe

This requires presenting the CI review training process in a true dialogic fashion

Elements of dialogue:

- Listening
- Suspending
- Respecting
- Voicing

Questions/Contact Info

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Approaches to Leadership and Systems

Complicated System:
Leaders are experts and authorities

Whole = sum of parts

System properties are definable and knowable

System change is by design and detailed planning

Causation is linear – traditional cause and effect understanding of events

System can be known if the parts are known

Complex system:
Leader as facilitator and supporter

Whole is > sum of parts

System properties are emergent and unpredictable

System is self-organizing - depends on interactions between agents

Causation is often non-linear and intractable (unknowable)

System knowledge depends on understanding network of relations

Improv comedy and leadership in CAS

Some fundamental principles:

- Suspend judgment
- Be flexible – let go of your “agenda”
- Listen in order to receive
- Build on what you receive
- Make your partners look brilliant
- Look for connections
- Serve the scene
- Be present

Sound familiar?