

## Course: To Err is Human

### Topic: Systems and the effect of complexity on patient care

#### Summary

Patients depend on many individuals doing the right thing at the right time. That is, they depend on a system of care. Being a health-care professional who practises safely requires an understanding of the complex interactions and relationships that occur in health care. Such awareness can help practitioners identify the opportunities for mistakes that can harm patients and take steps to prevent them.



#### What is a system?

- The word *system* describes any collection of two or more interacting parts or “an interdependent group of items forming a unified whole”.
- A *complex system* is one in which there are so many interacting parts that it is difficult, if not impossible, to predict the behaviour of the system based on knowledge of its component parts. The delivery of health care fits this definition of a complex system.
- All health-care professionals need to have an understanding of the nature of complexity in health care, as it is important for preventing adverse events. Health care is complex due to:
  - the diversity of tasks involved in the delivery of patient care;
  - the dependency of health-care providers on one another;
  - the diversity of patients, clinicians and other staff;
  - the huge number of relationships between patients, carers, health-care providers, support staff, administrators, family and community members;
  - the vulnerability of patients;
  - variations in the physical layout of clinical environments;
  - variability or lack of regulations;
  - implementation of new technology;
  - the diversity of care pathways and organizations involved;
  - increased specialization of health-care professionals—while specialization allows a wider range of patient treatments and services, it also provides more opportunity for things to go wrong and errors to occur.

Health services present as a system—buildings, people, processes, desks, equipment, telephones—yet unless the people involved understand the common purpose and aim, the system will not operate in a unified fashion. People are the glue that binds and maintains the system.

- Although health professionals face many challenges in their workplaces and understand the multiple components that are prone to dysfunction, they often have difficulty thinking in terms of systems, because they have not been trained to think in the concepts of systems theory, nor do they use its tools to make sense of the systems in which they work.
- A systems approach requires us to look at health care as a whole system, with all its complexity and interdependence, shifting the focus from the individual to the organization.
- It forces us to move away from a blame culture towards a systems approach.

A systems approach examines the organizational factors that underpin dysfunctional health care and accidents/errors (poor processes, poor designs, poor teamwork, financial constraints and institutional factors), rather than focus on the people who are blamed for an error. This type of approach helps to move away from blaming, towards understanding and improving the transparency of the processes of care.

## Two schools of thought

### 1. The traditional approach when things go wrong

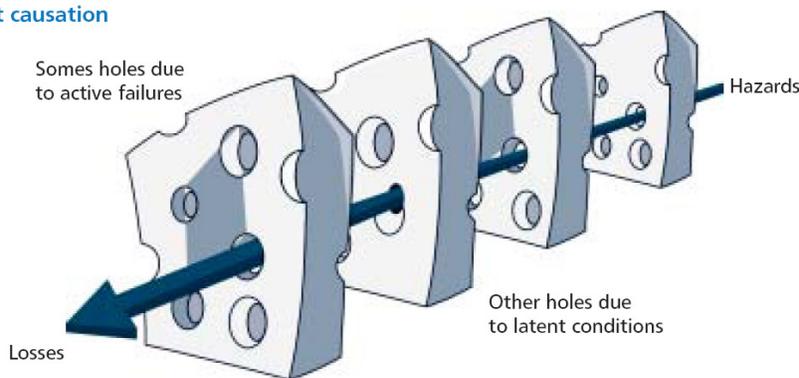
- This approach is to **blame and shame** the health-care professionals most directly involved in caring for the patient at the time of an adverse event or error. While the tendency to blame an individual is strong—and natural—it is unhelpful and counterproductive.
- Health-care professionals do not deliberately harm a patient (deliberate action is called a violation).
- A health-care professional involved in an adverse event /error can inadvertently be destroyed and become the “second victim”.
- Health-care professionals are hesitant to report incidents/errors if they will be blamed.
- Operating in a culture of blame, a health-care organization will have great difficulty in learning from errors and thus decreasing the chance of future adverse incidents.
- A systems approach emphasises the importance of understanding the underlying factors that caused an adverse event without diminishing the responsibilities or accountability of health professionals.

**Accountability:** All health professionals have ethical and legal responsibilities for which they are accountable. While these requirements may vary from country to country, they aim to give confidence to the community that the health professionals can be trusted to have the knowledge, skills and behaviours set by the relevant professional body. Accountability is a professional obligation and no one believes that health-care providers should not be held accountable. However, there is also system accountability, which includes mechanisms that are fair, transparent and predictable in a way that health-care providers are aware of the types of matters for which they will be held personally responsible for, and will be supported to deliver safer health-care services.

### 2. The new approach

- Experts say that although it is hard to change aspects of complex systems, it is even harder to change the behaviour of human beings, in terms of errors.
- Therefore, the foremost response to health-care errors should be making changes to the system using a systems approach.
- A systems approach requires an understanding and action on the multiple factors involved in each of the areas that make up the health-care system.
- The intention of a systems approach is to improve the design of the system so that errors are prevented from occurring and/or their consequences minimized.
- J. Reason outlined the elements of the system that should be considered as part of a “systems-thinking” approach:
  - patient factors
  - provider factors
  - task factors
  - technology and tool factors
  - team factors
  - environmental factors
  - organizational factors
- J. Reason created the “Swiss cheese model” to explain how faults in different layers of a system lead to adverse events and medical errors. This model shows how a fault in one layer of a system of care is usually not enough to cause an accident. Adverse events usually occur when a number of faults occur in a number of layers (e.g. fatigued workers + inadequate procedures + faulty equipment) and momentarily line up to permit the “trajectory” of an accident opportunity.

## Reason's "Swiss cheese" model of accident causation



Successive layers of defences, barriers & safeguards

### Understanding the term high reliability organization (HRO)

- HRO refers to organizations that operate under hazardous conditions, but manage to function in a way that is almost completely “failure-free”. They have very few adverse events. Some examples of HROs include air traffic control systems, nuclear power plants and naval aircraft carriers.
- The message for health care is that it is possible to achieve consistently safe and effective performance despite high levels of complexity and unpredictability in the work environment.
- Characteristics of HROs:
  - preoccupation with failure: acknowledge and plan for the possibility of failure due to the high-risk, error-prone nature of their activities;
  - commitment to resilience: proactively seek out unexpected threats and contain them before they cause harm;
  - sensitivity to operations: pay close attention to the issues facing workers at the frontline;
  - establishing and maintaining a culture of safety in which individuals feel comfortable drawing attention to potential hazards or actual failures without fear of criticism.

### Applying the lessons learned from HROs to health care

We do not have a culture of safety in health care yet. Health-care organizations can learn from other HROs. Their successes can be examined, including the factors that made them work. Lessons can be learned from their failures, specifically how disasters occur and what factors are typically present.

The key principles from HRO theory are:

- Maintain a powerful and uniform culture of safety
- Use optimal structures and procedures
- Provide intensive and continuing training of individuals and teams
- Conduct thorough organizational learning and safety management.

***A systems approach helps us to understand and analyse the multiple factors underpinning adverse events. Therefore, using a systems approach to evaluate the situation—as distinct from a person approach—will have a greater chance of resulting in the establishment of strategies to decrease the likelihood of recurrence of an error and the promotion of a culture of safety in health care.***