The systems approach to medicine: Controversy and misconceptions

Sidney W. A. Dekker[1]
Safety Science Innovation Lab, Griffith University
and School of Psychology, The University of Queensland

Nancy G. Leveson[2]
Aeronautics and Astronautics
and Engineering Systems Division
MIT, Cambridge, MA

Abstract. The 'systems approach' to patient safety in healthcare has recently led to questions about its ethics and practical utility. In this viewpoint we clarify the systems approach, by examining two popular misunderstandings of it: (1) the systematization and standardization of practice, which reduces actor autonomy; and (2) an approach that seeks explanations for success and failure outside of individual people. We argue that giving people a procedure to follow or blaming the system when things go wrong, both misconstrue the system approach.

Introduction

The 'systems approach' to patient safety has recently led to questions about its ethics and practical utility. Recently, Levitt, a retired neurosurgeon, wrote how "the medical profession has put its faith in a systems approach to the problem … [a] so-called solution that doesn't address the problem."[1] These arguments stem in part from misunderstanding the 'systems approach' as (1) equating to standardizing practice and reducing individual autonomy (e.g. creating more rules, policies and compliance demands),[2] and (2) blaming the system rather than holding people accountable.[3 4 5] Neither of these characterizations captures the essence of the systems approach as practiced in

[1] Corresponding author. Contact details: Professor Sidney W. A. Dekker, PhD, Griffith University, HUM. N16 Macrossan Building, Nathan Campus, QLD 4111, Australia. Telephone 07 – 37354842. Email: s.dekker@griffith.edu.au
[2] Professor Nancy G. Leveson, PhD, Massachusetts Institute of Technology, Aeronautics and Astronautics, 77 Massachusetts Avenue, Building E40-261, Cambridge, MA 02139-4307, USA. Email: leveson@mit.edu

industries that have used it to increase safety to extremely high levels, such as commercial aviation. Here we briefly explain the systems approach in the broader ways it has been applied elsewhere, and then reflect on the questions of standardization and accountability it has generated in healthcare.

What is a system and a systems approach?

A system, such as a hospital, is a dynamic and complex whole, interacting as a structured functional unit to achieve goals (e.g. treating patients). One system may be nested within another system, e.g., a hospital is nested within a larger healthcare system; an ICU exists inside a hospital. The behavior of a system reflects the linkages and interactions among the components that make up the entire system. All medicine is practiced within a system. The behavior of the components or entities that exist within that system is influenced by the system design and structure, such as the remuneration schemes, time and financial pressures, the accuracy of available information about the patient or the procedure being performed, and much more. These system design factors can help or hinder medical professionals from doing their job. While it is laudable that professionals accept responsibility for their actions, it is unrealistic to believe that their behavior is not affected by the context in which it occurs. We can have an impact on behavior by careful design of the structure and incentives of the systems in which it occurs.

Reducing the system approach to following a checklist or standardized procedure trivializes what can be accomplished by careful system design. Checklists, protocols and other devices that aim to streamline and reduce variation play a role in a number of safety-critical fields. The goal of a systems approach, however, is not to reduce human behavior to rule-following, but to design a system in which individual responsibility and competence can effectively help create desired outcomes. The usefulness of standardized responses depends on the thinking and engineering that went into the system design, as well as on the human ingenuity in selecting and applying and even modifying standard responses. Procedures or checklists per se do not reduce harm. Mistakes in using checklists in aviation, for example, do not directly produce catastrophe because of careful engineering and design that preceded operational use. At the same time, human resilience fills the gap between work-as-imagined and work-as-done: autonomy is maintained for a variety of processes (e.g. how and when to configure an airliner for landing—within certain parameters), and in many situations checklists are not useful because of time constraints or decision ambiguity.

Thus, standardization, or giving people a procedure to follow, does not constitute a ‘systems approach,’ and advice given to hospitals or medical specialties to that effect should not be taken at face value. Claiming that a systems approach doesn’t work because standardization doesn’t always work Is equivalent to prescribing a treatment of limited efficacy for a particular disease and then concluding that the disease is untreatable and that a more powerful and comprehensive treatment regime would be no more effective.

Does a systems approach conflict with personal accountability?

The systems approach argues that a flawed hospital system, rather than flawed individuals, is responsible for patient harm.[6] Some then invert this, suggesting that a systems approach entails just blaming the system, not the individual. This critique seems to be more prevalent in medicine than in safety-critical industries that more freely acknowledge and engineer against human fallibility.[7]

But a systems approach does not eschew individual responsibility and accountability. First, the rate at which healthcare produces "second victims" compared to other domains shows just how much individual accountability its practitioners assume.[8] Second, in a system, each component has specific responsibilities to help attain its ultimate goals. While surgeons, for instance, have and take responsibility for performing surgery safely and effectively, others have responsibility to ensure that required resources are available. A New Zealand surgeon, for example, was criminally prosecuted for a number of deaths to patients in his care. What received scant attention was that he was forced to operate with help from medical students, because of a lack of available competent assistance.[9] Prosecuting the surgeon, who had little control over the context in which he worked, did not solve the problem. After all, it would have similarly affected most people practicing surgery in that environment.

Blame is the enemy of safety.[10] Emphasizing blame and punishment results in hiding errors and eliminates the possibility of learning from them. So-called 'just culture' programs and systems have been effective in aviation by encouraging the reporting of errors so that steps can be taken to reduce them—or their consequences.[11] A just culture can also fairly adjudicate how to respond to undesired practice, particularly when it is made clear who gets to determine the response, and if those persons are familiar with the messy details of practice.[12] Such things are consistent with a systems approach, which, after all, considers error to be reducable through processes, procedures, training, and system design, including the design of the incentive structure around practitioners. Similarly, the management of (in)competence can be seen as a system issue, by carefully looking at training, selection, continuing development, and life-long competency checking. In aviation, individual competence is taken as a system responsibility: too important to leave its retaining, refreshing and checking to an individual professional.[13] Structures are in place to oversee and eliminate incompetent practice, instead of leaving its discovery and management only to individual moral valence. This can be made more effective in medicine too so patients can be protected.[14 15]

Some years ago, Atul Gawande published a reflection on an emergency tracheotomy he bungled. Gawande concluded that "although the odds were against me, it wasn't as if I had no chance of succeeding. Good doctoring is all about making the most of the hand you're dealt, and I failed to do so".[3] But while good doctoring may be making the most of the hand one is dealt, the systems approach has always been about providing a better hand in order to improve the opportunity to do

the right thing. Merely leaving the hand with what it is dealt and banking on personal virtue to do the rest is both practically and ethically irresponsible.

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