

Patient Safety: Getting It Right by Doing It Backwards

Jeffrey C. Bauer, PhD

As the son and grandson of university engineering professors, I was taught to use ideal design as a tool for solving problems. The general idea is to imagine a desired solution and then to work backwards—to “reverse engineer”—from the desired solution to the current problem. Ideal design is fundamentally creative (and fun) because it starts with the solution, not the problem; it works in the opposite direction of most approaches to solving problems.

People who do not think like engineers are more likely to start with the problem and focus on finding a way to repair what is broken. Different fixes are tried until the system again functions normally, just like it did in the past. This approach is reflected in the adage, “If you like what you have always gotten, keep doing what you have always done.” Ideal designers, on the other hand, are motivated by seeking something better than what they have always gotten.

Doing It Backwards

Ideal design strongly shaped my approach to teaching in the two decades I spent as a professor. The final examination for my course in health economics always included an essay question that asked students to create a “backwards” solution to a persistent problem of healthcare

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delivery. The exercise was structured to focus initial attention on a desired improvement in quality, cost, or access—a solution that purposefully met a new objective.

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Part of the fun of ideal design is creating a new solution from scratch, so I prepared students for the final exam question by encouraging them to approach a chosen problem without fear of existing constraints. A real problem is a challenge to be overcome by working backward—not a reason to prevent going forward—in ideal design.

I illustrated the point in classroom lectures by stating my belief that a major systemic problem of American healthcare is the lack of alignment between the economic objectives of physicians and health systems. With a few prominent exceptions, medical care in the U.S. is inefficient and ineffective because physicians and hospitals are playing a zero-sum game. One party's gain is the other's loss.

In the realm of health information technology, the adoption of computerized practitioner order entry (CPOE) illustrates this problem. Hospitals can immediately enhance patient safety and ultimately save money by replacing handwritten orders with automated systems that improve clinical decision-making and simultaneously prevent expensive medical errors. Physicians, on the other hand, lose money when CPOE is implemented because using an automated system takes more time than scribbling orders on paper. They bear real short-run costs but do not share in the long-term economic gains. The only exceptions to this occur in health maintenance organizations and academic health centers, where physicians' incomes are directly linked to the health system's financial success through employment, not voluntary affiliation.

When I envision an ideal alternative to our dysfunctional health system, hospitals and physicians work

together because their economic incentives are the same. Their fortunes literally rise or fall together based on how well they work toward a common goal. The challenge for ideal design is to reverse-engineer a system that aligns the economic interests of physicians and hospitals. No aspect of healthcare, including patient safety, will perform optimally until these two provider groups are aligned economically.

Carrots and Sticks

Other articles in this issue discuss the use of appropriate incentives to facilitate adoption of information

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technology. Physicians' losses in time and money need to be compensated by equal or greater gains in income or other rewards sought from the practice of medicine.

However, experience also has demonstrated the importance of “sticks” to prevent abuses that can arise from unfettered pursuit of “carrots” or simple distaste for making changes. For example, we all know that a few members of any hospital's voluntary medical staff will resist or even sabotage an HIT project as a matter of principle, no matter how attractive the incentives are for them to support it.

Experiences in other industries clearly demonstrate that process

standardization is an essential “stick” for performance improvement. Incentives for change are not sufficient to produce desired outcomes if workers are still free to perform in inconsistent ways. To use a common saying that makes the point, the carrots and the sticks must get everyone “reading off the same page,”—that is, doing the same thing the same right way.

Standardization to promote patient safety is all but impossible when practitioners must rely on manual information systems. Even if all caregivers were able to read from the “same page” at every stage of a paper-based patient care process, clinical performance would still be uneven because of potential differences in their interpretation of information and deviations from standards. Standardization is a significant benefit of IT in comparison to paper. In 21st century terms, the appropriate phrase is to get everyone reading off the “same screen.”

Getting It Right

For any student who would use patient safety to answer the ideal design question on my final exam, discussion of IT would be essential for getting an A.

Fixing glitches in paper-based information still leaves us with a system that is the root of most errors in healthcare. Admittedly, some errors are caused by professional incompetence, but the vast majority of safety problems in patient care are explained by a failure of information. Experience in aviation shows that good IT can counteract incompetence. Errors in the cockpit of a commercial airliner virtually have to be intentional; safe performance is enforced by built-in information technology.

Our process of ideal design should

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begin with the vision of a truly modern health system, one where patients do not have to worry about medical care any more than they have to worry about air travel. Looking backwards from this desired future, automation is indisputably the way to ensure patient safety in healthcare.

The paper trail will not lead us to this ultimate solution. We need standards-based IT as a “stick” to move us from where we are to where we must be.

About the Author

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