



# Medical Device Daily Perspectives

A free weekly perspective on the med-tech industry

## Technology isn't a silver bullet without human change

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As chief pharmacy officer at **Baxa** (Englewood, Colorado), Dennis Tribble is focused on health-system pharmacy operations, patient safety and related medication safety issues. A pharmacist and software engineer, he is passionate about the need for a complete restructuring of the pharmacy practice paradigm and the role technology will play in bringing about that vision. Tribble is a fellow of the **American Society of Health-System Pharmacists** (ASHP; Bethesda, Maryland) Section on Pharmacy Informatics and Technology and a charter member of the Pharmacy Informatics Task Force for the **Healthcare Information and Management Systems Society** (HIMSS; Chicago). He also serves as a reviewer on automation for the American Journal of Health-System Pharmacy.

Technology presents a number of attractive opportunities to reduce the incidence of error. Why then, has the deployment of this technology not produced some of the striking reductions in error rates that we expected from this silver bullet?

It has been more than 10 years since the **Institute of Medicine** (Washington) published its landmark report "[To Err is Human](#)," yet recent reviews of error rates have shown no dramatic reduction. Indeed, it would appear that the error rate landscape remains largely unchanged.

One explanation involves the human element of technology deployment, literally "aiming the silver bullet." When the deployment of the technology fails to accommodate the requisite human factors, the technology fails. These factors include a number of human attributes that may confound the deployment of the technology.

- **Preference for avoiding change.** Human beings equate habit with competence, and actively avoid taking on new ways of working, *even when the new way offers opportunities for better outcomes*. Pre-automation work habits are built around the lack of that automation; the addition of technology to a given work practice should therefore result in that practice changing. That change creates discomfort, the feeling of incompetence. Until new habits are formed, the provider feels less productive. When stressed, we will naturally fall back to old, habitual ways of solving problems.
- **Failure to understand or believe the reason for the technology.** Another human bias is to maintain the illusion of control, even when control does not actually exist. In healthcare, this takes the form of denial: "Errors happen to someone else, not me . . ." or "I have been a nurse for 35 years and have never made an error!" When we don't believe a problem exists, we see no reason to endure the discomfort of learning a new way of working. Rather, we stoically endure the imposition of the technology and find workarounds to force-fit it into our old way of working. In many cases, each provider must go through the epiphany that they can, and do make errors themselves (the average intelligent person will make three mistakes for every 100 actions), and that the technology, appropriately used, will help avoid those errors. That takes time and may require breaking down old conceptions about work and competence.
- **Failure to implement the technology with sufficient support and infrastructure.** Human beings excel at filtering out and ignoring background noise, such as warnings that turn out to be inconsequential. Consider this example: If my oil light comes on in my car, and my mechanic tells me that it was good I had things

checked out, I will continue to pay attention to the oil light in my car. On the other hand, if it consistently gives me warning with no cause, I will teach myself to ignore it. Similarly, warning systems (such as bar-code medication administration systems) that have a high rate of false warnings eventually train users to presume that a system problem led to the illumination of warning lights and not human error.

### **Learning new habits**

Implementing technology must take into account the notion that it will require some effort and hand-holding to help providers accept and learn new habits around that technology. Key up-front tasks should include:

- **Describe the endpoints that the technology is expected to achieve.** If those endpoints include improved safety, then some discussion of normal human error rates is important as part of the effort to get providers to realize, and admit, that human error is part of everyone's life, and the proper use of this tool will help identify those errors before they cause harm.
- **Build consensus.** Adoption of the new technology will require the development of new habits around tasks that have been done "the old way" for a long time. While this will likely feel uncomfortable until the new habits are formed, the technology's success hinges upon this.
- **Ensure that the technology is implemented with sufficient infrastructure to succeed.** Users who cannot tell the difference between a system that finds a lot of errors and a system that just doesn't work will presume quickly that the system just doesn't work.

The human element will always play a pivotal role in the practice of medicine. Organizations that consider, and plan for this, will be better positioned to aim the silver bullet for success.