

Mistake Proofing Solutions Endorsed by the Agency for Healthcare Research and Quality – Is That All There Is?

Ken Black

University of Houston-Clear Lake, 2800 Bay Area Blvd, Houston TX 77058.
281-283-3239 (Voice)
black@uhcl.edu

Jami Kovach

University of Houston, 312 Technology Building, Houston, TX 77204, U.S.A.
713-743-1704 (Voice); 713-743-4032 (Fax)
jvkovach@uh.edu

Lee Revere

University of Houston-Clear Lake, 2800 Bay Area Blvd, Houston TX 77058.
281-283-3205 (Voice)
revere@uhcl.edu

Abstract

There is a long-held assumption that health care systems routinely deliver mistake-free care. Patients seem unaware of the nature and frequency of medical errors. Medical errors are often incorrectly viewed as unforeseeable individual-driven mistakes that are unlikely to reoccur. This view is not true, in fact, the Joint Commission (2009) has asserted that “no matter how knowledgeable or careful people are, errors will occur in some situations and may even be likely to occur.” Minimizing or eliminating the opportunities medical errors is a pressing concern for healthcare constituents.

In 1999, the Institute of Medicine published *To Err is Human* and startled the U.S. by suggesting up to 98,000 people die in hospitals each year as a result of preventable medical errors. This figure exceeds the number of individuals that die each year in motor-vehicle wrecks, breast cancer and AIDS and costs between \$17 billion and \$29 billion U.S. dollars per year (Korr et al., 1999). In 2001, the Institute of Medicine again surprised the Nation with its report, *Crossing the Quality Chasm* which states, “The U.S. health care delivery system does not provide consistent, high-quality medical care to all people (Corrigan, 2001).” In fact, approximately 1.1 million total patient safety incidents occurred among the nearly 41 million Medicare hospitalizations during 2004 through 2006 (Science Digest, 2008). The IOM (Corrigan, 2001) furthered their position by stating “...the quality of healthcare received by the people of the United States falls short of where it should be” while the National Patient Safety Foundation states, “The system of health care is fallible and requires fundamental change to sustainably improve patient safety” (Cooper et al., 2000). More recent research suggests, there has been an abrupt change within the healthcare field in which the focus has shifted away from a purely cost centered mindset to concern for building a more quality and safety conscious environment (Kovach, de la Torre, & Walker, 2008).

Today's healthcare institutions feel enormous pressure to improve both clinical and operational practices due to the cost in lives and dollars that can be attributed to preventable medical errors (Berwick, Calkins, McCannon, & Hackbarth, 2006). Quality improvement efforts, are often focused on patient safety initiatives that address the reduction of medical errors or mistakes (Revere & Black, 2003). Mistake proofing is a quality improvement technique, which was originally developed for manufacturing (Hinckley, 2001; Hirano, 1989; Shingo, 1986), but is now used successfully in healthcare to prevent medical errors or mitigate the negative impact of such errors (Godfrey, Clapp, Nakajo, & Seastrunk, 2005). This approach uses process and design features to prevent, detect, and/or mitigate mistakes by building cues into work systems and/or devices so that medical staff do not have to rely entirely on human memory to do things correctly (Grout, 2007; Norman, 1989). This research focuses on identifying and organizing the plethora of healthcare processes and design features that are aimed at reducing medical errors and their effects on patient and system outcomes.

A recent publication by the Agency for Healthcare Research and Quality (AHRQ) (Grout, 2007) summarizes information about the principles and use of mistake proofing in healthcare. In this work, the AHRQ list 100 mistake proofing solutions that were obtained from their national research. Using this as a point of departure, local and international healthcare leaders and future leaders were asked to evaluate the AHRQ list of mistake proofing solutions as well as to add additional solutions currently in use. Specifically, over 40 healthcare professionals ranked the perceived effectiveness, cost and ease of implementation of the 100 AHRQ mistake proofing solutions. These same healthcare professionals then added and/ or expanded the AHRQ list with error proofing solutions currently being utilized within their own communities and/ or healthcare facilities. Comparisons between the national (AHRQ), local (Houston) and international (Dubai) mistake proofing solutions were performed to better understand the quantity, implementation, and effectiveness of mistake proofing solutions.

The results of this research are intended to both educate and inspire the use of better error-prevention efforts within healthcare institutions. Our findings contain a list of approximately 140 mistake proofing solutions currently used in healthcare settings worldwide. This report is likely the most comprehensive list of mistake proofing solutions in the literature and is aimed at assisting healthcare leaders to create cultures of patient safety. Improvements in patient safety are not only important in and of themselves, but also because safety is the foothold for developing and maintaining a high quality, productive healthcare system – a ongoing challenge for all Nations.

References

(2008). "Medical Errors Cost US \$8.8 Billion, Result In 238,337 Potentially Preventable Deaths, Study Shows." Science News, April 8. Available at <http://www.sciencedaily.com/releases/2008/04/080408085458.htm>

Berwick, D. M., Calkins, D. R., McCannon, C. J., & Hackbarth, A. D. (2006). The 100 000 Lives Campaign Setting a Goal and a Deadline for Improving Health Care Quality. *Journal of the American Medical Association*, 295(3), 324-327.

- Cooper JB, Gaba DM, Liang B, Woods D, Blum LN(2008). *National Patient Safety Foundation agenda for research and development in patient safety*. Medscape Gen Med. Available at: <http://www.medscape.com/medgenmed/patientsafety>, accessed 1/3/2001.
- Corrigan, J. M. (2001). *Crossing the Quality Chasm*. Washington, DC: National Academy Press.
- Godfrey, A. B., Clapp, T. G., Nakajo, T. N., & Seastrunk, C. S. (2005). *Application of healthcare-focused error proofing: principles and solution directions for reducing human errors*. Paper presented at the ASQ World Conference on Quality and Improvement, Seattle, WA.
- Grout, J. (2007). *Mistake-Proofing the Design of Health Care Processes*. Rockville, MD: Agency for Healthcare Research and Quality.
- Hinckley, C. M. (2001). *Make No Mistake: An Outcome-Based Approach to Mistake-Proofing*. Portland: Productivity Press Inc.
- Hirano, H. (1989). *Poka-yoke: Improving Product Quality by Preventing Defects*. Portland: Productivity Press Inc.
- Kohn, L. T., Corrigan, J. M., & Donaldson, M. S. (1999). *To Err Is Human: Building a Safer Health Care System*. Washington, DC: National Academy Press.
- Kovach, J., de la Torre, L., & Walker, D. (2008). Continuous Improvement Efforts in Healthcare: A Case Study Exploring the Motivation, Involvement, and Support Necessary for Success. *International Journal of Six Sigma and Competitive Advantage*, 4(3), 254-269.
- Norman, D. A. (1989). *The design of everyday things*. New York: Doubleday.
- Revere, L., & Black, K. (2003). Integrating Six Sigma with total quality management: a case example for measuring medication errors. *Journal of Healthcare Management*, 48(6), 377-391.
- Shingo, S. (1986). *Zero quality control: source inspection and the poka-yoke system*. New York: Productivity Press.
- The-Joint-Commission. (2009). FMECA. Available online at: <http://www.jointcommission.org> (accessed 29 September 2009).