Editorial

Mistake Proofing A quality tool to improve care of our patients

Wissam Abdul Hadi

INTRODUCTION: Mistake proofing is an old tool formalized by Shigeo Shingo from Toyota motors which contributed in what is called nowadays the 'Toyota Production System' that is synonymized with 'Quality'. The tool is used to reduce occurrence of errors, make errors hard to occur unnoticed, easy to correct errors before they can cause serious harm, and let the system fail safely when it fails. Healthcare is a risky industry and the mistake proofing tool is a good technique that was used from automobile industry to improve quality and patient safety.

CASE PRESENTATION: Mistake proofing uses changes in the physical design of processes to reduce human error. It can be used to change designs in ways that prevent errors from occurring, to detect errors after they occur but before harm occurs, to allow processes to fail safely, or to alter the work environment to reduce the chance of errors. Effective mistake proofing design changes should initially be effective in reducing harm, be inexpensive, and easily implemented. Over time these design changes should make life easier and speed up the process. Ideally, the design changes should increase patients' and visitors' understanding of the process.

CONCLUSION: The PSIC team felt that it was important to be able to determine whether the bed was at the correct angle from outside the room in the ICU. Their solution was to apply a label to the bed to indicate the correct angle (fig 33).). The label is easily made and installed, but requires a judgment call on what 30° looks like.

Keywords: *Endocrine; Drug design; Molecules*

Key Words: *cardiovascular diseases; Endocrinology; Diabetic eye disorders*

INTRODUCTION

Mistake proofing uses changes in the physical design of processes to reduce human error. It can be used to change designs in ways that prevent errors from occurring, to detect errors after they occur but before harm occurs, to allow processes to fail safely, or to alter the work environment to reduce the chance of errors. Effective mistake proofing design changes should initially be effective in reducing harm, be inexpensive, and easily implemented. Over time these design changes should make life easier and speed up the process. Ideally, the design changes should increase patients' and visitors' understanding of the process. These designs should themselves be mistake proofed and follow the good design practices of other disciplines.

CASE PRESENTATION

Mistake proofing is an old tool formalized by Shigeo Shingo from Toyota motors which contributed in what is called nowadays the 'Toyota Production System' that is synonymized with 'Quality'. The tool is used to reduce occurrence of errors, make errors hard to occur unnoticed, easy to correct errors before they can cause serious harm, and let the system fail safely when it fails. Healthcare is a risky industry and the mistake proofing tool is a good technique that was used from automobile industry to improve quality and patient safety. According to an article published in the Journal of Patient Safety in 2013 "premature deaths associated with preventable harm to patients was estimated to be more than 400,000" in hospitals. One of the key areas of implementation that made a positive difference in healthcare is Health Systems Design. Designing a safe healthcare system.

Mistake proofing uses changes in the physical design of processes to reduce human error. It can be used to change designs in ways that prevent errors from occurring, to detect errors after they occur but before harm occurs, to allow processes to fail safely, or to alter the work environment to reduce the chance of errors. Effective mistake proofing design changes should initially be effective in reducing harm, be inexpensive, and easily implemented. Over time these design changes should make life easier and speed up the process. Ideally, the design changes

NMC Royal Hospital, UAE

Correspondence: Wissam Abdul Hadi, NMC Royal Hospital, UAE, e-mail: wissam.ah@gmail.com

should increase patients' and visitors' understanding of the process. These designs should themselves be mistake proofed and follow the good design practices of other disciplines.

Processes occur in a physical environment populated with equipment, supplies, devices, and technologies. This paper is intended to help generate ideas about how this physical environment can facilitate processes—how design changes can make processes, executed by humans within a physical environment, more reliable and effective. It is about how changing the design of processes can prevent the performance of a prohibited action, ensure required actions are performed, or ensure that information required for correct action is available at the correct time and place, and that it stands out against a noisy background. Creating such designs is called "mistake proofing". It is also known by its Japanese slang buzzword "poka-yoke". The ideas and impetus for design changes will not come solely from a single area of expertise; rather, all medical personnel, doctors, nurses, technicians, engineers, designers, managers, and executives need to think about how the design of healthcare processes could be improved.

Examples of mistake proofing include "self-blunting" sharps and the revolving door style lid of a sharps container that insulates its users from its hazardous contents. The pin indexing systems common in medical gas connections in many hospitals is another example. Mistake proofing would also include high tech solutions like bar coding, automated medication dispensing systems, and electronic infant abduction detection systems. However, as a case study will show, many designs are far easier to change than these.

The Institute for Healthcare Improvement's "100 000 Lives Campaign"28 includes four recommended practices to reduce the incidence of ventilator associated pneumonia, also known as "the ventilator bundle". One of these practices is to ensure that the head of the bed is elevated to between 30° and 45°. Participants in the Patient Safety Improvement Corps (PSIC) from Mississippi29 implemented a simple mistake proofing design change to help ensure that this practice was being followed. Their design change was an instance of mistake prevention in the work environment, one of the weaker forms of mistake proofing. However, it had a few of the attributes of good mistake proofing and, while not eliminating errors, it has helped to reduce them substantially. A few alterations which may add additional attributes to the design will be proposed.

The PSIC team felt that it was important to be able to determine whether the bed was at the correct angle from outside the room in the ICU. Their solution was to apply a label to the bed to indicate the correct angle (fig 33).). The label is easily made and installed, but requires a judgment call on what 30° looks like. The staff quickly became adept at judging the angle, and the design change helped hospital personnel to determine more easily if something was wrong. The design change was a significant success.

CONCLUSION

Effective mistake proofing design changes should initially be effective in reducing harm, be inexpensive, and easily implemented. Over time these design changes should make life easier and speed up the process. Ideally, the design changes should increase patients' and visitors' understanding of the process. These designs should themselves be mistake proofed and follow the good design practices of other disciplines.