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KHI Journal Club

Date	March/April 2010
Reviewer	Anwar Al-Awadhi, MD
Title	System Changes to Improve Patient Safety
Authors	Thomas W. Nolan
Citation	Nolan TW. System changes to improve patient safety. BMJ 2000;320(7237):771-3.

The Author presents strategies to improve patient safety. Researchers have already documented errors in the medical system. The person performing the task safely can achieve reduction of errors. The Author illustrates the fact that we can't change the aspect of human cognition that causes the error, but we can design safety systems to reduce those errors.

- A) Strategies for the design:** 1) Prevent errors, 2) Procedures to make errors visible so they can be intercepted, 3) Mitigating the adverse effects, once an error has occurred.
- **Preventing Errors:** from the institution, organization, management, work environment, medical provider team, individuals, tasks and patients. Most of the time, the error involves mistakes from more than one party.
 - **Making Errors Visible:** to be corrected before harm occurs, e.g. cross checking of medication by doctor, nurse and pharmacist. Education of patients about their treatment so they can also identify the errors.
 - **Mitigation the Effect of Errors:** if undetected, process is needed to reverse, halt or stop the harm ASAP, e.g. an anti-dot of a drug given by mistake, should be readily available.
- B) Tactics to reduce errors and adverse effect:** Reduction in complexity by creating simple reliable and reproducible tasks and procedures. Optimizing information processing, using the automated processes when needed, implementing constrains, mitigating the unwanted side effect of changes.
- **Reduce Complexity:** researched found that complexity cause errors. Complexity measures like steps, number of choices, duration or execution, information, distracting tasks, patterns of interventions, could be adapted and improved over time. Reduce complexity be reducing delays, recover missing information and improve the delivery of care.
 - **Optimize Information Processing:** the goal is to increase the understanding and comprehension of the processes and procedures to reduce the dependence on memory. For example, using check lists

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and protocols, when providing care. Tools to adhere to given tasks, like color coding, elimination or minimizing of abbreviation. Making the information more readily available when needed.

- **Automate Wisely:** application of the electronic medication order entry, robotic medication packing system, reminders and the calculation of the correct dilution dosages of a drug.
- **Use Constrains:** error proof reading, medication alerts, physical, procedural and cultural constrains. Example, electronic system blockage or luck down, in an overdose order of a medication.
- **Mitigate the Unwanted Side Effect of Change:** in new medication, cross-reaction between drugs, procedures and monitoring equipments. This can be observed and analyzed through learning curves. Conclusions, adaptive methods and corrective actions can be drawn from those learning curves. This lead to the need for formal processes to predict errors and mitigate their effects, by implementing standardized contingency plans, trainings and reversal processes. Changes can be tested on small scales, then adaptive procedures and metrics can be established when problems are identified. During testing and implementation of procedures, monitoring of clinical outcomes, errors, and adverse effects over time leads to better decision making on corrective measures that needs to be adopted.

Setting Aims: To implement changes, will is a must. To achieve this, decreasing errors should be set in magnitudes or 1 per 100, or 1 per 1000 and so on. Research is vital in implementing those changes. Also, reduction of steps and tasks in the process due to the fact that in general, more steps mean more errors due to the increase in complexity and time of the delivery of care. In practice, some of the steps are hazardous but with fewer rates, the outcome of which is much worse than the rest of the steps with higher rates, but much lesser adverse outcomes. Changes in the system will produce a substantial safety improvement. More is yet to be learned about the design of health care systems that are effective and safe. Having said that, medical and scientific knowledge already exist to build a health care system that both the provider and the patient will benefit from.

KHI: The Kuwait health Initiative, has been building up the necessary resources and the expertise required to achieve the goals of providing safe, reliable, valid, reproducible, efficient, equitable and sustainable health care system, that the provider (medical Staff), receiver (patients) and the supervisor (regulatory authority), will all benefit from.