**Strengths of Interventions**

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When crafting an improvement plan, either proactively or in response to a safety event, the goal is to prevent future, similar systems errors. When evaluating potential solutions, it is important to consider the strength of the proposed interventions. The strongest interventions remove the human element from the process, often via process redesign that completely removes an error-prone, unnecessary step, a physical redesign or an electronic solution (Figure 1). Weaker interventions depend on individuals to remember to do the right thing or perform a double check. Although educational interventions are often a necessary component of the improvement plan and can be easiest to implement, these interventions by themselves are nearly always ineffective. Their impact usually vanishes quickly because of the multiple issues continually competing for each health care team member’s attention and the frequent turnover of members within many clinical teams (residents changing rotations, nurses off for a week, etc.). For this reason, the Institute for Healthcare Improvement (IHI) recommends that at least one strong or intermediate action be implemented to address key contributing factors to an event.1

Use of an action hierarchy tools can help the improvement team evaluate the strength of each proposed intervention. The Institute for Healthcare Improvement (IHI) recommends use of a detailed hierarchy, an adapted version of which is given in Figure 1.

Example: During Mortality and Morbidity conference, delays were noted in performing suction curettage to treat an immediate postpartum hemorrhage due to retained products of conception. Much of the delay was due to confusion related to which curette and suction tubing to use. The labor and delivery (L&D) technicians shared that they don’t use this equipment often, making it stressful for them to have to make it work in emergencies. A different group of technicians uses the suction equipment for missed abortions in the main operating room, which is physically remote from L&D.

The multi- and interdisciplinary L&D Patient Safety and Quality Improvement committee reviewed the event and planned two interventions. The first was to remove the extraneous smaller curettes and tubing because the immediately postpartum cervix reliably permits insertion of larger curettes. Now, only the 16mm and 20mm sizes and the larger tubing were stocked on L&D (Standardized equipment: a stronger intervention). A rotation was also established so that the L&D technicians could scrub suction curettage cases for missed abortions in the main operating room (Education: a weaker intervention). Follow-up data monitoring showed that the 16mm curette could also be safely omitted, further strengthening this intervention. Of note, the L&D technicians reported no longer needing to scrub cases in the main operating room after the equipment was simplified/standardized.

Figure 1 Action Hierarchy Tool

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| **Strength Category** | **Action Category** | **Example(s)** |
| **Stronger**  Actions rely on engineering or  environmental changes | Architectural or Physical Changes | -To reduce fall risk, replace an uneven threshold with a smooth,  seamless transition.  -Removal of all hook or loop points from rooms used for patients at risk  for suicide. |
| Implementation of New Devices with Usability  Testing | -Implementation of retained surgical sponge detection equipment with  education and training designed based on the specific organization’s  usability testing and noted work- arounds. |
| Forcing Functions | -Use of tubing and connections that only allow correct or intended  connections.  -Creation of an engineering-type hard stop that cannot be bypassed  unless appropriate steps occur first. |
| Simplify Process | -Removal of unnecessary, error prone step(s) in a process.  -Elimination of duplicate data entry. |
| Standardized Equipment | -Change over to all same branded and model IV pumps.  -Standard code cart equipment, placement and stocking. |
| Tangible involvement by  senior leadership | -Leadership visibly involved in unit/department safety evaluations and  interacting with staff. This includes supporting time for patient safety  and quality improvement work, purchases of needed equipment and  ensuring adequate staffing and workload balance. |
| Technology or Engineering Reliant Redundancy | -Addition of battery or generator back up for essential equipment.  -Ready availability of a backup piece of essential equipment. |
| **Intermediate**  Actions partially human reliant but have more sustainable components | Human Reliant Redundancy | -Require 2 RNs to independently calculate and confirm high-risk  medication dosage, route, etc.  -Require that 2 RNs independently trace IV tubing from the bag to the  correct IV pump. |
| Increase in Staffing/  Decrease in Workload | -Utilize float staff to assist during peak demands.  -Off load unnecessary work from cardiac monitor tech to allow focus on  monitors. |
| Software Enhancements | -Use of barcode scanning or computer-generated alerts for potential  drug interactions. |
| Eliminate or Reduce Distractions | -Use private, quiet rooms for IV pump programming  -Relocate medication dispensing machine to a private, quiet room. |
| Simulation-based training with periodic refresher sessions and observations | Conduct quarterly patient handoffs in a simulation lab/environment, with after action critiques and debriefing. Follow-up with observations between simulation sessions. |
| Checklists/Cognitive Aides | -Pre-induction and pre-incision checklists in operating rooms.  -Checklist for reprocessing hysteroscopy equipment  -Shadow boards to ensure that equipment is complete |
| Reduction of  look-alike or  sound-alikes | -Store look-alike and sound-alike medications in different medication  drawers.  -Replace look-alike and sound-alike medications with reasonable  alternatives. |
| Standardized Communication | -Use of read-back (check-back) for all critical results.  -Use of standardized patient hand-off template (i.e. I-PASS) |
| Enhanced Documentation or Communication | -Highlight medication name and dose on IV bags.  - Use a different color label for high-risk medications. |
| **Weaker**  Actions rely on human memory or vigilance. | Double Checks | -One person calculates a medication dosage, another reviews their  calculation. |
| Warnings | -Place caution labels on a medical device.  -Add audible alarms.  -Add Best Practice Alerts (BPA) that can be dismissed or bypassed. |
| New Procedure/ Memorandum/Policy | -Development of a new procedure or policy for urinary catheter  insertion.  -Policy requiring all to perform hand hygiene.  -Bulletin board flyer or email communication reminding staff how to  perform a certain task |
| Training/Education | -Education on correctly using a difficult-to-use medical device.  -Training on proper IV hub cleaning. |

Adapted from Institute for Healthcare Improvement1

Reference:

1Institute for Healthcare Improvement. “Action Hierarchy (part of RCA2).” <https://www.ihi.org/sites/default/files/SafetyToolkit_ActionHierarchy.pdf> Published 2019. Accessed February 5, 2025.