Leveraging Human Factors Engineering to Optimize Low Level Disinfection of Bedside Medical Tools

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BACKGROUND

• Inadequate cleaning and low-level disinfection (LLD) of shared medical equipment can lead to healthcare-associated infections and outbreaks.
• Stethoscopes were identified as the most commonly used piece of shared equipment at Children’s Hospital of Philadelphia (CHOP), but cleaning practices were inconsistent among providers.

OBJECTIVE

To assess provider attitudes and practices around stethoscope disinfection and to subsequently implement a change supported by human factors observations to improve cleaning consistency and frequency.

METHODS

• An electronic survey was created to understand the frequency of stethoscope cleaning, as well as to identify any barriers to cleaning regularly.
• Physicians, nurses, and advanced practice providers were eligible to participate.
• Human factors observations and workflow simulations were performed to design an intervention to standardize LLD.
• Small mesh baskets to house alcohol prep pads were installed at the exit of each patient room. (Fig 1)
• Procedure developed for LLD (Fig 2)
• Brightly-colored signage placed on the baskets to increase attention and to develop a visual cue for providers to clean equipment
• Outcome metrics were collected by a post-survey and direct observations.

RESULTS

Baseline Data

• 381 Providers surveyed (58% physicians, 2% advanced practice providers, and 39% nursing)
• 92% of all surveyed healthcare providers believe stethoscopes pose a transmission risk to patients.
• 38% of providers reported cleaning their stethoscope between patients. (Fig. 3)
• Most common cited barrier to cleaning: lack of easily accessible cleaning product (49%)
• Majority of inpatient units did not have alcohol pads readily available.

Post-Intervention

• Direct observations revealed an increased frequency of cleaning, while qualitative interviews elicited increased awareness from staff.
• 321 providers surveyed (54% physicians, 1% advanced practice providers, and 41% nursing)
• Of the 321 surveyed, 80% of providers who carry a stethoscope reported an increased frequency of cleaning.
• Increased low level disinfection was due to alcohol being more accessible (92%), consistent mounting location in every room (68%), and a brightly colored visual cue to disinfect equipment (10%).
• Increased satisfaction of families reinforced the behavior.

CONCLUSIONS

• Placement and design of easily accessible disinfection supplies informed by human factors engineering led to increased frequency of stethoscope cleaning by healthcare providers.
• Future steps include implementation in additional care areas, such as intensive care units and procedural areas.