Human Factors Engineering Approach, including Observations and Contextual Enquiry, to Improve Patient Room Cleaning.

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Abstract

Background

A clean patient environment is important to prevent transmission of multidrug resistant organisms in the hospital. Patient room cleaning is often performed inadequately. We apply a Human Factors Engineering (HFE) approach and collect different types of data, including observations, semi-structured interviews, and focus groups with environmental care associates (EVCA) to identify failure modes in the room cleaning process and potential solutions to improve room cleaning. Here, we present the observation data on daily cleaning.

Methods

An observation tool was developed by a transdisciplinary team, including HFE, hospital epidemiologists, infection preventionists, and a front line EVCA. Daily cleanings were observed by at least one human factors engineer. Contextual enquiry with the EVCA post-observation was used to clarify issues.

Results

We observed 7 EVCAs clean 70 rooms. Room cleanings lasted an average of 15.7 minutes, and 30.4 surfaces were cleaned per room. There were frequent interruptions, e.g. EVCA asked to leave the room by another healthcare worker (HCW) or asked to help a co-worker. Some surfaces were infrequently cleaned, such as the bed-rails which were touched only 42% of the time (see table for cleaning frequency of other surfaces). Upon contextual enquiry, EVCAs reported not cleaning items that were covered by patient belongings or in use by patients or other HCWs.

Conclusion

Many surfaces in the patient room are not consistently cleaned. Frequent interruptions and inability to access the surfaces may contribute. These results will inform interviews and focus groups with EVCAs, the next step in this iterative HFE process.

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Background

We applied a Systems Engineering Initiative for Patient Safety (SEIPS) 2.0 model for patient room cleaning. Using this model, which is anchored within HFE, patient room cleaning is collaborative work of EVCA, healthcare providers (eg, nurses), and patients and their families, who perform different tasks (eg, cleaning high-touch surfaces, communication), with various tools and technologies (eg, cleaning tools and supplies, checklists), under certain organizational conditions (eg, safety culture, work schedule), in an internal (eg, patient room and bathroom) and external (eg, social attitude, regulations) environment. See figure 1.

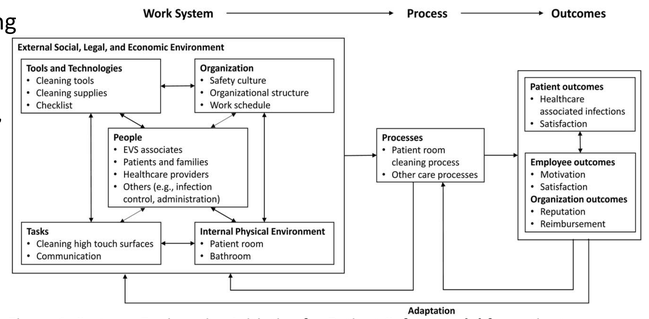

Figure 1: Systems Engineering Initiative for Patient Safety model for patient room cleaning. EVS, environmental services.

Methods

An observation tool for patient room cleaning was developed. See figure 2. A similar tool was also used for the patient bathroom. Each observation was conducted by a research team member. A convenience sample of front line EVCA volunteers were observed.

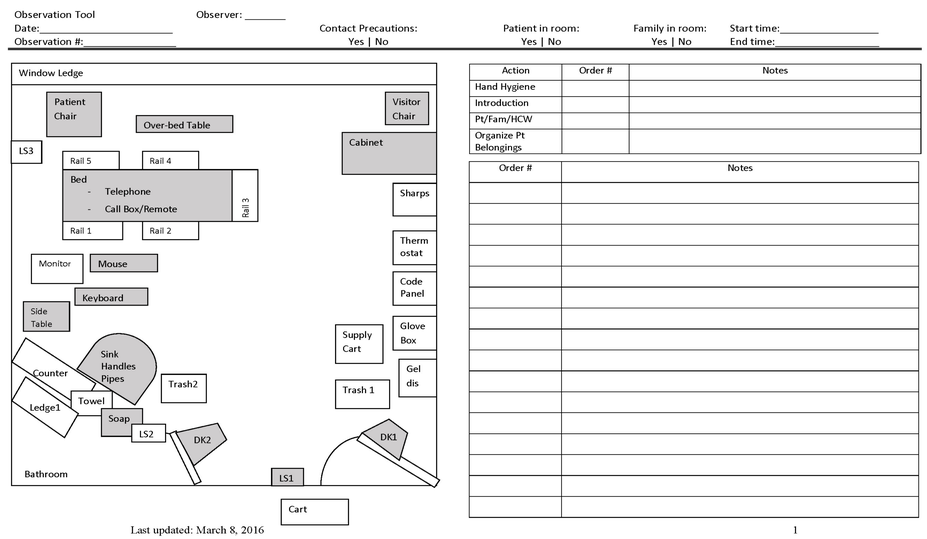

Figure 2: Observation tool for patient room cleaning.

Results

Observations of 7 EVCAs who cleaned 70 rooms are reported. The majority (59/70, 84%) of rooms were cleaned with the patient present; 13/70 (19%) with both patient and family present. Table 1 shows the surfaces that were touched during the cleaning process. Some surfaces were touched less frequently, such as the bed rails, cabinet and patient chair.

Table 1: Cleaning of High Touch Surfaces in the Patient Room and Bathroom

High Touch Surfaces	Number of rooms where surface was touched	Number of rooms where surface was present	Percent touched
Bed rails (5 rails/room)	29	69	42%
Cabinet	35	70	50%
Telephone	38	70	54%
Patient Chair	36	66	55%
Side Table	38	68	56%
Visitor Chair	37	61	61%
Call box/Remote	44	70	63%
Bathroom Doorknob	38	58	66%
Grab bar	44	65	68%
Bathroom Sink	40	58	69%
Towel bar	49	70	70%
Main Room Light Switch	48	69	70%
Bathroom Light Switch	52	69	75%
Bathroom Soap Dispenser	44	58	76%
Main Room Soap Dispenser	47	61	77%
Over Bed Table	55	70	79%
Keyboard	56	70	80%
Main Room Sink	50	61	82%
Flush handle	58	70	83%
Main Room Doorknob	59	70	84%
Mouse	59	70	84%
Toilet Seat	61	70	87%
Supply cart	24	26	92%

There were multiple interruptions including other EVCA asking for help or supplies, asked to leave by other healthcare workers for procedures. Contextual inquiry confirmed that some items were not cleaned as they were in use or covered by other items.

Conclusion

Many surfaces in the patient room are not consistently cleaned. Frequent interruptions and inability to access the surfaces may contribute. Next steps in this study are to conduct semi-structured interviews with EVCA to further identify barriers and facilitators to patient room cleaning.