



# Cleaning Practices for Hospital Mattresses in Top US Adult Hospitals

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## Background:

Manufacturers of hospital beds and mattresses recommend cleaning the mattress first with soap and water, disinfecting the surface, and then rinsing the surface. It is also recommended to only use disinfectants with a pH of 5-7. Quaternary ammonium compounds, hypochlorite and other chlorines, and phenolics are the most commonly used industrial disinfectants in the United States. The problem is that these compounds are approved by the Environmental Protection Agency for use on "hard inanimate surfaces." Since mattresses and other furniture in hospital rooms are soft porous surfaces, it means that use of these compounds to clean hospital mattresses would "off-label." All testing for approval is done on hard surfaces, and performance of these products on soft surfaces is unknown.

## Objectives:

Determine the extent to which hospital mattresses and bed decks are being disinfected.

## Methods:

All the top 113 hospitals for 2011-2012, as listed in the US News & World Report, were contacted by phone and asked about their cleaning procedures for hospital mattresses. Each respondent from environmental services was asked five questions: What chemical do you clean your beds and mattresses with? How do you mix or dilute the chemical? How long do you leave the chemical on the bed or do you just let it dry on the bed? Do you use anything other than that chemical first, like soap and water? Do you rinse off the cleaner after you clean the bed?

## Results:

Of the top hospitals, 69 (61%; 95% CI, 52-70%) agreed to answer the survey questions. Six (5%; 95% CI, 3-11%) refused to participate and 38 (34%; 95% CI, 26-43%) could not be reached after multiple attempts.

### Chemicals Used:

quaternary ammonia compounds (58/69; 84%; 95% CI 74-91%), bleach compounds (7/69; 10%; 95% CI 5-19%), phenolic cleaners (3/69; 4%; 95% CI 1-12%), and hydrogen peroxide (1/69; 1%; 95% CI 0-8%).

### pH of Chemicals

67 (97%; 95% CI, 90-99%) two hospitals were using disinfectants with a pH between 5 and 9, as recommended by the manufacturers.

### Cleaning Prior to Disinfection

16 (23%; 95% CI, 15-34%) of the hospitals reported cleaning the mattress prior to disinfection.

### Rinsing after Disinfectant Use

6 (9%; 95% CI, 4-18%) reported rinsing off the disinfectant after use.

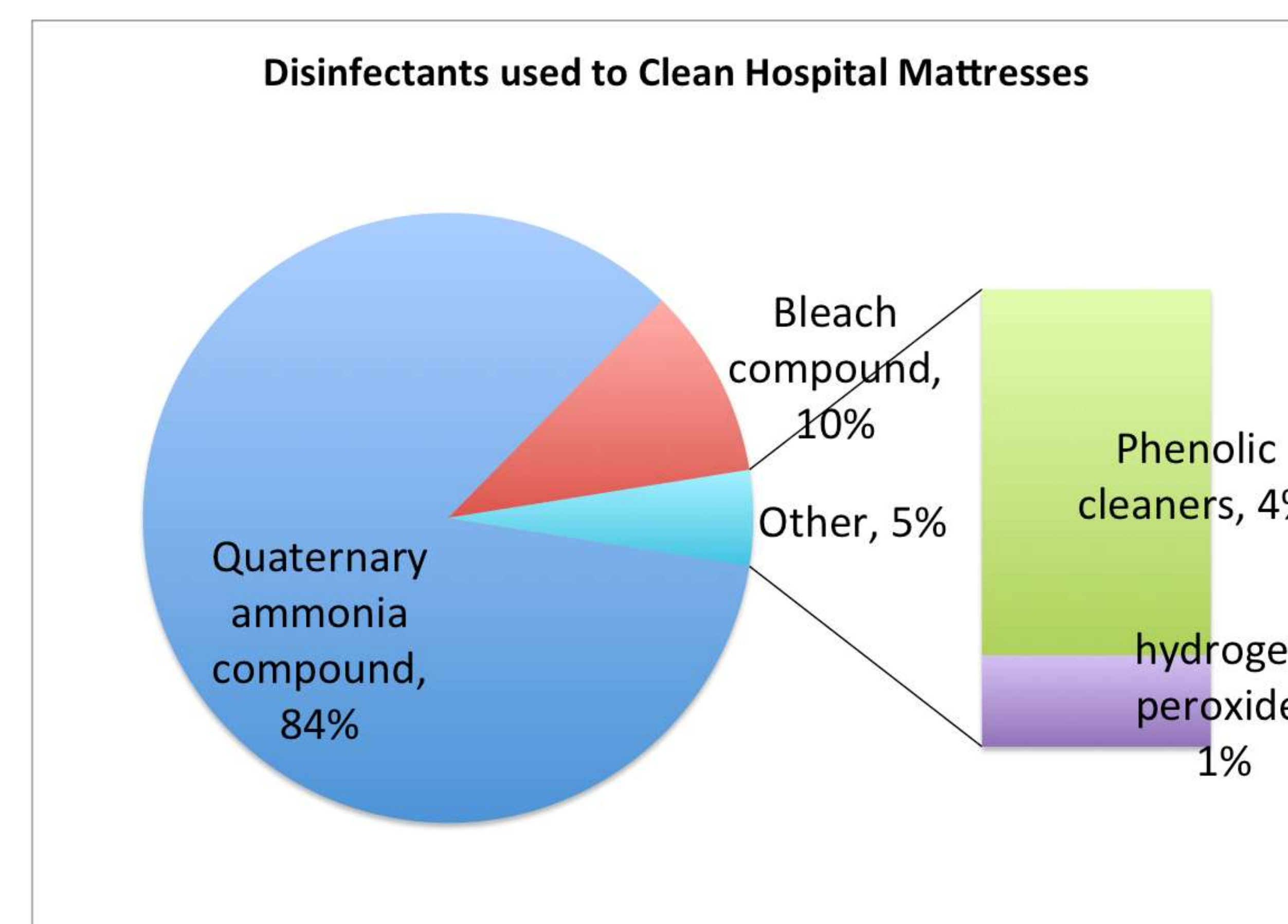
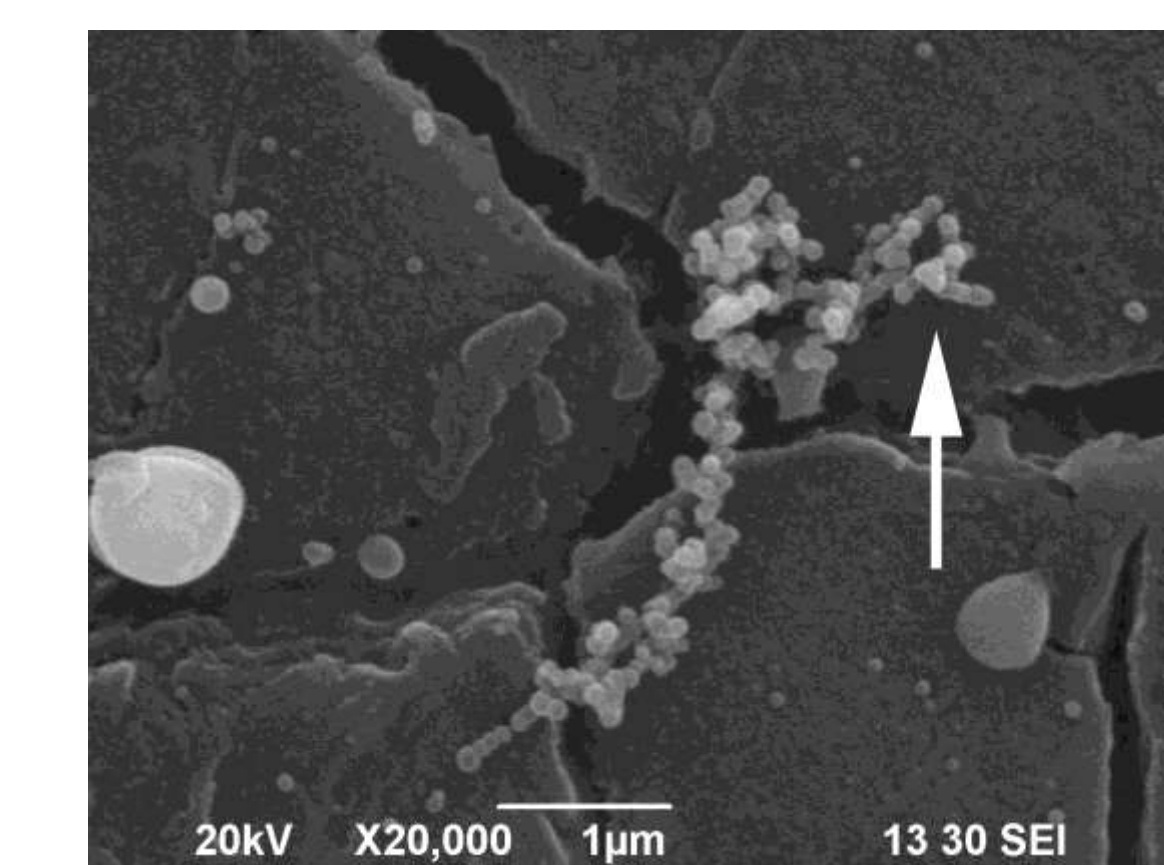
### Rusted Bed Deck from use of Quaternary Ammonia Compounds



### Damaged Mattress from use of Quaternary Ammonia Compounds



### SEM of cleaned mattress surface showing cracking and bacteria



## Conclusions:

Most top adult hospitals in the U.S. do not follow manufacturer's recommendations on appropriate cleaning and disinfection of hospital mattresses. This failure may result in inadequate cleaning and may damage the surface of the mattresses and ruin the bed.