

temperature for several weeks. Each week, viral titers decreased by 2-3 logs<sub>10</sub> and after 28 days viral infectivity was completely lost. Analysis of RNA copy numbers revealed no drop in genome copy numbers during this time period.

Conclusions: This study describes a novel system for the validation of chemical disinfectants active against HCV by analyzing virucidal activity of various alcohols and hand disinfectants using a quantitative suspension assay. In addition, HCV stability was determined at different temperatures and data demonstrated no correlation between infectivity and RNA levels. The described assay and these data should be useful to define rigorous disinfection protocols to prevent nosocomial transmission of HCV.

Presentation Number: 2-23

## Rapid Containment of a Norovirus Outbreak in an Acute Care Hospital Rehabilitation Unit

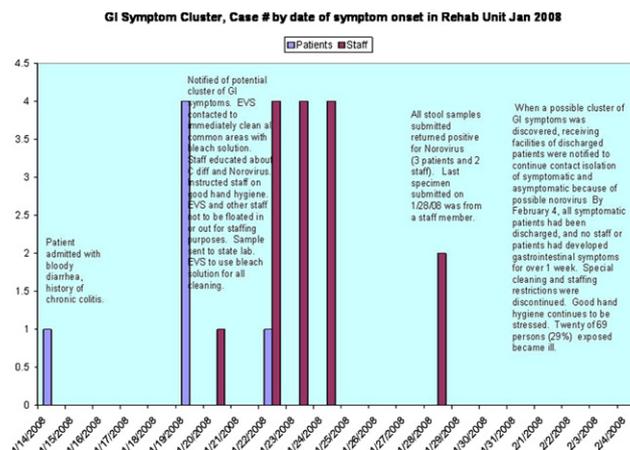
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Issue: Norovirus (calicivirus) is spread through direct contact with an infected person or by touching a contaminated object or surface and then placing the hands near the mouth. Infection generally causes illness within 24-48 hours of exposure, but can occur within 10 hours of exposure. Symptoms include diarrhea, cramps, nausea, and vomiting. Infected persons are contagious from the time of symptom onset until about 2 weeks later. Norovirus is not a serious illness, except when diarrhea and vomiting cause dehydration in the elderly and young. (1, 3)

Project: The Infection Preventionist was notified that 4 patients had developed diarrhea and some staff had diarrhea and vomiting on 21 January 2008. (2)

Immediate decisions:

- ü County Health Department, administration, and medical advisor for Infection Prevention & Control Committee notified
- ü Staff and patients informed about hand hygiene; washing with soap and water recommended, but use of an alcohol-based sanitizer allowed (3)
- ü CDC Fact Sheets on norovirus and *Clostridium difficile* posted (4)
- ü Housekeeping contacted to begin cleaning all high-touch areas with a 1:50 concentration of bleach solution and to change rags frequently; group areas and rooms underwent a "terminal clean" (6)
- ü Stool specimens collected from symptomatic patients and staff (3)



- ü Patients allowed to continue rehabilitation in a group setting, but had to practice good hand hygiene, change clothes afterward, and immediately clean equipment and mats used (1)
- ü Staff not allowed to “float”
- ü Outbreak details communicated to other facilities when patients transferred; isolation of patients recommended

Results: The suspect index case was admitted 4 days before outbreak onset. He was homeless, had diarrhea on admission, and was discharged before others developed symptoms. Five patients and 15 staff developed symptoms; 5 had norovirus-positive stool specimens. The outbreak was contained to 9 days.

Lessons Learned: Prompt identification of infection and proper cleaning of the environment and hands can prevent a gastrointestinal virus outbreak. The outbreak was contained because the hospital promptly notified the Infection Preventionist of a possible outbreak, the Executive team willingly followed Infection Control recommendations, Environmental Services immediately initiated the appropriate cleaning protocol, and laboratory personnel processed stool specimens quickly.

#### References:

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4. Norovirus in Healthcare Facilities Fact Sheet, 2006, [http://ncidod/dhqp/id\\_norovirusFS.html](http://ncidod/dhqp/id_norovirusFS.html)
5. Siegel JD, Rhinehart E, Jackson M, Chiarello L, and the HICPAC Committee, 2007 Guideline for Isolation Precautions: Preventing Transmission of Infectious Agents in Healthcare Settings, June 2007
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## **The Assessment of the Sporicidal Activity of Selected Environmental Surface Disinfectants Using Spores of *Clostridium difficile***

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Background/Objectives: The emergence of the NAP1 strain of *Clostridium difficile* (*C. difficile*), an anaerobic spore-former, as a major nosocomial pathogen, points to the need for safe, effective and fast-acting environmental sporicides for infection control. Available formulations which are effective in inactivating such spores in a contact time of a few minutes can be corrosive and unsafe for humans and the environment. This study was aimed at evaluating the sporicidal activity of selected formulations at their drying time.

Methods: The quantitative carrier test (QCT), which is a standard (E2111) of ASTM International was used for sporicidal tests against spores of *C. difficile* and its surrogates *Bacillus subtilis* and *Clostridium sporogenes* with contact times of 1, 5 and 10 minutes at  $20 \pm 1$  °C. The tested products were a 4.5% AHP sporicidal gel, and domestic chlorine bleach at 500 PPM and 5000 PPM of free available chlorine (FAC).

Results: In sporicidal tests, 4.5% AHP and bleach at 5000 PPM of FAC inactivated  $>6 \log_{10}$  of viable spores of all three types at 10 min contact, but were unable to do so after 1 min. Bleach at 500 PPM of FAC did not show any significant sporicidal activity even after 10 min. In drying tests, 4.5% AHP remained wet for the entire 10min contact time, while Bleach dried in about 4 min.

Conclusions: 4.5% AHP sporicidal gel (tested undiluted) and bleach at 5000 PPM of FAC showed strong activity at 10 min against all three types of spores tested. The gel was able to keep the surfaces wet for the entire 10 min required