facility were identified. Statewide notices were distributed to hospitals, ambulatory care centers, and infection control professionals in January 2003 and October 2004.

RESULTS: Between December 2002 and December 2006, 17 healthcare facilities reported to CDHS that they had inadequately reprocessed endoscopes, and requested assistance. As a result of these exposures, over 9000 patients were notified of potential exposure to bloodborne pathogens and offered free testing. Media reports occurred in 12 of 17 instances, either through ''leaks'' or hospital press releases, and correlated with the number of patients notified. The number of reported deficiencies decreased following each statewide notice, but still continued to occur. The nature of deficiencies has shifted from procedural and technical natures to personnel errors. These included items such as laryngoscopes that were reprocessed at point of use rather than central services, or changes in endoscopes or policies, often without the knowledge of infection control staff. Hospitals are increasingly tracking the reprocessing of endoscopes and their use in patients, as recommended by CDHS in 2004, but this appears to be less common in ambulatory care settings. In 2006, outbreaks of infections occurred in association with the use of endoscopes occurred in two hospitals.

LESSONS LEARNED: Inadequate reprocessing of endoscopes and related equipment can lead to notification and testing of large numbers of patients, resulting unwelcome publicity, patient anxiety, testing costs, identification of infections of uncertain source, and lawsuits. Adequate reprocessing requires identification of all equipment requiring reprocessing, the development of appropriate policies and procedures, training and competency testing of employees and their backups, and attention to equipment design, function, and maintenance. Any inadequately reprocessed endoscope posed a risk of transmission of bloodborne pathogens. The assessment of the magnitude of risk and decisions for appropriate patient testing for the exposure incident are best addressed on a case-by-case basis. Regardless of the estimated risk, CDHS recommends notification of all patients who might have been at risk.

Publication Number 7-86

Prevention and Control of Norovirus Outbreaks in Long-Term Care Facilities: The California Experience, 2002-2007

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ISSUE: Norovirus outbreaks are common, occur seasonally, and disproportionately affect long-term care facilities (LTCF), particularly skilled nursing facilities (SNF), where the transmission is almost always person-to-person. In 2002 the California Department of Health Services recognized that the etiology and nature of transmission of such outbreaks were often not recognized, and therefore poorly reported, investigated or controlled.

PROJECT: A series of interventions were implemented to improve the control of norovirus outbreaks in California LTCF. A guideline for the control of outbreaks of acute gastroenteritis was developed and distributed to all licensed healthcare facilities, local health departments (LHD), and licensing and certification (L&C) offices in December 2002 and annually thereafter. Sample line listings for ill residents and staff and a sample summary log were included, and facilities encouraged or, in some cases, required by LHD or L&C to be reported. A guideline for the investigation of norovirus outbreaks was developed and distributed to LHD and L&C offices in December 2003. Because of ongoing questions from LHD, a control checklist and supplemental guidelines in the form of questions and answers were distributed in December 2006 and January 2007. Where line listings were available, epidemiologic curves were generated and examined for efficacy of control interventions.

RESULTS: The initial publication of the guideline was followed by an immediate increase in reports of outbreaks to local health departments and L&C offices. In 2007, in response to an apparent increase in outbreaks compared to previous years, issues not anticipated in the guidelines arose from LHD and were addressed in supplemental guidelines. Issues included closure of the facility to new admissions and/or visitors, restriction of workers from

working at other facilities, the duration of exclusion of ill employees, restriction of asymptomatic residents to their rooms (quarantine), use of alcohol hand hygiene products, and methods of cleaning and disinfection including the use of disinfectants registered by the Environmental Protection Agency (EPA) as effective against norovirus. Some epidemiologic curves showed rapid diminutions in daily case counts, possibly in association with implementation of recommended control measures, while others continued for weeks until resident attack rates of reached 50-70%. Control appeared to be unlikely when four or more of residents became ill on a single day, often anecdotally associated with residents or staff vomiting in a location that exposed multiple persons and/or contaminated frequently touched and difficult to clean environmental surfaces.

LESSONS LEARNED: Outbreaks of norovirus are common in LTCF, occur seasonally, and are transmitted person-to-person propagated by direct exposure to vomitus and contact with ill persons and contaminated environmental surfaces. The key to containment is early recognition and implementation of control measures. Specific studies to determine best methods to achieve control are needed.

Environment of Care/Construction/Remediation

Publication Number 8-87

Brown Water in the Building: Infection Control and Engineering Lessons Learned from a Water Supply Incident

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ISSUE: Potable water service had to be interrupted in our facility one morning due to multiple concerns regarding a sudden discoloration of water and loss of water pressure.

PROJECT: The following actions were taken: 1) The impact of the lack of water in high-risk areas (ie. OR, ER, dialysis) was assessed and prioritized, 2) The hospital went into alert/diversion mode, 3) Water bottles were distributed for patients and staff, 4) Water samples were taken on the discolored water from various areas in the facility, 5) The main water tank was drained, cleaned, and disinfected with chlorine and then refilled with city water. The water was tested for chlorine with a 5.0 ppm of chlorine achieved, 6) The entire water system was flushed using the hyperchlorinated water and tested to achieve $\geq$1.0 ppm of chlorine in terminal areas, and 7) Surveillance for water-borne diseases was initiated.

RESULTS: No water-borne pathogens were identified in water samples before an after the chlorination. The potable water system was cleared for use before midnight on the same day. There were no adverse outcomes or cases of water-borne diseases.

LESSONS LEARNED: This was a temporary interruption in our water supply, but the hospital response was appropriate, controlled and carried out in order to ensure patient safety was not compromised. Cooperation between engineering, environmental services, infection control, industrial safety professionals, hospital leadership, and third-party testing companies was key to restore water service the same day with minimal operational impact.

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