

University of Rhode Island

DigitalCommons@URI

---

Infectious Diseases in Corrections Report (IDCR)

---

6-2008

## IDCR: Infectious Diseases in Corrections Report, Vol. 9 No. 23

Infectious Diseases in Corrections

Follow this and additional works at: <https://digitalcommons.uri.edu/idcr>

---

### Recommended Citation

Infectious Diseases in Corrections, "IDCR: Infectious Diseases in Corrections Report, Vol. 9 No. 23" (2008). *Infectious Diseases in Corrections Report (IDCR)*. Paper 94.

<https://digitalcommons.uri.edu/idcr/94><https://digitalcommons.uri.edu/idcr/94>

This Article is brought to you for free and open access by DigitalCommons@URI. It has been accepted for inclusion in Infectious Diseases in Corrections Report (IDCR) by an authorized administrator of DigitalCommons@URI. For more information, please contact [digitalcommons@etal.uri.edu](mailto:digitalcommons@etal.uri.edu).



# IDCR

**INFECTIOUS DISEASES IN CORRECTIONS REPORT**  
JOINTLY SPONSORED BY NOVA SOUTHEASTERN UNIVERSITY HEALTH PROFESSIONS DIVISION

**FORMERLY HEPP Report**

June 2008 Vol. 9, Issue 23

Release Date: June 1, 2008  
End Date: June 30, 2009

## ABOUT IDCR

IDCR, a forum for correctional problem solving, targets correctional physicians, nurses, administrators, outreach workers, and case managers. Published monthly and distributed by fax and email, IDCR is ACCME accredited and free of charge. Since its founding in 1998, IDCR has served as an important resource for correctional health care providers by offering the newest and most relevant information on the management and treatment of infectious diseases within the correctional setting.

Continuing medical education credits are provided by Nova Southeastern University Health Professions Division. This publication is jointly sponsored by IDCR and NSU. This activity has been planned and implemented in accordance with the Essential Areas and Policies of the Accreditation Council for Continuing Medical Education through the joint sponsorship of NSU and IDCR. NSU is accredited by the ACCME to provide continuing medical education for physicians.

Nova Southeastern University (NSU) Health Professions Division designates this educational activity for a maximum of 1 AMA PRA Category 1 Credit™. The target audience for this educational program is physicians.

**COMMERCIAL SUPPORTERS**  
None

**MANAGING EDITOR**  
Elizabeth Closson  
IDCR  
**Disclosures:**  
Community Advisory Board,  
Tibotec Therapeutics

**LAYOUT**  
Jose Colon  
Corrections.com  
**Disclosures:**  
Nothing to disclose

**DISTRIBUTION**  
Corrections.com  
**Disclosures:**  
Nothing to disclose

## CONTROL OF VIRAL GASTROENTERITIS WITHIN JAILS AND PRISONS

- **Main Article - Table 1:**  
Reported and estimated illnesses, frequency of food-borne transmission, and hospitalizations for known food-borne pathogens, United States- 2004
- **Main Article - Table 2:**  
The Kaplan Criteria for determining whether an outbreak of gastroenteritis is of viral origin
- **Table 3:**  
Sample Case Log of Residents and Staff with Acute Gastrointestinal Illness
- **101:**  
Preparation of Bleach Disinfectant Solutions

### OBJECTIVES

- The learner will be able to describe the epidemiology, transmission, symptoms, and signs of noroviruses.
- The learner will be able to explain the most effective norovirus infection control and containment methods.
- The learner will be able to discuss useful ways to educate inmates, health care professionals, and administrative staff on the prevention and containment of noroviruses.

### DISCLOSURES AND CREDENTIALS:

**EXECUTIVE EDITOR**  
**Anne S. De Groot, MD**  
Associate Professor of Medicine  
(Adjunct)  
The Warren Alpert Medical School  
of Brown University

**Disclosures:**  
Nothing to disclose

**CHIEF EDITOR**  
**Joseph Bick, MD**  
Chief Deputy, Clinical Services  
California Medical Facility,  
California Department of Corrections  
and Rehabilitation

**Disclosures:**  
Nothing to disclose

**DEPUTY EDITORS**  
**David A. Wohl, MD**  
Associate Professor of Medicine  
University of North Carolina  
AIDS Clinical Research Unit

**Disclosures:** Abbott Laboratories,  
Gilead Sciences, Inc., Tibotec  
Therapeutics, Roche Pharmaceuticals,  
Merck & Co., Boehringer-Ingelheim,  
Bristol-Myers Squibb.

**Renee Ridzon, MD**  
Senior Program Officer  
HIV, TB, Reproductive Health  
Bill & Melinda Gates Foundation

**Disclosures:**  
Nothing to disclose

### Purpose Statement

The purpose of this monograph is to increase the knowledge of physicians in correctional systems regarding strategies for the prevention, containment, and treatment of noroviruses.

### Instructions for Credit

To obtain credit read the Main Article, Table 1, Table 2, Table 3, and 101 sections of the monograph. When completed with these items, complete the post test and evaluation on the last page of the monograph. You must receive a test score of at least 75% and respond to all evaluation questions to receive a certificate. Mail or fax the post test and evaluation to:

**IDCR**  
146 Clifford Street  
Providence, RI 02903

or fax it to (401)272-7562

### FACULTY DISCLOSURE

In accordance with the Accreditation Council for Continuing Medical Education Standards for Commercial Support, the faculty for this activity have been asked to complete Conflict of Interest Disclosure forms.

### DISCLOSURES: MAIN ARTICLE

**Joseph Bick, MD**  
Chief Deputy, Clinical Services  
California Medical Facility,  
California Department of Corrections  
and Rehabilitation

**Disclosures:**  
Nothing to disclose



Go to [www.AAHIVM.org](http://www.AAHIVM.org) to learn about membership, continuing education and the new partnership with IDCR

## CONTROL OF VIRAL GASTROENTERITIS WITHIN JAILS AND PRISONS

### Joseph Bick, MD

Chief Deputy, Clinical Services  
California Medical Facility,  
California Department of Corrections  
and Rehabilitation

**Disclosures:** Nothing to disclose

### Introduction

The noroviruses are a group of related viruses in the Caliciviridae family. The name "norovirus" comes from the first identified member of this group, which was isolated from diarrheal stools in 1972 during an outbreak of gastroenteritis in an elementary school in Norwalk, Ohio. Subsequently, noroviruses have been identified as the most common cause of gastroenteritis in the U.S. Noroviruses cause an estimated 23 million cases of gastroenteritis each year in the U.S., more cases than are caused by all other viral, bacterial, and parasitic agents combined. Although noroviruses circulate year-round, epidemics are most commonly recognized in the winter and early spring.

Outbreaks of gastroenteritis due to noroviruses are especially common in congregate living environments such as hospitals, long term

care facilities, military barracks, summer camps, and cruise ships. More recently, noroviruses have been identified as the cause of gastroenteritis outbreaks in jails, prisons, and detention facilities. Norovirus outbreaks have the potential for significant morbidity, occasional mortality, and disruption in the routine operation of correctional facilities. This article provides recommendations to assist medical and custody personnel in the diagnosis, treatment, and containment of gastroenteritis outbreaks in the correctional setting.

### Epidemiology

There are approximately 267,000,000 episodes of diarrhea among adults in the U.S. each year, resulting in an estimated 612,000 hospitalizations and 3,000 deaths.<sup>1</sup> An etiologic agent is identified in less than 10% of these cases of diarrhea, and most persons with acute diarrhea do not seek medical care as a result of their illness. The very young, the elderly, and the immunocompromised are most affected by these illnesses.

Little has been published on the frequency and etiology of diarrheal illness among the incarcerated. Inmates often store food in their cells or dorms for later consumption, and do

not usually have access to refrigeration or cooking appliances. Perishable food stuffs can be a source of viral and bacterial gastroenteritis. In non-incarcerated institutional settings, toxins and over 200 different bacteria, viruses, fungi, and parasites have been identified as the source of diarrheal outbreaks. Contaminated foods that have been linked to diarrheal illness include pork<sup>2</sup>, chicken<sup>3</sup>, ground beef<sup>4</sup>, milk<sup>5</sup>, unpasteurized apple cider<sup>6-7</sup>, spinach<sup>8</sup>, eggs<sup>9</sup>, raspberries<sup>10</sup>, onions<sup>11</sup>, raw nuts<sup>12</sup>, cantaloupe<sup>13</sup>, tomatoes<sup>14</sup>, soft cheeses<sup>15</sup>, and shellfish.<sup>16</sup> **Table 1** details the estimated total number of cases, frequency of food-borne transmission, and hospitalizations for the most common causes of infectious organisms that can cause diarrhea in the U.S..

### Signs and symptoms of noroviruses

The incubation period for norovirus following infection is 12-48 hours. In healthy adults, clinical signs and symptoms are generally mild and of short duration, usually 12-60 hours. The illness can be more severe in the elderly and others who have compromised immunity. Rarely, severe dehydration due to norovirus can be fatal. There are no known long-term sequelae that result from norovirus infection. Most of those who become ill experience the sudden onset of nausea, vomiting, abdominal cramps, and diarrhea. Constitutional symptoms including low-grade fever, headache, chills, and myalgias are common. Patients may experience only vomiting, commonly referred to as winter vomiting disease.<sup>17</sup> Diarrhea due to norovirus is usually watery, and less severe than that caused by bacteria. After recovery from illness due to norovirus, individuals generally experience short-lived immunity from recurrent illness and are therefore susceptible to repeated infection and disease within 6 months.

### Transmission

Viral gastroenteritis can be introduced into a jail or prison by employees, visitors, volunteers, or inmates who are transferred into the facility. Less frequently, the virus can enter a facility in contaminated food or water. Norovirus is excreted in the stool of infected persons, and can be shed from those who do not become clinically ill. Excretion of virus precedes clinical illness and can persist for more than a week after symptoms resolve.<sup>18-20</sup> Noroviruses are readily spread from person to person, by fomites, and from contaminated environmental surfaces. The major route of transmission is person to person (fecal-oral) via hands contaminated with feces or emesis. Norovirus is characterized by both a low infectious dose (<100 viral particles) and a high attack rate among exposed persons.<sup>21</sup> The prolonged shedding of virus in the stool of asymptomatic persons increases the likelihood of transmission by infected food handlers. Noroviruses can survive temperature extremes from freezing to 140 F, and resists killing by numerous disinfectants including relatively high levels of chlorine.<sup>22</sup>

### Diagnosis

The first and most important step in the diagnosis of gastroenteritis is to remain vigilant, especially when norovirus is known to be circulating in the outside community. Once viral gastroenteritis is suspected, a rapid definitive diagnosis of the causative agent will help

## LETTER FROM THE EDITOR

### Dear Correctional Colleagues,

Each year, over 30 million cases of infectious diarrhea are diagnosed in the United States. The overwhelming majority of these illnesses are due to viral pathogens, of which noroviruses are the most common. Gastroenteritis outbreaks due to noroviruses have been reported in numerous settings, including schools, day care, restaurants, military barracks, and cruise ships. More recently, norovirus outbreaks have been diagnosed in correctional facilities.

Jails and prisons are perfect settings for the incubation and propagation of viral gastroenteritis. In many ways, correctional facilities are functionally very similar to large cruise ships. Both house hundreds if not thousands of transient residents and employees, and in both settings the residents utilize a common source for food, water, and laundry. Eating is the main recreational activity for both inmates and cruise ship passengers, and neither inmates nor cruise ship passengers can depart their vessel at will.

One important difference complicating gastroenteritis outbreaks in the correctional setting is that in most jails and prisons, inmates perform much of the essential work including culinary, house-keeping, grounds keeping, painting, and building maintenance. When a contagious disease outbreak such as viral gastroenteritis hits a correctional institution, the sudden loss of large numbers of critical workers can severely impact day-to-day operations. Clearly, a prompt and effective infection control response to contagious disease outbreaks is essential for both public health and institutional safety and security.

This month's issue of *IDCR* provides useful information and recommendations regarding the diagnosis and management of viral gastroenteritis in a correctional setting. It is our hope that by preparing in advance, you, our correctional colleagues, will be better prepared to respond if/when your facility is impacted by a gastroenteritis outbreak. As always, we welcome your feedback on this and every issue, and encourage your recommendations regarding future infectious diseases topics of interest.

Sincerely,

### Joseph Bick, MD

Health Care Manager  
Chief Deputy, Clinical Services  
California Medical Facility  
California Department of Corrections and Rehabilitation

## CONTROL OF VIRAL GASTROENTERITIS... (continued from page 2)

guide strategies for infection control and containment. An outbreak should be suspected if > 2 inmates and/or employees concurrently develop nausea, vomiting, and diarrhea. The coexistence of vomiting and diarrhea is a useful clue to the presence of norovirus.

During a suspected outbreak, fresh stool should be collected from six to twelve persons. In addition to testing specimens for norovirus, stool should be cultured for campylobacter, salmonella, and shigella. If the stool is bloody, it should also be tested for *E. coli* 0157:H7. Noroviruses cannot be cultured. Options for diagnosis include direct visualization of viruses by electron microscopy (EM), enzyme-linked immunosorbent assays (EIA) for detection of virus in stool, the serologic detection of a fourfold increase of specific antibodies in acute- and convalescent-phase blood samples, and the use of reverse-transcription polymerase reaction (RT-PCR).<sup>22-25</sup> Because most adults have been infected with norovirus at some point, the simple presence of IgG antibody to norovirus is not useful in terms of making a diagnosis. Serologic diagnosis, therefore, requires detecting either virus-specific IgM antibodies or rising antibody titers in paired acute and convalescent blood samples. The time lag involved in the development of antibodies further limits the usefulness of serological diagnosis. Currently available EIAs are insufficiently sensitive and specific to justify more widespread use at this time. RT-PCR has significantly improved the ability to rapidly and accurately diagnose norovirus as the cause of gastroenteritis outbreaks. Most state public health laboratories can test stool, emesis, rectal swabs, and environmental swabs for noroviruses utilizing RT-PCR. Norovirus can be identified from stool specimens taken between 2 and 7 days after onset of symptoms. Once the presence of norovirus has been confirmed within a facility, additional cases can be diagnosed with sufficient accuracy utilizing clinical criteria. One such definition, the Kaplan criteria, is quite specific for viral gastroenteritis (see Table 2).<sup>26</sup>

### Treatment

There are no specific antiviral therapies for norovirus, and in most cases, oral re-hydration is sufficient. Occasionally, anti-emetics, intravenous fluids, and/or electrolyte replacement therapy is necessary.

### Infection control and containment

In the absence of prompt, thorough infection control measures, norovirus can circulate within an institution for an extended period of time. Managing an institutional outbreak of any contagious illness requires close collaboration between medical and custody staff. During an outbreak of gastroenteritis, movement of inmates should be restricted as much as possible. Even those who are not symptomatic may be incubating the virus, and can spread the illness to others. Movement in and out of the impacted housing units should be limited. Viral gastroenteritis is more likely to be spread in congregate settings. For this reason, strong consideration should be given to temporarily suspending indoor group activities such as visitation, school, and religious services. Inmates who are experiencing nausea and/or vomiting should be confined to quarters until they have been asymptomatic for at least 48 hours. Likewise, employees who are

ill should be encouraged to stay away from the worksite until they have been without symptoms for at least 48 hours. Sick inmates should be fed in their cell, dorm, or housing unit.

If possible, well inmates should eat in groups by unit. The placement of alcohol-based hand cleansers at the beginning of feeding lines should be considered. Dining areas should be cleaned and then wiped with bleach solution between seatings.

Local operating procedures (LOPs) should facilitate the closing of dormitories, yards, or entire facilities to incoming inmates during outbreaks of gastroenteritis and other communicable infectious disease such as varicella, tuberculosis, or scabies. Movement within the institution should also be limited as much as possible. This includes bed moves, visiting, religious meetings, mental health groups, art and music programs, hobby shop, and inmate canteen. All non-essential inmate work should be temporarily suspended. The only inmates who should be allowed to work are those who have been symptom free for at least 48 hours. Food handlers should be monitored to ensure that they perform frequent hand hygiene and appropriately use gloves. LOPs should also provide for the rapid screening and clearance of critical inmate workers. Plans should be in place to allow for the identification on short notice of alternate workers for food handling, laundry, and essential functions.

### Housecleaning and hand hygiene

During outbreaks of gastroenteritis, employees and inmates should be regularly reminded about the importance of frequent hand washing. Routine housecleaning efforts should be intensified, including the cleaning of walls, floors, table tops, handrails, sinks, toilets, and door knobs in day rooms, communal restrooms, dining facilities, and showers. In addition to environmental surfaces, medical and custodial equipment such as blood pressure cuffs, stethoscopes, and restraint gear should be routinely sanitized. Rapid response teams should be created to remove and disinfect spills of body fluids such as feces or vomit, especially in common areas. The body fluid should be removed, and the area disinfected by the application of a bleach solution for a minimum of ten minutes. After ten minutes, the excess solution should be wiped up. Mop buckets should be disinfected and mop heads cleaned or discarded after each episode of cleaning up a contaminated spill. Mops and other cleaning materials that are used for cleaning up spills should not be reused for routine cleaning in other areas. All mop heads should be changed and either laundered or discarded at least once daily. Housecleaners should utilize wear personal protective equipment to include masks, disposable gowns, and gloves.

Based upon studies of viral killing with other related calciviruses, chlorine bleach is the only disinfectant that is fully endorsed by the CDC for use against norovirus (see 101). Therefore, bleach-containing solutions should be used for surface cleaning and mopping. The solution should be mixed fresh each day utilizing 1 cup of bleach to 3 gallons of water. This disinfectant solution must be changed frequently to prevent dirt and organic materials from inactivating the activate disinfectants. The 101 Section provides directions for mixing bleach solutions. Unfortunately, bleach is caustic and could potentially be used in an assault. Additionally, bleach can be used to

change the color of inmate clothing and/or alter personal appearance by dying hair. For these reasons, it is important to work in advance with custody to develop procedures that allow for the safe use of bleach when it is legitimately necessary.

Inmates and employees should be encouraged to frequently wash their hands with soap and water, or an alcohol-based hand rub. Healthy inmates should be allowed access to the showers first, followed by those inmates who are ill. Showers should be cleaned and disinfected with bleach solution after being used by sick inmates.

### Education and communication

Educational efforts should be directed at inmates, employees, visitors, volunteers, and the public. The use of multiple teaching methods including handouts, overheads, in-house cable television channels, and posters is encouraged. Inmate peer educators can be a valuable resource, as can inmate advisory counsels, inmate family groups, and labor unions. Educational materials should be provided in multiple languages, and be written to accommodate those with low levels of literacy. Daily briefings should be provided to key medical and custody stakeholders. The public information officer should be prepared to communicate with the media and the surrounding community if called upon to do so.

### Tracking the outbreak

Tracking of all individuals (inmates and employees) greatly facilitates the management of outbreaks of viral gastroenteritis and other communicable conditions. Each day, a list should be updated with essential information to include at least the inmate name, number, housing, date symptoms began and ended, date of confinement to quarters and release, date specimens collected, and results of specimens. This information should be collated each day into a new updated report that can be shared with key outbreak managers (see Table 3). Each day, a nursing team should conduct face-to-face evaluations of any inmates who are experiencing symptoms consistent with gastroenteritis. This is to include new cases and those who are confined to quarters. Nursing staff should carefully monitor these individuals, and rapidly bring them to medical attention if they require additional medical intervention such as intravenous fluid replacement.

### Conclusions

Outbreaks of gastroenteritis commonly occur in congregate living environments such as jails and prisons. Most of these outbreaks are due to viruses, with noroviruses being the most common etiology. Gastroenteritis outbreaks can result in a large number of sick inmates and employees, significant morbidity, and major disruption to normal programming. A coordinated response involving on-site medical and custody staff, augmented as needed by local, county, and state public health resources, can be quite effective in mitigating the impacts of gastroenteritis outbreaks. Jail and prison administrators would be prudent to establish policies and procedures in advance of these outbreaks to help facilitate the best possible outcome.



**CONTROL OF VIRAL GASTROENTERITIS...**  
(continued from page 3)**Table 1:**

Reported and estimated illnesses, frequency of food-borne transmission, and hospitalizations for known food-borne pathogens, United States- 2004

ORGANISM	ESTIMATED TOTAL CASES	% FOOD-BORNE	HOSPITALIZATION RATE
<b>VIRUSES</b>			
Norwalk-like viruses	23,000,000	40	N/A
Rotavirus	3,900,000	1	N/A
Astrovirus	3,900,000	1	N/A
Hepatitis A	83,391	5	0.130
<b>BACTERIA</b>			
Campylobacter spp	2,453,926	80	0.102
Salmonella, non-typhoidal	1,412,498	95	0.221
Shigella spp.	448,240	20	0.139
Clostridium perfringens	248,520	100	0.003
Yersinia enterocolitica	96,368	90	0.242
Escherichia coli O157:H7	73,480	85	0.295
<b>PARASITES</b>			
Giardia lamblia	2,000,000	10	N/A
Cryptosporidium parvum	300,000	10	0.150

Source: Modified from *Diagnosis and Management of Food-borne Illnesses: A Primer for Physicians and Other Health Care Professionals*. MMWR 2004; 53 (No. RR-4)**Table 2:** The Kaplan Criteria for determining whether an outbreak of gastroenteritis is of viral origin

Stool cultures negative for bacterial pathogens
Mean (or median) duration of illness - 12-60 hours
Vomiting in greater than or equal to 50 percent of cases
Mean (or median) incubation period (if known) of 24-48 hours

Continued on page 5

## CONTROL OF VIRAL GASTROENTERITIS... (continued from page 3)

### References

- Mounts AW, Holman RC, Clarke MJ, et al. Trends in hospitalizations associated with gastroenteritis among adults in the United States, 1979–1995. *Epidemiol Infect* 1999; 123:1–8.
- Tauxe RW, Wauters G, Goossens V, et al. *Yersinia enterocolitica* infections and pork: the missing link. *Lancet* 1987; 1: 1129–32
- Istre GR, Blaser MJ, Shillam P, et al. *Campylobacter enteritis* associated with undercooked barbecued chicken. *Am J Public Health* 1984; 74: 1265–7
- Escherichia coli* O157:H7 infections associated with eating a nationally distributed commercial brand of ground beef patties and burgers- Colorado, 1997. *MMWR* 1997; 46: 777–8
- Headrick ML, Korangy S, Bean, N. The epidemiology of raw milk-associated food-borne disease outbreaks in the United States, 1973 through 1992. *Am J Public Health* 1998; 88: 1219–21
- Hilborn ED, Mshar PA, Fiorentino TR, et al. An outbreak of *Escherichia Coli* O157:H7 infections and haemolytic uremic syndrome associated with consumption of unpasteurized apple cider. *Epidemiol Infect* 2000; 124: 31–6
- Outbreaks of *Escherichia coli* O157:H7 infection and cryptosporidiosis associated with drinking unpasteurized apple cider-Connecticut and New York, October 1996. *MMWR* 1997; 46:4–8
- Ongoing Multistate Outbreak of *Escherichia coli* serotype O157:H7 Infections associated with consumption of fresh spinach - United States. *MMWR* 2006; 55: 1–2
- Outbreaks of *Salmonella* serotype enteritidis infection associated with eating raw or undercooked shell eggs- United States 1996–1998. *MMWR* 2000; 49: 73–9
- Herwaldt BL, Ackers ML. An outbreak in 1996 of cyclosporiasis associated with imported raspberries. The *Cyclospora Working Group* [see comments]. *N Engl J Med* 1997; 336:1548–56
- Hepatitis A outbreak associated with green onions at a restaurant, Monaca, Pennsylvania, 2003. *MMWR* 2003; 52:115–7
- Outbreak of *Salmonella* serotype Enteritidis infections associated with raw almonds-United States and Canada, 2003–2004. *MMWR Morb Mortal Wkly Rep.* 2004 Jun 11; 53(22): 484–7
- Multistate outbreaks of *Salmonella* serotype Poona infections associated with eating cantaloupe from Mexico-United States and Canada, 2000–2002. *MMWR Morb Mortal Wkly Rep.* 2002 Nov 22; 51(46): 1044–7
- A multistate outbreak of *Salmonella enterica* serotype Baildon associated with domestic raw tomatoes. *Emerg Infect Dis.* 2001 Nov–Dec; 7(6): 1046–8
- Outbreak of listeriosis associated with homemade Mexican-style cheese-North Carolina, October 2000–January 2001. *MMWR Morb Mortal Wkly Rep.* 2001 Jul 6; 50(26): 560–2
- Desenclos J, Klontz KC, Wilder MH, et al. A multistate outbreak of hepatitis A caused by the consumption of raw oysters. *Am J Public Health* 1991; 81: 1268–72
- Adler JL, Zickl R. Winter vomiting disease. *J Infect Dis* 1969; 119:668–73
- Thornhill TS, Kalica AR, Wyatt RG, et al. Pattern of shedding of the Norwalk particles in stools during experimentally induced gastroenteritis in volunteers as determined by immune electron microscopy. *J Infect Dis* 1975; 132:28–34
- Graham DY, Jiang X, Tanaka T, et al. Norwalk virus infection of volunteers: new insights based on improved assays. *J Infect Dis* 1994; 170:34–43
- Okhuysen PC, Jiang Xi, Ye L, Johnson PC, et al. Viral shedding and fecal IgA response after Norwalk virus infection. *J Infect Dis* 1995; 171:566–9
- Kapikian AZ, Estes MK, Chanock RM. Norwalk group of viruses. In: Fields BN, Knipe DM, Howley PM, eds. *Fields virology*. 3rd ed. Philadelphia, PA: Lippincott-Raven, 1996; 783–810
- Keswick BH, Satterwhite TK, Johnson PC, et al. Inactivation of Norwalk virus in drinking water by chlorine. *Appl Environ Microbiol* 1985; 50:261–4
- Atmar RL, Estes MK. Diagnosis of noncultivable gastroenteritis viruses, the human caliciviruses. *Clin Micro Rev.* 2001; 14(1):15–37
- Brinker JP, Blacklow NR, Estes MK, et al. Detection of Norwalk virus and other genogroup 1 human caliciviruses by a monoclonal antibody, recombinant antigen-based immuno globulin M capture enzyme immunoassay. *J Clin Micro.* 1998; 36(4):1064–1069
- Yuen LKW, Catton MG, Cox BJ, et al. Heminested multiplex reverse transcription-PCR for detection and differentiation of Norwalk-like virus genogroups 1 and 2 in fecal samples. *J Clin Microbiol.* 2001; 39(7):2690–2694.
- Kaplan JE, Feldman R, Campbell DS, et al. The frequency of a Norwalk-like pattern of illness in outbreaks of acute gastroenteritis *Am J Public Health.* 1982; 72(12):1329–32

### Additional Resources

- CDC MMWR: "Norwalk-Like Viruses" Public Consequences and Outbreak Management. June 1, 2001. Vol. 50, No RR-9. <http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5009a1.htm>
- Recommendations for the Prevention and Control of Viral Gastroenteritis Outbreaks in California Long-Term Care Facilities (CDHS, October 2006) [http://www.dhs.ca.gov/ps/dcdc/dsb/pdf/PCofGE0900\\_ms.pdf](http://www.dhs.ca.gov/ps/dcdc/dsb/pdf/PCofGE0900_ms.pdf)
- CDC: Viral Gastroenteritis (Fact sheet in English and Spanish) <http://www.cdc.gov/ncidod/dvrd/revb/gastro/faq.htm>
- CDC: Norovirus: Q&A <http://www.cdc.gov/ncidod/dvrd/revb/gastro/norovirus-qa.htm>
- Norovirus: Food handlers. <http://www.cdc.gov/ncidod/dvrd/revb/gastro/norovirus-foodhandlers.htm>
- Diagnosis and Management of Food-borne Illnesses: A Primer for Physicians and Other Health Care Professionals. *MMWR* 2004; 53 (No. RR-4)

## RESOURCES

### CDC's Norovirus (Viral Gastroenteritis) Website

<http://www.cdc.gov/ncidod/dvrd/revb/gastro/norovirus.htm>

### CDC's Norovirus in Healthcare Facilities Fact Sheet

[http://www.cdc.gov/ncidod/dhqp/id\\_norovirusFS.html](http://www.cdc.gov/ncidod/dhqp/id_norovirusFS.html)

### Norovirus Activity --- United States, 2006—2007

CDC. *MMWR* August 24, 2007; 56(33):842–46. <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5633a2.htm>

### Department of Health and Human Services 2007 Adult and Adolescent Antiretroviral Treatment Guidelines

<http://aidsinfo.nih.gov/Guidelines/Default.aspx?MenuItem=Guidelines>

### International AIDS Society-USA Panel

2006 Recommendations of the Treatment for Adult HIV Infection <http://jama.ama-assn.org/cgi/content/full/296/7/827>

### National HIV/AIDS Clinician's Consultation Center Warmline: National HIV Telephone Consultation Services

1-800-933-3413

### PEPLINE: National Clinician's Post-Exposure Prophylaxis Hotline

1-888-448-4911

### Perinatal Hotline: National Perinatal HIV Consultation and Referral Services

1-888-448-8765

### CDC's Correctional Health Website

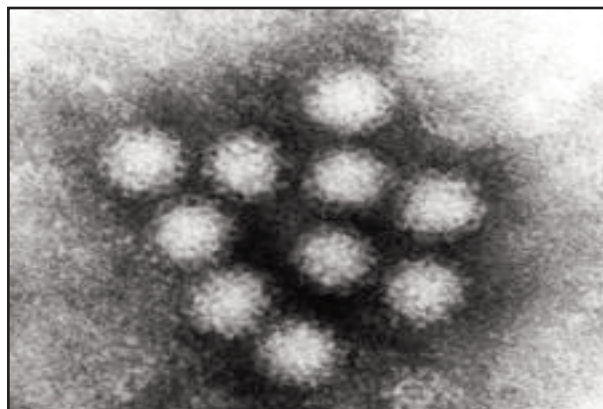
<http://www.cdc.gov/correctionalhealth/>

### American Correctional Health Services Organization

<http://www.achsa.org/index.cfm>

### American Academy of HIV Medicine

<http://www.aahivm.org/>



Transmission electron micrograph of noroviruses. The bar = 50 nm

Source: F.P. Williams, U.S. EPA



**101: Preparation of Bleach Disinfectant Solutions**

		Desired Chlorine Concentration		
		500 ppm (0.05%)	1000 ppm (0.1%)	1000 ppm (0.5%)
Dilutions of standard (5.25%) bleach prepared fresh for use within 24 hours	Bleach/water	1:100	1:50	1:10
	Preparation	2 1/2 tablespoons (1/6 cup) bleach in a gallon of water	5 tablespoons (1/3 cup) bleach in a gallon of water	25 tablespoon (1 2/3 cup) bleach in a gallon of water
Dilutions of standard (5.25%) bleach prepared fresh for use within 24 hours	Bleach/water	1:50	1:25	1:5
	Preparation	5 tablespoons (1/3 cup) bleach in a gallon of water	10 tablespoons (2/3 cup) bleach in a gallon of water	50 tablespoons (3 1/3 cup) bleach in a gallon of water
"Ultra" concentrations of bleach contain 6-7.35% hypochlorite and are not recommended to avoid producing higher than intended concentrations of chlorine.				

**NEWS AND LITERATURE REVIEWS****48-Week raltegravir Data Confirm Salvage Safety, Potency, and Tolerability**

Raltegravir (Isentress) is the first FDA approved medication in a new class of HIV drugs called integrase inhibitors. raltegravir is approved for use in combination with other agents in patients who have developed resistance to other antiretroviral therapy.

The efficacy and safety of raltegravir is being evaluated in two ongoing phase III, randomized, double-blind, placebo-controlled trials (BENCHMRK 1 and 2). At entry, all patients were failing treatment and demonstrated resistance to three classes of antiretroviral therapy. The 3 primary endpoints for both studies are changes in CD4 count from baseline, percentage of participants with viral load reduction to <400 copies/ml, and percentage of participants with viral load reduction to <50 copies/ml.

Interim analyses at 16 and 24 weeks demonstrated that raltegravir produced superior efficacy compared with placebo in all 3 endpoints. Approximately 75% of study participants experienced a decrease in HIV viral load to <400, and approximately 60% reached a viral load of <50. On average, CD4 counts increased by 80/mm<sup>3</sup>.

More recently, combined 48 week data from BENCHMRK 1 and 2 was presented at the 15th Conference on Retroviruses and Opportunistic Infections (CROI) (Cooper et al, poster #788). The 48 week data demonstrated that the response rates exhibited at weeks 16 and 24 have been maintained to 48 weeks. Encouragingly, this agent has shown benefit even in a significant number of patients who have low CD4 counts, highly resistant virus, and viral loads >100,000.

Of note, approximately 45% of patients who had no other active agents in the optimized background therapy (as assessed by genotype and phenotype) maintained <50 copies/ml at 48 weeks. Although this response in highly resistant patients is encouraging, every effort should still be made to utilize raltegravir in combination with at least one other fully active agent. raltegravir has been very well tolerated, on par with placebo. Thusfar, treatment with raltegravir has not lead to cross resistance to other approved antiretroviral agents.

Data was also presented at CROI regarding the substitution of raltegravir for efavirtide (Fuzeon) in patients who have an undetectable viral load. (Harris et al, Abstr. 99). Although this study involved only 29 patients with a maximal follow-up of only 4 months, all patients maintained an undetectable HIV viral load. If confirmed by further data, this may provide a useful option for those patients who are unwilling or unable to continue with a Fuzeon based regimen.

*Mascolini, Mark. 15th Conference on Retroviruses and Opportunistic Infections, Boston, February 3-6 2008.*

**California Governor Requests \$7 Billion for Prison Health Care**

In 2001, a class action law suit was brought against the State of California over the quality of medical care in the state's 33-prison system. The court found that the care was a violation of the Eighth Amendment of the U.S. Constitution, which forbids cruel and unusual punishment of the incarcerated.

The state settled the suit in 2002, agreeing to a range of remedies that would bring prison medical care in line with constitutional standards. However, the court ruled that the state failed to comply with the settlement, and therefore established a Receivership in June 2005. This Receivership has full authority to manage medical care operations in the prison system.

In his 2008/2009 budget, California Governor Arnold Schwarzenegger has requested an additional \$7 billion for building and upgrading prison medical and mental health care facilities. Most of the \$7 billion Schwarzenegger is requesting would be borrowed. This request is in addition to \$7.4 billion in bonds voters approved last year to pay for prison and jail construction, and comes at a time that California is wrestling with a projected budget deficit of \$16 billion.

"Medical facilities, when they exist at all, are in an abysmal state of disrepair. Basic medical equipment is often not available," CDCR Receiver Clarke Kelso said in a strategic plan he released last month. "Indeed, it is a misnomer to call the existing chaos a 'medical delivery system'—it is more an act of desperation than a system."

*Don Thompson. Associated Press Writer; San Jose Mercury News; California Prison Health Care Receivership Corp, <http://www.cprinc.org/about.htm>*

**Trials of NIH HIV Vaccine Candidate Scaled Down After Failure of Merck Vaccine**

In September 2007, Merck abruptly halted a large-scale clinical trial of its candidate HIV vaccine after initial analysis suggested that the vaccine not only failed to prevent HIV infection in participants or delay the virus's progression to AIDS, but might have made some participants more susceptible to HIV infection. Subsequently, the NIH has announced that it will significantly scale down its trials of the PAVE-100 HIV vaccine from the original proposal.

The vaccine candidate uses a combination of the cold virus adenovirus-5 and DNA in order to stimulate cells to produce proteins that will generate an immune response against HIV. Merck researchers found that individuals who had a high baseline immunity to adenovirus-5 were at an increased risk of contracting HIV.



## SAVE THE DATES

### 2008 National Health Care for the Homeless Conference and Policy Symposium

Phoenix, AZ  
Country: United States  
June 11-14, 2008  
Visit: <http://www.nhchc.org/2008conference/2008conference.html>

### Tuberculosis Intensive - Seattle

Seattle, WA  
June 19-20, 2008  
Visit: [http://www.nationaltbcenter.edu/training/tb\\_intensive.cfm](http://www.nationaltbcenter.edu/training/tb_intensive.cfm)

### 2008 Viral Hepatitis Health Leadership Summit

Baltimore, MD  
June 20, 2008  
Visit: <http://www.hepfi.org/>

### TB Nurse Case Management

Albuquerque, NM  
July 22-23, 2008  
Visit: <http://www.heartlandntbc.org/training.asp>

### XVII International AIDS Conference (AIDS 2008)

Centro Banamex Convention and Business Centre  
Mexico City, Mexico  
August 3-8, 2008  
Visit: <http://www.aids2008.org/>

### American Correctional Association - 138th Congress of Correction

New Orleans, Louisiana  
August 8-13, 2008  
Visit: <http://www.aca.org/conferences/summer08/home.asp>

### The 48th Annual ICAAC/IDSA 46th Annual Meeting

Washington, DC  
October 25-28, 2008  
Visit: <http://www.icaacidsa2008.org/>

### Correctional Mental Health Seminar

Las Vegas, NV  
July 13-14, 2008  
Visit: <http://www.ncchc.org/education/mental/index.html>

### National Conference on Correctional Health Care

Chicago, IL  
October 18-22, 2008  
Visit: <http://www.ncchc.org/education/national2008.html>

### Trials of NIH HIV Vaccine Candidate Scaled Down After Failure of Merck Vaccine... (continued from page 3)

Anthony Fauci, director of NIH's National Institute of Allergy and Infectious Diseases, has announced that future trials of the candidate vaccine will not include anyone who has a high immunity to the cold adenovirus-5, so as to minimize risk of HIV-infection to the trial's participants. As part of the scale down, the trial will only include 2,000 participants from Africa and the U.S., a marked decrease from the original 8,500 planned participants. The trial will require that male participants be circumcised, a practice that has recently been found to reduce risk of HIV-infection in men.

The International AIDS Vaccine Initiative, however, has announced plans to withdraw from the planned trials. The group had intended to enroll 1,000 African participants in the trial, but has stated that the new trial is "a safety unknown" given the general lack of "clear understanding of why" the Merck vaccine candidate failed. Similarly, many researchers have questioned new HIV vaccine trials in the wake of the unanticipated failure of the Merck vaccine.

*Kaiser Daily HIV/AIDS Report. Trials of NIH HIV Vaccine Candidate Scaled Down After Failure of Merck. March 25, 2008. [http://www.kaisernetwork.org/Daily\\_reports/rep\\_index.cfm?DR\\_ID=51109](http://www.kaisernetwork.org/Daily_reports/rep_index.cfm?DR_ID=51109)*

### HPV in Heterosexuals, Prevalence and Factors Associated with Anal Lesions Mediated by HPV in Men with HIV/AIDS

Researchers at the University Hospital in Pernambuco, Brazil are investigating the relationship between human papillomavirus and anal lesions in men who are HIV-positive. Such co-infections with HIV and HPV are relatively widespread, as both are transmitted through sexual contact. Persons who are co-infected with these viruses stand a greater likelihood of having premalignant and malignant anogenital lesions due to HIV's compromising effect on the immune system. While antiretroviral therapy has been effective in reducing the prevalence of opportunistic infections in persons infected with HIV, such treatment has had little effect in preventing anogenital lesions.

In response to a lack of information in this field, researchers in northern Brazil developed a study population of sixty HIV-positive men who, on average, had been living with HIV-infection for 6.8 years. Approximately 88% of the men had been on highly active antiretroviral therapy for over six years. 43.3% of the study's participants were homosexual, while heterosexuals comprised 41.7% of the patients. The remaining 15.0% of the patients identified themselves as bisexual. Over 60% of all participants reported having had receptive anal intercourse, and all participants submitted to a series of diagnostic tests for anogenital lesions.

Anal lesions were found in 16.7% of patients according to anal cytology, 35.0% according to anoscopy under colposcopic vision, and 23.3% according to anal biopsy. Over 85% of patients with abnormal histology were homosexual or bisexuals and 78.6% of patients with anal lesions reported having had 10 or more same-sex partners during their lifetime. Interestingly, CD4 cell count, viral load, and use of antiretroviral therapy seemed to have little impact on anal biopsy results.

The results of this study call in to question the use of anal cytology as the sole screening test for anal lesions. Researchers suggest that the screening process also include anoscopy under colposcopic vision and biopsy as a means of preventing and diagnosing anal lesions in men co-infected with HIV and HPV. While a large portion of this study's participants were homosexual or bisexual men, it is important to note that HIV/HPV co-infected heterosexual men with no reported history of receptive anal intercourse can also be at risk for anal cancer.

*HPV in Heterosexuals. Prevalence and factors associated with anal lesions mediated by human papillomavirus in men with HIV/AIDS. H R Lacerda and R R Barros. International Journal of STD & AIDS 2008;19:192-96.*

### Is Jail Screening Associated With a Decrease in Chlamydia Positivity among Females Seeking Health Services at Community Clinics? San Francisco, 1997-2004

San Francisco's Jail Health Services has partnered with the Center for Disease Control and Prevention's Epidemic Intelligence Service in order to research how chlamydia screening and treatment programs in jails would impact chlamydia positivity among females attending neighborhood medical clinics.

Although chlamydia can lead to long-term health problems in women, including infertility and pelvic inflammatory disease, the infection is generally asymptomatic and can go undetected if a patient is not tested for it. Like most sexually transmitted infections (STIs), chlamydia disproportionately infects both incarcerated persons and ethnic and racial minorities. As such, programs to screen and treat adults entering jail for chlamydia might decrease chlamydia positivity in the neighborhoods where a substantial number of persons in jail usually reside.

In order to determine the impact of chlamydia screenings in jail on neighborhoods in San Francisco, researchers compared jail screening rates by neighborhood from 1997 to 2004 to chlamydia positivity in two neighborhood health clinics. Approximately 45% of eligible males and 38% of eligible females entering jail during the eight year evaluation period were tested for chlamydia, resulting in 6.1% positivity in males and 7.3% positivity among females. Of those inmates who tested positive for chlamydia, an estimated 81% were known to have received treatment for their infection. Testing for chlamydia was conducted at health Clinics O and S among females aged 15 to 25 years. Females tested at Clinic S were predominantly black and patients tended to reside in neighborhoods with jail testing density. In contrast, only a small percent of females tested at Clinic O were black and from neighborhoods with high jail testing density.

Chlamydia positivity at Clinic S decreased significantly over the evaluation period, from 16.1% in 1997 to 7.8% in 2004. In contrast, positivity remained constant at 4.7% in patients at Clinic O.

These results demonstrate that chlamydia screening in jail can have a significant impact on chlamydia positivity in the outside community. Moreover, chlamydia screening was widely accepted amongst persons entering jail and the vast majority of those who tested positive were able to be treated, despite the short length of jail stays. This study underscores both the feasibility and importance of STI screening in jail as incarceration represents an important opportunity to test and treat at-risk populations.

*Is Jail Screening Associated With a Decrease in Chlamydia Positivity among Females Seeking Health Services at Community Clinics? - San Francisco, 1997-2004. Barry, P et al. Sexually Transmitted Diseases. 2008;35(12).*

Compiled by Christine Devore

## SELF-ASSESSMENT TEST FOR CONTINUING MEDICAL EDUCATION CREDIT

This activity has been planned and implemented in accordance with the Essential Areas and Policies of the Accreditation Council for Continuing Medical Education through the joint sponsorship of Nova Southeastern University Health Professions Division, Inc. (NSU) and IDCR. NSU is accredited by the ACCME to provide continuing medical education for physicians.

Nova Southeastern University Health Professions Division designates this educational activity for a maximum of 1 AMA PRA Category 1 Credit™. The target audience for this educational program is physicians. Physicians should only claim credit commensurate with the extent of their participation in the activity. Statements of credit will be mailed within 6 to 8 weeks following the program.

**Objectives:**

- The learner will be able to describe the epidemiology, transmission, symptoms, and signs of noroviruses.
- The learner will be able to explain the most effective norovirus infection control and containment methods.
- The learner will be able to discuss useful ways to educate inmates, health care professionals, and administrative staff on the prevention and containment of noroviruses.

1. The major route of transmission for the noroviruses is person to person (fecal-oral) via hands contaminated with feces or emesis.

True or False

2. Which of the following is NOT a useful serologic indicator of acute norovirus infection:  
 A. The presence of IgG antibody to norovirus  
 B. The presence of virus-specific IgM antibodies  
 C. Rising antibody titers in paired acute and convalescent blood samples

3. Which of the following may be useful to prevent further transmission of the norovirus within a correctional institution  
 A. Temporarily suspending indoor group activities such as visitation, school, and religious services  
 B. Increasing hand washing of inmates and employees  
 C. Encouraging employees who are ill to stay away from the worksite until they have been without symptoms for 1 or 2 weeks  
 D. Both A and B

4. The use of bleach as a disinfectant should be discouraged because it has not been shown to be useful in killing noroviruses.

True or False

5. According to Table 2 which of the following is NOT a criteria for determining whether an outbreak of gastroenteritis is of viral origin  
 A. Mean or median of incubation period (if known) of 24-28 hours  
 B. Vomiting in less than 25% of cases  
 C. Stool cultures negative for bacterial pathogens  
 D. None of the above

### IDCR EVALUATION

*5 Excellent 4 Very Good 3 Fair 2 Poor 1 Very Poor*

1. Please evaluate the following sections with respect to:

	educational value	clarity
Main Article	5 4 3 2 1	5 4 3 2 1
In the News	5 4 3 2 1	5 4 3 2 1
Save the Dates	5 4 3 2 1	5 4 3 2 1

2. Do you feel that IDCR helps you in your work?

Why or why not?

3. What future topics should IDCR address?

4. How can IDCR be made more useful to you?

5. Do you have specific comments on this issue?

**In order to receive credit, participants must score at least a 75% on the post test and submit it along with the credit application and evaluation form to the address/fax number indicated. Statements of credit will be mailed within 4-6 weeks following the program.**

**Instructions:**

- Applications for credit will be accepted until June 30, 2009.
- Late applications will not be accepted.
- Please anticipate 4-6 weeks to receive your certificate.



Please print clearly as illegible applications will result in a delay.

Name: \_\_\_\_\_ Profession: \_\_\_\_\_

License #: \_\_\_\_\_ State of License: \_\_\_\_\_

Address: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_ Telephone: \_\_\_\_\_

**Please check which credit you are requesting**  ACCME or  Non Physicians

**I certify that I participated in IDCR monograph June 2008 Issue**

Please fill in the number of actual hours that you attended this activity.

Date of participation: \_\_\_\_\_

Number of Hours (max. 1): \_\_\_\_\_

Signature: \_\_\_\_\_

**Please Submit Completed Application to:**

Infectious Disease in Corrections Report  
 146 Clifford Street, Providence, RI 02903

or fax it to (401)272-7562